THE EFFECTS OF DEMOGRAPHIC CHANGE AND THE PRESENT CHALLENGES FOR HUMAN RESOURCE MANAGEMENT IN GERMAN LOCAL AUTHORITIES IN RELATION TO WORKFORCE PLANNING TO FACILITATE THE MANAGEMENT OF KNOWLEDGE

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I first became interested in the topics of Human Resources and managing knowledge more than eight years ago. My special focus on the public sector is due to personal experience; I completed my training and education in the civil service, and spent almost ten years working in a local authority administration. In Germany, the current effects of demographic change are becoming ever more noticeable, and many new strategies are being discussed in HR management. However, there is currently a lack of ideas that take this new process of change into account. The present study is aimed at addressing this gap and at providing both a theoretical account of the current changes and practical plans and strategies for its management in German local authorities.

I would like to thank all those who supported, inspired and motivated me during the process of writing this thesis. Completing a scientific investigation like this one requires the support of many additional people behind the scenes.

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Dana Noack
Abstract

Demographic change has been an urgent current topic in Germany for some time. The aim of the present research was to determine how demographic change is affecting HR management and managing knowledge as one key element of HRM in German public administration. The important questions are whether current working methods are suitable for the changed situation, whether these methods can be improved through new strategic directions or cultural changes, and what policies local authorities need to develop. The first part presents the most important existing theories in HR management and workforce planning with the instruments of an age structure analysis and managing knowledge. The study examines the effects of demographic change on these strategies and approaches. The second part presents the results of a quantitative survey. The following chapters discuss the results in the context of other comparable studies and the existing theoretical literature. Policy recommendations for German local authorities are offered, offering new insights beyond those from the existing literature. The results show that German local authorities are competing with the private sector for new trainees. The declining numbers of applications make this clear. This situation is made worse by a lack of strategic direction and a failure to acknowledge its link to demographic change. In order to develop a new strategic direction, it is important first to put in place an age structure analysis in order to accurately estimate future resource demands. The results suggest that larger local authorities are better placed to meet these challenges. It is therefore recommended that local authorities undergo a restructuring involving mergers or collaborations among currently separate local authorities. This will enable those authorities to better implement a new strategic direction for HR management with its key element of managing knowledge.

This study is of interest both for HR managers in local authorities and for teachers and researchers in the field of HR management specialising in the public sector.
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Glossary of terms

BMI Bundesministerium des Innern (Federal Interior Ministry)
CEO Chief Executive Officer
DAQ Demografieaktive Qualifizierung in Kommunen und Kreisen (Demography-oriented training in local authorities)
DGFP Deutsche Gesellschaft für Personalführung e. V. (German Association for Personnel Management)
EDP Electronic Data Processing
e.g. for example
et al. et alii
EU European Union
F Factor
f-bb Forschungsinstitut Betriebliche Bildung (Research Institute for Managerial Training)
HR Human Resource
HRM Human Resource Management
IAB Institut für Arbeitsmarkt- und Berufsforschung (Institute for Employment Research)
INQA Initiative Neue Qualität der Arbeit (Initiative New Quality of Work)
IT Information Technology
IW Institut der Deutschen Wirtschaft (Institute for the German Economy)
KGSt Kommunale Gemeinschaftsstelle für Verwaltungsmanagement (Municipal Association for Administration Management)
n number of possible values
N size of population
NPM New Public Management
OECD Organisation for Economic Co-Operation and Development
p Probability Value
PC Personal Computer
Q Question
RP Research Proposition
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<td>UK</td>
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<td>VIF</td>
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Chapter 1 - Introduction

1.1 Background and Thematic Context

The future has many names:
For the weak, it means the unattainable.
For the fearful, it means the unknown.
For the courageous, it means opportunity.

(Victor Hugo, French writer 1802-1885)

Drawing on the quotation above, the work before you assesses the future of local authorities in Germany and how they are coming to terms with the effects of demographic change in relation to strategic workforce planning processes. The topic of research is ‘The effects of demographic change and the present challenges for human resource management in German local authorities in relation to workforce planning to facilitate the management of knowledge’. Demographic shift brings with it irreversible change, which local authorities have no choice but to address (Bossaert, Demmke and Moilanen, 2012). Human Resource Management (HRM) will be required to respond to demographic change with measures from the new fields of operation, among them strategic HRM, managing knowledge and age structure analysis (Preißing, 2010). There is a rapidly increasing volume of academic literature on the various specific topics. It has been established, however, that there is a gap in the research on the connections between, and the effects of, the various issues in the specific context of public administrations in Germany.

The present research addresses important current questions and issues confronting HR managers in German local authorities today. The research reviews the most recent theoretical literature and results from comparable studies. For local authorities in Germany, the present study represents the most up-to-date assessment of the key topic areas of demographic change, HR management and workforce planning to
facilitate the management of knowledge as a part of workforce planning, and the links between them.

Before beginning with the specialist aspects of the research topic, it is important to explain some of the basic facts about the organisation of public administration in Germany, as this is necessary to understanding the selection of the study sample for the primary research.

The administrative structure of government is first divided into the federal and state levels. Directly under state-level administration are the regional authorities (‘Landesbehörden’), to which the local authorities are subordinate. The local authority level is in turn composed of towns with independent district status (‘kreisfreie Städte’), towns belonging to a local authority area (‘kreisangehörige Städte’) and local authorities with their member communities or rural districts (‘Landkreise’) (Bogumil and Jann, 2005). These authorities represent “the units of the lowest geographical level of government administration” (Freiling and Geldermann, 2011, p. 5). This study adopts Freiling and Geldermann’s (2011) definition of local authority, therefore taking it as the population of interest. Diagram 1 shows the structure of local government in Germany as an example.
The diagram displays a selection of federal states and rural districts and gives a graphical impression of government administrative structure in Germany. The state of Brandenburg is divided into a total of 14 rural districts, though the diagram shows only five for illustrative purposes. Rural districts (the example shown here is Teltow-Fläming), are in turn divided into municipalities. Ludwigsfelde, Luckenwalde, Zossen and Blankenfelde-Mahlow are, according to estimates by the federal bureau of statistics, municipalities with more than 15 000 inhabitants. According to Bogumil and Jann (2005), local authorities are by constitutional law considered to be part of their respective federal states, although article 28 of the constitution guarantees them the right to autonomous management. The federal states retain the right of supervision and of direction. Administrative and legal control rests with the rural districts. Within the scope of their autonomy, local authorities have final authority in organisation, human resources, finance, planning, bylaws, land use and contracting. The rural districts retain authority in higher-level matters in order to guarantee all of their inhabitants an equal quality of
life. Remaining with the example of Brandenburg, under article 122 of the state constitution (Germany. Kommunalverfassung des Landes Brandenburg, 2007) the rural districts are responsible for:

Ensuring the effectiveness of their respective municipalities and for discharging public duties that go beyond the functions of municipal offices, as far as is not stated otherwise in law and as far as these duties are not already discharged by the action of local authorities in cooperation with each other. The rural district supports its respective municipalities and their offices in the fulfilment of their duties, complementing through its action the autonomy of the municipalities and their offices and contributes to a fair balancing of the different demands made on the municipalities and their offices. In particular, the rural district promotes the economic, environmental, social and cultural development of its territory to the benefit of the inhabitants. (Germany, Kommunalverfassung des Landes Brandenburg, 2007, Article 122).

Included in these responsibilities are local public transport, emergency services, waste disposal, vehicle licensing, food standards, etc.

Article 3 of the Brandenburg municipalities charter (Germany. Kommunalverfassung des Landes Brandenburg, 2007) regulates the responsibilities of the municipalities. A distinction is drawn between matters of responsibility and matters of autonomy. Matters of responsibility are those that involve fulfilling a given duty, such as managing passports and registration. Matters of autonomy, according to Bogumil and Jann (2005, p. 82), are responsibilities "in the fields of internal management and general government, social, health and economic services, transport and public buildings". Thus the municipalities must secure the upkeep of public services. Alongside their compulsory responsibilities, municipalities may also opt to provide additional services (e.g. swimming pools, theatres, libraries), depending upon the state of their finances.
The term 'local authority' is used as an overarching term for the rural districts, local municipalities and towns, although it is not a term that is used in the constitution. On the basis of the respective laws, the responsibilities of these entities were set out separately. Since cities with populations in the millions as well as tiny villages with fewer than 100 inhabitants can both find themselves included in this broad, overarching category, a clear distinction between categories of local authority was made when selecting the sample.

1.2 The Research Problem and The Author's Motivation

The quotation cited at the outset shows that the coming challenges should be viewed as opportunities and as new fields of operation. In order to communicate this opportunity clearly to local authorities, it is necessary to present a clear, concrete picture of the effects of demographic change for local authority administrators. This is the aim of the present research. Demographic change in Germany is producing fundamental changes in the public sector. Two key areas that are affected are recruitment and knowledge preservation. If HR managers do not address these issues, staff shortages may result, leading to inefficient working methods. In the extreme case, this can even lead to delays or cancellations of service provision. The following analyses and discussions address these problems. Important aspects of the study include recommendations for future HR management policies, restructuring local authorities, close collaborations between groups of local authorities and an analysis of path dependence. An investigation of these topics is necessary in order to identify policy solutions. In the following section, a short summary presents the problem and relevant findings from the literature.

In September 2011 an article in the Wirtschaftswoche (Employment Weekly) stated that Germany had indeed managed to reduce unemployment rates, in spite of the effects of the financial crisis. The chief editor of the same newspaper claimed there won’t be a shortage of available positions in Germany, but rather a shortage of education
and training, which will increasingly develop into a production factor (Methfessel, 2011).

According to Methfessel (2011a), the labour supply decreased by 70,000 workers in 2011 and, throughout Germany, companies are in search of skilled personnel. Scholz (2006) has looked ahead towards the coming 40 years and predicts a decrease in labour supply from 40 million down to 25 million persons in active employment. In particular, the civil service faces the problem of a large number of retiring employees compared to a small number of potential new recruits (Markus, 2011).

Businesses must prepare themselves for this reality as quickly as possible and invest in retaining and expanding their existing knowledge base, all as part of an education and training offensive. Furthermore, Germany is a country lacking in natural resources, with the result that knowledge could become the central resource for stimulating economic growth and wealth (Schneider, 2011). In addition, Scholz (2006) maintains that no one can dispute the importance of education – and, as a consequence, also employee training – as a decisive factor in Germany’s future.

There are three components that comprise the background to this work:

- demographic change and its predicted implications
- the resulting new challenges in HRM that arise
- and, explicitly in this context, workforce planning to facilitate better knowledge retention and transfer.

The author’s personal motivation for dealing with the three relevant fields stems from the fact that there is currently much discussion about demographic change and its effects but this does not mean that it is has become embedded in the consciousness of local administration. The object of research is, for this author, subjective, in view of the ten years she spent as an employee in a local administration and, furthermore,
eight additional years spent at an institute for further education which offers seminars for civil service employees. The institute offers, among other things, seminars on demographic change and knowledge retention. However, the level of interest in these is low. One concludes from this that the burning nature of the topic is lost on many. This is the point from which the author’s interest in the topic began to develop, an interest that was furthered as a result of discussions with numerous officers in the field in question. It is the author’s wish to find out what employee age structures in authorities look like and whether measures for knowledge retention are being put in place and supported.

As a result of the intensive, nation-wide contact with local authorities in Germany and an abundance of available literature (albeit not in the context of the three topics dealt with here), there is a proportionate level of access to relevant materials and to the relevant authorities for this study. The benefit of this empirical study lies in the practical significance of the anticipated results for HR managers and department heads in local authorities, in addition to the academic contribution made to the subject of research. Along these lines, the author wishes to conclude her aspects of motivation with the following quotation: “Germany will change from the ground up. Because for decades, fewer children have been born than people have died. Because we keep getting older” (Kröhnert, Medicus and Klingholz, 2006, p. 2).

1.3 Conceptual Basis

This thesis is divided into two main parts. The first consists of a literature review, which assesses the most contemporary output on: demographics and workforce planning to facilitate the management of knowledge. The second section is devoted to the empirical study of the connected implications for selected local authorities in Germany.

Part I, Chapter 2 deals with the changing conditions that the present-day HR manager must deal with – conditions that are bringing about a defining change in the economic landscape. The concept of shifting
The next chapter then deals with the new challenges facing the field of HRM, whose task it will be to actively deal with the aforementioned changes. The tasks for training and development and HRM have always been of great significance in terms of an organisation’s efficiency and competitiveness. The responsibilities and challenges that lie in wait are, however, more complex than ever because people and labour must be assigned more significance as they increasingly become a company’s most valuable resource (Bouabba, 2010; Tatje, 2011; Stock-Homburg, 2008). In addition to the traditional tasks of personnel administration, HR managers have the extra responsibility of maintaining productivity by means of employing capable and qualified staff (Kröhnert, Medicus and Klingholz, 2006).

New strategies need to be developed as the widely-practiced youth-oriented HRM policy is no longer viable. In light of the skills shortage, senior staff can no longer simply be replaced by younger workers (Preißing, 2010). Jochmann (2006a) points to this in his description of the ‘War for Talent’. He explains that the HR manager will in future, alongside standard recruitment responsibilities, be required to carry out specific tasks in terms of sustaining employee loyalty and retaining company knowledge (Jochmann, 2006a). The assessment of the
Theoretical–conceptual approaches of workforce planning with respect to demographic change acts as a closing of the literature review.

The concept of workforce planning as a way to facilitate the management of knowledge assumes a central role in this thesis. Drucker (1993) has already drawn attention to this and sees in knowledge the single key resource of the future, while also identifying the significance of tacit knowledge. While contextual experience has been derived from the introduction of concepts to assist the management of knowledge within the economy, one must consider that in local administration it is not managers that take action but rather civil servants and employees. The concepts are not like for like and cannot be implemented as such. A strategy must be adapted to the dynamic of the administration before they are implemented by an HR manager (Edeling, Jann and Wagner, 2004).

This is where the challenge for HR lies in the coming years; workforce planning to facilitate the management of knowledge and HR development are very closely linked. It is the responsibility of HR development to avoid knowledge gaps resulting from employee retirement and to implement appropriate measures for passing on and utilising knowledge (Schüle, 2006).

The theoretical analyses in the first two chapters are intended to give an initial insight into the subject matter and to introduce current facts and data. Consequently, a summarised overview of the research topic ‘The effects of demographic change and the present challenges facing human resources management in German local authorities with regards to knowledge-retention’ will be presented. This topic is examined in Part II, by means of an empirical study. There is a necessary separation of the literature review from the empirical research here because the academic research always relates to the research propositions and assumptions.
The following table shows the most important conclusions of the literature review, as well as the research propositions derived from the review.

<table>
<thead>
<tr>
<th>Aim</th>
<th>To investigate the effects of demographic change and the present challenges for HRM in German local authorities in relation to workforce planning to facilitate the management of knowledge.</th>
</tr>
</thead>
</table>
| Key Issues 1 | • Declining population in Germany in relation to the world’s population  
• Ageing population and fewer applicants  
• Ageing workforce  
• New HRM tasks |
| Gap/weakness and objective | Demographic change is a current issue in Germany, but there is a lack of academic research looking explicitly at the effects on local authorities, particularly in terms of staff recruitment.  
Objective 1 is therefore to determine whether local authorities need to act and how they should act to recruit new trainees/employees. |
| Research proposition (RP) | RP1: That demographic change is hindering the acquisition of new junior employees. |
| Key Issues 2 | • Implementation of a strategic and resource-based HRM approach under consideration of UK/US models  
• New fields of operation like workforce planning  
• Strategic implementation of forward-thinking HR policy, taking into account supply and demand  
• Age structure analysis as a form of workforce planning  
• Importance of knowledge  
• Dimensions of knowledge  
• Knowledge blocks  
• Activities for knowledge preservation  
• Barriers  
• Competition for skilled labour  
• Improve employer attractiveness |
| Gap/Weakness and objective | It is first necessary to implement a workforce planning model in order to carry out strategic HR management measures that address the challenges posed by demographic change. More specifically, this requires both data analysis and managing knowledge. It is currently not standard practice in German local authorities to carry out a regular age structure analysis as a basis for workforce planning. Local authority managers are also not aware of the importance of managing knowledge.  
Basic principle: An age structure analysis is a precondition for the use of workforce planning tools. Managing knowledge must play a strategic role in this process.  
Objective 2 is therefore to determine whether an age structure analysis is a precondition for HRM tools. And to evaluate the strategic role of workforce planning to facilitate the management of knowledge and the specific and prerequisites of which it is composed. |
Table 1: Summary and derivation of research propositions (compiled by present author)

<table>
<thead>
<tr>
<th>Research propositions 2 to 6</th>
<th>RP2: That if an age structure analysis is in place in local authorities then it serves as a foundation for HR development.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RP3: That the effects of demographic change are positively associated with the deployment of instruments for HR development.</td>
<td></td>
</tr>
<tr>
<td>RP4: That there will be an influence from the demographic change on the strategic direction of training activities.</td>
<td></td>
</tr>
<tr>
<td>RP5: That there will be a number of separate processes that local German authorities will engage in with regard to knowledge sharing and preservation within the organisation.</td>
<td></td>
</tr>
<tr>
<td>RP6: That the implementation of workforce planning processes to facilitate the management of knowledge depends on how well HR managers understand the topic, the location and size of the local authority.</td>
<td></td>
</tr>
</tbody>
</table>

Part II begins with an explanation of the methodology used, in particular a description and categorisation of the research methods undertaken. In line with Hug and Porschenschnik (2010), an online questionnaire collection method was chosen as the means of gathering and processing data. A quantitative research method is used because research propositions are to be tested and facts are to contribute to an objective response. As such, the empirical facts are processed through statistical methods. The quantitative data, obtained through the use of a standardised survey, acts as a foundational basis for the statistical analysis and interpretation of the results (Hug and Porschenschnik, 2010). The survey in question is based mainly on closed questions and guarantees participants’ anonymity, so that there is no suggestion of a strategic approach to answering in the selected authorities.

The results of this study are presented and analysed in detail in Chapter 5. These are laid out in a variety of presentation forms and data is put forward in both statistical and diagrammatic form. Chapter 6 presents a conclusion that assesses the theoretical argumentation against the research results, demonstrating possible future courses of action for local authorities. The final chapter, chapter 7, reviews the findings of the study and discusses potential further studies and their likely results.
Part 1

Literature Review on the Subject of Demographic Change and the Related Challenges for HR Management and Workforce Planning to Facilitate the Management of Knowledge
Chapter 2 - Demographic Conditions in Germany

2.1 Initial Findings on the Topic of Demographic Change and the Corresponding Challenges for Recruitment

Bauer (2009, p. 11) argues that “In the 21st century, tackling demographic change is becoming a task vital to safeguarding our common future”. Following on from this statement, Germany is currently facing challenges that demographers have long drawn our attention to. The change began 30 years ago, when a significant decline in the German national birth rate was recorded. In 1990 Germany was in the worst position globally with respect to generation imbalance. It had the largest proportion of citizens over 65 and is today, alongside Italy and Japan, the country most severely impacted by demographic change (Jansen and Huchler, 2005a). Furthermore, demographers have been pointing to the severity of the possible effects for years. According to Walle et al. (2006), demographic change is a certainty – only the scale remains open to debate.

Demographic change is not, as mentioned at the outset, a new phenomenon. Buse (1979) dealt with the topic of population development and its potential problems over 30 years ago. But at that point in time politicians were still focused on the baby-boomer generation, as talk of future population developments took a back seat. Ordemann (1979) quotes a government statement in response to a question posed in 1977, whereby the federal government saw no cause for concern in the current demographic developments and believed that no problems of adjustment were present. The statement was, based on current evidence, misguided and in many political and social fields difficulties have indeed arisen.

Turning to Flöthmann (2004), demographic change is a process that continues for a period of 25 to 30 years and, according to Hummel (2006), leads to social problems in virtually all sectors.
The following image references the German Bundestag (Germany. Deutscher Bundestag, 2002) on the development of the average age of the German population. As can be seen, there is a consistent increase from 2000 until 2050 as a result of demographic change.

Figure 1: Average age of total population (Germany, Deutscher Bundestag, 2002, p. 34)

According to Germany. Bundesministerium für Wirtschaft und Energie (2014) demographic change is very different around the world. A few figures are useful here for comparison (see Table 2):
<table>
<thead>
<tr>
<th>Country</th>
<th>2013</th>
<th>2060</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>82.0</td>
<td>71.0</td>
</tr>
<tr>
<td>France</td>
<td>65.6</td>
<td>75.6</td>
</tr>
<tr>
<td>Denmark</td>
<td>5.6</td>
<td>6.54</td>
</tr>
<tr>
<td>Sweden</td>
<td>9.6</td>
<td>13.1</td>
</tr>
<tr>
<td>Japan</td>
<td>127.4</td>
<td>102.5</td>
</tr>
<tr>
<td>United States (US)</td>
<td>312.3</td>
<td>417.8</td>
</tr>
</tbody>
</table>

Table 2: Population forecasts (Germany. Bundesministerium für Wirtschaft und Energie, 2014, p. 25-31)

As is apparent from this figure, in the United States (US) the population will continue to grow. Muenz (2007) assumes that this will last until 2050. The population will also continue to grow in Africa and the Middle East. In these countries the median age is 20. The percentage of the European Union (EU) population in relevance to the world population will decline to 6% by 2050 (Wöhlcke, Höhn and Schmid, 2004). Wöhlcke et al. (2004) state that 97% of population growth will take place in developing countries.

This comparison of population forecasts shows that Germany will be particularly affected by demographic change. The general population forecast can be supplemented by a more detailed forecast for the working-age range from 20 to 65 years (see Tables 3 and 4).
<table>
<thead>
<tr>
<th>Year</th>
<th>Average population (upper bound) in millions of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>50</td>
</tr>
<tr>
<td>2020</td>
<td>48</td>
</tr>
<tr>
<td>2030</td>
<td>43</td>
</tr>
<tr>
<td>2040</td>
<td>40</td>
</tr>
<tr>
<td>2050</td>
<td>39</td>
</tr>
<tr>
<td>2060</td>
<td>36</td>
</tr>
</tbody>
</table>

Table 3: Change in German working-age population (Federal Bureau of Statistics, 2009, p. 18)

<table>
<thead>
<tr>
<th>Percentage proportion of people of working age by federal state in millions (‘000,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal state</td>
</tr>
<tr>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Baden-Württemberg</td>
</tr>
<tr>
<td>Bavaria</td>
</tr>
<tr>
<td>Berlin</td>
</tr>
<tr>
<td>Brandenburg</td>
</tr>
<tr>
<td>Bremen</td>
</tr>
<tr>
<td>Hamburg</td>
</tr>
<tr>
<td>Hesse</td>
</tr>
<tr>
<td>Mecklenburg-West Pomerania</td>
</tr>
<tr>
<td>Lower Saxony</td>
</tr>
<tr>
<td>North Rhine-Westphalia</td>
</tr>
<tr>
<td>Rhineland-Palatinate</td>
</tr>
<tr>
<td>Saarland</td>
</tr>
<tr>
<td>Saxony</td>
</tr>
<tr>
<td>Saxony-Anhalt</td>
</tr>
<tr>
<td>Schleswig-Holstein</td>
</tr>
<tr>
<td>Thuringia</td>
</tr>
<tr>
<td>Germany</td>
</tr>
</tbody>
</table>

Table 4: Percentage proportion of people of working age by German federal state (Federal and State Offices for Statistics, 2009, p. 15)
In addition to a graphical representation of demographic changes, Figure 2 shows projected changes in the size of the German labour force.

![Estimated development of number of employees in federal states 2005-2030 in %](image)

A study by the Robert Bosch Foundation (2009) highlights the changes in the public sector, where a decline in the under-55 age group of up to 6.3 million people is expected by 2030 (see Figures 3 and 4). This age group represents the aforementioned baby-boomer generation.
The initial findings shown here lead to the conclusion that demographic change in Germany is likely to be particularly severe when compared with other countries. Reductions in the numbers of working-age people, as well as the overall forecasts for the working population, therefore motivate an analysis of the structure of the working population and of HRM measures.
2.2 Demographics in the Broader Economic Context

Demography should not be analysed separately from other areas of research, but rather should be analysed in connection with fields such as statistics, economics and sociology. According to Höpflinger (1997), the age distribution of the population is causally associated with these fields of research, and the shift in the ratio of young to old people also has an impact. Höpflinger (1997) stresses that in highly-developed societies, such as the German Federal Republic, the frequency of births continues to decrease while life expectancy rises. In a corporate context demographic change is, according to Kistler (2006), a universal issue affecting all industries and must be looked upon as a challenge. As such, the changes cannot be examined on separate research or business levels.

Population projections therefore have far-reaching effects on economic planning considerations. Fuchs (2002) addresses this topic in the context of labour force potential. He describes how 30 years ago the employment market was significantly shaped by unemployment but the focus has now shifted in the public debate, whereby discussion increasingly trends towards full employment and a skilled labour shortage. The difference between the last three decades is also an issue dealt with by Kröhntert, Medicus and Klingholz (2006), who state that the child population has fallen below the value necessary for stable, long-term population growth. The parental generation is becoming depleted and lags significantly behind on an international level, with a rate of 1.4 children per woman. The situation in the late 1950s cannot be compared to that of the present day because, as attested to by Paqué (2011), there will be no future baby-boomer generations. Indeed, statistics show that Germany has the lowest birth rate in the world in relation to population figures. In terms of numbers this means that “Germany today has only half as many children as it had 40 years ago […] At the same time the number of 60 year olds will increase by one third within 20 years” (Kröhntert, Medicus and Klingholz, 2006, p. 6). A functioning economy requires a population with a mixed age
distribution, otherwise demographic change can culminate in a social crisis.

The following scenarios are based on assumptions. It cannot be predicted with certainty whether they will occur as portrayed here, but nevertheless they illustrate a tendency which, in light of the current conditions, acts as a justifiable starting point.

2.3 Clarification of Terminology – Demography and Demographic Change

The word “demography” comes from the Ancient Greek words, “demos” (people) and “graphé” (to describe) (Joas, 2007). According to Günther (2010) demographics as an object of research consists of the: birth, life and death of a population.

The population, meanwhile, is “the totality of all people living at a certain point in time, in a certain place” (Günther, 2010, p. 4). Günther (2010) describes demographic change as a shift in demographic data, which is to say the structure and size of the population. Berger and Kahlert (2006, p. 9) continue along similar lines, describing the process as “change in the direction of an aging or even shrinking society”. This change can be represented in the form of an age pyramid which is continually losing its traditional pyramid structure; at present it more closely resembles a mushroom. The base, representing the birth rate, disintegrates while the summit, representing the older population, expands. The German Bundestag claimed in 2002 that the national population pyramid was standing on its head (Germany. Deutscher Bundestag, 2002). A graphical representation of the two forms follows under Section 2.5.1.

Demographic change is therefore immediately apparent: the numbers of young people are falling and those of the elderly are climbing dramatically.
2.4 Causes of Demographic Change

According to Walla, Eggen and Lipinski (2006), the global population has increased by 4 billion since 1950. However, EU nations are an important exception to this trend; their populations are aging. By means of an example, in the year 2000 the world’s population stood at 6.1 billion, of which 82 million people were Germans. By 2050 it is expected that the global figure will reach 9 billion, with Germany’s population declining to 75 million and occupying last place among the 25 EU nations in absolute terms. Germany will also come in last place for comparative growth of labour force potential, which will have decreased by 13.4 million by 2050. According to Walla et al., this change had already begun around the turn of the new millennium – since that point in time there have been more 60 year olds than 20 year olds in Germany. The effect on labour force potential will become noticeable after 2020. The original pyramid-form of the age structure has changed due to the following factors (Bauer, 2009; Höpflinger, 1997):

• a fall in birth rate after the First World War
• a fall in birth rate during the Great Depression of the early 1930s
• a fall in birth rate after the Second World War
• a decrease in births caused by the introduction of birth control pills in the 1960s
• the political upheaval of 1989 to 1991 caused by the fall of the Berlin Wall.

The causes can be summarised – with reference to Bauer (2009), Höpflinger (1997) and Günther (2010) – in the three key words which have formed the basis of the coordinated population projection by the Federal Bureau of Statistics since 2003 and which furthermore constitute the factors that determine demographic development:

1. Fertility
2. Mortality
3. Migration
The decisive factor here is fertility, hence it is mentioned first. This denotes changes in birth rate. The level of births has immediate and long-term effects on the age structure of the population. As a result of the reunification of Germany in the years after the fall of the Berlin Wall the nation’s population was so uncertain about its future that between 1990 and 1994 the aggregate birth rate fell to 0.77. This is the lowest figure that has ever been recorded worldwide (Günther, 2010). The current birth rate is still insufficient and a figure of 2.1 births to every woman would be necessary to maintain the numbers of the current parental generation. It would then still take until 2080 to make good the birth deficit, even given the additional requirement that those children born would themselves go on to have more offspring (Birg, 2001).

In reality the current birth rate stands at 1.30 in the east of the country and 1.37 in the west; this means that the number of children born is decreasing by approximately 30% with every generation (Germany. Deutscher Bundestag, 2002). A birth surplus was last recorded in 1971 according to Priddat (2005). Additionally, immigration levels have been unable to balance out the surplus of deaths and the meagre birth rate since 2003; the German population has been shrinking ever since (Kröhnert, Medicus and Klingholz, 2006). The level necessary to maintain population numbers – and here the rates of the baby-boomer generation after the Second World War act as the reference point – accordingly, cannot be reached (Höpflinger, 1997).

The endemic decline in birth rates is clearly recognisable in an expected decrease in numbers of 20–60 year olds by 16 million and in the numbers of under-20s by 8 million in the period 1998 to 2050, at the same time as an increase in 10 million among those over 60 (Birg, 2009, p. 23).

The second cause is mortality, which refers to the number of deaths in relation to the total population. This number is decreasing as life expectancy continues to rise. An average life expectancy of 100 years is now predicted for new-borns in Germany. But alongside increasing
life expectancy comes a considerably improved health situation for the elderly. This human potential will be needed and must be taken advantage of. Nonetheless, Kröhnert, Medicus and Klingholz (2006) state that only 41% of men and 30% of women between the ages of 50 and 65 are in active employment. A re-evaluation on both the part of the employer and employee is necessary here. Lifelong learning and the utilisation of older employees' experience must become a core consideration.

Last in the list of causes of demographic change is migration: the emigration or immigration of the population out of or into an area. According to Günther (2010), migration can be distinguished as being of two types: within one country (internal migration) or across national borders (transnational immigration and emigration). Transnational immigration and emigration have a powerfully negative effect on a number of German states, particularly in the east of the country and, as already discussed, migration can no longer balance out the effects of demographic change (Birg, 2009). As reasons for migration, Günther (2010) cites work, humanitarian needs and other motivations. Birg's (2009) assessment that numbers of immigrants have been declining since 2001 can be confirmed. However, the current refugee crisis will completely transform the migration situation in Germany. No information is currently available on refugees' levels of qualification or how appropriate their skills are for the German labour market. It is also important that migrants be prepared to adapt to new cultures in order that they can integrate into the labour market (Stock-Homburg, 2008). This presents a new challenge for research institutions, the German Government and employers. As well as a challenge, however, it is also an opportunity to use migration to mitigate demographic change and to tap into additional labour and consumer potential (Günther, 2010).

The aforementioned causes bring with them severe changes, with ramifications for the country’s economic structure and employment market, resulting in new action areas in the field of HRM. HR managers must prepare for the changes ahead, taking the most current
developments in structural and economic trends into consideration (Günther, 2010). The next section deals in detail with the related consequences.

2.5 The Consequences of Demographic Change

The challenges presented by demographics always impact social and economic processes of change and never arise as single, isolated consequences, but rather as a series of different changes (Mäding, 2009). This is supported by the German Bundestag (Germany. Deutscher Bundestag, 2002, p. 12), which states that demographic change is a “challenge for every individual, every family, for society as a whole, the economy and the job market, for the social security systems as well as for the political world as a whole”. Nevertheless, according to Höpflinger (1997), these factors initially have only an indirect impact and are to be assessed separately.

These changes are so severe that, alongside quantitative changes, qualitative changes are also necessary, which are primarily reflected in the employment market. Of further consequence for the job market is that by 2040 half the nation’s population will be over 50 years of age (Germany. Deutscher Bundestag, 2002). The consequence of demographic change is thus the necessity of putting in place political-legal and economic structures which ensure future sustainability (Walle et al., 2006).

In the coming years a shift in political consciousness will take place. The subject of debate will not be unemployment but rather the shortage of labour. Turning to Methfessel (2011c), by 2030 the number of those in employment will decrease by 1.2 million and 6 million people will have left the labour force due to retirement. New conditions need to be created to cope with the shortage of skilled labour and increased life expectancy (Paqué, 2011).
The related consequences here are not solely negative. Demographic change can also represent opportunities. Tatje (2006), for example, maintains that better employment opportunities will arise for women because of the necessity of using their labour potential. Utilisation of senior workers’ experience-based knowledge will increasingly become a focus and their contribution will receive increased recognition. Businesses and public administrations will depend on the employability of these age groups. Recruitment practices that until now have been focused on a youth policy will turn their attention to older candidates. Companies will no longer be able to afford to grant early retirement due to the level of dependence on each and every employee.

2.5.1 Germany's age distribution

Sommer (2002) talks of a shift in Germany's age distribution. The age pyramid seen in Figure 5 will not assume such a form in the future. In 2050 the most sizeable age group will be that of the 60 year olds. This corresponds to those people who were born in and around 1990. The under-50 year olds will make up a smaller proportion of the age structure and the younger they are the smaller this proportion becomes. This weak parental generation will be continually followed by even weaker generations of children based on the assumed birth rate of 1.4 children to each mother.

The shifting nature of the population’s age structure is well demonstrated through the formation of age groupings. Sommer (2002) divides these as follows:

1. Population under 20 years of age.
2. Population between 20 and 60 years of age.
3. Population over 60.

For the purpose of this thesis, this division is used throughout the thesis and, thus, when reference is made to “the elderly” this relates to those people over 60 years of age. According to Sommer (2002), the group
referenced under point 1 still consisted of 17.4 million people in the year 2000; by 2050 the number will stand at 11.4 million. The second group made up the largest percentage of the population in 2000 at 55%, with 45.4 million people. This figure will, however, drop to 48% by 2050, with 33.4 million people. The last grouping amounted to 19.4 million in 2000; in 2050 this will be 25.2 million. As such, the only visible increase is to be found in the over 60 grouping. Sommer (2002) also ascertains that, in global terms, the average age in Germany is very high at 42.1 years. The worldwide figure stands at 27.9. In these terms it is justified to speak of an aging German population. Günther (2010, pp. 14, 26), alongside the aforementioned median age, puts forward the following facts:

- in 2050 there will be twice as many elderly people as young people
- in 2050 there will be two 65 year olds to every new born baby
- by 2050 the proportion of young people will have declined to 15%
- by 2050 the elderly population will double to 64%
- by 2050 the number of middle-aged people in employment will decline from 24 million to 17 million
- as soon as 2020, approximately every third person in employment will be over 50 years of age.

In this context Jansen, Priddat and Stein (2005, p. 7) put Germany forward as a global leader by three measures: the earliest onset of decreasing population, the highest proportion of childless adults in a single age group, and the strongest offset of population decline through immigration. Although the latest reports from the German Federal Office for Statistics (‘statistisches Bundesamt’) show that the birth rate is once again increasing in Germany (now 1.47 children), this increase comes too late to influence the current trend towards an ageing population (Destatis, 2015). The crucial part of the age distribution in Germany will not change for some time, and by the middle of the 2020s the average age will increase. HR managers therefore have only short- or mid-term
options for adapting their policies and tools to the coming change (see also Chapter 3 of this thesis) (Knittel, 2014).

In order to provide a complete graphical illustration of this age structure and to clarify the nature of the relevant shift, the age pyramids from the years 1980 and 2020 are compared in Figure 5.
Demographic change is a global problem, especially in Europe and Japan (Muenz, 2007; Tyers et al., 2012). It should be noted, first, that in the EU as a whole the population is still increasing, but that this growth is becoming noticeably slower (Robustillo et al., 2013). Germany and Italy are among the countries for whom it is only possible to sustain population growth through immigration. However, according to a publication by the European Institute of Public Administration (Bossaert, Demmke and Moilanen, 2012) all EU member states will be faced with sharp changes caused by demographic change. Bossaert, Demmke and Moilanen (2012) conclude that the public sector will also be affected by the ageing process more rapidly than the private sector. This argument is supported by the observation that the public sector employs more people from the baby-boomer generation, who will reach retirement in the next 10 years (Bossaert, Demmke and Moilanen, 2012). In 13 OECD (Organisation for the Economic Development)
countries more than 30% of civil servants will retire in the next 15 years, with Belgium the most affected country at 39% (Bossaert, Demmke and Moilanen, 2012). In the United Kingdom (UK), Moseley et al. (2008) claim there will also be a large decline in the number of children and young adults. Demographic changes will also be a challenge for local administrations and their HR managers in Greece (Sotirakou and Zeppou, 2004), Canada (Sands, 2012) and the US (Wolf and Amirkhanyan, 2010; Goodman, French and Battaglio, 2015).

In their conclusions, Kohler and Schmid (2012) establish that tackling demographic change in European member states is only possible through cooperation, and that the different traditions and institutions in labour relations should be taken into account. The integration of older workers into the labour market is a key condition for further economic and social development in the EU. Platzer (2012) argues that because of the differences in wealth the interdependencies in the EU must be assessed individually.

2.6 The Political Reaction to Demographic Change and the Challenges for Local Authorities

By means of an introduction to this section it should be stated that, according to Bauer (2009), the necessary upheaval is something that politicians are aware of; they are assessing the consequences of the unfolding developments. Topics that arise in the debate include the municipal action fields of:

[...] education, culture, medical treatment, provisions for children, teenagers/young adults and the elderly, infrastructure for energy and water supplies, for public transport and for sewage and waste disposal, in addition to considerations of city planning and urban development. (Bauer, 2009, p. 18)

In the context of future planning, these action areas must take into account the effects of fertility, mortality and migration levels as
described in chapter 2.4. The administrational challenges are relevant to all levels of the federal state structure. According to Mäding (2009, p. 35) the political reaction needs four components:

1. Provision of administrative services.
2. Provision of infrastructural services.
3. Labour market policy.
4. Population policy in the broader sense.

This is also supported by Esche and Schmidt (2004), who maintain that the topic of demographic change is entering the public psyche and that local authorities are competing against each other for residents.

This gives rise to action fields in the political domains of urban redevelopment, child and family politics, and accommodation for the elderly, as based on points one and two of the above. Local authorities must ask themselves how much administration is necessary for the future and how many personnel are needed to perform the relevant tasks.

The resulting challenges in forming a suitable political reaction fall under point 3, the employment market. This will come to the fore over the further course of this work. The fourth and final point is linked to three causes of demographic change, but the related possibilities in terms of political reaction and influence do not form part of this work.

As a consequence, it is essential that politicians react in those action areas mentioned here at the outset and develop sustainable concepts for the future. The next section goes into greater detail on this topic, assessing HR policy as one form of reaction.
2.6.1 HR policy as a reaction to current demographic developments

In relevance to Borstel and Vitzthum (2010) and Niederstedt (2011), the effects of the falling German birth rate are so severe that by 2030 the country’s labour force potential will have dropped by as much as 6 million people. Fischer, Losse and Schmidt (2011) share this view and describe in an article on federal state rankings in Germany how the skilled personnel shortage is a nationwide problem.

The professional journal *Innovative Administration* (Innovative Verwaltung) has also addressed the issue of demographic effects on HRM in local authorities. Here Tatje (2011) claims that local administration must adapt to the changing landscape with a strong focus on HR development. This is because the trends that are important to commercial enterprises also affect public administration. The workforce is clearly growing older and, with that, it becomes more challenging for HRM to acquire young, qualified workers. Tatje (2011) states here that German local authorities have unfortunately not undertaken the necessary preparations and, furthermore, they are unaware of the gravity of the situation. They do admittedly see demographic change “as an important action field […] but there is a considerable lack of strategic concepts developed to deal with demographic developments” (Tatje, 2001, p. 29).

Of great necessity here is a pro-active approach on the part of HRM, which must apply itself to examining the current employee age structure and its implications.

Niederstadt (2011) references the German Chamber of Industry and Commerce, which maintains that approximately 70% of businesses have difficulties in filling open positions and the first shortages are becoming visible.
Demographic change will lead to a battle for field experts and skilled professionals. The drastic implications of this are already entrenched in the minds of HR managers, nevertheless the implementation of strategies to tackle the issue are still not on the horizon (Dettmer et al., 2010). Various mitigation strategies are discussed later in this work as part of a section on managing knowledge. Dettmer et al. (2010), however, point to several important points in relation to HR policy that warrant mentioning here. It is imperative that an organisation’s most valuable resource – the experience-based knowledge of senior employees – be retained. The practical knowledge of senior staff must be added to the theoretical knowledge of younger workers.

2.7 Consequences of Demographic Change for HR Policy in Municipal Administrations

As the previous section has already suggested, demographic change has far-reaching implications for HR policy. The following section introduces in concrete terms those consequences that local authorities must address. According to an article by Marjus (2011), the public service is confronted with a situation whereby a large proportion of ageing employees are retiring from working life on the one hand, with only a small volume of potential newcomers to the workforce on the other. This situation has arisen due to two significant developments: due to financial pressures municipal administrations have trained and hired fewer young people in the last few years, while an increasing number of senior employees have taken advantage of early retirement schemes. This stemmed from a policy of employee reduction, necessitated by a tight budgetary situation. As a consequence, the middle-aged employee bracket has remained stable but this is a demographic group that is aging and due to retire in the near future (Kühnert, 2009). In the years to come attention will not only be focused on a lack of financial resources but also on a lack of personnel. Methfessel (2011c, p. 52-53) envisages that this combination of shortages will lead to 400,000 jobs cuts in the public service and that
“[...] almost every sixth job in public administration is likely to become obsolete”.

Alongside these budgetary restraints on hiring policy, the public service has an increasingly limited supply of young job candidates to which it can turn. Conversely, the private sector can attract employees with purportedly better salaries and career opportunities of a kind that the public sector cannot offer (Markus, 2011).

Tatje (2006) maintains that the effects of demographic change first arise in a time period that is outside most HR planning periods for current employees (in local administrations). Furthermore, local authorities do not address this problem – it is omitted from decision-making processes. There is also a lack of available statistical data on future HRM that one can turn to when planning measures in individual organisational sectors. It is therefore essential for local authorities to create a dedicated data set in order to implement a demographics-oriented policy comprising effective measures. This data set could, for example, be created by means of an age structure analysis, which is dealt with later in this work.

What is essential, according to Sackmann, Reinhold and Jonda (2008), is an identity transformation among local authorities in response to the changes in the present economic structures. However, this is taking place slowly because the old structures and the hierarchical administrative set-up cannot be restructured overnight. It is vital that this identity transformation be approached in the context of demographic change as it is intrinsically linked to a changing personnel requirement in the public sector. This relates, for example, to the changing groups of people that public services are aimed at, as well as the changing action fields mentioned in section 1.5. It will be the public sector’s duty to specialise its services for youths, working adults and the elderly. Furthermore, employees must demonstrate competencies that cater to the age structure of the population and therefore to the specific needs of public service recipients. There could be a resulting redistribution of
personnel, whereby workers in child education, for example, may be increasingly required to care for elderly citizens. New skills and competencies are necessary here (Lutz, 2008). On the other hand, Lutz (2008) states that, alongside the shift in service requirements, severe changes are to take place in HRM. A young, emerging workforce is not forthcoming and recruiting qualified personnel is becoming increasingly more problematic.

Rump and Eilers (2006) countered this by stating that a skilled labour shortage is not to be confused with a shortage of workers generally. According to these authors one should not speak of scarcity in Germany in the general sense, rather one should focus attention on the structure of labour force potential in the coming years. This is where the greatest challenge lies for German local authorities. In 2020 the largest age group will be 50–59 year olds. This brings with it the necessity for increased flexibility in relation to the skills profile of older employees, because the determining factor in productivity is not age but rather educational level. In the absence of junior staff no new knowledge can be generated and senior employees must be given the opportunity to expand their knowledge-base by means of regular further training.

Sackmann (2008) maintains that HR policy in the public sector reacts in a much more cautious manner compared to its private sector equivalent. Nevertheless, Sackmann (2008) is strongly of the opinion that new challenges are arising for local authorities and that a response is necessary. However, these authorities assess their position as positive and, to that effect, they claim to be in a better position to overcome demographic challenges than the higher authorities at the state and federal level (Bartl and Jonda, 2008).

The assessment of the coming skilled labour shortage is, according to Conrads and Trischler (2012), an overestimate, as there is an increasing labour potential among women and the unemployment rate in Germany is still high; according to Conrads and Trischler (2012), the labour supply will remain stable until 2025.
2.8 Conclusions, Summary and Outlook

One can conclude that demographic change, as characterised by a fall in birth rate and an increase in life expectancy, has an effect on all areas of policy, with direct and indirect consequences for all fields of action by local authorities. According to Stopper (2008), local administrations will be faced with decreasing numbers and aging among their citizens, alongside an increasing scarcity of resources in the labour market.

The Municipal Association for Administration Management (Kommunale Gemeinschaftsstelle für Verwaltungsmanagement (KGSt), 2011a) describes the demographic consequences for local authorities as a proactive challenge in dealing with their own staff. The question as to whether this challenge will be taken on – and if so, how the local authorities will therefore react – is examined in Chapter 3 of this work. First, however, the activities of HRM from a theoretical perspective need to be examined. The following section is devoted to an analysis of the most important literature on the subject. Before moving on to this, however, these conclusions will first be used to derive and formulate a research proposition.

2.8.1 Formulation of the research proposition and objectives as a basis for the investigation

This section concerns basic facts about the situation regarding demographic change, which serves as the foundation for the rest of the investigation. The situation presents new challenges for HRM. The following table presents the basic facts.
**Aim:** To investigate the effects of demographic change and the present challenges for HRM in German local authorities in relation to workforce planning to facilitate the management of knowledge.

<table>
<thead>
<tr>
<th>Main facts from the literature</th>
<th>Key issues</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 2000</strong></td>
<td>Declining population in Germany in relation to the world’s population</td>
<td>2.2 and 2.4</td>
</tr>
<tr>
<td>World population = 6.1 billion</td>
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<tr>
<td>Population of Germany = 82 million</td>
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<tr>
<td><strong>Year 2050</strong></td>
<td>Ageing population and fewer applicants</td>
<td>2.4 and 2.5.1</td>
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<tr>
<td>World population = 9 billion</td>
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<tr>
<td>Population of Germany = 75 million</td>
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<tr>
<td>Demographic change for German population, 1998-2050:</td>
<td></td>
<td></td>
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<tr>
<td>• Under 20s = decline of 8 million</td>
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<td></td>
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<tr>
<td>• 20–60 years = decline of 16 million</td>
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<td></td>
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<td>• Over 60s = increase of 10 million</td>
<td></td>
<td></td>
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<tr>
<td>Change in labour market:</td>
<td>Ageing workforce</td>
<td>2.5</td>
</tr>
<tr>
<td>• By 2030 decline of up to 6 million people</td>
<td></td>
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<tr>
<td>• Public sector in OECD countries will face a decline of 30% by 2017</td>
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<tr>
<td>• Largest age group in the public sector by 2020 will be 50–59 = baby-boomer generation, which has not been replaced</td>
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<tr>
<td>• Change in public service provision</td>
<td>New HRM tasks</td>
<td>2.6 and 2.7</td>
</tr>
<tr>
<td>• Domestic and foreign labour market must be monitored</td>
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<tr>
<td>• Waves of retirement</td>
<td></td>
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<tr>
<td>• Lack of trainees</td>
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<tr>
<td>• Ageing workforce</td>
<td></td>
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</tbody>
</table>

**Key References:** Kröhnert, Medicus and Klingholz (2006); Tatje (2011); Bossaer, Demmke and Moilanen (2012); Methfessel (2011)

**Gap/weakness and objective**

Demographic change is a current issue in Germany, but there is a lack of academic research looking explicitly at the effects on local authorities, particularly in terms of staff recruitment.

Objective 1 is therefore to determine whether local authorities need to act and how they should act to recruit new trainees/employees.

**Research proposition 1**

Demographic change is hindering the acquisition of new junior employees.

Table 5: Summary – Demographic change (compiled by present author)
Chapter 3 - The Basic Principles of Human Resource Management and the Current Challenges it Faces

3.1 Basic Principles of Human Resource Management

As a result of the decrease in birth rate described in Chapter 2 and the associated decline in numbers of younger employees, in addition to the rising average age of the workforce, the field of HRM is facing a host of new challenges. These are to be dealt with in the sections that follow. Against this backdrop, it is vital that HR managers concentrate on ensuring administrative efficiency. In order to achieve this they need to find and motivate the necessary workers, while also fostering loyalty to the organisation (Bouabba, 2010). Tatje (2011) explains how the “rush hour of life” needs to be harmonised with the structures in local authorities. Here flexible working hours, a high estimation of employees, training opportunities and regard for familial issues must be brought to the fore. Ringlstetter and Kaiser (2008) describe the new challenges as a process of managing resources in such a way as to be able to fulfil present and future requirements. Buller and McEvoy (2016:468) call for strategic direction in HR management processes in response to the new challenges:

„The economic, environmental, and social problems (and opportunities) facing organizations today are highly complex, dynamic, and interconnected. Addressing them effectively requires new ways of thinking, strategizing, organizing, and working.“ (Buller and McEvoy, 2016:468)

Baron et al. (2010:4) define the workforce planning process as “A core process of human resource management (...) ensures the right number of people with the right skills, in the right place at the right time (...).”
3.2 An Understanding of the Term “Human Resource Management”

The origins of the concept of HRM go back to the 1950s in North USA, where HRM was first developed in the early 1980s as a discipline in a time of globalization and increasing competitiveness (Ozbilgin, 2004; Beer, Bodelie and Brewster, 2015). It was then subsequently developed further in the United Kingdom (Felger and Paul-Kohlhoff, 2004). Since the 90s there have been numerous publications and empirical studies of HRM (Knies et al., 2015). At the same time in Germany, the first arguments were being made in favour of the scientific approach as the “best possible use of human potential” (Felger and Paul-Kohlhoff, 2004:18). Even today, the original American concept continues to influence researchers and practitioners in Europe (Brewster, 2007) because it represented a new direction for traditional human resource management (Goederham and Nordhaug, 2010). Employees were reconceived as both the largest cost item in the company and also as a kind of capital, one that could extract value from other resources. Beer, Bodelie and Brewster (2015) took this as a starting point for discussing long-term strategic plans.

Two approaches to HRM dominate the literature. These two approaches are outlined below, based on the account given by Felger and Paul-Kohlhoff (2004) and Beer, Bodelie and Brewster (2015).

Harvard approach
The Harvard approach is based on a holistic concept of human resources, in which HRM is closely linked to the overall company strategy, and is adapted to influences from the surrounding environment. According to the Harvard approach, there are four subdivisions of HRM: Human resource flow, pay systems, work organisation and employee participation. The Harvard model was presented by Beer et al. (1984) and is distinguished by the assertion that employees cannot be handled in the same way as other material or immaterial resources (Brewster, 2007). According to Ozbilgin (2004),
Truss et al. (1997) and Gill and Meyer (2011), the Harvard model is regarded in the British context as a ‘soft model’.

**Michigan approach**
The Michigan approach emphasises support for employees and the employee life cycle. This approach does not determine company strategy. Instead, there is discussion and mutual agreement, based on strategic planning and guided training. The four subdivisions of HRM in the Michigan approach are recruitment, labour organisation, employee development and employee assessment. This model was presented by Fombrun et al. (1984) and its central feature is the relationship between HR and company strategy (Brewster, 2007). Ozbilgin (2004), Truss et al. (1997) and Gill and Meyer (2011) describe this model as a ‘hard model’ in the British context.

Further approaches were derived from these two in the United Kingdom. Based on Felger and Paul-Kohlhoff’s (2014) summary, the approaches of Schuler, Pettigrew and Guest are the most noteworthy. All approaches have in common the assertion that HRM should be seen as an investment and should be oriented towards the company’s strategic goals. Beer, Bodelie and Brewster (2015) call for further development of the dominant models, since these models originated in a situation in which employees were strongly motivated by incentives and special bonuses. The financial crisis has already overturned this system and placed a renewed focus on company’s social responsibilities. These authors believe that the guiding Harvard/Michigan model must be supplemented by an integrated workforce planning approach. “Required is research on (1) how HRM practices affect employee and social well-being; (2) how HRM practices such as performance evaluation, compensation, talent management, and leadership development, to name just a few (...)” (Beer, Bodelie and Brewster (2015:435). The present study aims to take the first step meeting this challenge and investigating the possibilities for a new strategic direction for German local authorities.
In the *International Journal of Human Resource Management*, Knies et al., 2015 note that HRM was first predominant in the private sector. Only once the public sector began to orient itself towards service provision did the effects of HRM begin to draw interest, and early studies showed positive associations between strategic HRM and the motivation and productivity of civil servants. Knies et al. (2015) argue, however, that HRM measures and how they are used differ between the private and public sectors.

It can likewise be concluded from a study by Brown (2004) in *Public Management Review* that the 'New Public Management' (NPM) model has brought criticism of the predominant bureaucratic HRM system in the public sector and that, due in part to the pressure of financial crises, modern HRM has gathered a strong influence. Beattie et al. (2007) also posit in their publications a change from the hitherto very bureaucratic management apparatus to new models from NPM and New Public Services. Brown (2004) cites various authors in a definition of the term (Stone, 1995; Walther, 1992), summarising it as: acquisition, development, reward and motivation. Like Knies et al. (2015), he highlights the difference between the public sector (goal: fulfilment of objectives for collective well-being) and the private sector (goal: competitive advantages and profitability).

The current review of the existing academic literature identified a very wide variety of viewpoints. It is therefore necessary to reduce the scope of the issue and, for cultural reasons, this entails limiting the focus to Germany (see also Felger and Paul-Kohlhoff, 2004. These authors argue that not all elements of HRM approaches from the Anglo-Saxon tradition are directly applicable to Germany.) The next section brings in the work of other authors who have highlighted cultural differences, and whose work can support the present investigation.

Brewster (2007) identified differences between the USA and European countries, emphasizing the limited influence of trades unions and the lack of legislative control over working conditions in the USA. In the
USA, HR management is characterised by “(...) comparatively low levels of state subsidy, support and legislative control” (Brewster, 2007:770). In Germany on the other hand, trades unions are very influential in the public sector, and the state imposes many regulations on working conditions (Brewster, 2007). Brewster’s conclusions were the basis for the work of Gooderham and Nordhaug (2010), who especially emphasised the differences between the USA and England on the one hand, and Germany on the other. The USA and England are liberal market economies that aim to maximise short-term business gains, whereas Germany is a planned market economy that places a great deal of trust in cooperative activities. The authors even go so far as to conclude that the American approach to HR management cannot be adapted to Germany, since HR management in Germany is strongly influenced by its historical context (Gooderham and Nordhaug, 2010). Tungli and Peiperl (2009) note that HR management practices are dependent on special aspects of the local culture, citing as examples differences between Japan, America and Europe. Nonetheless they conclude that in the further future management practices in the East and West could become more similar. In order to enable an assessment of this prediction for the future, the present study will consider publications from other countries where possible.

The investigator has worked for ten years in public administration in Germany and is familiar with the practical working methods of HR. As an additional particular focus, this study deals with the specific challenges HR faces as a result of demographic change. As Section 3.2.1 explains in more detail, this issue is particularly important for the employment structure of public administrations, and local authorities have in recent years lost a large number of employees. The investigator recognises that HRM represents a very broad and widely-researched topic area; one that many other countries are also investigating. In this case there are, however, sometimes different conditions for access and guidelines for implementation. For example, in 2004 the journal Public Personnel Management published a study from the US on the subject of ‘workforce planning’ (Johnson and Brown, 2004). Only 37% of
respondents in the study make use of workforce planning, and only 6% of those follow a plan of more than 5 years duration. However, as Table 2 shows, the demographic situation in the US is different from that in Germany. The population of the US will increase sharply until 2060, and needs and priorities in HR will therefore be different. Cultural differences also influence the focus of HRM. In Australia, according to Lexas (2015), the population will increase from 22 to 28 million by 2050. This is again different from the situation in Germany. Therefore, a culture-specific approach is taken in limiting the primary literature to publications focused on the German context. Nonetheless, HRM is also viewed as undertaking high risks in its strategic engagement with the workforce in other countries (Johnson and Brown, 2004). Comparable studies from other countries will therefore also be introduced where relevant and where their conclusions are applicable. Goodman, French and Battaglio (2015) address this issue in general, emphasising that HR activities must be integrated into a long-term strategy in public administrations for example via workforce planning. The results of their study strengthen the conclusions of Johnson and Brown (2004) to the extent that they accord prominent importance to HRM activities. A further publication from Goodman and French (2011) supports the conclusion that service provision in public administrations can only be fulfilled if the appropriate staff are available and if HRM focuses not only on the level of immediate daily operations but also follows a long-term strategic management plan. In a summary for EU countries, Bossaert's (2012) study of future-proof HRM established three main principles: age-conscious and non-discriminative HRM, holistic health management, and opportunities for training and career development/securing long-term employability.

It is clear, therefore, that in the following literature review it is not possible to draw specific conclusions from publications in many different countries given the very different cultural and demographic conditions which may prevail; this would go beyond the scope of the present study. The present research focus on German local authorities therefore explicitly requires analyses of Germany. Studies should be made use of
that take into account the particular cultural and political conditions and future scenarios of Germany. Given this, it was decided to focus the literature review on German-focused studies.

To begin this section, it is important to clarify for the purposes of this thesis what is generally understood by the term “HRM”. HR management can be seen as taking place at two time scales: both the long-term strategic deployment of human resources, and their everyday management (Felger and Paul-Kohlhoff, 2004). These authors consider not only the traditional functions of HR, which will be outlined below based on the account of Stock-Homburg (2008), but also the question of what human resources will be necessary under new future conditions. HR managers therefore also have to take a strategic approach.

According to Stock-Homburg (2008) the operative work of an HR manager can be divided as follows:

1. Target timeframe.
2. Setting targets.
3. Content.
4. Field of application.

Point 1 is concerned with the timeframe in which HRM activities are to take place. Here the author wishes to concentrate on the strategic perspective, whereby the long-term success of a business assumes a central position. Stock-Homburg (2008) suggests that in German local administrations this strategic perspective is not yet firmly established, even when demographic change renders it indispensable. On the contrary, HRM is geared here towards short-to-mid-term approaches, including operational activities such as processing of payroll, working-time accounts and calculating employee holiday leave.

Point 2 is closely associated with the long-term timeframe and involves value creation and analysing competitive advantage. Both of these
Factors should contribute, on a sustainable level, to business success and, more specifically, establish a workforce capable of driving the organisation into the future. Among other considerations here is the necessity to view demographic change as an opportunity to be seized, whereby employers make a point of presenting themselves as a more attractive option on the job market. In this context, HRM is the department within an administration that needs to ensure productivity through the recruitment of capable employees.

Points 3 and 4 will not be dealt with in further detail here as they do not make up part of the subsequent arguments presented.

The subject areas of HRM are, on the one hand, the formation of systems and, on the other, the management of employees and executive staff. Stock-Homburg (2008) demonstrates this through the following diagram (Diagram 2).

Diagram 2: Fields of responsibility for HRM (Stock-Homburg, 2008, p. 16)
This diagram demonstrates the typical tasks of HRM. The left and right sides of the diagram relate to macroeconomic and microeconomic levels respectively. For the purpose of this thesis, the factor of *demographic change* will also be added to the challenges listed in the Diagram 2.

Further to this, Ringlstetter and Kaiser (2008) state that the concept of HRM has fundamentally changed and has developed more into a resource-critical area. Ozbilgin (2004) sees this change in perspective from simple management of employees to a resource management as a historical development. The original responsibilities of HRM in relation to the Michigan-approach were, according to Nüsgens (1975):

- assessment of staffing requirements
- employee development
- deployment of staff
- employee retention
- administering employee leave.

These areas are all still of importance in the field of HRM but the focus is shifting. The assessment of staffing requirements, employee development and employee retention will remain core concerns. However, employees in HR departments can no longer consider themselves simply as administrative personnel, but rather as managers. The citizens in a local district are coming to expect an ever more competent and efficient service quality and customer orientation. The activities of local administrations are based increasingly on economic considerations, and current predominantly legal knowledge should be supplemented with economic and business competencies. In addition, greater demands are made of employees in terms of personality traits and individual behaviour (Pfahler, 2011). In order to cope with such demands HR managers must recruit workers from the external job market with the necessary skills or put in place opportunities for internal employees to acquire these competencies. Employee development measures need to be planned and a knowledge-exchange environment
fostered. According to Jochmann (1996), forward-looking HRM consists of the following areas which should be geared towards corporate strategy:

- resourcing and support
- HR strategy and management systems
- qualifications and staff development
- employee mobilisation and change management.

In 2006 Jochmann placed the main emphasis of HR development into concrete terms, dividing it into four areas:

- strategic HR planning
- allocation of staff
- evaluation and feedback
- education and training

The arguments put forward in this work deal with this strategic HR planning and, in addition, education and training. First of all, the aforementioned challenges for HRM are dealt with in detail.

### 3.2.1 New Challenges for HRM

Pinnow (2006) maintains that every enterprise must, in the course of its lifespan, make changes. These are prompted by a changing environment and can take the form of developments in technology, new legal parameters or changes in the economy. Kirschten (2010) and Rieckhof and Schüle (2006a) make the same claim, stating that HRM, based on current demographic challenges, will be confronted with new developments.

Stock-Homburg (2008) adds that alongside the traditional responsibilities of HR, new strategic challenges also need to be met. Roos (2010) puts forward the theory that employees expect more than just job security and see a company solely as a place where they earn a
living. Employees’ individual preferences must be given greater consideration; they wish to take on diverse roles where they can fulfil their own potential and take advantage of opportunities for professional development.

An increasingly important requirement of HRM is the management of knowledge, which is growing in importance due to demographic change, and should be seen as critical to success (Felger and Kohlhoff, 2004). This presents an opportunity to systematically analyse the knowledge present in an organisation to determine the level of knowledge that is present and, based on this, establish future requirements (Roos, 2010). This is supported by Günther (2010), who claims that in around 10 years employees will be required to be considerably more productive and that knowledge, due to technological progress, will date at a much faster rate. Much is required of HRM here because, in reference to Roehl (2002), it is the root of knowledge development and, because of the fundamental influence of HR development programmes on employee knowledge levels, HR policy is the most economical way to maintain these levels. This has a direct influence on the new challenges that are presented. Flatz (2014) identifies a new challenge posed by demographic change: how to achieve public sector service objectives more efficiently with fewer employees (Flatz, 2014, p. 14).

Markus (2011, p. 18) talks of “new challenges and limited Resources”, whereby “human resource management in local authorities has increasingly been caught between these conflicting priorities over the last few years”. In order to come to terms with this, a professional HRM approach is necessary, one that can be described as follows:

Human resource management can be considered professional [...] if it achieves above-average standards in configuring its management tasks [...] by means of competent staff, effective processes and appropriate tools and systems based on suitable organization, and furthermore when it has, through above-average efficiency [...] a
positive influence on the sustainable success of a business. (DGFP, 2005, p. 53)

This professional HRM approach must also involve an assessment of future labour supply. Figure 6 demonstrates the current developments, whereby it is obvious that overall the workforce is shrinking, with a concurrent increase in the numbers of elderly workers.

Figure 6: Development of German labour force potential (IW, 2007, p. 7)

Figure 6 shows the development of labour force potential for the entire employment market. Keller (2008), in an article on the current developments in employee numbers (and explicitly in relation to the public service) states that since 1990 a workforce reduction in the region of 30% has taken place. Wiechmann and Kißler (2010) add that the public service has lost approximately 2 million employees in the last 20 years. An international comparison is informative here. As in German local authorities, the age structure of public administrations in the US is dominated by the baby-boomer generation. Wolf and
Amirkhayan (2010) estimate that in the next 10 years the US will also see the loss of a large number of employees. In addition to the ageing workforce, this trend is further exacerbated by hiring freezes, a decrease in traineeships and a policy of not replacing departing or retiring staff. As a result, local authorities are now tasked with undertaking a systematic analysis: how many workers are currently employed in individual authorities, how many will leave the administrations due to retirement and what level of new staffing will be required. Even if statistical information published by the German Institute for Employment Research (Institut für Arbeitmarkt und Berufsforschung [IAB], 2008) shows that in 2007 the demand for skilled labour in the public service stood at 8% and the level of unfilled vacancies at 6% – the lowest figure in comparison to other sectors – this is still an indication of a predominant shortage of skilled labour. This fact is referred to by Wiechmann and Kißler (2010, p. 7), who conclude that local authorities must be familiar with the relevant population figures and “[… ] also have an internal perspective on their own workforce and the ageing body of personnel in their administrative structures”.

The action fields for HRM in relation to the new challenges are summarised in Diagram 3.
The remainder of the investigation focuses specifically on the three fields of “Managing Knowledge”, “Strategic HRM” and “Age Structure Analysis”. One reason for this is that strategic HRM is the essential basis for all subsequent HRM policies and therefore has to be the focus of the study (Stock-Homburg, 2008). As noted in the introduction, workforce planning to facilitate the management of knowledge will in the near future take on a central role following waves of retirement. In addition, this is also a topic in which the investigator has a special interest, given her position as a training manager. Age structure analysis provides an important basis in empirical data, one that should be accorded primary importance in the future because of its use in deriving strategic HRM policies. For these reasons, age structure analysis is also a focal point of the present study. Other important issues, such as employer branding, skills development or a demography-oriented business culture, are also dealt with in some sections. However, given their great breadth and variety, they cannot be considered in detail.
Kirschten (2010a) describes the topics of the present study with the following terms:

1. A youth-centred HR policy is no longer sustainable due to a prevailing majority of elderly workers, with a concurrent scarcity of younger employees. These older staff members must be made aware of their great importance to an organisation, particularly in terms of their skill sets.

2. HRM must address the fact that the proportion of elderly staff is rising and that this has an effect on all areas of working life. Strategic approaches toward training and further development are only one example here.

3. The body of knowledge of older employees needs to be safeguarded and any loss of knowledge avoided. HRM must make itself aware of the fact that, with retirement, not only the employee leaves the organisation but also knowledge.

Accordingly, the following sections deal with these topics:

- **Strategic HRM** (strategy between corporate targets and HRM targets).
- **Age structure analysis** (an analysis of the present and future age structure in German local authorities).
- **Workforce planning to facilitate the management of knowledge** (securing of knowledge relevant to the organisation).

Based on the literature, the question arises whether HRM in German local authorities has already addressed the new challenges it faces. The results of the empirical study presented in Part 5 will show this. The current part of the work first deals with the relevant theoretical findings and it warrants mention here that Pinnow (2006) takes a negative stance on the issue. He holds the opinion that the organisational structures currently in place are so resistant to change that the changes
needed to deal with the shifting conditions can scarcely be implemented. The fact is emphasised that nurturing the skills and competencies of the individual knowledge worker is not a topic that has yet come into the field of vision of HR managers. The need for action is considerable and we must recognise that the present administrative tasks no longer form the central competencies that are essential for the future (Kötter and Werthschütz, 2011). It must also be pointed out that HRM in German local administrations is supplied with neither the personnel nor the financial resources necessary to be able to confront the new challenges (Pfahler, 2011).

3.2.2 Some possible policies and practices for the future working environment

According to Stock-Homburg (2013), changes in the human landscape of work and employment have started to be felt in the mainstream of society, and businesses and administrations need to prepare for these changes better than they have done in the past. This means not only operative (i.e. short-term) adjustments, but a future long-term strategy (see the distinction drawn in Section 3.4.1.1). Stock-Homburg (2013) and Troger (2015) identify useful working practices in long-term recruiting strategies, employer branding and securing key skills, as well as life-cycle-oriented HR development in order to retain employee knowledge and integrate it into the organisation. Troger (2015) also identifies the strengths of age-mixed teams as a form of aging-friendly HR development and knowledge transfer.

Public administrations need to communicate better with employees and invest more in future-oriented HR activities. A strong administrative culture should be built up and leadership needs to make an unequivocal choice of future strategy (Stock-Homburg, 2013). In section 3.4.1.3 the process model of workforce planning will be introduced. This model allows HR managers to represent all relevant working areas and their projected future state.
3.3 Improvement of Efficiency in Relation to Human Resource Potential

“The best knowledge, the biggest talents, all intelligence and skills remain worthless if they are not used” (Malik, 2006, p. 7). Malik (2006) believes that HRM has not, up to now, effectively utilised and nurtured the potential of each worker but rather has obstructed the deployment of individuals’ skills. However, the responsibility of HRM, as a result of the changes brought about by demographic change, must lie in this area. In local authorities these management duties will assume a key role. Labour power as a resource – and here we mean not muscle but rather the knowledge base of the individual – will, alongside the classical economic resources, take on a completely new meaning. It is also important that not every employee extends his or her knowledge independently and then integrates it into the working processes; rather this is the responsibility of senior management in collaboration with HRM (Bellmann, 2006). Höpflinger (1997) also subscribes to this theory and puts forward the opinion that an average increase in the average age of the labour force requires the promotion of professional training and development. Buttler had already stated in 1989, along similar lines, that human capital must be afforded a greater focus and that cost-cutting in this area can have disastrous consequences:

The process of the increase in average age leads to a situation whereby the total labour force will, in the future, be able to learn comparatively less from the new human capital of the first-time employee and is thus more dependent on the further development of those already in employment, in order to learn how to overcome the structural change necessary for development. This occurs against the backdrop of a change in technology and presumably shorter duration of applicability of the acquired professional knowledge. (Buttler, 1989, p. 153)

So as to improve the handling of human resource potential, Tatje (2011) calls for a paradigm shift in the public sector; HR departments need to
move away from the tasks of classical personnel administration. In contrast, the performance capability of the present employees must be preserved and nurtured by means of a strategic approach and with the same approach applied to their management. Brauweiler (2010) terms this improvement in efficiency “retention management”: the recruitment of strategically-important employees. In reference to Brauweiler (2010), 90% of management employees interviewed maintained that their colleagues would be difficult to replace. This was explained by the fact that such staff possess experience, knowledge and qualifications that cannot be compensated for simply by hiring a new employee. As such, the current knowledge carriers must be afforded attention and recognition.

These ideas can be summarised under the terms of the resource-based approach to HRM activities, the basic premise of which is that the success of an organisation is dependent on its unique resources (Stock-Homburg, 2008). Employees are non-trivial resources and it is essential they be treated as individuals, with various skills, competencies and motivations. They cannot be compared with the management of finances, capital assets or consumer goods; rather they require, as non-material or also intangible resources, a specific approach to their management: “We focus on the knowledges, skills and abilities inherent in the individuals” (Wright, McMahan and McWilliams, 1994, p. 304). Gill and Meyer’s (2011) conclusions are relevant here. They conclude that positive outcomes in working productivity can be achieved by implementing the Harvard approach, or soft HR management. Here the focus is on employees as a resource. They conclude that the most important basis of this approach is strategic coordination between HR management strategy and overall company strategy. Gill and Meyer (2011) conclude that an improvement in effectiveness can only occur if the Harvard model is implemented both in theory and in practice. In their investigations they found that although the theoretical principles of the soft approach are in place, in practice the hard facts of the Michigan approach are evident, often in the form of control). Truss et al. (1997) view the mixture of approaches
as leading to conflicts, as the two are based on different assumptions. For example, the Harvard approach views employees as a resource to be trained and developed, whereas the Michigan approach views employees as a cost factor to be reduced. Truss et al. (1997) also found in their case studies of eight companies in the UK that none of these implemented a pure HR management model.

The resource-based approach gives, as also presented in section 3.2, strategy a central position because, on the one hand, workers are only available in limited quantities and are, due to their knowledge, non-substitutable while, on the other hand, they cannot be entirely controlled (Ringlstetter and Kaiser, 2008). Coff (1997, p. 375) describes this value assessment as “human capital under limited organizational control”. Edeling, Jann and Wagner (2004) also subscribe to this, classifying the employee as an underlying factor forming, through his or her wealth of knowledge, the basis upon which administrational activities can be carried out.

Stock-Homburg (2008) furthers this argument – with reference to the aforementioned strategic factors and contributors to an organisation’s success – by stating that the scarcity and complicated substitutability of labour, as caused by demographic change, are becoming an ever greater concern and, therefore, the effectiveness of an organisation’s HR potential must be made a strategic point of focus for HRM.

3.3.1 Setting Objectives for Sustainable HRM

Of foremost importance is unquestionably the furnishing of local authorities with employees who are capable of coping with all pending tasks. This objective should be reached by balancing organisational and performance requirements and personal performance levels. Qualifications and employee motivation are of great importance here (Ringlstetter and Kaiser, 2008). This is because employee productivity depends on a complex structure where a range of needs come into
play. Here we can turn to Maslow’s hierarchy of needs which divides human needs into five levels:

Level 1: Physiological needs, such as breathing, sleep, food, a space to live in.
Level 2: Safety needs, such as law and order, protection from danger, a steady income, job security.
Level 3: Social needs, such as a work–life balance (family, friends, love), a company culture, a satisfactory working atmosphere.
Level 4: Individual needs, such as respect, recognition, wealth, success.
Level 5: Needs relating to self-actualisation, such as individuality, talent, perfection.

The needs in levels 4 and 5 are becoming increasingly more important and must therefore be incorporated into the targets of a sustainable HRM approach. The facets of human working performance have thus become more diverse, expanding outwards from psychological and social needs – which mostly related to money – to include a greater range of individual needs. The previous epoch of the industrial society afforded the necessities of the worker too little attention (Graf, 2001). Management was not aware of the fact that administration could only fulfil its service obligations when employees were prepared to implement and utilise their knowledge on a daily basis in carrying out their tasks. The transition to a knowledge-based society presents company culture with new challenges, with individual needs attaining a higher level of importance (Graf, 2001). It is an essential task for HRM to find a balance between this want-factor of the current and potential employee and the skill-factor which, according to Ringlstetter and Kaiser (2008), comprises physiological and psychological ability as well as individual skills. Accordingly, the human resources of an organisation are to be viewed as a strategic resource – one which, in the long-term, is difficult to replicate and depends on individual want–skill factors.
Alongside the focus on the individual needs of the worker, the new environment, which has already been described in detail, also needs to be taken into account. In view of the skilled labour shortage in Germany, the country’s ageing workforce and the need for knowledge retention, the demographically-oriented HRM is tasked, according to Weinmann (2006, p. 321), with finding a balanced experience structure to sustain an organisation’s success: “The goal is not only an age-structure that is balanced in terms of employee age but rather to have the correct knowledge and experience structure”. In addition, we can also state here that, at present, older workers possess know-how and judgement skills in relation to working processes that younger employees do not. These are exactly the skills a sustainable HRM needs to promote and maintain. It must also, where necessary, make the appropriate investment in employee training and health (Priddat, 2005). In order to put this into practice people must be given a central focus in planning terms. What follows is the explanation of a possible strategy.

3.3.1.1 Adapting to the Life Cycle of Human Resources

At present, the attachment of human resources to one employer, from initial employee training all the way to retirement, is an increasingly rare occurrence. In reality employees are flexible, changing employers or demanding opportunities for career advancement within a company or flexibility in terms of working hours. Their lifecycle needs to be harmonised with the strategic approach of HRM. The following diagram 4 deals with the implications of this.
Firstly, Ringlstetter and Kaiser (2008) demonstrate that at the beginning of one’s working life, or when one changes job, the search for employment is always the central focus. This is what drives HRM hiring policy, which takes place mostly on the external job market. These days these recruitment measures need to be carried out on a more regular and intensive basis because, as shown in the demographics section of this work, the skills shortage in the job market is becoming increasingly more pronounced. Further to this, Stock-Homburg (2008) maintains that HRM relies on systematic procedures when it comes to acquiring staff because employees must serve the organisation on a qualitative and quantitative level. In order to find suitable labour an administration must enhance the attractiveness of its reputation. Alongside staff recruitment on the external market, the internal employment market also requires attention (Stock-Homburg, 2008). Of importance here is the hiring of trainees or working students, as well as providing support for experienced employees; relocation to another position or another field is also a consideration. There are a large number of benefits associated with internal hiring – after all, it is less time-consuming and there is increased employee motivation – but there are also risks, notably the danger of knowledge becoming out-dated if new, external stimuli are lacking (Stock-Homburg, 2008).
Recruitment is followed by a selection process and with that employee placement (Ringlstetter and Kaiser, 2008). In the working career that follows, the employer naturally expects professional competency and good performance levels. The employee, however, no longer provides these simply as a return for their salary; rather they demand personal advancement in the form of regular training and development and a high level of responsibility. Motivation and recognition of good performance also plays a role. Here HRM is required to adapt to the lifecycle of an organisation’s employees, putting in place developmental and motivational measures to harness staff potential; if employee expectations for their working lives are not met and individual skills are not developed within the position staff could be prompted to search for new employment and the cycle starts again from the beginning, for both parties (Ringlstetter and Kaiser, 2008).

Here it is necessary to mention Kröhnert, Medicus and Klingholz (2006), who state that HRM must intensify its efforts to orient itself to the life cycle of human resources. Here it is suggested that a working career be approached in such a way that people between 20 and 40 years of age deal at first with their initial training, career entry and family planning. The workload in this phase is thus somewhat reduced. Meanwhile the skills and experience of those over 50 years of age are to be fully utilised. If HRM takes these factors into consideration while adapting to the human resource lifecycle it can retain the services of capable staff, thus allowing it to cope with the challenges of the future.

3.4 The Integration of HRM into Corporate Strategy

The preceding sections of this work have provided an elucidation of the term “human resource management”. What follows is an explanation of how the relevant HRM measures can be integrated into a corporate strategy. This is a crucial factor because, in reference to Jochmann (2006), the success of an enterprise and the quality of staff are clearly interdependent and, with the increasing movement toward a service-oriented approach, employees make a decisive contribution to an
organisation’s success and image. The biggest aspect of employees’ work in German Administrations involves the interpretation and implementation of relevant legal documentation and in issuing the related official notifications. What is required in terms of the core administrative work is almost exclusively mental labour and, with that, employee knowledge. The theme of individuality in processing tasks is explained by Ringlstetter and Kaiser (1998, p. 56) as follows: “People are too complex and thus cannot be compared with the dynamics of a machine, which rather produces the desired output on the basis of specific input”. Wiig (2000) continues along these lines by stating that every employee of a local administration influences, through their role, residents’ quality of life and the potential development of a community. Such a role must always be carried out efficiently and within a narrow time frame; furthermore, it should produce a minimal strain on resources.

One can ascertain from this that administrations, when implementing a strategy, must assign particular importance to their employees and take steps to ensure motivation levels and productivity. The Municipal Association for Administration Management (‘Kommunale Gemeinschaftsstelle für Verwaltungsmanagement’ KGSt) (2011) has also attested to this in an article that maintains that the provision, retention and development of personnel are important duties for HRM, which need to correspond to the administration’s strategic targets. An Australian study by Jorgensen (2004) concludes that knowledge/learning must be linked to management strategy, and that the needs and abilities of individual employees must be recognised as a key resource. One can ascertain from this that administrations, when implementing a strategy, must assign particular importance to their employees and take steps to ensure motivation levels and productivity. French and Goodman (2011) conclude that in the US, HR managers must also reorient themselves from operative to strategic management of human resources. HR development and the system of knowledge on which it is based have to fit the overall strategy of the administration in question.
In relation to the private sector, Rieckhoff et al. (2006) established, in a 2005 study among managers in the HR departments of the top 600 companies in Germany, that HRM has not yet recognised the necessity for a change in strategic approach nor have they committed themselves to a strategy that would address the changing environment, the structural changes and the related strain on resources that arises (Rieckhof and Offermann, 2006). This strategic orientation toward resources is also supported by Ringlstetter and Kaiser (2008, p. 41), who state that “[...] HR direction can make a fundamental contribution to long-term corporate success […], bringing about long-term competitive advantages [and] generating a sustainable competitive edge.”

Wiechmann and Kißler (2010) are pessimistic about incorporating such a strategy into local administrations and state, stating in a relevant article that there is a complete lack of demographic–political strategies in place. This critical contribution can also be found in an English study of police stations. Seba and Rowley (2010) also conclude that the public sector has difficulty defining a strategy, but urgently needs one for managing knowledge given that most public sector employees see their knowledge as their power. If no strategy is in place and the administrative culture does not lead by example in transmitting knowledge then, according to Seba and Rowley (2010), it will be difficult to introduce sustainable management of knowledge.

Another important aspect of future strategic directions is the link between the size of a local authority and its use of new HRM tools. Kettinger (2004) has shown that local authority mergers are especially likely to be considered as a strategic move when local authorities have an increasing workload and more demanding responsibilities, or are nearing the limits of their capacity. The fact that a large city such as Munich has “gathered, built and maintained successive structured demographic knowledge” (Wiechmann et al., 2010, p. 47) also suggests that capacity is a key issue when analysing the issue of managing knowledge in local authorities and other public bodies. German local authorities are currently seeing structural change take place in Lower
and Saxony-Anhalt (Destatis, 2014) which, according to Reiners (2008), is a crucially important task for the future in order to ensure that the organisation and service delivery of public administrations are effective and citizen-centred. Reiners (2008) identifies a readiness for reform in Germany, one that is in part oriented towards acute, short-term adjustments, but also towards systemic changes. Changes to administrative structure take place in different starting contexts across the different federal states, and Reiners (2008) notes that they also have different capacities for reform. In a narrower sense, structural reform refers to “reform programmes that alter the formal organisation of administrative bodies, such as dissolving or merging administrative units, or creating new ones” (Blanke et al., 2011). This is also currently observable in Brandenburg, where population decline has led to the development of a new plan that involves reducing the number of local authorities (Blankennagel, 2016). Blanke et al. (2011) observe here that the productivity and service quality of smaller local authorities threatens to decline due to the concentration of responsibilities (some of them bringing entirely new challenges) on a smaller group of employees. Based on these conclusions regarding structural changes in the system of local authorities, size of local authority was added as a variable of interest in the empirical investigation.

This section has assessed the importance of incorporating HRM into a corporate strategy. Should this approach not be implemented, then local administrations are running the risk of not being in a position to counter the effects of demographic change. An effective approach is only a possibility if the company strategy supports the long-term activities of HRM with, where necessary, the provision of financial resources. It is also important that employees be aware that, for example, the measures relating to knowledge retention are also supported by administrative management. Only in this way can motivation be ensured, which acts as a prerequisite for the implementation of the measures of HRM strategy. This aspect will now be further examined.
3.4.1 Strategic human resource management

In the context of securing a competitive advantage, HRM not only needs to be integrated into the corporate strategy it must also be strategically-oriented. Germany has come off badly in this area (Heitze, 2011). Often in Germany “(...) the strategic importance of HR management is emphasised much less than the importance of its everyday operation”. (Felger and Kohlhoff, 2004:95). The authors see this as the result of the fact that the right of co-determination is emphasised more strongly in Germany than in the Anglo-Saxon countries, and that there is more legal structure to employee relations. Here, Buller and McEvoy (2016:470) argue, without mentioning specific countries, that a “resource-based view” can be used as an important theoretical framework for bringing together HR management, strategic direction and company performance. In the case of strategic direction, however, they add the important qualification that every company strategy is unique and that there is no correct or incorrect strategy. According to Buller and McEvoy (2016) every company must decide for itself which HR management strategies best support the overall company strategy. For German local authorities the following conclusions could be the basis of a deeper consideration of their strategy.

According to Ringlstetter and Kaiser (2008) and Hettstedt (2010) the flexible adaption to new challenges that would be necessary here forms part of the relevant strategic approach and HR management should have an influence on development. The playing field is changing and local authorities must operate pro-actively and dynamically with clearly-established goals. Also relevant to this topic, Bossaert, Demmke and Moilanen (2012) conclude that state employers in the EU will soon no longer be able to avoid having to deal with an ageing and diminishing workforce:
Demographic change is characterised by an over-pronounced ageing of the overall labour force, a dramatic shortage in the young replacement generation and utterly sinking labour potential. As a result, the demand for life-long learning and the preservation of the productivity of the available workforce become the central strategic focus of a business. (Preißing, 2010a, p. 217)

An action framework must be formulated: one which sets out a way of reacting to the new age structure present in the workforce and of ensuring future productivity in light of the skilled labour shortage and the shortened half-life of knowledge. Mintzberg stated in 1994 that a strategy is composed of:

1. An action plan for orientation.
2. A framework for consistent action.
3. Competitive position.
4. Company perspective.

Applied to HRM in German local authorities, an appropriate strategy is described below.

To ensure efficiency there must be concrete instructions or a framework for action in place, which determine how older employees are to be strategically integrated and how they can be motivated and supported. Furthermore, there should be stipulations as to how the knowledge of such individuals can be stored. On the other hand, there must also be a directive as to how the skilled labour shortage can be countered, for example through a hiring policy on the internal or external job market. The various directives must complement each other and present a coherent concept so as to ensure competitiveness in relation to other local administrations or private organisations in competition for staff. In order to be able to implement complementary measures, HRM requires a core data base which illustrates how the staff body will develop. This core database concept is dealt with in Section 3.4.1.1. In relation to strategic direction, Lönnies (2010) maintains that it should involve a
secure, long-term supply of skilled labour in the local authorities and the idea that an inexhaustible stream of manpower potential is available needs to be reconsidered. In order to achieve the goal of making the HR manager a strategic partner for the administration, the HR manager must be equipped with the necessary basic strategic knowledge and develop an understanding of the advantages to the whole organisation of having of a strategic HR management direction (Buller and McEvoy, 2016).

3.4.1.1 “Path dependence” process model

Strategic direction can be expressed in terms of a path dependence process model. This model is based on the characterisation of the chosen strategy as a path. An HR manager must select a future path through decision points regarding the acquisition, use and development of human resources, and requires a path that will maintain the administration’s productivity. At the outset of such a process many such paths are available. After selecting one there is an initial, unstable implementation phase. During this phase, or later, managers may consider switching to a different path, as a result of experience or new information. However, such a switch is usually only achievable with great effort and cost, so it tends to be the case that a chosen path remains in place (Pierson, 2004). Sydow, Schreyögg and Koch (2009) argue that human and organisational processes are to a large part determined by decisions made in the past and that all actions and choices are path-dependent. Their model emphasises “the importance of past events for future action” (Sydow, Schreyögg and Koch, 2009).

An alternative model is that of pragmatic decisions and tools. Kösters (2016) frames the difference between the process model and the pragmatic model as a question of whether local authorities have the resolve to meet fundamental, long-term social changes with innovative solutions or whether they will prefer older, tried-and-tested methods.
At its extreme, instrumentalist approaches may dominate over more long term strategic activities.

In order to develop and implement the necessary path dependence process model for human resources in German local authorities, section 3.2 gives some important conclusions. It describes the American Harvard and Michigan models, each of which has a different approach to human resources. According to Ozbilgin (2004), the first step to developing path dependence in each administration is the acceptance of these models and their principles.

3.4.1.2 Summary of strategic considerations

Accordingly, strategic HRM is part of a departmental strategy in which the overriding corporate strategy is underpinned by a set of concrete measures. The importance of this cuts across several fields (Hettstedt, 2010) and can, according to Scholz (2000), arise in a corporate strategy in four ways:

1. Deriving HRM from the corporate strategy.
2. A functioning component strategy of the overall corporate strategy.
3. Deriving corporate strategy from resource-oriented HR.
4. The interdependence of both strategies.

The relationship between these strategies differs from administration to administration.

As well as taking into account a strategic, quantitative approach to human resources, Richenhagen and Seidel (2014) also emphasise the importance of the qualitative aspect of allocating employee responsibilities. Administrative responsibilities will change because of demographic change, and they conclude that “the concept of job families is a tool for strategic HR management” (Richenhagen and Seidel, 2014, p.16). The concept of job families involves grouping tasks that involve the same core responsibilities in order to organise a pool of suitable employees for each job family.
In summary, strategic HRM, in the context of demographic change, must make particular efforts to establish a positive attitude to older employees, which actively involves older generations in service provision and giving them support while viewing employee development measures as an investment in the future. Furthermore, it is essential to create a database to recognise changes in personnel structures at an early stage and to formulate an appropriate reaction. These measures could be described as workforce planning, a core element of HRM (Baron et al., 2010). The following section explains this concept in more detail.

3.4.1.3 Forward-thinking HR management through workforce planning

The preceding sections of chapter 3 covered a detailed examination of the concept of HR management and strategic direction. This section covers an important additional tool for assisting short and long-term forward-thinking HR policy. Workforce planning began in the 1980s as an inflexible process, and was largely ignored. Only later, in 2007, was its central importance for HR management activities recognized, by the House of Commons Health Committee (Baron et al., 2010). In 2015 Goodman, French and Battaglio, working in local government in the USA, identified workforce planning as a useful strategic tool for dealing with the challenges of an ageing workforce and waves of retirement, as well as knowledge loss. Pynes (2004) sees workforce planning as an opportunity to react quickly to changes in the civil service, for example waves of retirement.

The aim of workforce planning is to create an organisational process by which HR managers can find “(...) the right number of people, with the right skills, in the right place, and at the right time (...)” (Sullivan, 2002:46; Baron et al., 2010:4). This process model allows managers to integrate all central aspects of everyday HR management (see section 3.2) into a forward-thinking HR policy. Workforce planning does not only consider the individual, but also an integrated process that can meet the
coming challenges (Pynes, 2004). According to Pynes (2004), this process involves the following five steps: integrating HR management into the company strategy, identifying challenges for HR management (for example with the use of an age structure analysis), developing implementation steps, implementation and a possible change process.

As noted earlier, most HR managers react only in the short-term, often introducing specific measures only as a response to a situation that has just arisen. Workforce planning can assist here by providing a talent forecast or talent action plan (Sullivan, 2002). The possibility of applying a talent forecast specially to the case of German local authorities is discussed in the next section, in the form of age structure analysis. A talent action plan helps specifically “(...) to meet the forecasted quantity and quality of employees in the future” (Sullivan, 2002:49). As well as age structure analysis, workforce planning to facilitate the management of knowledge is taking on ever greater importance. This will also be discussed in the following sections. According to Baron et al. (2010), workforce planning can identify future supply and future demand brought about by demographic change in the form of an ageing workforce and waves of retirement (Young, 2006). The benefits of implementing workforce planning are an engagement with the future of HR management (Baron et al., 2010) and an efficient analysis of possible gaps between supply and demand (Young, 2006; Goodman, French and Battaglio, 2015). The final important aspect of a workforce planning process is the development of a plan for bridging the gaps that are identified:

„It’s about being able to provide vital information to managers so they can look into the future and make decisions before events occur.“ (Young, 2006:28).

Based on these conclusions, it is clear that German local authorities, too, need strategic direction in HR management, because of demographic changes and competition with the private sector. Goodman, French and Battaglio (2015) draw the critical conclusions that workforce planning is not widespread in local government agencies.
in the USA. The current empirical study aims to show whether workforce planning processes, in the form of age structure analysis and managing knowledge, are being implemented in German local authorities.

3.4.1.4 Age structure analysis as a key tool in workforce planning

Age structure analysis, in the context of demographic change and its implications, provides an important foundation for strategic workforce planning processes. This allows HR managers to recognise possible risks that may arise in an administration’s employee structure. It is of particular importance here to note that staffing levels in German local administrations are not only shrinking – the average employee age is also rising. Furthermore, there are generally no data available on the topic (Wiechmann and Kißler, 2010). There are four different forms that personnel structures take: balanced, youth-centred, compressed, and senior-centred distribution of staff (Hettstedt, 2010).

As a consequence of the fact that recruitment of new staff is a rarity in the public service, that only some trainees are taken on permanently and that older workers are excluded from staff reduction measures due to dismissal protection, the public service is attaining a senior-centred structure.

Demographic change in the staff body and the possible appearance of staffing bottlenecks in local authorities is, according to Sotirakou (2004), of primary importance, given that modernisation, cultural change and maintenance of services in the public sector are particularly dependent on human capital. A comparable tool in the US is ‘workforce planning’, which according to Goodman, French and Battaglio (2015) shows mismatches between current staff and future staff needs, as does age structure analysis (see chapter 3.4.1.3). In the USA already in 2002 more than half of all public sector employees were older than 45 (Pynes, 2004). It is therefore possible to look back on the last 15 years as a test of how the necessary skills and numbers of employees can be
predicted in advance. According to Pynes (2004), this requires the cooperation of HR management, the administration leadership and employees. HR managers must also expand the scope of their responsibilities in order to understand the interests of all involved parties. Often it is the skills and knowledge of the HR manager that are the major obstacles to a successful workforce planning process, and likewise it is the costs, and in particular in the public sector the short-term focus of HR management activities, that prevent HR managers from taking on a proactive role as strategist.

The following conclusions give a detailed description of the factors relevant to workforce planning in the form of an age structure analysis in Germany.

Age structure analysis is a tool which helps identify the effects of demographic change at an early stage, thus avoiding a situation whereby decisive action and HR measures are initiated too late, which is to say when the consequences of demographic change have already taken effect on local authorities. Furthermore, age structure analysis provides a systematic approach to identifying current and future age structures, which are shaped by the effects of demographic change (Kreutle, 2010). Morschhäuser and Matthäi (2011) state that an age structure analysis provides an initial in-road into the issue of demographic change, giving local authorities an insight into the future in terms of how its conditions will differ from those of the present. It can act as an early-warning system for recognising staff shortages and establishing necessary succession planning measures. For local administrations the formula set out by the Institute for Social Research and Social Economics (Institut für Sozialforschung und Sozialwirtschaft e. V.) is a suitable blueprint, in that it serves to ascertain shortages at an early juncture. Morschhäuser and Matthäi (2011) provide three recommendations here:
1. Firstly, the administrative sphere (all administrative bodies or only selected ones) and the relevant levels (management or also lower-level employees) need to be defined.

2. Following this, the selected sphere according to age groupings and then the calculation of the average age needs to be presented, with results displayed in graphical form for clarity.

3. Furthermore, the results should be interpreted with respect to the introduction of necessary staffing policy measures.

As soon as the age structure analysis is available, a prognosis can be formed which details which measures are necessary in the future in terms of retirement, recruitment and staff fluctuations. The comparison of the age structure and prognosis data can demonstrate how staffing will change over the coming years and, accordingly, points to relevant HR policy action fields. Of importance here is how a knowledge loss can be avoided when older employees retire and how the organisation’s appeal can be boosted in order to attract young personnel (Kreutle, 2010). This means that knowledge gaps can be identified, whereby headcount numbers are determined along temporal, quantitative and qualitative lines (Jung, 2008).

Kreutle (2010) and Stock-Homburg (2008) maintain, however, that for the implementation of an age structure analysis personnel must be set aside to carry out the tasks and staff councils must consent to the measures. Everyone must be aware of the fact that the information to be evaluated is subject to data protection law. Due to the necessary provision of time and staffing capacities, HR managers must agree with senior management in advance what should be achieved through the age structure analysis and how the resulting information is to be used. Here the arguments put forward in Section 3.4 come into play, whereby HR and corporate strategies must be aligned.
An administration’s management must be aware, alongside the required effort and uncertainty involved in the projection, that this is not a one-off procedure; rather it can only deliver significant results by means of regular implementation and with a focus on the future. In addition, the results themselves say nothing as stand-alone information – they need to be interpreted. Morschhäuser and Matthäi’s (2011, p. 3) interpretation questions can be asked:

- Is the date of the employee’s departure already established?
- Does the departure pose the threat of staff shortages?
- Is there a threat of knowledge loss?
- Is there a procedure in place for systematic knowledge transfer?

Age structure analysis is thus a sub-instrument of workforce planning and gives an insight into which knowledge carriers possess which qualifications and which are due to leave the organisation in the future. This also provides an insight into the knowledge-oriented facets of the organisation and represents, for personnel requirements planning, the key area in terms of identifying an organisational knowledge basis (Kirschten, 2010a). Young (2006) concludes that it is only necessary to identify those areas or employees that are most difficult to replace or are in danger of being lost, but this conclusion should be viewed critically.

Although age structure analysis as a tool in headcount planning details the qualitative and quantitative aspects of staffing requirements – thus contributing to a long-term strategic direction – only every tenth company uses demand planning beyond a timeframe of five years (Stock-Homburg, 2008). Wiechmann and Kißler (2010) also state that HR policy only takes place over the short term, in that it doesn’t look beyond a timeframe of three years.
3.4.2 Effects of strategic measures at the macroeconomic level of public administrations

In reference to Ringlstetter and Kaiser (2008), it is not only the combined performance ability of staff that is observed via the macroeconomic perspective; rather, one must also take into account the importance of the synergetic effects that arise from the interplay of individual performance abilities. An analysis at the macroeconomic level is preceded by a quantitative measure of staff numbers to ascertain whether sufficient resources for efficient performance are in place. As already described in the previous section, age structure analysis can be employed as a tool. Here, alongside existing staffing, future changes must also be taken in consideration, for example those resulting from retirements, deaths and resignations. The established headcount at the point in time “X” needs to be compared with the necessary headcount level required at point ‘Y’ in order to ensure the sustainable performance capacity of local authorities. Ringlstetter and Kaiser (2008) expand this age analysis to include performance analysis, whereby staff capabilities are evaluated over a specific time period. The use of both analyses should then establish whether HRM measures have been implemented in a way that is strategically successful. Ringlstetter and Kaiser (2008) have come to the conclusion that the analysis cannot be based on the performance level of single employees, but rather on the synergy of all employee capabilities within the organisation’s environmental dynamic. Meier (2004) observes a re-defining of the central paradigms, a move away from the ‘I’-centred approach to a macroeconomic perspective which takes into account all capabilities within an administration.

3.5 Basic parameters for HRM

Basic parameters are relevant to the investigation of future performance levels because HRM acts in a dynamic environment which is influenced by the conditions that are to be described here. These can be divided into internal and external factors. Internal factors can be influenced,
whereas external are predetermined. Both internal and external conditions are, however, always dependent on certain overriding factors.

3.5.1 Internal Factors

The internal factors, according to Ringlstetter and Kaiser (2008), can be divided into:

- corporate strategy
- company structure
- company culture.

As already discussed in Section 3.4, the policies put forth in a corporate strategy strongly influence the strategic approach of HRM. The strategy of German local administrations at present is primarily one of consolidation. This is supported by Wiechmann and Kißler (2010, p. 12), who call this fact an “ambivalent development”. On one hand, budget pressures force savings measures which are mostly achieved through reductions in personnel; on the other, these decisions are taken without a strategic assessment of changes in the population or among an organisation’s own staff, which could lead to negative consequences for the employment structure.

The company structure, according to Ringlstetter and Kaiser (2008), is what demarcates hierarchical levels and therefore the distribution of management in relation to their subordinates.

Company culture, in turn, includes old-fashioned conventions which are partly reflected in, for example, clothing regulations (Ringlstetter and Kaiser, 2008). In addition, core values and behavioural guidelines contribute to a company’s culture. This aspect of the internal factors do not constitute part of this work.
In summary, we can state that the internal factors for action planning by HRM are closely linked to corporate strategy and the dominant structure within an organisation. Obstacles could arise if, for example, managers do not approve certain training and development measures because an administration is adhering to a consolidation approach. Should available data – for example information derived from an age structure analysis – not be considered by an administration’s management then HRM needs to put forward a persuasive concept which points to the future challenges facing the organisation on a macroeconomic level.

### 3.5.2 External Factors

In contrast to internal factors – which HRM can influence with coherent strategies – external factors need to be considered more carefully, because they must be accepted as given and therefore play a greater role. Ringlstetter and Kaiser (2008) consider the most important relevant factors to be:

- law
- economy
- technology
- socio-culture.

The first factor relates to the legal regulations that an employer must observe in relation to employment, where employment-contract law and the established rulings of the courts are of particular significance.

The next factor is economic development. This is a primary focus of this thesis due to the fact that the employment market will, as a result of the current demographic changes, assume a central role and has an important influence on HRM. Ringlstetter and Kaiser (2008) maintain that German companies have fewer candidates at their disposal, which necessitates a greater recruitment effort, and that alongside a more limited labour supply there is also a lack of qualified labour. Human resources must first be equipped with a range of skills so that they can
deliver the required performance levels. As already mentioned, HRM is also faced with the new challenge of an increasing average age among employees and must arrive at suitable solutions to preserve performance levels. The combination of these external factors – an ageing workforce and low quantities of young workers – necessitates the need for workforce planning to facilitate the management of knowledge. For one thing, one must ensure that this knowledge is not lost as a result of the retirement of older staff. On the other hand, knowledge must always be kept at the most up-to-date level and made accessible for all staff.

The factors of technology and socio-culture will only be dealt with briefly here. These involve, firstly, the implementation and use of new technological tools. In local administrations personal computer (PC)-based procedures will shape daily working routines and the use of PC software and web-based programs will be the norm. This will also have an important bearing on managing knowledge, in that older employees must also become versed in using advancing technology, becoming dependent on further training or an exchange with co-workers who are experienced in this area.

Socio-culture is, according to Ringlstetter and Kaiser (2008), shaped by the attitude of employees toward the organisation and changing values. HRM must accept that employees can only be bound to an organisation in the long term by means of strengthened individual motivation, incentive schemes, and flexible working hours. Should workers be unable to identify with the organisation and its values the result will be the regular turnover of staff.

3.6 The Increasing Competition for Human Resources and Ensuring Competitive Advantage

As put forward in Section 3.3, human resources should be viewed as important strategic resources that safeguard local authorities’ productive capacity, while also providing a competitive advantage. This
competitive element is characterised by two vital factors: human resources ensure long-term competitive advantages when they have developed a non-substitutable performance potential; and when, on the other hand, they are scarce and valuable (Ringlstetter and Kaiser 1998). This consideration becomes increasingly more important in the context of demographic change: labour potential falls, a shortage of skilled labour arises, and businesses and administrations become involved in a battle for qualified staff, both young and old. In reference to Wiechmann and Kißler (2010), the public sector is in a worse position than the private sector because it is less flexible and cannot react to changes as quickly. A management strategy, as explained in Section 3.4, cannot simply focus on the present, rather it must make particular efforts to orient itself toward the future.

Goodman, French and Battaglio (2015) identify a competitive pressure in the US, driven by the private sector, which forces local public bodies to rethink HRM. They point out a necessity for a long-term strategic direction (i.e. workforce planning) in dealing with human resources, and for an awareness of the state of competition with the private sector for skilled labour. This competitive situation is not limited to the German labour market. French and Goodman (2011) found that in the US, HRM in the public sector has had to deal with rapidly changing conditions and that competition with the private sector is intensifying. The private sector offers employees lucrative short-term contracts. In Australia, 42% of Chief Executive Officers (CEOs) see employee acquisition and retention as the greatest challenge of demographic change (Jorgensen, 2004). According to Jorgensen (2004), employers need to improve their attractiveness in order to meet the challenge of competition for labour.

In order to secure this advantage human resources must be retained by means of appropriate policy measures, with existing potential expanded and utilised efficiently. Ringlstetter and Kaiser (2008) maintain that public administrations need to anticipate how human resources will develop and, on this basis, evaluate which human resources are valuable, how their performance potential can be improved and, in some cases, which skills are lacking. In addition to this internal policy
approach, the employment market also needs to be analysed because, as explained at the outset, resources are limited and the external job market cannot be influenced (see Section 3.8). Administrations need to react early, observing the internal employment market closely (in terms of retirements for example) and then specifically targeting employees in the external market, thus securing a competitive advantage over other local authorities and the private sector. According to Kersten, Neu and Vogel (2014, p. 93), local authorities should publicise the “attractive working conditions they offer, and which can compete well with those offered by the private sector”. In particular, this means emphasising their basic “legal and social principles” (Behrens and Zempel, 2012, p.29), characterised by a commitment to the “provision of social goods and a focus on the well-being of citizens” (Behrens and Zempel, 2012, p.29). These authors also explicitly note the breadth and diversity of training and experience that no other employer can offer. Section 3.8 gives some further conclusions on this topic.

3.7 Developing the Competencies of Existing Staff

Because the acquisition of staff will become an ever more challenging task, HRM must concentrate on measures for retaining existing personnel and, furthermore, place particular emphasis on staff qualifications and advancing employees’ competencies (Stock-Homburg, 2008). Competencies can be divided into four categories: professional, methodological, social and human relations-based. In addition, it is necessary at present to expand this to include experience as a competency. Experience-as-competency denotes tacit knowledge which every worker assimilates over the course of their career. Tacit knowledge is of particular importance in the field of competency development because the majority of those employed in local administrations will, in the foreseeable future, retire from the workforce, whereby their experience leaves with them. Measures for retaining such information must be implemented at an early stage (Preißing, 2010).
The professional, methodological, social and human competencies can be furthered and brought to the most up-to-date standards by means of regular staff training and development (Stock-Homburg, 2008). A policy of regular staff exchange programmes also plays a role here. For example, professional competencies can be broadened through a reading of current case-law in the relevant field or by means of following legal developments. In addition to this general development of staff competencies, employees must also come to terms with new tasks and challenges (Edeling, 2008). The original responsibilities of the public services in local administrations, as they have existed since the 19th century, are expanding into a wide diversity of tasks. The typical bureaucratic municipal administration is being increasingly replaced by the “city-as-corporation” model and employees must be equipped with business competencies among others (Edeling, 2008).

However, maintaining high levels of competent performance requires staff to be motivated in addition to the use of their intellectual capacities. The potential of older workers must not be disregarded: according to Stock-Homburg (2008), even when mechanical intelligence (the speed at which information is processed) decreases, pragmatic intelligence (experience, social/cultural skills) remains stable and increases. It is essential that these be utilised. Stock-Homburg (2008) talks of a positive balance between age and experience which needs to be implemented at present in local administrations, at least for all tasks that do not necessitate physically strenuous labour. Tatje (2011, p. 29) also supports this argument, maintaining that while the proportion of older workers will be higher in the future this does not mean that these people have less performance potential, but rather that “… through their experience” they are “a fundamental pillar in their area of expertise”.

Only with the extension of this competency development policy will the service provided by local authorities become more competent, more time-efficient, with a potentially-reduced strain on financial resources. This presents a means of overcoming the challenges that exist at present (Wiig, 2000). In their management study, Sotirakou and Zeppou
(2004) added to these conclusions, noting that demographic changes put pressure on bureaucracy in administrations; administrations can only overcome this pressure if they apply modern and flexible tools in dealing with employees. Jorgensen (2004) found that short-term measures hinder future-oriented HRM the public sector in Australia and that with such measures it is not possible to run an effective administration. He criticises the tendency to bureaucracy in local authorities, which prevents them from deploying modern HR development tools.

3.7.1 Human resource development through learning – knowledge-oriented human resource management

The previous section has established the importance of competency development. What follows now is an explanation of the relevant practical implementation.

In the context of technological changes and the half-life of knowledge, the retaining and furthering of employee skills stands as a central objective for HRM. As a result of those two factors the half-life of knowledge for schooling and (higher education) stands, according to Stock-Homburg (2008), at 10 years, and for professional knowledge at only 5 years. For this reason it is essential that the knowledge of human resources be continually developed. Stock-Homburg talks of an “updating training” which she defines as: “Activities which serve the retention, expansion and updating of professional knowledge, skills and capabilities and enable professional advancement” (Stock-Homburg, 2008, p. 168).

This can come in three forms (Ringlstetter and Kaiser, 2008):

1. Development of personal skills.
2. Development of collective skills.
3. Recombination.
According to Ringlstetter and Kaiser (2008), the first form includes opportunities for individual employees to observe and reflect upon their own actions, furnishing them with new experiences which can then be used for problem solving. Employees derive subjective theories from this and then test the practicality of these in carrying out their tasks. An example of this in terms of local authorities is the interpretation of new legal documentation.

Collective skills are somewhat more complex and represent the interplay between individual skills. Thus, the interplay of individual skills contributes to increased performance efficiency.

Recombination constitutes the expansion of the organisation’s collective skills. Here the knowledge exchange of experiential knowledge is combined in a new way and problem solving approaches are re-defined. This process is to be viewed as learning according to Ringlstetter and Kaiser (2008). The exchange of experience between colleagues via the execution of daily working duties facilitates a particularly high potential for learning, therefore it should be in the interest of HRM to promote this interplay of individual skills.

HRM’s responsibility for resource development is also of great importance in terms of the arguments presented in Section 3.2. The broad increase in numbers of older employees nationwide – and with that the altered structure of Germany’s labour force potential – necessitates continuous employee development so that workers, in the long-term, possess the most up-to-date knowledge in relation to legislation and technology. This is because, up until now, carriers of up-to-date knowledge have been predominantly younger employees who have recently acquired such knowledge in their training or schooling and who, furthermore, are continually supported by HRM who provide them with further training opportunities. The factors mentioned here now force HRM to guarantee all human resources in local administrations continued training and development opportunities. Knowledge as a resource needs to be promoted and supported as an
initiative for all employees. Investment in education is necessary throughout a worker's professional career (Germany. Deutscher Bundestag, 2002).

According to Kirschten (2010a), a company culture must be created which entrenches the idea of knowledge-oriented values among staff, all the while supporting employees in their exchange of knowledge. Furthermore, this culture should entail an appraisal of the experiential knowledge of all workers, regardless of age. As noted in section 3.4.1.3, the process model of workforce planning can be implemented here. The two tools mentioned earlier, age structure analysis and managing knowledge, are particularly important. If the age structure analysis happens to certify that existing knowledge carriers are not sufficient to carry out the relevant duties in the future then policies need to be decided upon to balance out the organisation’s knowledge levels. This means that knowledge may need to be obtained externally. The external acquisition of knowledge in the context of HRM entails "[…] obtaining the required staff in the necessary quantity and with the relevant qualifications, at the appropriate time for the relevant position and at a market-based and performance-oriented wage level" (Jung, 2008, p. 13).

Stock-Homburg (2008) has put forward the opinion that in the present age solely relying on educational staff development measures is no longer sufficient to meet the modern challenges facing an organisation. Experience-based methods, for example the internal development of human resources, are assuming a central importance in HRM activities. A structured knowledge transfer between employees must further develop or expand the existing knowledge base (Kirschten, 2010a).

The following section, 3.7.2, covers the basic concepts in workforce planning to facilitate the management of knowledge. This area of workforce planning is becoming increasingly important because of demographic change. Therefore, the challenges and implications for HR managers are discussed in more detail.
3.7.2 Managing knowledge as a specific function of workforce planning

In the fast-moving society of the present day, new developments, almost as soon as they happen, are already a thing of the past. Concerted efforts are thus necessary to maintain employment levels. Loebe (2006) sees professional development as a key factor. According to Pinnow (2006), social-economic development is now in its fourth stage of development. Once an agricultural, industrial or service society, Germany is in the process of transforming into a knowledge society in which employees represent information workers. This is supported by Malik (2006, p. 9), who states on the subject of human resource development that “knowledge is [...] the most important resource of a developed economy and for many industries today it is the only resource”. Presently, in today’s fast-moving and globally-networked world, the significance of knowledge is becoming ever greater (Graf, 2001). Bellmann (2006) is of the same opinion and considers this an organisation’s greatest potential. Nevertheless, he highlights a problem: this is also the resource that is used least effectively (Toffler, 1990, Quinn, 1992). The accumulation and transfer of knowledge has been taking place for years in companies, but not based on a methodical approach; rather, this was as a self-evident aspect of working processes (Kirschchen, 2010a). Seidel (2003) and Graf (2001) state that knowledge is the sole resource that is multiplied with increased use. This facet of knowledge, as a basic function of workforce planning, needs to be incorporated into a strategic approach by HRM. It must also be made clear to staff that with the transfer of knowledge, this knowledge is not lost; rather, it is multiplied and can be used to contribute to the increased success of an organisation. In reference to Jochmann (2006), the success of an enterprise and the quality of staff are clearly interdependent and with the increasing movement toward a service-oriented approach employees make a decisive contribution to an organisation’s success and image.
In the public sector, managing knowledge is only now receiving significant attention (Voigt, 2004). Müller (2004) states that presently in local authorities – which are notable for their limited finances, the complexity and dynamics of their administrative procedures – employee knowledge must be systematically and sustainably retained, distributed and made use of.

Wilke (1996) emphasizes the importance of managing knowledge as a process of workforce planning. Wilke asserts that knowledge is a part of approximately two thirds of management functions. Handy (1998) even considers intellectual capital to be worth more than material capital.

3.7.2.1 What is knowledge and what are knowledge carriers

The following is the definition put forward by Probst, Raub and Romhardt (2010), who for the purpose for this thesis have volunteered the most comprehensive explanation:

Knowledge denotes the entire range of understanding and skills that individuals use in the solving of problems. This comprises theoretical insights in addition to the practical everyday rules and behavioural instructions. Knowledge relies upon data and information but in contrast to these it is always tied to people. (Probst, Raub and Romhardt, 2010, p. 23)

The US university professors Davenport and Prusak consider knowledge to be:

 [...] a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluation and incorporating new experiences and information. It originates and is applied in the minds of knowers. (Davenport and Prusak, 1999, p. 32)

Knowledge is, according to Edeling, Jann and Wagner (2004) and Probst, Raub and Romhardt (2010) represented in a three-stage relationship based on symbols, data and information, which are
hierarchically structured one atop the other, whereby the next term up always contains an additional characteristic. As such, knowledge is the result of a learning process (North, 1999) and a necessary medium for knowledge creation (Nonaka and Takeuchi, 1997). The following diagram 5 is a graphical representation:

![Diagram 5: Knowledge as a Learning Process (Probst, Raub and Romhardt, 2010, p. 15)](image)

According to Nonaka and Takeuchi (1997), human knowledge is the fundamental and universal element of every organisation. Amelingmeyer (2000, p. 21) defines management of knowledge as the configuration of the organisational knowledge base and states that knowledge should be made available “[…] in the necessary volume, with the necessary quality at the right time, in the right place, in an effective and efficient way”. Müller (2004) and Edeling, Jann and Wagner (2004) also subscribe to this theory and maintain that what is at stake here is an activity that provides structured information from heterogeneous sources, thus giving systematic support for knowledge-based working practices. This definition makes clear the parallel with the definition of workforce planning (see section 3.4.1.3). Because workforce planning is a vital part of HR management, people and employees are also an important aspect of managing knowledge.
Katenkamp (2011) sees individuals as for managing knowledge because it is only people who possess cognitive skills. Drucker (1993, p. 152) sees knowledge carriers as knowledge workers and their knowledge is “their own means of production that they can carry everywhere”. This knowledge leaves the office each evening with its carrier and in the case of dismissal or retirement it is no longer available to the organisation, giving rise to potential knowledge gaps. Managing knowledge, which here refers to, in concrete terms, the explicit focus on individual knowledge, is therefore becoming ever more important. These stand as the tasks for HRM with workforce planning processes (Kirschten, 2010a). HRM needs to determine the optimal allocation of resources while the available administrative knowledge held by knowledge carriers must be actively used (Rehfeld, 2011). Probst, Raub and Romhardt (2010) therefore consider the cultivation of this immaterial value of the employee an urgent management task, in addition to assigning central importance to knowledge carriers when it comes to HRM decision-making processes.

3.7.2.2 The dimensions of knowledge

Knowledge arises through individual learning processes and is therefore initially only present as tacit knowledge in a person’s mind. Nevertheless, pieces of individual and tacit knowledge can be externalised, for example by means of verbal or written messaging which are available to other people or to organisations as data. Thus one can distinguish between tacit knowledge and explicit knowledge (Hasler Roumois, 2007, p. 39).

The above citation makes clear the two knowledge dimensions that were coined by Polanyi in 1996. Managing knowledge should always distinguish between tacit knowledge, which is stored in the minds of employees, and explicit knowledge, which is accessible for others. Nonaka and Takeuchi (1997) add that a separation of epistemological dimensions is crucial to an organisation’s success. Therefore, it is the
responsibility of HRM to analyse the dimensions of knowledge and make both forms of knowledge available for use (Kirschten, 2010a).

**Explicit Knowledge** relates to facts and information and can be transferred with ease. It is also termed “objective knowledge” (Nonaka and Takeuchi, 1997). This knowledge only makes up a small part of the productive knowledge possessed by employees but because of its ease of access, management of knowledge often affords it a somewhat one-sided focus.

The daily work of the individual takes place within a specific context in which **tacit knowledge**, which is difficult to isolate and cannot be expressed verbally, plays a very prominent role. This involves, according to Kugler and Wicki (2001) and Nonaka and Takeuchi (1997), the employee’s personal experience, practical skills and expertise. Roehl (2002) adds to this the factor of anticipation, in that it is also an aspect of carrying out duties. Katenkamp (2011), who observes tacit knowledge from two sides, also provides an important definition.

Knowledge can surface in consciousness in a subsidiary capacity as latent knowledge or in combination with explicit knowledge. And this is exactly where the challenge lies, because it cannot be referenced or replicated. It also cannot, accordingly, be transferred to other employees without significant time and effort. According to Edeling, Jann and Wagner (2004), however, the mental labour done by workers constitutes the most notable feature of public sector activities. Accordingly, tacit knowledge stands as of central importance for management of knowledge processes to address.

At this point it may be useful to bring in some general academic conclusions on implicit knowledge from other countries. The results of a study from Malaysia argue that the focus of managing knowledge in the public sector is not the improvement of organisational performance but rather the securing and sharing of implicit knowledge (Salleh et al., 2013). The securing of implicit knowledge is also viewed critically in the US (Amayah, 2013). Amayah (2013) makes the explicit
recommendation that motivational factors be identified that prompt employees to share their knowledge. Finally, an academic article from England lends support to the notion that strategies to manage knowledge must address explicit and implicit knowledge and transfer among employees (Seba and Rowley, 2010). In practice, in public administrations the focus is on explicit knowledge (Jørgensen, 2004).

Furthermore, Nonaka and Takeuchi (1997) make a further distinction according to the social aggregation of knowledge, calling this an ontological dimension. Knowledge can, accordingly, come into existence on an individual, group or organisational level. These two dimensions – epistemological and ontological – are interconnected (Edeling, Jann and Wagner, 2004).

3.7.2.3 Knowledge as a Component of Workforce Planning and its most important Building Blocks

Schüle (2006) shows that several different issues must be taken into consideration in terms of the levels across an entire organisation and that managing knowledge as a process of workforce planning must be harmonised with the other areas of responsibility. The following diagram 6 demonstrates this.
Diagram 6: Integration of managing knowledge into the entire organisation (Schüle, 2006, p. 205)

The concept of knowledge as a component of the organisational whole is also put forward as an important strategic factor by Mildenberger (2006). He explains this by means of the metaphor of a balance sheet: soft skills and the knowledge of each individual employee account for a significant proportion of the liabilities-side of the sheet; these skills and knowledge should be transferred over to the asset-side as invested capital. In order to do this, integration of knowledge into the organisational structure is indispensable. Here Zack (1999) is critical, stating that such integration into the overall strategy of an organisation is rare. Workforce planning to facilitate the management of knowledge is thus a cross-sectional task on all levels of the administration.

The essential preconditions for a workforce planning process are motivated leadership and employees, clear concepts and open strategies. (Katenkamp, 2011). The model put forward by Probst, Raub and Romhardt (2010) who have defined the individual building blocks that decision-makers need to assess is of interest to this thesis. This model appears to offer administrations the best practical starting points
from which to approach a first engagement with managing knowledge as a form of workforce planning.

The following are the elements necessary for the effective management of knowledge which workforce planning needs to then take into account – also known as core processes (Probst, Raub and Romhardt, 2010). These are interconnected and affect each other and are thus not to be examined on an individual basis (see Diagram 7).

Diagram 7: The building blocks for management of knowledge (Probst, Raub and Romhardt, 2010, p. 32)

The outer flow of knowledge targets and knowledge assessment involves a strategic approach, while the inner activities relate to operational implementation. These building blocks form the basis for workforce planning to facilitate the management of knowledge and demonstrate the most important sub-domains which local administrations need to address. The implementation of these blocks takes place, according to the concept put forward by Probst, Raub and Romhardt (2010), on two levels: an individual or group level or an organisational level.
3.7.2.4 Knowledge Targets in Local Authorities must be Defined

As the result of a lack of competition, managing knowledge as a key process of workforce planning is not highly developed in the public sector. Nevertheless, as a consequence of demographic change and the fact that activities in local administrations involve complex and challenging processes, workforce planning to facilitate the management of knowledge needs to become a central point of focus (Edeling, Jann and Wagner, 2004). Although managing knowledge stands as an important issue in the study of business economics and public administration its strategic implementation has so far received little attention in the public sector (Edeling, Jann and Wagner, 2004). Nevertheless, local administrations must define strategic targets in their evaluation of managing knowledge – targets that set out the desired skill sets and determine core organisational knowledge in the administration (Probst, Raub and Romhardt, 2010).

According to Schüle (2006), knowledge targets need to address the following:

- target criterion – “what I want to achieve”
- achievement of targets – “how I can achieve the target”
- a time factor – “the timeframe within which I want to achieve something”.

Alongside the aforementioned knowledge targets, the factors of time, cost and quality can also be important for local administrations (Voigt, 2004). In specific terms, this means that the duplication of work should be avoided since it can lead to higher costs, while all information available within the administration relating to revenue sources should be accessible for employees. Edeling, Jann and Wagner (2004) summarise these three factors as follows: an administration has an obligation towards its citizens to effectively organise its material and human resources and to effectively implement legislation, while actively
seeking to learn from those citizens. Knowledge targets thus need to be based on the needs and expectations of the people in a municipality.

According to Milchrahm (2004), a knowledge manager can be made responsible for managing knowledge in the workforce planning process. The public sector in the US began discussing the use of knowledge managers in 2000. In Germany, however, this job title rarely appears on job listings. Röllecke (2014) stresses that a knowledge manager must be someone who has worked in the organisation for many years and has considerable experience with its procedures.

3.7.2.5 Knowledge profile/Knowledge mapping as a visual medium for workforce planning processes

Possibilities for documenting employee knowledge as mentioned in the previous section involve, on the one hand, knowledge profile and/or knowledge maps and, on the other, HR development systems. In the latter case it is the task of HRM to match knowledge profiles to job descriptions (Schüle, 2006). HR systems are mostly only available to management and, in terms of the daily processing of tasks, they are not usable in a practical context, nor are they helpful.

On the other hand, knowledge maps, in which graphical lists of knowledge carriers, bodies of knowledge and knowledge sources are laid out, are of practical use. By way of an example, knowledge maps pertaining to specific departments can be created that can be accessed by all employees in the administration. According to Probst, Raub and Romhardt (2010), such maps should contain the following information:

- which knowledge carriers possess which expertise (e.g. computing, book-keeping, legal or social knowledge)
- in which forms this expertise exists (basic or expert knowledge)
- in which department an employee is employed
- how their knowledge can be drawn upon (in paper form, intranet, personal conversation)
• which other knowledge sources are available (data banks, professional journals, administrative regulations, legal documentation).

Alongside this consideration of which knowledge is to be retained, the knowledge that is stored must also be put to some use, otherwise investment in workforce planning will prove useless. According to Schüle (2006), managing knowledge depends on the regular exchange of information between employees.

Just how important knowledge utilisation and retention is for a local administration has been demonstrated by the demographic changes outlined at the outset of this work and the resulting losses in terms of experienced staff. The German Bundestag (Germany. Deutscher Bundestag, 2002) has suggested that, in the near future, companies will no longer be able to afford to let the knowledge of older employees – an important knowledge resource – remain unused. These workers possess important organisational expertise that contributes to the overall success of an organisation. The early involvement of employees in the establishment of workforce planning structures to facilitate the management of knowledge is therefore beneficial, and Voigt (2004, p. 6) suggests a systematic approach:

• evaluate current knowledge processes
• identify action fields
• establish knowledge targets and their dependence on other processes
• create concepts which describe and connect the administration’s processes, organisation and specific culture
• implement, evaluate and update management of knowledge processes.

Sections 3.7.3.2 to 3.7.2.5 explained the importance of knowledge for workforce planning. Knowledge is an important company resource, and in a period of demographic change it requires particularly careful
attention. As well as taking steps to secure knowledge, it is important also to use it and to transmit it. The following sections describe how this use and transmission can be implemented.

3.7.2.6 Strategies for Knowledge Sharing and Knowledge Use

In the past, knowledge was viewed as something that one acquired through schooling or training and then expanded upon as one gained experience. In the fast-moving society of today, that which we learn is quickly overtaken by newer knowledge and is thus not sufficient for the entire duration of a person's working career. The professional life of the modern employee is punctuated by repeated phases of further training (Walle et al., 2006). Lifelong learning is a central concern in the modern life of a professional, characterised, according to Roehl (2002, p. 184), by "[…] the demanded revision of one's own knowledge, involving a critical reappraisal". Bosch (2006) adds that the educational level attained with one's initial professional training is not adequate for the entirety of a working career and that it must be expanded and refreshed by means of lifelong learning.

According to the study by Jorgensen (2004), this is also a necessary condition for competence among public employees in Australia. The German Bundestag (Germany. Deutscher Bundestag, 2002, p. 42) terms this: "[…] a life-long, reflexive learning process in the acquisition and application of knowledge, expertise and skills […]". This theory is supported by Scholz (2006), who states that the changes described in Chapter 2, necessitate continued further training measures for all age groups. Conrads and Trischler (2012) add that older people are being put at a disadvantage and that a rethinking is necessary in companies and organisations. Partial retirement, in particular, must be rethought, as it is counterproductive. This remains, since 2002, the most widespread measure for older employees. Conrands and Trischler (2012) also note that lifelong learning in order to reinforce the working abilities of older employees is not very widespread. This situation must be reversed in order to make use of older employees' knowledge. Stapf
(2012, p. 177) concludes that knowledge-oriented intelligence increases from the age of 30 onwards and “increasing knowledge, skill and experience come to the fore”. Older employees are therefore not less productive or able and their knowledge and abilities should be retained and passed on. Stapf (2012) asserts that in the light of this conclusion, working life in Europe should be extended in order to remain competitive in the future relative to other economic powers. Currently, the rate of employment of older workers in Europe is the lowest in the world. Kirchoff et al. (2012) sees here a chance for Europe:

If the willingness of business increases to employ older workers in age-oriented workplaces [...] demographic change can be anticipated and actively shaped. Because in the future, older workers together with immigrants and women will be the most important personnel reserves for business in Europe. (Kirchoff et al., 2012, p. 206)

There needs to be a re-assessment of the old idea of supplementary training measures that follow on directly from school education (Preißing, 2010). Koch (2005) states that lifelong learning is a strategic measure that is not easily implemented. In the case of local authorities it is difficult to assess which knowledge will be required in the future; one cannot carry out a random set of training and development procedures – these need to be based on knowledge analysis.

HR management needs to use strategic workforce planning to create the conditions in which employees can pursue lifelong learning as a means to personal development. According to Rump and Eilers (2006) there are not many measures required here; rather, there is a need for the aforementioned knowledge mapping and, based upon that, targeted and practice-oriented measures can be put in place.

In addition to lifelong learning, this thesis concentrates on three particular methods. All these methods are based on the act of communication, without which the transfer of knowledge is impossible. As part of an experience exchange, employees are required to question
the actions of others; they must find out, by means of communication, which tacit knowledge is necessary to process tasks and which tacit knowledge can be used in terms of laws, directives or other types of regulations. Communication partners must aim to derive critical findings from these talks and ascertain argumentation guidelines in order to process specific cases (Roehl, 2002). The three particular methods (according to Bossaert, Demmke and Moilanen, 2012) are presented below.

1. *Forming internal organisational networks*

This entails forming internal knowledge-based networks that come into contact with each other on a regular basis and perform exchanges. Through the creation of this social interaction, experience can be collected on both an epistemological and an ontological level.

2. *Mixed-age working groups*

Knowledge exchange occurs directly in the workplace, and implicit knowledge can be transmitted directly from one employee to others. This approach is directed at extrapolating subjective experience. According to Preißing (2010), this form of experiential exchange has the greatest potential in terms of knowledge transfer. Katenkamp (2011) has compiled the following questions that could be brought up in such working groups:

- How do you obtain the knowledge that is most important in your job?
- What do you need to know so as to be able to process tasks?
- What experience do you have of critical situations?
- Which other departments could this task potentially concern?
3. **Targeted successor development**

An age structure analysis is a useful tool for administrations in identifying where potential knowledge gaps could arise. In knowledge sharing terms, one possibility is the targeted development of a successor who can learn from the experience of a departing staff member. One method that is being increasingly used in local authorities is the so-called “tandem model” (Kirschten, 2010a). This model has also been endorsed by the German Bundestag (Germany. Deutscher Bundestag, 2002, p. 48), which has described it as the “[…] cooperation between older staff who possess experience and younger employees who are geared more towards change”, whereby this involves “[…] a combination of qualities such as experiential knowledge, commitment and expert competencies”.

According to Katenkamp (2011), this successor development model can act as a new form of mentoring. As already explained, informal knowledge is imparted by those with experience, while the concept of social skills as a tool for work, organisational routines, information sourced from informal networks and standardised systems are demonstrated to the junior employee (or mentee). The learning-by-doing aspect sees the development of core competencies and, upon completion of the process, the retiring staff member has furnished their successor with relevant, complex knowledge, putting the latter in a position where they are able to cope with the challenging situations and complex administrative procedures that are the daily reality of local authorities.

These tools offer opportunities for workforce planning in HR management. However, these are only opportunities, because Katenkamp (2011) states that knowledge does not necessarily equate to competence. Brown and Duguid (1991, p. 41) describe this dilemma in the following terms:
“Knowledge is a tool for action and competence, while experience shapes knowledge in a given situation. Knowledge allows for competence but they are not the same thing”.

3.7.2.7 Possible Barriers to Managing Knowledge

The management of knowledge needs to conform to the organisation’s strategic targets. The responsibility of local administrations is to further and preserve the common good of a community and to ensure order and safety. But these are legal obligations, not targets like those a private company sets itself. Independent action takes a back seat because of the pressure to consolidate legal obligations. In German local authorities there is a strict separation of duties between individual departments/fields and the knowledge of one department is generally not available to others. These functional barriers must be overcome by a strategic workforce planning.

Further knowledge barriers are present in the form of limited communications skills and knowledge islands that close themselves off from each other in the absence of a unifying strategy (Roehl, 2002).

It is essential that these barriers be removed. The following diagram 8 serves to further elucidate the issue.

Diagram 8: Barriers to the process of managing knowledge (Probst, Raub and Romhardt, 2010, p. 160)
Further to these barriers, there is also the fact that the success of workforce planning to facilitate the management of knowledge often only becomes noticeable a considerable time after its implementation and that the people required to pass on their knowledge may no longer be employed by a local authority when the improvements become apparent. For this reason, a level of trust needs to be forged among employees, and management must offer incentives so that workers pass on their knowledge (Katenkamp, 2011). There are material and immaterial options here. In terms of a material incentive system Kirschten (2010a) maintains that a “knowledge premium” or knowledge-oriented target agreement could work here, occurring each time the desired exchange takes place between knowledge carriers. The immaterial reward could take the form of a new or expanded transfer of responsibilities or greater responsibility or decision-making powers. According to Edeling, Jann and Wagner (2004), to overcome barriers there is always a need for an intrinsic motivation because only then do the means and the ends correspond with each other. The message for employees must be to think not in terms of internal competition but in terms of cooperation (Nonaka and Takeuchi, 1997). According to Jorgensen (2004), it is also important to emphasise mutual trust. Sandhu, Jain and Ahmad (2009) from Malaysia offer a different opinion, concluding that the most effective method of breaking down barriers is a system of rewards and incentives. The authors do not see employees’ lack of trust in a workforce planning system as a barrier.

There are also, however, barriers that cannot be overcome and knowledge that cannot be documented. Müller (2004) puts forward common sense, intuition and complex skills as examples here. Then there are also barriers that do not necessarily depend on employees, but rather depend on the rigid structure of the administrative apparatus. According to Voigt (2004), Germany’s civil service is characterised by rigidly laid out processes that have cemented themselves into the organisational structure over the course of many years. Fulfilling legal obligations is always at the forefront, while the ideas or individual skills
of staff take a back seat. As such, a specific cultural factor can become a barrier – one which cannot be overcome by individual administration.

To conclude this section, attention should again be drawn to the issue of technology as a possible barrier to managing knowledge (McDermitt, 1999). This is particularly true in the case of older staff who may be reluctant to get involved in practice that assist in the management of knowledge due to concerns relating to the use of technical tools. Accordingly, workforce planning to facilitate the management of knowledge in local authorities needs to be implemented in such a way that every employee is granted – regardless of their level of technical expertise – constant access to the system for managing knowledge.

3.7.2.8 Key impact of managing knowledge as a process of workforce planning

The preceding discussion shows that securing and transmitting knowledge during a period of demographic change is becoming ever more important for local administrations. Managing knowledge in HR should be seen as a central aspect of workforce planning. According to Armstrong (2011), however, workforce planning is itself not yet accorded central importance. Workforce planning takes a strategic approach to the question of how many and what sort of employees will be required in future in order that an organisation be able to meet its goals. Employees are therefore seen as the most important resource, and workforce planning goals should be integrated into the administration’s overall strategy. Workforce planning involves forecasting supply and demand, and age structure analysis is a proactive planning process on the basis of which future demands can be estimated. Managing knowledge is also an important process for identifying and securing knowledge within the organisation in the framework of workforce planning (Armstrong, 2011).

As well as securing the skills of existing employees, an administration should also consider acquiring new staff from outside the internal labour
market as part of its workforce planning measures. The following section describes the challenges that public sector employers must meet during a period of demographic change in Germany.

3.8 Recruitment in the External Employment Market

The arguments presented thus far have focused on the personnel already employed in German local authorities. As a result of demographic change and the climbing average employee age, younger generations of workers on the external employment market must be obtained, thus establishing external recruitment as one of the most important responsibilities of HRM. It is no longer job applicants who need to portray themselves in a positive light by underscoring their skills and competencies; rather, it is companies who need to promote their benefits as employers (Salz, 2011).

Whether this change in the playing field is also applicable to German local authorities is to be established in the empirical study. Until now the public sector has traditionally hired younger replacement staff from the internal job market, with activity on the external market a seldom occurrence. This is explained, on the one hand, by the long turn-over time in a single employment position and, on the other, by the fact that junior workers are trained internally. This is, however, no longer sufficient as a result of the now homogenous age structure, and recruitment from the external market is essential (Bartl and Jonda, 2008).

In order to recruit capable human resources, however, the employment market must be analysed carefully. According to Ringlstetter and Kaiser (2008) it is the market on which labour is demanded by companies and offered by the working population. According to Porter (1992), HR managers must be aware that they are involved in a constant rivalry with other competitors. Of particular importance here are an organisation’s own competitive advantages, for example above-average salaries, bonuses, flexible working hours, opportunities for development
and job promotion (Kirschten, 2010). Alongside these competitive advantages it must also be clearly established how a competitor positions itself on the market and how many of them there are. In the context of observing competitors, Ringlstetter and Kaiser (2008) also place an emphasis on the employer’s image. Local administrations must realise that the job positions they offer are desirable and that this fact needs to be emphasised. What is required here is the creation of a positive employer image, in addition to putting forward direct, subjective advantages. In the public sector these include, among others, clear wage guidelines for the level and structure of salaries, regulated working hours, possibilities for promotion and challenging fields of activity (Werries, 2012). This allows for local administrations to establish themselves as an attractive employment opportunity and to identify potential employees through these job offers.

Höllmüller (2002) summarises this by stating that in any selected market segment it is the specific attributes of the organisation that appeal to the needs of candidates from that segment that need to be communicated. The result of this market segmentation should be to create a level of appeal that generates interest among candidates for the organisation in question. If it is not possible for local authorities to find suitable workers the aforementioned factors in the selected market segments must be better communicated and presented to the external market in comparison to competitors. According to Ringlstetter and Kaiser (2008), the competitive position and the attraction of the employer need to be improved in this case. Differentiation from competitors should take place in three areas:

- organisation
- the job to be performed
- payment.

More specifically, these involve company values, corporate culture and leadership, the challenges of the job, career perspectives and training opportunities, in addition to the total pay package and social security
benefits. As soon as local authorities have laid out these merits in public and continue to stress them, applicants will be interested in positions in the public sector.

As well as the emphasis of unique, attractive features, the use of new media can make a decisive contribution to competitiveness (Fischer, 2013). This author recommends using information technology (IT)-based HR marketing tools, such as social networks, interactive online tests or a comprehensive and informative website.

3.9 Conclusions, Summary and Outlook

Chapter 3 has dealt with the challenges presented to HRM, which must face up to these problems now and in the years to come. This section has highlighted the fact that the focus of action planning must centre on the development and retention of human resources. This planning must be embedded in German local administrations because employees will only be pro-active when support, encouragement and motivation from management are in place. HRM must create a framework for this and develop effective strategies. Workforce planning and its key processes, age structure analysis and managing knowledge, are very important here. Workforce planning can help in deriving forecasts of how staff structure will change and consequently in identifying necessary courses of action. According to Armstrong (2011), workforce planning has not yet been established as a standard process in HR management. Wiechmann et al. (2010) also conclude that not all local authorities have an age structure analysis in place, because they are not yet aware of the problem of age structure. They are also unaware of workforce planning to facilitate the management of knowledge. The present empirical study aims to raise awareness of these issues.
3.9.1 Formulation of research proposition and objectives as a basis for the investigation

The following table 6 summarises the most important conclusions from this section. It is clear that this section makes an important contribution to formulating the research propositions. In Section 2 it was established that demographic change and the shrinking workforce also affect the public sector. For the empirical investigation this section reveals possible new directions and fields of operation that the public sector will be faced with.

**Aim:** To investigate the effects of demographic change and the present challenges for HRM in German local authorities in relation to to workforce planning to facilitate the management of knowledge.

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<th>Main facts from the literature</th>
<th>Key issues</th>
<th>Section</th>
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<td>With the introduction of the NPM approach, HRM measures gain in importance:</td>
<td>Implementation of a strategic and resource-based HRM under consideration of UK/US models</td>
<td>3.2, 3.3, 3.4</td>
</tr>
<tr>
<td><strong>Previous approach:</strong> classic HRM</td>
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<td><strong>New approach:</strong> strategic, resource-oriented HRM, guided by the overall strategy of the administration</td>
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<td>New fields of operation:</td>
<td>New fields of operation</td>
<td>3.2.1</td>
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<tr>
<td>• Strategic HRM</td>
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<td>• Demography-oriented management culture</td>
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<td>A precondition for recruitment of new employees in a competitive situation is a positive image as an</td>
<td>Competition for skilled labour Improve employer attractiveness</td>
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</tbody>
</table>
Key References: Wiechmann et al. (2010); Morschhäuser et al. (2011); Ringlstetter et al. (2008); Rieckhoff et al. (2006a); Stock-Homburg (2008); Preißing (2010); Armstrong (2011); Nonaka et al. (1997); Probst et al. (2010); North (1999)

Gaps/Weaknesses and objective

It is first necessary to implement a workforce planning model in order to carry out strategic HR management measures that address the challenges posed by demographic change. More specifically, this requires both data analysis and managing knowledge. It is currently not standard practice in German local authorities to carry out a regular age structure analysis as a basis for workforce planning. Local authority managers are also not aware of the importance of managing knowledge.

Basic principle: An age structure analysis is a precondition for the use of workforce planning tools. Managing knowledge must play a strategic role in this process.

Research proposition 2
If an age structure analysis is in place in local authorities then it serves as a foundation for HR development.

Research proposition 3
The effects of demographic change are positively associated with the deployment of instruments for HR development.

Research proposition 4
There will be an influence from the demographic change on the strategic direction of training activities.

Research proposition 5
There will be a number of separate processes that local German authorities will engage in with regard to knowledge sharing and preservation within the organisation.

Research proposition 6
The implementation of workforce planning processes to facilitate the management of knowledge depends on how well HR managers know the topic, the location and size of the local authority.

Table 6: Summary – Human resource management (compiled by present author)

Chapter 4 accomplishes another important task, which is to describe the empirical methods in detail, before chapters 5 and 6 outline the results and discussion, respectively. The following framework (Diagram 9) serves as the basis of the empirical approach. Diagram 9 shows how
the three complexes influence one another, how they are characterised and what research propositions can be derived from these characterisations. This diagram offers the reader a precise summary of the important content.

Diagram 9: Summary literature review
Part II

The primary research and discussion
Chapter 4 - Methodology

Häder (2006) states that the research process always requires a problem to be identified. As concluded in the chapters of the literature analysis, demographic change in the local authorities may bring conflict with traditional HRM approaches. In some cases, opportunities to achieve goals may be being squandered.

Following the literature analysis, a methodology is established, based on considerations regarding how empirical investigations should be conducted (Bortz and Döring, 2006). Empirical investigations aim to draw a conclusion about reality. In order to be able to verify these conclusions the methods must follow certain rules (Stier, 1996). The methodology is therefore decisive for the degree of certainty with which the research propositions can be answered. The methods are chosen from a wide variety of available options (Schnell, Hill and Esser, 1999).

Before describing the methods in detail, it is important to outline the classification of different scientific approaches: qualitative and quantitative paradigms, as well as mixed methods (Döring and Bortz, 2016; Raithel, 2008). Qualitative research has as its goal the understanding of behaviour through interpretation (Raithel, 2008). The quantitative approach aims to explain behaviour with inductive or deductive reasoning (Raithel, 2008).

According to Bohnsack (1998), empirically-based conclusions in the social sciences can only be made if there exists a communicative understanding with the people who are the object of the research. However, this is not generally the case. The author instead identifies the problem of understanding the ‘other’ through one’s own interpretation of the research subject’s behaviour and utterances. Again, the two facets of social scientific knowledge and research are apparent: subjectivity and objectivity, both important considerations in planning and carrying out an empirical study (Fuchs-Heinritz et al., 1994). Husey and Husey (1997) conclude that these two dichotomies
are one and the same (qualitative = subjectivity and quantitative = objectivity). According to Fuchs-Heinritz et al. (1994) and Döring and Bortz (2016), this is a fundamental conflict in sociological research, and represents a meeting of the natural and social sciences. The natural sciences assert that there can be no objectivity in the social sciences, because the investigators are always themselves part of the phenomenon under investigation. However, it is important to note that objectivity is not simply the same thing as keeping one's distance from the subject of one's research. Much more importantly, it results from a controlled and testable methodology. These two approaches require different study designs and have different ways of gathering information on the research subject. According to Holden and Lynch (2015), the objective approach is guided by the assumption that there are facts and causes that exist independently of the researcher's beliefs, and that can support or contradict a given hypothesis. A sample is used to draw representative conclusions, and the results should be generalisable (Fuchs-Heinritz et al., 1994). According to Ratner (2002, p. 4), “Objectivism is the highest form of respect for the subjects we are studying”. The subjective approach, on the other hand, assumes that there are no definite causes and that the results of an empirical study depend on the opinions of the individual, or on those of the investigator. Ratner (2002) asserts that in this approach the researcher’s values, ideas and knowledge influence the research project. Important considerations include flexibility, openness and communication, and not the statistical representativeness of the sample (Fuchs-Heinritz et al., 1994).

Because the acquisition of new knowledge in the social sciences depends on solving practical problems or building on existing, secured knowledge (Döring and Bortz, 2016), this conflict of paradigms is gradually being resolved through the use of mixed methods. The two approaches to the theory of science should not be in conflict, but rather should complement each other. The important thing is that the research process be clearly understandable and replicable, and that it can be tested and evaluated (Döring and Bortz, 2016).
The following section explains the considerations made in selecting the particular methods used for the present study (Opp, 2014). The study design should be one that is best suited to answer the research propositions (Döring and Bortz, 2016). There is therefore no one correct or incorrect approach. However, given the considerations outlined above, as well as the time and financial constraints, a methodological approach should be chosen that is appropriate for answering the research proposition. Most researchers in the field of business studies follow the objective approach, which is also the basis of the present study.

4.1 Conceptual Basis of the Primary Research

Chapters 2 and 3 dealt with the academic literature on the study topic. A fast-growing body of literature is available on the three main subjects. The following table summarises the conclusions. Those facts are emphasised that are most relevant to the rest of the study and from which the research propositions are derived.

| Aim: To investigate the effects of demographic change and the present challenges for HRM in German local authorities in relation to workforce planning to facilitate the management of knowledge |
| Demographic change |
| Key issues |
| • Declining population in Germany in relation to the world’s population |
| • Ageing population and fewer applicants |
| • Ageing workforce |
| • New HRM tasks |
| Gap/weakness and objective |

Demographic change is a current issue in Germany, but there is a lack of academic research looking explicitly at the effects on local authorities, particularly in terms of staff recruitment.

Objective 1 is therefore to determine whether local authorities need to act and how they should act to recruit new trainees/employees.

Research Proposition 1:

Demographic change is hindering the acquisition of new junior employees.

HRM and workforce planning activities
Key issues

- Implementation of a strategic and resource-based HRM approach under consideration of UK/US models
- New fields of operation/workforce planning
- Strategic implementation of forward-thinking HR policy, taking into account supply and demand
- Age structure analysis as a form of workforce planning
- Importance of knowledge
- Dimensions of knowledge
- Knowledge blocks
- Activities of knowledge preservation
- Barrieers
- Competition for skilled labour
- Improve employer attractiveness

Gap/weakness and objective

It is first necessary to implement a workforce planning model in order to carry out strategic HR management measures that address the challenges posed by demographic change. More specifically, this requires both data analysis and managing knowledge. It is currently not standard practice in German local authorities to carry out a regular age structure analysis as a basis for workforce planning. Local authority managers are also not aware of the importance of managing knowledge.

Basic principle: An age structure analysis is a precondition for the use of workforce planning tools. Managing knowledge must play a strategic role in this process.

Objective 2 is therefore to determine whether an age structure analysis is a precondition for HRM tools. And to evaluate the strategic role of workforce planning to facilitate the management of knowledge and the specific and prerequisites of which it is composed.

Research Proposition 2:

*If an age structure analysis is in place in local authorities then it serves as a foundation for HR development.*

Research Proposition 3:

*The effects of demographic change are positively associated with the deployment of instruments for HR development.*

Research Proposition 4:

*There will be an influence from the demographic to the strategic direction of training activities.*

Research Proposition 5:

*There will be a number of separate processes that local German authorities will engage in with regard to knowledge sharing and preservation within the organisation.*

Research Proposition 6:

*The implementation of workforce planning processes to facilitate the*
management of knowledge depends on how well HR managers know the topic, the location and size of the local authority

Table 7: Summary of key issues literature review (compiled by present author)

The following diagram 10 shows how the objectives and research propositions fit together.

Diagram 10: Summary objectives and propositions for research

As noted in the sections before no concrete academic investigation of the consequences of demographic change for HR and workforce planning to facilitate the management of knowledge has yet been undertaken in the context of German local authorities, nor has any
analysis of the situation been made. Academic works on the individual research topics are available and have been presented in the literature review. However, there are no existing academic analyses that link demographic change to the state of HRM in German local authorities. Instead, there exist various expert reports by federal ministries or practical handbooks produced by research institutes. These are briefly summarised below and then referred to again in the discussion of the results. Since no academic analysis yet exists, the present study aims to fill this gap by supplying empirical findings.

The German Federal Bureau of Statistics has compiled reports on the effects of demographic change, while the Municipal Association for Administration Management (KGSt) has identified the necessity of HRM efforts in this area. The Forschungsinstitut Betriebliche Bildung (f-bb) has produced a study on sustainable HR policy that highlights the impact of demographic change (Freiling and Geldermann, 2011). This study was conducted among German local authorities and therefore concerns the same population of interest as the current empirical investigation. However, the f-bb study took in a very broad field of phenomena and concerned itself with the general impact of demographic change (Freiling and Geldermann, 2011). No specialised investigation in the field of managing knowledge has been carried out. The current study will compare and contrast existing results as part of a data analysis. In composing the research topic, the researcher has taken into account the fact that no previous investigation has focused on workforce planning to facilitate the management of knowledge in local authorities. In response, this study aims to fill the gap by examining the relationships between demographic change and HRM practices.

4.1.1 General methodological approach

The initial situation, worked out in Chapters 2 and 3, is taken into account when selecting the focus of the study, which is defined as follows:
Aim:

*Investigate the effects of demographic change and the present challenges for HRM in German local authorities in relation to workforce planning to facilitate the management of knowledge.*

This section of the thesis explains the primary research procedure with reference to theoretical models. Following this, the primary data will be analysed and presented in the results chapter. A chapter on analysis and discussion then follows, in which the answers obtained from the primary research are set in the context of the theoretical knowledge outlined in the literature review. In gathering the primary data, the researcher relied primarily on the theoretical advice of the “research onion” (see Figure 7) identified by Saunders et al. (2007, p. 102), which scrutinises the following specific aspects:

- research philosophies
- research approaches
- research strategies
- research choices
- time horizons
- research techniques and procedures.

![Figure 7: Research onion (Saunders et al., 2007, p. 102)](image-url)
This procedure was chosen because the structure of the design frame is comprehensively laid out and explains the research procedure to the reader in clear detail. The aim is to compare the advantages and disadvantages of the different research methods with reference to the research onion. It is imperative to ensure that the choice of method serves to test the research propositions. In addition, possible time and financial resource constraints should be taken into account.

The researcher would first like to clarify what considerations were made in the composition of the research proposition and what form of question was chosen.

4.2 Nature and Composition of the Object of Investigation

According to Nuissl (2010), in formulating an object of investigation, one can choose between a descriptive and an analytical question. A descriptive question enables a description of the subject matter without a value judgement and without interpreting or making associations between variables. The analytical question, on the other hand, investigates associations using scientific methods. Since this study is investigating associations it makes use of an analytical question frame with the aim to investigate:

*The effects of demographic change and the present challenges for HRM in German local authorities in relation to workforce planning to facilitate the management of knowledge.*

Demographic change represents an independent variable, since it lies outside the control of local authorities. Its effects on HR structure and knowledge retention policies are the dependent variables, which the primary research will measure and analyse.

However, the descriptive approach is not to be neglected. De Vaus (2002) explicitly notes that descriptive statistics furnish an investigation with the basis for later explanation of trends and relationships. Data
description can provide social research with an important point of reference from which to begin. The researcher has followed this advice and, as such, Chapter 5 presents a descriptive analysis of the survey results.

According to Diekmann (1998), the aims of social science investigations, and therefore of the present study, can be organised into four categories:

1. Exploratory investigations, which target relatively unknown subject areas.
2. Descriptive investigations, which focus on measuring distributions and estimating frequencies, proportions and averages.
3. The testing of theories and hypotheses, which involves investigating postulated relationships between variables and phenomena.
4. Evaluative research, which investigates the effectiveness or ineffectiveness of different social measures and initiatives.

In the analysis of the literature, principles were derived that were relevant to the issues of demography, HRM and managing knowledge as a process of workforce planning activities. The investigation aims to establish to what extent the academic conclusions are already being put into practice. The present study pursues three of the four stated goals. The aim is to: contribute descriptive results; investigate associations among variables; and, in some cases, to provide initial exploratory suggestions. In order to investigate relationships from various angles, six research propositions were formulated.

In accordance with Gesemann, Roth and Aumüller's (2012, p. 20) approach to investigation, the present survey aims to "shed light on the local state of affairs and relevance of the implementation of guidelines in each field, as well as information regarding barriers, difficulties, successes [...]".
4.2.1 Variables as changeable characteristics in research proposition construction

In research proposition construction, variables serve as a means of investigating their own interrelationships. Variables, as the name suggests, are variable characteristics of individuals, groups or organisations, and their values can be measured (Thomas, 2009; Diekmann, 1998). Variables have different characteristic values, which can be used to test research propositions and discriminate differences in individual attitudes (Micheel, 2010). According to Diekmann (1998), variables must always have at least two possible values. Using a coding scheme, these values are then allocated a code, which can be used to conduct statistical measurements and analysis. Variables that have only two possible values, such as male/female, are termed dichotomous variables. Variables with several possible values are termed polytomous (Schumann, 2011). In formulating research propositions and constructing variables it is important to make sure that the values a variable can take on are disjunct and exhaustive. The list of possible answers provided for a closed question should not include overlapping possibilities and the respondent should be able to characterise their own individual value as one of the given options.

There are, according to Micheel (2010), various distinctions to be drawn between types of variable. For the purposes of the empirical study in this thesis the difference between dependent and independent variables is important. In formulating a research proposition, one value is taken as given and is defined as the independent variable. This independent variable can have different values and is used to explain the dependent variable. A further explanation follows in Section 4.3.

4.3 Operationalising the Research Propositions

Research propositions can be derived from the object of investigation defined above that embody “propositions (or speculations) regarding a real situation and the relationships between phenomena” (Nuissl, 2010,
Research proposition operationalisation is indispensable to the quantitative research method and represents an important step in fulfilling research aims. The individual research propositions are compared to each other after data analysis (Schumann, 2011). Lippl (2003) characterises this process as a hypothesis-testing investigation.

The following six research propositions have been proposed for study. The research propositions relate to the previously discussed theoretical insights:

Research proposition 1:
Demographic change is hindering the acquisition of new junior employees.

→ Research-Outcome-Sought:

The survey questionnaire aims to raise awareness of the problem posed by demographic change as an independent variable that influences the dependent variable acquisition of new junior employees. It aims to investigate whether local authorities are already taking a critical approach to this problem.

Research proposition 2:
If an age structure analysis is in place in local authorities then it serves as a foundation for HR development.

→ Research-Outcome-Sought:

Local authorities are presented with a basis for HR development in the form of the independent variable age structure analysis. This research proposition aims to establish whether age structure analysis is being applied reasonably.
Research proposition 3:  
The effects of demographic change are positively associated with the deployment of instruments for HR development.

→ Research-Outcome-Sought:

Demographic change is taken as the independent variable and the study will investigate whether the effects associated with it influence the dependent variable, HR development strategies.

Research proposition 4:
There will be an influence from the demographic change on the strategic direction of training activities.

→ Research-Outcome-Sought:

Because of demographic change, it is essential that local authorities direct their training efforts strategically and orient them as closely as possible to the goals of the overall management strategy. The aim is to establish whether local authorities have a strategy on the basis of which they can construct their training programmes.

Research proposition 5:
There will be a number of separate processes that local German authorities will engage in with regard to knowledge sharing and preservation within the organisation.

→ Research-Outcome-Sought:

The acquisition, transmission and securing of knowledge, especially of implicit knowledge, will become an increasingly challenging task for HR management. It is therefore necessary that these measures be strategically supervised and implemented by HRM. This research proposition aims to establish whether distinct and separate strategic
knowledge processes are already implemented in German local authorities.

Research proposition 6:
The implementation of workforce planning processes to facilitate the management of knowledge depends on how well HR managers know the topic, and the location and size of the local authority.

→ Research-Outcome-Sought:

This research proposition is aimed at determining whether the implementation of knowledge sharing policies depends on HR managers' level of understanding of knowledge (e.g. their approach to knowledge gaps or knowledge transfer). In order to view the approach to knowledge from different angles, the effects on demands on HR managers are used as variables, as is the type of local authority (i.e. location and size).

Diekmann (1998) argues that the foremost aim of an empirical investigation is to test the stated hypotheses (here: research propositions). To fulfil this aim, this study uses a written survey. The questionnaire is attached to the present work. A copy of the questionnaire can be found in Appendix. Table A9 in the appendix gives an indication of the questions aimed at testing the various research propositions (all further questions are checks or opinion questions).

The following sections explain in detail how the data were collected. Potential research designs are presented, and the advantages and disadvantages of each will be weighed. The researcher's choice of a particular procedure will also be justified. The fact that not all methods can be considered will be taken into account, in particular because research resources are limited.
4.4. Research Design in Detail

Once the research investigation is formulated and the research propositions have been derived, the researcher turns to the question of study design. The study design provides a clear, structured approach to answering the research propositions and sets out the individual steps towards this goal, such as access to the research field, the data collection procedure and data analysis. According to Hug and Porschenschnik (2010), the research design serves to provide structure for the empirical investigation and, in the following sections, the researcher turns to Saunders et al.'s (2007, p. 102) concept of the "research onion" (see Figure 8). There is a wide range of alternatives for research design, which are briefly outlined. The focus of this section, however, is on presenting the methods applied in this study, selected with reference to the "nature of the survey, the sample, time and cost constraints, the importance of response rate and the types of questions" (De Vaus, 2002, p. 126-127).

Before Sections 4.4.1 to 4.5.1.1 go into more detail, the general research approach is briefly introduced.

The reasons for the decision for the research design can be summarised as follows: the aim is to test research propositions and draw generalisable conclusions from these tests. This is only possible in the current study if theories are first presented. The theories were outlined already in the literature analysis, and clear research propositions were derived for each topic area. For this reason, this study adopts the deductive approach and the philosophy of positivism. The survey strategy follows the deductive approach and the goal of the study, which is to pose a large number of questions to a large sample. Largely due to time constraints a single method is deployed in a cross-sectional study. The mono-method is suitable for answering the research propositions posed here. The cross-sectional nature of data collection allows for a current survey of the work and attitudes of HR managers in German local authorities at the time of the study, therefore providing an up-to-date analysis of the issues. Because the aim is to
analyse as large a number of survey results as possible, while having gathered the results in a short period of time, only quantitative data from a standardised questionnaire are gathered.

Figure 8: Research onion for the present study (compiled by present author)

This brief summary in Figure 8 gives the reader an overview of the following sections. These sections will explain in detail the methodological approach and the choice from among the available methods.

4.4.1 Research philosophy

As Saunders et al. (2007) note, the question of research philosophy arises not at the point of formulating a research design but much earlier, with the earliest considerations of the research topic. The research philosophy reflects the principles by which the researcher approaches the research propositions and the field to which it applies. Saunders et al. (2007) draw a distinction between positivism, realism and interpretivism. At this point, the focus of this study will be confined to the distinction between the principles of the positivist and interpretivist approaches, as the realist approach is very similar to the positivist approach. The positivist approach takes as its point of departure the
assumption that the researcher is not influenced by the research object and that, vice versa, the researcher does not exert any influence over the research object. The aim is to test hypotheses in a process free of personal value judgements. This enables the extrapolation of general rules from the results of the hypothesis testing. In contrast, the interpretivist approach assumes that no general conclusions can be drawn from the results, since the research field is too complex. No general theories can be formulated, because human beings are social actors in every situation and their decisions and behaviour depend on the moment; at a later date they may well behave differently even in the same situation.

Given these two philosophies, the current research propositions rely on the positivist approach. The aim is to test the research propositions and draw generalisable conclusions. The researcher deploys a value-free research strategy that does not influence participants. The results should inspire further investigation and point the general field in the direction of new policy approaches.

### 4.4.2 Research approaches

At the outset of considering the research propositions, the researcher posed the question of how she might arrive at a conclusion. Saunders et al. (2007) draw a distinction between the deductive and inductive approaches. The deductive approach begins by outlining a theory and deriving hypotheses/research propositions. In a deductive approach these hypotheses/research propositions are tested and relationships and dependencies among variables are deduced from the collected data. The inductive approach, by contrast, aims first to gather data and only after the analysis of these data is a theory constructed. The inductive approach is applied in investigations aimed at discovering more about the general background of a research topic or about people’s points of view concerning particular phenomena and in which the main focus is not quantitative data collection. The inductive
approach assumes that the researcher immerses themselves in the environment of interest and thus becomes part of the research process.

As explained in the preceding section on research philosophy, the aim of the current investigation is to test specified research propositions and draw general conclusions. Despite the limits of time and personal resources, the investigation takes a deductive approach, although Saunders et al. (2007) note that a low response rate may result. The risk of the inductive approach, on the other hand, is that no theory can be derived from the collected data and that the response rate may not compensate for the additional time taken.

**4.4.3 Research strategies**

The research strategy details the form in which the data will be collected. Hug and Porschenschnik (2010) and Saunders et al. (2007) put forward the following strategies as examples:

- experiment
- case study
- survey
- grounded theory.

This list is not exhaustive and there are many further possible strategies. A survey is the chosen method since, according to Saunders et al. (2007), it can be used to answer many different research propositions, particularly in the fields of business and management. This strategy corresponds with the deductive approach and therefore fulfils the dissertation’s requirements.

**4.4.4 Choice of methodology and time frame**

In answering the research proposition the researcher has, according to Saunders et al. (2007), the choice between the mono method and the multiple method. This means that the choice exists to collect
quantitative data, qualitative data or a combination of the two. The multiple method affords better prospects for answering the research proposition, as it allows a deeper insight into the research field. For example, questionnaire surveys can be conducted first and then followed up with interviews with selected respondents. This provides detailed information that goes beyond the purely quantitative data. In the researcher’s opinion this is the best method for arriving at a deeper conclusion. It is, however, associated with a greater expenditure of time. After the quantitative data have been analysed it should be carefully considered what further qualitative information is to be gathered, which respondents are to be sampled and how these additional data are to be gathered. This would entail more research time than the researcher could afford alongside her full-time job. For this reason, the mono method of gathering exclusively quantitative data has been adopted.

In addition, it is important for the research design to consider the temporal aspects of the study. Two distinct temporal designs are the longitudinal and the cross-sectional design (Saunders et al., 2007; Thomas, 2009). The longitudinal study is a design in which participants are investigated over a long period of time in order to determine whether their behaviour, opinions or decisions change. The cross-sectional study, on the other hand, provides a snapshot of people or organisations at one point in time.

Micheel (2010) and Diekmann (1998), however, identify three types of design with respect to the temporal dimension:

- cross-sectional design (‘Querschnittsdesign’)
- trend design
- panel design.

As discussed above, the cross-sectional design collects data at one point in time, providing a snapshot of the sample’s characteristics. The trend design collects data at different time points and from different
samples. The panel design collects data from the same sample at different time points and is therefore equivalent to the above-mentioned longitudinal study.

In view of the available resources and the need for results to be made available as quickly as possible, the researcher has opted for a cross-sectional study. This decision also takes into account the fact that the results are exploratory in nature and aim to describe the current situation in local authorities (Micheel, 2010). The study does not aim to observe and analyse the behaviour of local authorities over a period of time. It aims instead to give only an informative, up-to-date snapshot that should inspire further investigation by highlighting current problems and raising awareness of key issues.

4.4.5 Ethical issues

In the case of a questionnaire survey, according to Büchner (2006), Hug and Porscheschnik (2010) and Micheel (2010), there are principal and subordinate quality criteria to consider with respect to ethical issues. The principal quality criteria can be organised into three types: objectivity, reliability, validity.

These three criteria stipulate that “the results of an investigation should not be an expression of the personal preferences and opinions of a particular researcher” (Hug and Porscheschnik, 2004, p. 94).

Objectivity can be further divided into three categories (Schumann, 2011). First, every survey, or in the present case every questionnaire, should be the same. Every respondent should be approached with the same selection criteria and the same possible answers. Hug and Porscheschnik (2010) identify the concept of procedural objectivity, which requires that contact between the researcher and the participant be minimised. Analytical objectivity requires, in addition, that every answer is coded in the same way and not in a way that varies depending on the particular respondent. This consideration is especially
important in the analysis of open questions. Interpretational objectivity refers to the requirement that every analyst with access to the data comes to the same conclusion from the same results (Hug and Porscheschnik, 2010).

Reliability refers to the precision and stability of a survey. Nuissl (2010) and Hug and Porscheschnik (2010) stipulate that the data be collected in the same way even after a period of time has passed and that the results are free from the influence of chance. Schumann (2011) understands the reliability of a study to refer to the extent to which a test provides similar measures of the same characteristic across arbitrary changes in circumstances.

Validity refers to the extent to which a study considers the questions that could test the stated hypotheses. This means that the true object of study is actually captured by the questions posed (Nuissl, 2010; Schumann, 2011). According to Schumann (2011), the most complex form of validity is construct validity. By this criterion, a study is only valid if the stated research propositions can be tested.

The researcher has ensured that the above-mentioned ethical issues were taken into account throughout the whole research process. Objectivity is ensured through the consistent composition of the survey questionnaire. Reliability is guaranteed by the fact that, throughout the precise specification of the research design and data collection procedure, all steps have been clearly defined and data collection does not depend on chance factors. The validity of the study can also be established. The researcher first carried out a thorough literature search and specified potential interrelationships in the form of research propositions. With these research propositions as a starting point, she has arrived at questions that can test the propositions and that can answer the overall research proposition. This guarantees that all questions are concerned exclusively with the research process.
According to Büchner (2006) there are also four subordinate quality criteria to be considered. The survey should fulfil certain normative criteria, such as being representative, and the conditions in which the survey is carried out should be presented in a coherent manner. In addition, the test should be economically viable, comparable and useful. Micheel (2010) adds ethical criteria as follows:

_Independence:_
The researcher takes personal responsibility for conducting the study.

_Transparency:_
The researcher must fully inform participants of the study's aims and methods.

_Consent:_
Answers should be obtained with the free consent of the participants.

_Anonymity:_
Participants in the empirical study must be guaranteed that their data will be handled confidentially and anonymously.

Saunders et al. (2007) consider these criteria, stating that the rights of participants must not be compromised and that all data collected must be handled anonymously and objectively. This applies to all stages of the research process. De Vaus (2002) also holds that ethical responsibilities with respect to the survey participants should be of the same importance as the design and construction of the questionnaire.

Respect for privacy is the most important ethical consideration. Care has been taken not to breach any of these fundamental ethical guidelines, and the researcher can assure that they have been fully observed. Participants were assured in particular about anonymity and the freedom of consent to participate – principles that are respected throughout the research process. It is not possible to determine which response comes from which local authority.
4.5 Data Collection – Qualitative versus Quantitative

In empirical research a distinction is drawn between qualitative and quantitative data collection. Nuissl (2010) argues that these do not represent two mutually exclusive approaches, but each has, of course, its own advantages and disadvantages and should be chosen carefully with reference to the research proposition. They may, however, be used to complement each other when necessary and are not fundamentally different. Thomas (2009, p. 83) summarises this issue as follows:

It is absolutely the case that qualitative and quantitative research differ, and that they are governed by different assumptions and ground rules. But it is not the case that they are incompatible. Indeed, they complement each other.

Ferlander (2004) endorses this viewpoint and adds that the quantitative method first provides background information, which can then be investigated and explained further with qualitative research. Crossan and Osborne (2004) support this approach and see the advantages of both approaches, especially advocating their use in combination.

The researcher is interested in objective facts, which a large sample can deliver. An exclusively quantitative investigation was therefore chosen. The aim is to test the stated research propositions, which according to Hug and Porschescnik (2010), is characteristic of quantitative research. With the help of mathematical/statistical methods, the data will be processed and measures of association calculated in order to confirm the research propositions. The background to this decision has been explained in the preceding sections, in particular in Section 4.3.4. Due to time constraints, a combination of methods is not feasible.

4.5.1 Data collection methods

Now that the choice of investigatory approach and the design frame has been explained, the following sections define the methods of data
collection and explain the rationale for their use. Hug and Porscheschnik (2010) characterise method as being a three-step process in empirical research, consisting of collection, processing and analysis. The choice of data collection method is of paramount importance to an empirical investigation, since it represents a construct that marks out a concrete path to obtaining results (Thomas, 2009). The different available methods can approximately be categorised as investigation, observation and survey.

In this context, investigation refers to an analysis based on the use of existing data. An investigation can also be characterised as a secondary analysis (Micheel, 2010). The research proposition in the present study has been specially formulated so as to deliver new conclusions, and does not call into question or aim to confirm any existing results. For this reason, the investigatory method can be ruled out.

Observation will not serve to answer the research proposition either, since no “human behavioural or interactive tendencies” are under investigation (Hug and Porscheschnik, 2010, p. 83). According to Saunders et al. (2007), if data are to be collected by observation the researcher has to enter the research field directly and take part in the subject’s everyday life. The observational method can therefore be ruled out, since there is no possibility of becoming a member of the local authorities under investigation. The researcher has a full-time job and it is therefore not possible for her to carry out observations in the chosen sample.

If a researcher is interested in finding something out about people or organisations, about how they behave in particular contexts or if one wishes to know something on a specific topic, then Nuissl (2010) recommends a survey. Hug and Porscheschnik (2010, p. 83) add that a survey can gather information about “opinions, views, knowledge, thoughts and emotions”. The research proposition aims to obtain this
sort of information, so the researcher has elected to gather data through a survey. This is outlined in more detail below.

### 4.5.1.1 The survey as the chosen method of data collection

A survey can be standardised, in which case it contains the same structure and questions for every respondent in the selected sample. Micheel (2010) describes this data collection method in terms of the presentation, organisation and order of the questions, as well as the possible responses. Standardised methods represent a controlled procedure that usually permits a deductive process and collects and analyses numerical data. The advantages of this method lie in the ease of measurement, the high degree of representativeness afforded by larger sample sizes and the better opportunities for careful control.

Non-standardised methods, on the other hand, may pose only one introductory question and then allow the respondent to relate their experiences or opinions in whatever form they wish. This survey method can afford deeper insights.

Diekmann (1998) distinguishes three methods of communication for surveys:

1. The personal interview.
2. The telephone interview.
3. The written questionnaire.

The personal and spoken/telephone methods are recommended for non-standardised data collection, since the respondent can hardly be expected to write out everything that comes to mind on the research topic. The principal focus lies in finding out about the ‘why’ of a topic (Saunders et al., 2007). One advantage is the constant opportunity for follow-up questions and the course of questioning can be varied and adapted according to need. Lippl (2003) warns that one should not
underestimate the disadvantage posed by the costs entailed (such as the cost of travelling to the respondent) and the demands on time.

According to Saunders et al. (2007, p. 313), if the survey is carried out in the form of a standardised interview, one can refer to ‘interviewer-administered questionnaires’. According to Ferlander (2004) a written survey employing questionnaires allows the investigation of a large population, which is the aim of the present research. In a questionnaire survey, states Thomas (2009), facts and attitudes are collected, without a critical scrutiny of the background to the answer. A major advantage of written surveys is that the demands on time and on personal and financial resources can be kept to a minimum. Hugo et al. (2010), however, maintain that it is not possible to verify who has filled in the questionnaire. In addition, respondents may alter the consistency of their responses by checking them against the answers they have given to other items in the questionnaire and they may give dishonest responses (Schumann, 2011). Also, potential misunderstandings of the questions cannot be discussed and dealt with. Ferlander (2004) and Lippl (2003) are critical of the relatively low response rate associated with written questionnaires.

After weighing up the advantages and disadvantages, the written survey form was chosen for this research, since the advantages of low demands on resources and the possibility of reaching a large number of respondents outweigh the advantages of a spoken interview. This approach is supported by Saunders et al. (2007) and Wosnitza et al. (2000), who conclude that deploying questionnaires in a survey is the most economical research method.

### 4.5.2 Questionnaire design

Having determined that a written survey will be carried out, the task now is to determine what should be taken into account in composing the questionnaire. The design of a questionnaire has a decisive impact on the response rate; Diekmann (1998) notes that written surveys rarely
attain response rates of over 20%. It is therefore of paramount importance that the questionnaire design adheres to the following recommendations made by Hug and Porscheschnik (2010) and Micheel (2010) and aims at a high response rate: the questions should be formulated as clear, unambiguous and understandable; complex sentences, specialist jargon and multiple meanings should be avoided; and the structure of the questions should follow an internal logic. According to Schumann (2011), each question should only ever inquire about one phenomenon and there should not be a mixture in terms of content. Likewise, the introduction and completion instructions, as well as the explanation of the background to the study, should be precisely explained in a special attachment. This attachment also serves to motivate participation and outlines the researcher’s intentions precisely. The aims of the questionnaire should be made clear to the respondent.

4.5.2.1 Selection of questions for the questionnaire

The questionnaire for the present primary research is divided into three parts: demography, HRM and managing knowledge as a form of workforce planning. The questionnaire concludes with socio-demographic questions. These questions will also be put to research proposition testing, since the socio-demographic characteristics of the local authorities in question will allow conclusions regarding the effects of their size or location (Diekmann, 1998).

A distinction is drawn between open and closed questions (De Vaus, 2002), and most investigations use a combination of the two. In the case of closed questions, which are characterised by the stipulation of a limited number of possible answers, it is particularly important that these possible answers are straightforward and meaningful and refer concretely to the object of the corresponding question (Saunders et al., 2007). Further distinctions can be drawn between: dichotomous questions, in which only two possible answers are given; scale questions, to which one of several answers is possible; and list questions, to which multiple answers can be given.
For the scale questions employed here the Likert scale is used, in which the degree to which a respondent agrees with a statement is expressed on a four-point scale, with the addition of a ‘no response’ category (Diekmann, 1998). Likert scales are well suited to questions in which respondents should indicate their level of agreement with different responses, from ‘agree entirely’ to ‘disagree entirely’ (De Vaus, 2002). Since the researcher wishes to assess this form of attitude, numerical Likert scales are the dominant form of question.

Along with closed questions there are also open questions, in which the respondent is given the opportunity to present their own opinion or experience. Schumann (2011) notes that respondents must have good communication skills, otherwise answers can become distorted. Subjectively significant insights can be gained through open questions – insights that the researcher would not have arrived at when formulating the possible responses to closed questions (Diekmann, 1998). The choice of open questions should be made carefully, however, since answer coding for analysis is difficult and time-consuming.

Open and closed questions are both used in the present empirical investigation. This will provide both generalisable conclusions and suggestions for new avenues of exploration. The bulk of the questionnaire, however, uses closed questions with dichotomous answers as well as scaled questions. The questionnaire only poses two open questions on the subject of knowledge. In these instances, the researcher has followed De Vaus' (2002) advice in recommending a questionnaire with closed questions if:

- respondents have a low motivation to take part
- respondents and researchers have limited time to invest
- the questions can be given informative and meaningful answers using pre-set responses.
In addition to these types, Micheel (2010) and Schumann (2011) identify hybrid questions. Hybrid questions are a combination of closed and open questions. Along with the specified answers, an ‘other’ option is given, in which the respondent can add their individual answer.

In designing a questionnaire Saunders et al. (2007) note that it is important to ensure that it is not too long, otherwise the respondent will lack the motivation to complete it and the response rate will diminish. It is, however, also important that the questions included can test the stated research propositions; too few questions will limit the aims of the study. Saunders et al. (2007) consider a length of between 4 and 8 pages acceptable. The research therefore followed this recommendation.

4.5.2.2 Sending the questionnaire

Along with the design of the questionnaire, the method of distribution influences the response rate (Saunders et al., 2007). A distinction can be drawn between postal distribution (in which case it should be noted that in the present study the researcher would not have been able to ensure that the questionnaire actually reached the correct addressee) and internet distribution or online surveys. In consideration of the financial costs, an internet-mediated questionnaire was chosen.

4.5.2.3 Incorporating comparable existing studies

The derivation of the research propositions was guided by the conclusions from the literature review. The questions were posed in light of the study’s objectives. At the time the questionnaire was designed no comparable study had been conducted. Only during the survey did the publications by f-bb (Freiling and Geldermann, 2011) and the Harz University (Hochschule Harz, 2013) come to light (see Table 8). The questions therefore include overlap, particularly in the following topics: average age, importance and value managing knowledge for administrations (Hochschule Harz, 2013); and effects of demographic change on staff structure, the state of competition with other employers,
skills strategies (age structure analysis, managing knowledge) and strategic HRM (f-bb, Freiling and Geldermann, 2011). The Harz University survey assumes that a system to manage knowledge is already in place. It includes no questions about foundations, knowledge objectives, a knowledge profile or opportunities for knowledge preservation and sharing (Hochschule Harz, 2013). f-bb considers in detail strategies for internal and external recruitment, as well as measures for the promotion of a healthy working and occupational organisation (Freiling and Geldermann, 2011).

Table 8 gives an overview of the most important conclusions of the present study and the studies by the f-bb and the Harz University. This gives a clearer picture of the areas of overlap between the studies, their unique findings, their respective samples and their methods.

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<th>Present study</th>
<th>f-bb (published by Freiling and Geldermann, 2011)</th>
<th>Harz University (published by Hochschule Harz12/2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Object of research</strong></td>
<td>Effects of demographic change and current challenges for HRM in German local authorities in relation to workforce planning to facilitate the management of knowledge</td>
<td>Challenges and policy options in the light of demographic change, derived from a nationwide survey</td>
<td>Management of knowledge in public administration</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Web-based, standardised questionnaire</td>
<td>Telephone survey</td>
<td>Partly-standardised online survey, interactive PDF-questionnaire</td>
</tr>
<tr>
<td><strong>Sample</strong></td>
<td>N=295 rural districts and 977 district and independent towns and municipalities with 15000 inhabitants or more</td>
<td>N=700 local authority administrations with 5000 inhabitants or more</td>
<td>N=637 federal and state administrations and towns with 30000 inhabitants or more</td>
</tr>
<tr>
<td><strong>Response rate</strong></td>
<td>156 =12.8%</td>
<td>421 = 60.1%</td>
<td>148 = 29%</td>
</tr>
<tr>
<td><strong>Central questions</strong></td>
<td>• demography • HRM</td>
<td>• significance of demographic</td>
<td>• status quo of management</td>
</tr>
</tbody>
</table>
Given that the two studies mentioned above are similarly placed in the topic area the results are compared here.

Before the results of the investigation are presented in Chapter 5, the next section details the composition of the sample.

4.6 Determining the Sample

Now that the previous sections have established how the investigation is to be carried out, it must be determined to whom the questionnaires should be sent. As Nuissl (2010) notes, conclusions require data that have been collected from the real world. According to Saunders et al. (2007) and Micheel (2010), in almost every empirical social science study it is impossible to collect data from every possible target group. They also note critically that a census does not necessarily provide more reliable data. It is in accordance with these principles that the researcher must define a target group or sample to whom the questionnaires are to be sent. In doing so, all available time and material resources must be assessed (Wosnitza et al., 2000).

4.6.1 Target sample

The aim of sampling is to estimate population parameters from the empirically collected data. The sample should not be too limited, in order to safeguard its representativeness (Schumann, 2011). Hug and Porschenschnik (2010) state that a sample is representative if it reproduces the most important characteristics of the population. Therefore, the population of interest should first be determined (Schlittgen, 1998). This approach is also in accordance with that of Gesemann, Roth and Aumüller (2012), who investigated the current state of integration policies in local authorities. Since the present study addresses the same group of respondents, the researcher has followed
the same recommendations in taking into account the structure of local authorities in Germany, with their division into towns, municipalities and rural districts, as well as their differing sizes and regional distribution. The population of interest for the parameters under investigation consists of the local authorities in the 16 federal states (Bundesländer) of Germany. The definition of ‘local authority’ (‘Kommune’) is explained in chapter 1.4

4.6.2 Selection of participants

Because of the peculiarities of the city states of Berlin, Bremen, Bremerhaven and Hamburg, whose structures and responsibilities are different, they have been excluded from sampling. The population of interest consists of the Landkreise in the 13 federal states, which must all fulfil the same aforementioned duties in accordance with the state constitution and therefore have comparable HR structures.

The number of Landkreise in which a full data collection will be carried out, is taken from statistics published by the German Local Authority Association (‘Landkreistag’) (see Table 9).
**Landkreise in Germany (as of 11/2012)**

<table>
<thead>
<tr>
<th>Federal state</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baden-Württemberg</td>
<td>35</td>
</tr>
<tr>
<td>Bavaria</td>
<td>71</td>
</tr>
<tr>
<td>Brandenburg</td>
<td>14</td>
</tr>
<tr>
<td>Hesse</td>
<td>21</td>
</tr>
<tr>
<td>Mecklenburg-West Pomerania</td>
<td>6</td>
</tr>
<tr>
<td>Lower Saxony</td>
<td>38</td>
</tr>
<tr>
<td>North Rhine-Westphalia</td>
<td>31</td>
</tr>
<tr>
<td>Rhineland-Palatinate</td>
<td>24</td>
</tr>
<tr>
<td>Saarland</td>
<td>6</td>
</tr>
<tr>
<td>Saxony</td>
<td>10</td>
</tr>
<tr>
<td>Saxony-Anhalt</td>
<td>11</td>
</tr>
<tr>
<td>Schleswig-Holstein</td>
<td>11</td>
</tr>
<tr>
<td>Thuringia</td>
<td>17</td>
</tr>
</tbody>
</table>

**N=295**

Table 9: Overview of the number of local authorities in Germany (Deutscher Landkreistag, 2012)

A full census was carried out in the districts, since the aim is to investigate all local authorities with more than 15 000 inhabitants. Prof. Dr. Henneke of the German district council (*Landkreistag*) states in his report on the structure of German local authorities that the smallest district has 49 017 inhabitants, therefore no further restriction need be applied at the district level.

Data on towns with independent district status and towns and communities belonging to a local authority were taken from summaries made by the Federal Statistical Office (‘Statistisches Bundesamt’) (Destatis, 2012). Here, the researcher decided to incorporate into the selected sample those local authorities which are responsible for a population of more than 15 000. With a population of this size it can be assumed that the number of employees in the local authority requires a dedicated HR department and that responsibility for HR is not distributed across other departments. In making this choice, the methodology employed by Freiling and Geldermann (2011) was referred to, who set their sample at 5000 inhabitants. These researchers also concluded that no recognisable HRM can be expected to exist where there are fewer inhabitants than this. A
sample of 2861 local authorities resulted. Freiling and Geldermann (2011) subsequently divided these into three size categories, reduced each proportionately and established a final sample of 700 local authorities. The current study does not reproduce this method step-by-step, since Freiling and Geldermann (2011) came to the conclusion that an analysis of their sample did not permit generalisation of the results; some federal states were well-represented and others were not reached. In view of this conclusion, the present study concerns all size classes above 15,000 inhabitants without carrying out any further reduction. The sample is, as a result, 80% larger and the author hopes to achieve nationally-representative results that can be generalised to the whole country.

### 4.6.3 Characteristics of the selected sample

Figure 9 provides a graphical display of the population (N=11,245) and the chosen sample sizes for each federal state.

![Figure 9: Distribution of local authorities in population and chosen sample](compiled by present author)

In summary, the population chosen for sampling consists of 295 local authorities and 977 communities and towns, either with independent district status or belonging to a local authority. After determining the sample, the researcher sought out basic data on each local authority via the internet. On each website the researcher sought out information on
who is responsible for HR and the corresponding email address. Individuals were sought who were specifically engaged in HRM. In some individual cases there were even employees specifically responsible for demography. It was unfortunately not possible in all cases to find a direct respondent and general email addresses had to be relied on instead. For seven local authorities no email address could be found and the sample was limited to n=1265 local authorities.

4.7 Aim of the Empirical Investigation

On the basis of the preliminary theoretical considerations and the consequent research propositions, the present investigation aims to illuminate the current state of affairs in the selected local authorities regarding the effects of demographic change and the present challenges for HRM in German local authorities in relation to workforce planning to facilitate the management of knowledge. The written survey aimed to generate statistically meaningful results concerning local authorities with a population of over 15 000. The following diagram 11 gives an overview of the links between the aims, objectives and research propositions of this research:
Diagram 11: Summary of objectives, research propositions and aims (compiled by present author)

Three groupings of questions can be constructed from these aims, which are set out in corresponding order within the questionnaire and which match the procedures set out in the literature review. The central focus is on the sphere of activity of a demography-oriented HR policy, with an emphasis on managing knowledge as a key process of workforce planning. The representative investigation aims to provide conclusions as to whether and how HRM in German local authorities is approaching the issue.
4.8 Summary of Grounds for Choice of the 'Right' Methodology, Looking Forward to Continuation

The preceding chapters have outlined the different possibilities for data collection. In selecting a methodology the special characteristics of the field of enquiry, as well as the available time and financial resources, must be taken into account. Selected strengths and weaknesses of the different approaches, as detailed in Section 4.4.1, are arranged in the following table 10 as recommended by De Vaus (2002, p. 132).

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Face-to-Face Interview</th>
<th>Telephone Interview</th>
<th>Mail Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response rate</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General sample</td>
<td>good</td>
<td>good</td>
<td>good</td>
</tr>
<tr>
<td>Specialised sample</td>
<td>good</td>
<td>good</td>
<td>good</td>
</tr>
<tr>
<td><strong>Representative Samples</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control over who completes</td>
<td>good</td>
<td>satisfactory</td>
<td>satisfactory</td>
</tr>
<tr>
<td>Gaining access to selected person</td>
<td>satisfactory</td>
<td>good</td>
<td>good</td>
</tr>
<tr>
<td>Locating the selected person</td>
<td>satisfactory</td>
<td>good</td>
<td>good</td>
</tr>
<tr>
<td><strong>Effects on questionnaire design</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long questionnaire</td>
<td>good</td>
<td>satisfactory</td>
<td>satisfactory</td>
</tr>
<tr>
<td>Complex questions</td>
<td>satisfactory</td>
<td>good</td>
<td>poor</td>
</tr>
<tr>
<td>Boring questions</td>
<td>good</td>
<td>satisfactory</td>
<td>Poor</td>
</tr>
<tr>
<td>Open-ended questions</td>
<td>good</td>
<td>good</td>
<td>Poor</td>
</tr>
<tr>
<td><strong>Implementing the survey</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>speed</td>
<td>poor</td>
<td>good</td>
<td>poor</td>
</tr>
<tr>
<td>cost</td>
<td>poor</td>
<td>satisfactory</td>
<td>good</td>
</tr>
</tbody>
</table>

Table 10: Advantages and disadvantages of face-to-face, telephone and mail questionnaire surveys (De Vaus, 2002, p. 132)

On the basis of this comparison and of the preceding considerations, the researcher laid out the procedure and framework for the empirical study and elected to carry out a survey by mailed questionnaire. Although this is, according to De Vaus (2002), not ideal for longer
questionnaires, the financial and time costs of travelling ruled out the option of face-to-face interviews. Telephone interviews are also time-consuming and must therefore be ruled out.

A total of 11 weeks were allocated for the researcher to send out the questionnaires to the selected local authorities and for responses to be returned. This long time span was necessary because the survey was carried out during the summer holidays, and these holidays took place at varying times in the different German states. Such a time span allowed all respondents time to participate in the study. The summer holiday period was selected because local administrations are likely to have a lighter work load during this period.

The next part of the thesis presents the survey results. These are made clear with the help of graphs and diagrams. In the immediately following sections these results will be set in the context of the theoretical approach outlined in part 1, and different recommendations for action will be discussed.
Chapter 5 - Results of the empirical investigation

5.1 Empirical Investigation

After setting out the theoretical underpinnings of the empirical investigation and deriving a suitable procedure in the last section, this section deals with the results of the survey.

The researcher chose an online platform www.q-set.de for carrying out the online questionnaires necessary for the empirical investigation. This choice was based on the fact that a price comparison with other providers revealed this to be the most economical while still including all the necessary functions, such as an interface for exporting data to Excel and SPSS.

On 17 June 2013, N=1265 local authorities in Germany were contacted by email and asked to take part in the survey. A link was provided in the email, taking participants directly to the questionnaire. After 2 weeks the researcher sent an email reminder to all local authorities. On 30 August the survey was closed. From the total 1265 questionnaire links sent, the researcher received 156 returned questionnaires, which represents a response rate of approximately 12.5%. Schonlau, Fricker and Elliott (2002) conclude that a response rate between 7% and 44% is good. Hence, this result is good, given the generally lower response rates achieved by online surveys compared to postal questionnaires (Evans and Mathur, 2005). A total of 10.8% of the rural districts took part in the survey (32 responses), as did 12.8% of the other local authorities (34 municipalities and 90 towns). The following table 11 shows a breakdown of responses by local authority type and federal state:
<table>
<thead>
<tr>
<th>Federal state</th>
<th>Rural districts</th>
<th>Towns and municipalities with over 15,000 inhabitants</th>
<th>Correction</th>
<th>Total N</th>
<th>%</th>
<th>Responses</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baden-Württemberg</td>
<td>35</td>
<td>134</td>
<td>-2</td>
<td>167</td>
<td>13.2</td>
<td>21</td>
<td>13.5</td>
</tr>
<tr>
<td>Bavaria</td>
<td>71</td>
<td>115</td>
<td>-1</td>
<td>185</td>
<td>14.6</td>
<td>18</td>
<td>11.5</td>
</tr>
<tr>
<td>Brandenburg</td>
<td>14</td>
<td>41</td>
<td>-1</td>
<td>54</td>
<td>4.2</td>
<td>11</td>
<td>7.1</td>
</tr>
<tr>
<td>Hesse</td>
<td>21</td>
<td>88</td>
<td></td>
<td>109</td>
<td>8.6</td>
<td>7</td>
<td>4.5</td>
</tr>
<tr>
<td>Mecklenburg-Western Pomerania</td>
<td>6</td>
<td>11</td>
<td></td>
<td>17</td>
<td>1.3</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Lower Saxony</td>
<td>38</td>
<td>120</td>
<td>-2</td>
<td>158</td>
<td>12.5</td>
<td>22</td>
<td>14.1</td>
</tr>
<tr>
<td>North Rhine-Westphalia</td>
<td>31</td>
<td>267</td>
<td></td>
<td>296</td>
<td>23.4</td>
<td>39</td>
<td>25</td>
</tr>
<tr>
<td>Rhineland-Palatinate</td>
<td>24</td>
<td>33</td>
<td></td>
<td>57</td>
<td>4.5</td>
<td>8</td>
<td>5.1</td>
</tr>
<tr>
<td>Saarland</td>
<td>6</td>
<td>25</td>
<td></td>
<td>31</td>
<td>2.5</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Saxony</td>
<td>10</td>
<td>47</td>
<td>-1</td>
<td>56</td>
<td>4.4</td>
<td>9</td>
<td>5.8</td>
</tr>
<tr>
<td>Saxony-Anhalt</td>
<td>11</td>
<td>34</td>
<td></td>
<td>45</td>
<td>3.6</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Schleswig-Holstein</td>
<td>11</td>
<td>36</td>
<td></td>
<td>47</td>
<td>3.7</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Thuringia</td>
<td>17</td>
<td>26</td>
<td></td>
<td>43</td>
<td>3.4</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>295</strong></td>
<td><strong>977</strong></td>
<td><strong>-7</strong></td>
<td><strong>1265</strong></td>
<td><strong>100</strong></td>
<td><strong>156</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 11: Comparison of total participation requests to responses broken down by federal state

Figure 10 displays the same information graphically. In a visual comparison it is clear that the proportion of the total N=1265 for each federal state corresponds approximately to that state’s share of survey participants. There are no significant deviations and the distribution of participants reflects the underlying distribution. Kirchoff et al. (2001) recommend carrying out such a comparison in order to check for any possible deviations. It was therefore determined that no non-response bias was immediately evident and therefore adjustments to the data were not necessary. Further tests were carried out, however, which are discussed in the section below.
The returned questionnaire data were exported to SPSS via the provided interface, and were then analysed in several stages. This method of data analysis is recommended by Raab-Steiner and Benesch (2012), as SPSS is an effective, computer-supported system for statistical analysis. Data analysis is based on De Vaus (2002) as well as on bivariate and multivariate techniques. In the methodological system employed here, and illustrated in De Vaus (2002), it is clear that the questionnaire responses are all of either a categorical or an ordinal type. None of the answers can be ordered along a ratio scale with comparable unit differences between the items (as would be the case, for example, with age in years).

The following paragraphs present the most important results using descriptive statistics (Raab-Steiner and Benesch, 2012; De Vaus, 2002), before testing the earlier-stated research propositions. In so doing, previous research is referred to and the data is set in the context of demographic change, then in the context of HRM, and finally in the context of knowledge preservation. For data presentation, the researcher follows predominantly the recommendation of De Vaus (2012) that graphical representations of the data are preferred.
5.1.1 On the meaning of significance tests for census data

The previous section described the composition of survey participants. Since the researcher, having established the population of interest, did not take a partial sample, this can be regarded as a census design. A census, in which all units of interest are included, requires no significance tests, as sample and population are in this case identical (Behnke, 2005). However, a problem with such reasoning arises in a case such as the present one, in which a census was carried out but the proportion of actual respondents was relatively low, in this case 12.5%. For this type of survey (online survey), this result is nonetheless good (see the annotations in Section 5.1).

For the data analysis two interpretations are possible. On the one hand, the most statistically rigorous and conservative method implies reducing the population of interest to include only those units that fulfil an additional condition, namely having taken part in the survey. In the present case, this would mean limiting the population of interest about which conclusions may be drawn to local authorities with over 15 000 inhabitants who were willing to take part in the survey. By this interpretation, significance tests may be dispensed with. The problem, however, is that the aim of the investigation was to draw conclusions regarding all local authorities with more than 15 000 inhabitants.

In order to justify generalising the results, additional assumptions must be made, and these assumptions must be justified. For the present investigation, an assumption must be that the local authority administrations that took part in the study differ from those that did not in only one respect: that they took part. It is necessarily impossible to be sure of the truth of this assumption, since no data are available regarding the responses that the non-participating administrations would have made. It is, however, possible to at least test the plausibility of the assumption using the publicly-available general data on all local authority administrations to ask whether participating and non-participating local authorities differ with respect to their location or
population. If the plausibility of the assumption cannot be falsified, then
tests should reveal any differences between the two groups to be non-
significant based on the null hypothesis of no difference. In this case,
the survey respondents could be seen as theoretically equivalent to a
random sample from the population of interest of all local authorities
with over 15 000 inhabitants.

5.1.2 Non-responses

Before proceeding to test the research propositions the investigator
carried out an analysis of response bias. First, the response rates of
communes of different population sizes were examined to see whether
there was any overall discrepancy between the proportion of local
authorities contacted and the proportion responding. Table 12 reports
the resulting response frequencies.

<table>
<thead>
<tr>
<th>Population bracket</th>
<th>Local authorities contacted (%)</th>
<th>Responding local authorities (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.000-25.000</td>
<td>37.3</td>
<td>38.5</td>
</tr>
<tr>
<td>25.001-50.000</td>
<td>25.2</td>
<td>19.9</td>
</tr>
<tr>
<td>50.001-100.000</td>
<td>12.4</td>
<td>12.2</td>
</tr>
<tr>
<td>&gt;100.000</td>
<td>25.0</td>
<td>29.5</td>
</tr>
</tbody>
</table>

Table 12: response frequencies of present study

The proportions differ only slightly. Responses therefore do not need to
be weighted, as no significant bias was found.

In the next step the most important questions for the investigation were
tested for non-response bias by comparing early with late respondents.
These questions are:

3. The effects of demographic change.
4. The time-scale of a decrease in workforce potential.
7. New issues in HRM.
8. The responsibilities of HRM.
27. Fundamentals of managing knowledge.
30 Barriers to the introduction of processes to manage knowledge.
34 The presence of a knowledge profile.
37 Knowledge and experience of knowledge sharing and preservation.
40 Number of employees.

The questionnaire was sent on 17 June 2013 and participation remained open until 30 August 2013. This period was divided into four parts, each comprising equal numbers of respondents. Because fewer local authorities took part towards the end of the period the division was as follows:

- 1st quartile: 17 to 19 June (time: until 13.32 o’clock)
- 2nd quartile: 19 June (time: from 13.32.01 o’clock) to 1 July (time: until 09.22.29 o’clock)
- 3rd quartile: 1 July (time: from 9.22.30 o’clock) to 9 July (time: until 15.39.45 o’clock)
- 4th quartile: 9 July onwards (time: from 15.39.45 o’clock)

In the response bias analysis the first quartile was compared to the last. The analysis revealed no significant differences in mean values, with the exception of Question 40. The difference in responses to this question revealed that the earlier responses tended to come from local authorities with fewer employees. This could be explained by the fact that in smaller administrations flat hierarchies predominate. The recipient of the questionnaire email tended also to be the person who answered it, and could therefore do so very quickly. In larger administrations, the need to first clarify who was responsible for answering led to longer delays. This would be problematic were it not for the fact that the distributions in Table 6 are approximately proportional. Since the larger local authorities responded in an approximately equal or even slightly larger proportion than the smaller local authorities the difference in response delays according to number of employees need not be considered problematic.
In summary, it can be concluded that the response rates should have no effect on the interpretation of the present results (Diekmann, 1998). Subsequent analyses of correlation and multivariate statistics are not believed to be distorted by response bias, as there is no significant difference between the responses of the first and last quartiles of respondents.

5.1.3 Overview of general statistics for survey participants

Following the questionnaire structure the general information was analysed first. This approach was taken so as to provide some information regarding the survey participants and thus gain a better understanding of their answers. The reader then has more detailed information about who took part in the survey. Participants are first analysed according to the items 'number of employees' and 'number of inhabitants' (see Figures 11 and 12 respectively).

![Figure 11: Respondents by number of employees](image)
These statistical results show that most responses came from local authorities with more than 500 employees. Because there is no information available on how many employees the contacted local authorities have, this result is given as a purely descriptive piece of information. Figure 12 confirms the pattern established in Table 12 on the non-response bias. According to these results, most responses come from the smallest local authorities, followed by the largest local authorities. This corresponds to the proportions of small and large local authorities contacted.

Table 13 gives an overview of the socio-demographic characteristics of survey participants. In the numerical description it is clear that these questions were not answered in full by all survey respondents.
Table 13: Socio-demographic characteristics of participants

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>96 respondents</td>
<td>61.5 %</td>
</tr>
<tr>
<td>Female</td>
<td>55 respondents</td>
<td>35.3 %</td>
</tr>
<tr>
<td>Under 25 years</td>
<td>4 respondents</td>
<td>2.6 %</td>
</tr>
<tr>
<td>26-40 years</td>
<td>37 respondents</td>
<td>23.7 %</td>
</tr>
<tr>
<td>41-55 years</td>
<td>80 respondents</td>
<td>51.3 %</td>
</tr>
<tr>
<td>Over 55 years</td>
<td>27 respondents</td>
<td>17.3 %</td>
</tr>
<tr>
<td>Department head</td>
<td>43 respondents</td>
<td>27.6 %</td>
</tr>
<tr>
<td>Department administrator</td>
<td>45 respondents</td>
<td>28.8 %</td>
</tr>
<tr>
<td>Team leader</td>
<td>5 respondents</td>
<td>3.2 %</td>
</tr>
<tr>
<td>Clerical assistant</td>
<td>28 respondents</td>
<td>17.9 %</td>
</tr>
<tr>
<td>other</td>
<td>30 respondents</td>
<td>19.2 %</td>
</tr>
</tbody>
</table>

5.2 Univariate Results

The summary of the following univariate survey results is for descriptive presentation only; these results aren’t used to analyse the research propositions.

5.2.1 Survey results regarding demographic change

The results regarding demographic change from survey questions 1 to 5 are displayed in Table 14. These results are purely descriptive and are therefore not subjected to tests of significance or analysed here. Table 14 shows the questions, the possible answers and the percentage proportions of responses for each answer.

<table>
<thead>
<tr>
<th>Have you addressed the topic of demographic change?</th>
<th>Number of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>146</td>
<td>93.6</td>
</tr>
<tr>
<td>No</td>
<td>8</td>
<td>5.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Does demographic change affect labour potential in your administration?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Within what period of time will this decline take place?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 3 years</td>
</tr>
<tr>
<td>4 to 5 years</td>
</tr>
<tr>
<td>6 to 10 years</td>
</tr>
<tr>
<td>in more than 10 years</td>
</tr>
</tbody>
</table>
## Effects of demographic change

<table>
<thead>
<tr>
<th>Effect</th>
<th>Average (1=not at all / 4=very much so)</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasingly older average employee age</td>
<td>3.46</td>
<td>1.</td>
</tr>
<tr>
<td>Fewer applicants for new positions</td>
<td>3.02</td>
<td>2.</td>
</tr>
<tr>
<td>Unsuitable applicants for new positions</td>
<td>2.72</td>
<td>5.</td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td>2.26</td>
<td>7.</td>
</tr>
<tr>
<td>Retirements in large numbers</td>
<td>2.81</td>
<td>4.</td>
</tr>
<tr>
<td>Family and work commitments</td>
<td>2.92</td>
<td>3.</td>
</tr>
<tr>
<td>Available knowledge cannot be retained</td>
<td>2.62</td>
<td>6.</td>
</tr>
</tbody>
</table>

### Specific effects of demographic change in the context of hiring and HRM

<table>
<thead>
<tr>
<th>Effect</th>
<th>Average (1=not at all / 4=very much so)</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does age also play a role?</td>
<td>1.84</td>
<td>7.</td>
</tr>
<tr>
<td>Monitoring the external job market?</td>
<td>2.52</td>
<td>5.</td>
</tr>
<tr>
<td>Is there a pool of qualified workers?</td>
<td>2.05</td>
<td>6.</td>
</tr>
<tr>
<td>Competition with the private sector?</td>
<td>2.95</td>
<td>2.</td>
</tr>
<tr>
<td>Disadvantages in terms of the attractiveness as an employer compared to private enterprises?</td>
<td>2.72</td>
<td>3.</td>
</tr>
<tr>
<td>Decrease in the numbers of applicants for apprenticeships?</td>
<td>2.55</td>
<td>4.</td>
</tr>
<tr>
<td>Are trainees taken on permanently?</td>
<td>3.49</td>
<td>1.</td>
</tr>
<tr>
<td>Announcement of layoffs carried out as part of downsizing measures?</td>
<td>1.19</td>
<td>8.</td>
</tr>
</tbody>
</table>

Table 14: Survey results demographic change

### 5.2.2 Survey results regarding HRM and workforce planning activities

The survey results for Question 1 (*Have you addressed the topic of demographic change in your administration?*) show that 93.6% of respondents are already confronting demographic change. A
comparison of means shows that, unsurprisingly, the strongest effect is that of the ageing workforce, followed by the decline in applicants. It is clear from further means comparisons regarding effects on HRM that the strongest effects are on trainee positions and competition for labour with the private sector. The analysis of questions 6 to 15 concerns strategies for HRM. In summary, it can be said that out of the 156 respondents, in 124 cases (80.9%) HR managers are responsible for such strategies. This can be explained through the fact that HR managers face this issue daily and that it forms one of their principal responsibilities. This question permitted multiple responses, and the second most frequent response was that top-level management was responsible. In 89 cases HRM strategies were the responsibility of the highest level of management.

The following survey results (Table 15) show the means and rankings of respondents’ agreement with statements about new fields of operation and new responsibilities of HRM:

<table>
<thead>
<tr>
<th>New fields of action of HRM</th>
<th>average (1=not at all / 4=very much so)</th>
<th>ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge management</td>
<td>2.62</td>
<td>4.</td>
</tr>
<tr>
<td>Employee skills development</td>
<td>3.06</td>
<td>2.</td>
</tr>
<tr>
<td>Demographics-oriented administrative culture</td>
<td>2.44</td>
<td>5</td>
</tr>
<tr>
<td>Age structure analysis</td>
<td>3.16</td>
<td>1.</td>
</tr>
<tr>
<td>Strategic HRM</td>
<td>2.81</td>
<td>3.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HRM responsibilities</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HR deployment management</td>
<td>2.97</td>
<td>5.</td>
</tr>
<tr>
<td>Departing employees</td>
<td>2.81</td>
<td>6.</td>
</tr>
<tr>
<td>Head count analysis</td>
<td>3.04</td>
<td>4.</td>
</tr>
<tr>
<td>Employee retention</td>
<td>3.10</td>
<td>3.</td>
</tr>
<tr>
<td>HR development</td>
<td>3.36</td>
<td>2.</td>
</tr>
<tr>
<td>Assessment of staffing requirements</td>
<td>3.44</td>
<td>1.</td>
</tr>
</tbody>
</table>

Table 15: Survey results HRM
It is clear that for respondents, development of employee skills and age structure analysis are the most important fields of action. Among the responsibilities, fulfilment of labour requirements and employee development are the dominant themes. Departing employees is accorded the least importance.

After having asked about the basic general facts of HRM, the remaining questions concern important details of time frames, employee development systems and age structure analysis. Table 16 gives the corresponding questions and possible answers, as well as the responses given by survey participants.

<table>
<thead>
<tr>
<th>What is the time frame for head count planning?</th>
<th>Number of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term</td>
<td>64</td>
<td>41.0</td>
</tr>
<tr>
<td>Mid-term</td>
<td>60</td>
<td>38.5</td>
</tr>
<tr>
<td>Long-term</td>
<td>28</td>
<td>17.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Does your organisation have an HR development system in place?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>74</td>
</tr>
<tr>
<td>No</td>
<td>71</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Does your organisation have an age structure analysis?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>86</td>
</tr>
<tr>
<td>No</td>
<td>58</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time frame for using the age structure analysis</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 4 years</td>
<td>21</td>
</tr>
<tr>
<td>5 to 10 years</td>
<td>62</td>
</tr>
<tr>
<td>More than 10 years</td>
<td>14</td>
</tr>
</tbody>
</table>

Table 16: Survey results – employee development systems and age structure analysis

In 47.7% of participating local authorities an employee development system is in place. There is an interesting pattern of using an employee development system; employee development systems are used disproportionately by local authorities with more than 500 employees. A graphical representation is given in Figure A1, in the Appendix.

The next question (Please describe the age structure (average employee age) in your administration) concerned the average age in
the local authorities in the years 2008, 2013 and 2018. Unfortunately, 54 respondents omitted or partially omitted to answer this question. This is most likely due to the fact that age figures were never collected and therefore no estimate could be given. In particular, the average age for 2018 could not be predicted in many cases. Had an employee development system been in place, however, it would have been possible to answer this question. The following table 17 gives a summary of questionnaire results regarding the average age in the local authorities.

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2013</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baden-Württemberg</td>
<td>44</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Bavaria</td>
<td>42</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>Brandenburg</td>
<td>45</td>
<td>48</td>
<td>49</td>
</tr>
<tr>
<td>Hesse</td>
<td>43</td>
<td>44</td>
<td>48</td>
</tr>
<tr>
<td>Mecklenburg-Western Pomerania</td>
<td>46</td>
<td>46,5</td>
<td>49</td>
</tr>
<tr>
<td>Lower Saxony</td>
<td>43</td>
<td>45</td>
<td>48</td>
</tr>
<tr>
<td>North Rhine-Westphalia</td>
<td>44</td>
<td>45</td>
<td>47</td>
</tr>
<tr>
<td>Rhineland-Palatinate</td>
<td>42,5</td>
<td>45</td>
<td>47</td>
</tr>
<tr>
<td>Saarland</td>
<td>43</td>
<td>45</td>
<td>48</td>
</tr>
<tr>
<td>Saxony</td>
<td>43</td>
<td>49</td>
<td>51</td>
</tr>
<tr>
<td>Saxony-Anhalt</td>
<td>50</td>
<td>53</td>
<td>50</td>
</tr>
<tr>
<td>Schleswig-Holstein</td>
<td>43</td>
<td>46,5</td>
<td>47</td>
</tr>
<tr>
<td>Thuringia</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>44</strong></td>
<td><strong>47</strong></td>
<td><strong>48</strong></td>
</tr>
</tbody>
</table>

Table 17: Average age by federal state

The next question regarding the use of age structure analysis considers only those cases in which an age structure analysis is in place; 86 local authorities could answer these questions and a graphical representation can be found in Figure A2 in the appendix. It can be concluded here that where an age structure analysis is in place it is used in particular to estimate the year of retirement. This information can help identify when labour shortages may occur.

It should be noted that the age structure analysis is employed in a large number of local authorities but predominantly among those that employ
more than 301 people (61 positive responses). Among smaller local authorities it is only being used in 24 cases. That 59.7% of local authorities use age structure analysis is in clear contradiction to the results of Question 7 (Which new fields of policy are part of HRM in your organisation?). Here, 82.7% mostly or completely agreed that age structure analysis was a new aspect of HRM.

Having now reported the results on age structure analysis as a workforce planning activity, the following section will show in detail the results from questions regarding managing knowledge as a further workforce planning activity.

Respondents were asked at the beginning of this section of the questionnaire what importance local authorities felt was placed on knowledge, whether it was important and whether a strategic approach was in place. A total of 152 respondents (number) considered knowledge to be an important or very important aspect of their administrative tasks. Knowledge was also judged to be of high importance. No clear conclusions can be drawn about whether there was a strategic approach to knowledge preservation. A total of 64 local authorities judged this to be unimportant and 75 judged it to be important.

The corresponding answers are provided in Figure A3 in the Appendix. Each local authority's interpretation of knowledge can be found in Figure A4 in the Appendix.

It can be concluded from these responses that knowledge is interpreted in a very individual manner and has a different meaning for different local authorities. The vast majority agree, however, that knowledge is essential for fulfilling normal responsibilities and for making decisions. The responses also show that knowledge is tied to people, as it concerns skills, requirements and resources. Transmission is currently still carried out using the traditional method of formal training. Since the researcher hypothesised in advance that formal training would be the
predominant method, Question 19 asked about further details on this topic (see Table 18).

<table>
<thead>
<tr>
<th>Training activities</th>
<th>average (1=not at all / 4=very much so)</th>
<th>ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementing lifelong learning</td>
<td>2.26</td>
<td>5.</td>
</tr>
<tr>
<td>Support of initiatives for learning while working</td>
<td>2.63</td>
<td>3.</td>
</tr>
<tr>
<td>Knowledge controlling</td>
<td>1.88</td>
<td>7.</td>
</tr>
<tr>
<td>Increase of initial and further training</td>
<td>2.67</td>
<td>2.</td>
</tr>
<tr>
<td>Cutbacks of training and development budget</td>
<td>2.11</td>
<td>6.</td>
</tr>
<tr>
<td>Are older staff discriminated</td>
<td>1.26</td>
<td>8.</td>
</tr>
<tr>
<td>Comparison needs of staff with organisational requirements</td>
<td>3.12</td>
<td>1.</td>
</tr>
<tr>
<td>Is there a training and development concept</td>
<td>2.55</td>
<td>4.</td>
</tr>
</tbody>
</table>

Table 18: Survey result training activities

It is clear from these data that in almost all local authorities a correspondence exists between employees’ needs and organisational demands, as well as an increase in formal training measures. Unfortunately, agreement with knowledge controlling is relatively low, and, at 2.55, agreement on the presence of a further training policy is also potentially problematic.

In order to explore this issue in more depth further questions were posed. Only overviews of the results to knowledge transfer possibilities are given without further analysis (see Table 19).
Is the experiential knowledge of older employees transferred to younger employees

<table>
<thead>
<tr>
<th></th>
<th>Number of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>140</td>
<td>89.7</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Is the up-to-date knowledge of young employees transferred to older employees?

<table>
<thead>
<tr>
<th></th>
<th>Number of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>112</td>
<td>71.8</td>
</tr>
<tr>
<td>No</td>
<td>22</td>
<td>14.1</td>
</tr>
</tbody>
</table>

Is there support for knowledge transfer between employees?

<table>
<thead>
<tr>
<th></th>
<th>Number of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>80</td>
<td>51.3</td>
</tr>
<tr>
<td>No</td>
<td>56</td>
<td>35.9</td>
</tr>
</tbody>
</table>

How does the knowledge transfer occur?

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontally</td>
<td>12</td>
<td>7.7</td>
</tr>
<tr>
<td>Vertically</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>In both directions</td>
<td>68</td>
<td>43.6</td>
</tr>
</tbody>
</table>

Has a knowledge management system been introduced?

<table>
<thead>
<tr>
<th></th>
<th>Number of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5</td>
<td>3.2</td>
</tr>
<tr>
<td>No</td>
<td>136</td>
<td>87.2</td>
</tr>
</tbody>
</table>

Are knowledge targets defined?

<table>
<thead>
<tr>
<th></th>
<th>Number of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>11</td>
<td>7.1</td>
</tr>
<tr>
<td>No</td>
<td>114</td>
<td>73.1</td>
</tr>
</tbody>
</table>

Table 19: Survey results for Managing Knowledge Processes

Various options for knowledge transfer are available in order to preserve knowledge in local authorities. Question 22 presented seven such options, with the following results (see Table 20).

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>Team meetings</th>
<th>Intergeneration of working groups</th>
<th>Entry in database</th>
<th>Internal network building</th>
<th>Individual exchange among employees</th>
<th>Directed succession management</th>
<th>External working groups</th>
<th>No answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-150</td>
<td>15</td>
<td>4</td>
<td>7</td>
<td>7</td>
<td>16</td>
<td>11</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>151-300</td>
<td>32</td>
<td>13</td>
<td>7</td>
<td>8</td>
<td>37</td>
<td>18</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>301-500</td>
<td>21</td>
<td>9</td>
<td>8</td>
<td>3</td>
<td>25</td>
<td>14</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>over 500</td>
<td>54</td>
<td>27</td>
<td>17</td>
<td>14</td>
<td>59</td>
<td>25</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>122</td>
<td>53</td>
<td>39</td>
<td>29</td>
<td>137</td>
<td>66</td>
<td>19</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 20: Forms of knowledge transmission

Only five local authorities use a system to manage knowledge. It was also asked, however, whether the local authority planned to introduce one. This result and the graphical representation of the use of
knowledge profiles and maps are attached in Figure A5 and Table A1 in the Appendix.

It can be concluded from these results that the component 'knowledge profile' is still relatively unknown to local authority employees, and is in use in only 14 local authorities. A graphical knowledge map is only present in one local authority.

The eight answers to Question 37, as shown in Table 21, give a general overview of familiarity with the issues of 'knowledge sharing' and 'knowledge preservation'. Table 21 shows which measures local authorities in Germany are already using in these areas.

<table>
<thead>
<tr>
<th>Answer</th>
<th>Agree</th>
<th>Disagree</th>
<th>No Answer</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding of distinction between implicit and explicit knowledge</td>
<td>39.5%</td>
<td>34.3%</td>
<td>26.3%</td>
<td>5.</td>
</tr>
<tr>
<td>Encouragement of measures to explicate implicit knowledge</td>
<td>15.2%</td>
<td>47.7%</td>
<td>31.7%</td>
<td>8.</td>
</tr>
<tr>
<td>Identification of sources of explicit knowledge and access for employees</td>
<td>75%</td>
<td>11.2%</td>
<td>13.8%</td>
<td>3.</td>
</tr>
<tr>
<td>Analysis of knowledge requirements</td>
<td>24.8%</td>
<td>54.3%</td>
<td>20.9%</td>
<td>7.</td>
</tr>
<tr>
<td>Identification of knowledge sources</td>
<td>41.1%</td>
<td>37.2%</td>
<td>21.6%</td>
<td>4.</td>
</tr>
<tr>
<td>Overview of which areas require generation of new knowledge</td>
<td>26.8%</td>
<td>52.9%</td>
<td>20.3%</td>
<td>6.</td>
</tr>
<tr>
<td>Closure of knowledge gaps through training</td>
<td>79.8%</td>
<td>7.8%</td>
<td>12.4%</td>
<td>2.</td>
</tr>
<tr>
<td>Management support for employee training requests</td>
<td>85%</td>
<td>3.3%</td>
<td>11.8%</td>
<td>1.</td>
</tr>
</tbody>
</table>

Table 21: Responses for knowledge sharing and knowledge preservation

Clearly the traditional method of formal training is the most frequently used tool for knowledge sharing and preservation; management supports requests for training, for example in the form of seminars, and this closes knowledge gaps. In addition, identifying and accessing new laws and regulations is widespread. However, these measures are limited to transmitting explicit knowledge. Ignorance of the distinction between explicit and implicit knowledge is relatively high, as is encouragement to explicate knowledge. In addition, in only 25% of local authorities are knowledge requirements assessed. Knowledge
preservation is therefore being carried out one-sidedly. When demographic change occurs, and its effects include waves of retirement, a large portion of experiential knowledge may go unpreserved. Since it is important to find out here who needs to be made aware of knowledge gaps and is responsible for taking appropriate measures, the next question concerned who recognises knowledge gaps in local authorities. This varies greatly according to type of authority and number of employees (see Table A2 in the Appendix). The larger a local authority is, the greater the tendency for knowledge deficits to be recognised by employees. The higher in the management hierarchy one goes, the lower the proportion. This is, however, entirely understandable given that the responsibility of high-level management is to carry out strategic planning.

5.2.3 Interpretation of the univariate survey results

The analysis of the univariate survey results shows that demographic change is an issue in local authorities. Over 90% responded that they have already addressed the issue. It is clear from the variety of responses, in particular concerning the transmission of knowledge, that different local authorities address the issue differently. The results presented here show gaps in HRM policies, which local authorities need to address. These gaps can be explained as a result of the fact that more than 50% of survey respondents believe that the effects of demographic change on workforce potential will only be noticeable in approximately 6 to 10 years. They therefore likely do not see this as an important current issue. The objectives and the use of a system to manage knowledge are still mostly unknown. So far, only conservative measures for HRM and knowledge preservation (seminars and recruitment) are being utilised. New tools, such as a system to manage knowledge, the definition of knowledge targets or the use of a knowledge profile, are almost unheard of. Knowledge is also still being transmitted predominantly by the traditional method of training seminars. Because HR managers need to take into account the fact
that this approach focuses on the transfer of explicit knowledge, a framework for the transmission of implicit knowledge is also needed.

In summary, demographic change is an issue recognised by most authorities but there seems to be much less consensus on policies to address it and a seeming reliance on informal as opposed to formal systems (see Table 20), along with potentially insufficient acknowledgement of the value of tacit as opposed to explicit knowledge, given the reliance on training.

Social science is, however, too complex for a solely univariate representation of survey results. The aim is to answer the research propositions with newly-gathered empirical data. Therefore, the following sections deal with relationships between data features, which are identified through bivariate and multivariate analyses.

Since the questionnaire contains a wide variety of questions, analysis of individual questions can quickly become cumbersome and difficult to interpret. The number of responses also made it sensible to employ data reduction techniques.

5.3 Generating Variables for Analysing the Research Propositions

The factor analysis serves to compress information, in particular in semantic differences, and to restructure data for cluster and regression analysis and the classification of variables. The difference between cluster and factor analysis lies in the method of summarising data. In factor analysis, variables are summarised in overarching descriptions and compressed into these descriptions. In cluster analysis, groups are constructed into which objects which are then classified (Backhaus et al., 2011). In detail, Backhaus et al. (2011) explain these analysis methods such that factor analysis identifies structure in a large set of variables and summarises them into factors; cluster analysis, on the other hand, places respondents’ response patterns in homogeneous groups whose pattern of response clearly differs from that of other groups.
5.3.1 Factor analysis

There is a danger that the large number of variables to take into account makes it difficult to make reasonable tests of correlation. The researcher has therefore followed the recommendations of Bortz (1989), who advises analysing the relationships among many variables and making a preliminary selection of variables. According to Backhaus et al. (2011), the aim is to identify structure in the responses. In order to accomplish this, factor analysis has been used, which serves to identify underlying shared factors. This enables dimension reduction – a reduction in the number of variables being considered. This reclassification into independent components makes the multivariate analysis, in this case multiple regression, simpler. The extracted components represent maximally-independent dimensions along which the variance in the data can be explained (Bortz, 1989). As a result of dimension reduction, a large number of variables were replaced with a few factors. Each factor contains information from several variables. Each factor explains more variance than any single variable. The factors that have been calculated must then be interpreted in terms of their content so that further analyses can be made meaningful and conclusions drawn about relationships among real phenomena. Factor analysis aims to arrive at structured factor values (Backhaus et al., 2011).

In the current investigation factor analyses were attempted at several points in the analysis. In carrying out these analyses the researcher focused on the most important questions, which were also addressed in the non-response bias analysis. The researcher attempted to carry out dimension reduction with factor analysis for Question 7; however, no underlying structure with high explanatory power was found, since only one factor was extracted. A successful factor analysis was possible for questions 3 (What are the effects to labour potential in your administration?), 5 (Specific effects of demographic change in the context of hiring and HR management) and 19 (Questions relate to the provision of further training in your local authority). However, the
reliability analysis with Cronbach’s alpha (Diekmann, 1998) did not yield a satisfactory result. Cronbach’s alpha varies among the factors and is below 0.7. It is therefore not justified to assume internal consistency. It is clear that no grouping of variables into factors is possible for the questions regarding the effects of demographic change on workforce potential and HRM, nor for those regarding the implementation of new fields of operation and various training measures (Backhaus et al., 2011). No clear relationships could be discerned and no central factors derived. These results led to the cluster analysis detailed in Section 5.3.2. If it is not possible to group variables it may be possible, according to Backhaus et al. (2011), to group observations.

Factor analysis was successful for Question 37 regarding knowledge sharing and knowledge preservation. Table 22 shows the generation of the three factors.

<table>
<thead>
<tr>
<th>Item</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of knowledge requirements</td>
<td>0.877</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identification of relevant knowledge sources</td>
<td>0.787</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overview of the areas in which new knowledge needs to be generated</td>
<td>0.733</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee requests for training and development are supported by managements staff</td>
<td></td>
<td>0.945</td>
<td></td>
</tr>
<tr>
<td>Knowledge gaps are removed through training schemes</td>
<td></td>
<td>0.828</td>
<td></td>
</tr>
<tr>
<td>Familiar with the division of knowledge into tacit and explicit forms</td>
<td></td>
<td></td>
<td>0.905</td>
</tr>
<tr>
<td>Support for the explication of tacit knowledge</td>
<td></td>
<td></td>
<td>0.820</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>3.204</td>
<td>1.243</td>
<td>1.017</td>
</tr>
<tr>
<td>% of Variance</td>
<td>40.055</td>
<td>15.534</td>
<td>12.708</td>
</tr>
<tr>
<td>Cronbach’s Alpha for Factor</td>
<td>0.784</td>
<td>0.754</td>
<td>0.709</td>
</tr>
</tbody>
</table>

Table 22: Factor analysis Question 37

The proportions of variance explained (given in the summary) show how much predictive power each factor has for the dependent variables. The three factors explain between them 68.3% of the variance in the eight dependent variables.
The researcher interpreted the extracted factors as follows:

- Factor 1 Understanding of knowledge.
- Factor 2 Deal with knowledge gaps through training.
- Factor 3 Support for knowledge transfer.

These three factors summarise the basic information regarding knowledge preservation in local authorities. With them, it was possible to determine from a large number of variables (see Table 9) which topic areas management of knowledge preservation can be divided into. The results show a clear grouping into 'understanding the management of knowledge' (as represented by the variables analysis of knowledge requirements, knowledge sources and fields of knowledge), 'approach to knowledge through training' (represented by support for employee training requests and approval of training programmes) and 'support for knowledge transfer' (represented by appreciation of the distinction between implicit and explicit knowledge).

In the analyses that follow, the factors are used as dependent variables.

5.3.2 Cluster analysis

Cluster analysis is used in order to identify similarities among the various objects of the investigation. The aim is to group objects into clusters such that the characteristics of objects within clusters are as homogeneous as possible. The differences between clusters should be as great as possible (Backhaus et al., 2011). As explained in Section 5.3.1, an exploratory factor analysis had already been carried out for some variables, but this did not yield any correlations among factors. The next step was to determine whether the observations could be summarised by grouping them into clusters whose members are maximally similar.
The investigator carried out cluster analysis with questions:

3  Impact of demographic change on workforce potential in the administration.
5  Effects of demographic change on recruitment and HRM.
7  New fields of policy as part of HRM.
10 HR development system is in place.
19 Further training measures in the local authority.
24 Support, alongside the classic training and development measures, for knowledge transfer between employees.
26 Knowledge management system has been introduced.
34 Knowledge profile for each employee exist.

Questions 3-19 and 37 involve a four-level measurement scale (completely disagree/somewhat disagree/somewhat agree/completely agree). Questions 10, 24, 26 and 34 are dichotomous questions and were analysed with a two-step cluster analysis.
Two clusters were found to be the optimal number of clusters in order to maintain manageability, as recommended by Backhaus et al. (2011).

5.3.2.1 Cluster analysis Question 3 – Effects of demographic change on workforce potential

<table>
<thead>
<tr>
<th>Ward Method</th>
<th>Ageing workforce</th>
<th>Fewer applicants for free positions</th>
<th>Unsuitable applicants for free positions</th>
<th>Decreased employee productivity</th>
<th>Waves of retirement</th>
<th>More difficult compatibility of family and work commitments</th>
<th>Current knowledge can't be secured</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>mean</td>
<td>3.11</td>
<td>2.65</td>
<td>2.51</td>
<td>2.07</td>
<td>2.57</td>
<td>2.65</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Standard deviation</td>
<td></td>
<td>0.727</td>
<td>0.878</td>
<td>0.778</td>
<td>0.644</td>
<td>0.774</td>
<td>0.762</td>
</tr>
<tr>
<td>2</td>
<td>mean</td>
<td>3.90</td>
<td>3.53</td>
<td>3.02</td>
<td>2.50</td>
<td>3.15</td>
<td>3.18</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Standard deviation</td>
<td></td>
<td>0.03</td>
<td>0.566</td>
<td>0.596</td>
<td>0.567</td>
<td>0.860</td>
<td>0.725</td>
</tr>
<tr>
<td>total</td>
<td>mean</td>
<td>3.46</td>
<td>3.04</td>
<td>2.73</td>
<td>2.26</td>
<td>2.83</td>
<td>2.89</td>
</tr>
</tbody>
</table>
The result of the cluster analysis in Table 23 shows that the averages in cluster 1 all lie below the mean, and the values in cluster 2 lie above it. Therefore, on average, survey participants who report a lower negative effect of demographic change on workforce potential belong in cluster 1. Participants who already report more negative effects belong in cluster 2.

In order to be able to make use of this result for further analyses, the answer scale is dichotomised into a binary scale (Backhaus et al., 2011). For the following regression analyses, Question 3 is coded as follows:

- Below average negative effect on workforce potential – 1 (Code: 3_1)
- Above average negative effect on workforce potential – 2 (Code: 3_2)

The extracted clusters are used as dependent variables in the following analyses.

5.3.2.2 Cluster analysis Question 5 – Effects of demographic change with respect to recruitment and HRM

Cluster analysis with all variables did not lead to any meaningful result. In the next stage of analysis, therefore, the variables ‘The age of the applicant plays a role’ and ‘The external labour market is monitored for trainee recruitment’ are removed. The subsequent cluster analysis for Question 5 yields the following picture (see Table 24):
## Ward Method

<table>
<thead>
<tr>
<th>Is there a pool of qualified workers?</th>
<th>Competition with the private sector for new employees</th>
<th>Disadvantage in terms of the attractiveness as an employer to private sector</th>
<th>Decrease in the number of applications for apprenticeships</th>
<th>Trainees taken on permanently once they completed their training</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>3.09</td>
<td>2.81</td>
<td>2.59</td>
<td>2.74</td>
</tr>
<tr>
<td>N</td>
<td>58</td>
<td>58</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.657</td>
<td>0.868</td>
<td>0.817</td>
<td>0.983</td>
</tr>
<tr>
<td>2 mean</td>
<td>1.39</td>
<td>3.06</td>
<td>2.83</td>
<td>2.50</td>
</tr>
<tr>
<td>N</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.612</td>
<td>0.839</td>
<td>0.783</td>
<td>1.063</td>
</tr>
<tr>
<td>total mean</td>
<td>2.05</td>
<td>2.96</td>
<td>2.74</td>
<td>2.59</td>
</tr>
<tr>
<td>N</td>
<td>148</td>
<td>148</td>
<td>148</td>
<td>148</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>1.042</td>
<td>0.856</td>
<td>0.803</td>
<td>1.036</td>
</tr>
</tbody>
</table>

Table 24: Cluster analysis question 5

It can be concluded from table 24 that local authorities that have already had to deal with higher than average negative effects belong in cluster 1. On the other hand, survey participants who notice less negative effects of demographic change on HRM and recruitment (with the exception of a decline in applicants for trainee positions) belong in cluster 2.

Question 5 is coded as follows:

More negative effects of demographic change on recruitment
− 1 (Code: 5_1)

Below average negative effects of demographic change on recruitment
− 2 (Code: 5_2)

The clusters are then used to identify dependent variables.
5.3.2.3 Cluster analysis Question 7 – New fields of policy as part of HRM

<table>
<thead>
<tr>
<th>Ward Method</th>
<th>Strategic HRM</th>
<th>Age structure analysis</th>
<th>Demographic-oriented administrative culture</th>
<th>Employee skills development</th>
<th>Knowledge management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>mean</td>
<td>3.04</td>
<td>3.41</td>
<td>2.82</td>
<td>3.31</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>68</td>
<td>68</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Standard derivation</td>
<td>0.721</td>
<td>0.496</td>
<td>0.571</td>
<td>0.496</td>
</tr>
<tr>
<td>2</td>
<td>mean</td>
<td>2.54</td>
<td>2.78</td>
<td>1.98</td>
<td>2.75</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>63</td>
<td>63</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Standard derivation</td>
<td>0.839</td>
<td>0.941</td>
<td>0.729</td>
<td>0.671</td>
</tr>
<tr>
<td>total</td>
<td>mean</td>
<td>2.80</td>
<td>3.11</td>
<td>2.42</td>
<td>3.04</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>131</td>
<td>131</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td>Standard derivation</td>
<td>0.817</td>
<td>0.806</td>
<td>0.774</td>
<td>0.649</td>
</tr>
</tbody>
</table>

Table 25: Cluster analysis Question 7

According to Table 25, respondents with an above-average deployment of new perspectives in HRM were assigned to cluster 1. Respondents with a below-average deployment of these new perspectives were assigned to cluster 2. According to Table 25, question 7 is coded as follows:

Frequent use of new perspectives in HRM – 1 (Code: 7_1)
Limited use of new perspectives in HRM – 2 (Code: 7_2)

The clusters are then used to identify dependent variables.
5.3.2.4 Cluster analysis Question 10 – HR development system is in place

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th></th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>frequency</td>
<td>%</td>
<td>frequency</td>
</tr>
<tr>
<td>Cluster 1</td>
<td>59</td>
<td>100.0</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0.0</td>
<td>48</td>
</tr>
<tr>
<td>combined</td>
<td>59</td>
<td>100.0%</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 26: Cluster analysis Question 10

It can be concluded from the two-step cluster analysis in Table 26 that local authorities with an HR development concept were assigned to cluster 1. Cluster 2 contains the local authorities without an HR development system.

Question 10 is coded as follows:

HR development system in use – 1 (Code: 10_1)
No HR development system in use – 2 (Code: 10_2)
Table 27: Cluster analysis Question 19

Table 27 shows that in cluster 1 the variables show higher values than the mean, with the exception of 'disadvantage to older employees' and 'training budget is subject to cuts'. It can therefore be concluded that local authorities that rate training measures and their strategic deployment as important are included in this cluster. The two variables noted above show values below the mean, indicating that these local authorities also do not set older employees at a disadvantage and do not cut their training budgets.

The dichotomisation is coded as follows:

Importance higher than average accorded to the strategic use and assessment of training measures – 1 (Code: 19_1)
Importance lower than average accorded to the strategic use and assessment of training measures – 2 (Code: 19_2)

The clusters are then used to identify dependent variables.

**5.3.2.6 Cluster analysis Question 24 – Support, alongside the classic training and development measures, for knowledge transfer between employees**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>frequency</td>
<td>%</td>
</tr>
<tr>
<td>Cluster 1</td>
<td>40</td>
<td>67.8</td>
</tr>
<tr>
<td>Cluster 2</td>
<td>19</td>
<td>32.2</td>
</tr>
<tr>
<td>combined</td>
<td>59</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 28: Cluster analysis Question 24

It can be seen from Table 28 that local authorities in cluster 1 strongly support knowledge transfer among employees. Local authorities assigned to cluster 2 place less importance on knowledge transfer.

The dichotomisation is coded as follows:

Support for knowledge transfer among employees plays an important role – 1 (Code: 24_1)

Support for knowledge transfer among employees plays only a minor role – 2 (Code: 24_2)

The clusters are then used to identify dependent variables.
5.3.2.7 Cluster analyses Question 26 – A knowledge management system has been introduced; and Question 34 – knowledge profiles for each employee exist

<table>
<thead>
<tr>
<th>Has a knowledge management system been introduced?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>frequency</td>
<td>%</td>
<td>frequency</td>
</tr>
<tr>
<td>Cluster 1</td>
<td>4</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>combined</td>
<td>4</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Does your HR department have a knowledge profile of each employee?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>frequency</td>
<td>%</td>
<td>frequency</td>
</tr>
<tr>
<td>Cluster 1</td>
<td>8</td>
<td>88.9</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>11.1</td>
</tr>
<tr>
<td>combined</td>
<td>9</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 29: Cluster analyses Question 26 and 34

Answers to the question regarding the presence of a system to manage knowledge, as well as to the question regarding the presence of a knowledge profile could not be characterised by cluster analysis. The differences between the clusters are not significant (see Table 29).

5.3.3 Summary of cluster and factor analyses

In summary, in attempting to reveal structure in the data through dimension reduction measures, a successful grouping of variables was possible for one question. In six further cases, grouping by observations was successful, resulting in a division of participating local authorities into two groups. Only in two cases were there no coherently interpretable relationships to be found among variables or observations. Therefore, successful dimension reduction was carried out and new variables were produced that can be used to answer the research propositions.
5.4 Bivariate and Multivariate Analysis

In the following sections the descriptive analysis is supplemented by additional information in the form of relationships between one dependent variable and one or more independent variables, following Kaiser's (2013) recommendation. The value of the additional information lies in the fact that influencing factors are tested for statistical significance.

In order to examine relationships between variables and features of the data, correlation was used, which is a bivariate method of analysis. When the value of one variable tends to correspond with the value of another the two are said to be correlated. The closer the correlation coefficient is to 1, the stronger the association between the two variables (Raab-Steiner and Benesch, 2012). The correlation coefficient can take on values between +1 and -1, with a value of +1 indicating a perfect positive linear association, and a value of -1 indicating a perfect negative linear association (Bortz, 1988). In the following analyses a comparison of means by t-test is applied in cases in which only one ordinal variable must be compared across dichotomous groups.

The next step aims to establish whether multiple independent variables have an influence on a dependent variable. This is accomplished by means of logistic and linear regression analysis (Diekmann, 1998; Bortz, 1989). All regression models include the independent variables number of employees and type of local authority as control variables. These covariates have previously proven useful as controls in the investigations carried out by f-bb (Freiling and Geldermann, 2011). As in the present study, these previous investigations anticipated encountering differences in the results purely as a function of number of employees and type of local authority, and assumed that susceptibility to the effects of demographic change would depend on these two variables.
The following additional details concern only those results that are statistically significant and can therefore be considered probable indications of a true relationship. A large number of correlation and regression tests were carried out where the results were nonetheless not statistically significant.

5.4.1 Research proposition 1 – Demographic change is hindering the acquisition of new junior employees

In order to clarify the association the independent variables in Question 3 were used. It is expected that in particular the variables will be associated with the effects on recruitment according to dependent variable 5:

- fewer applicants for free positions
- unsuitable applicants for free positions
- occurrence of waves of retirement.

The investigator would especially like to find out whether the private and public sectors are competing for labour and whether training positions can be filled with applicants.

Independent variables: Demographic change
Question 3

Dependent variables: Effects of demographic change with respect to recruitment and HRM
Question 5

5.4.1.1 Results based on Pearson's correlation

Questions 3 and 5 make use of a Likert scale, and so the outcomes are treated as quantitative ratio data. Therefore, as shown in Table 30, the following significant results are based on Pearson's correlation:
Competition with the private sector. Does age also play a role?

Disadvantages in terms of the attractiveness as an employer compared to private enterprises

Monitoring the external job market

Decrease in the numbers of applicants

Pool of qualified workers

Lay-offs carried out as part of downsizing measures

Trainees taken on permanently

Ageing workforce

Fewer applicants for free positions

Unsuitable applicants for free positions

Decreased employee productivity

Retirement in large numbers

Current knowledge cannot be secured

<table>
<thead>
<tr>
<th>Research proposition</th>
<th>Competition with the private sector</th>
<th>Does age also play a role?</th>
<th>Disadvantages in terms of the attractiveness as an employer compared to private enterprises</th>
<th>Monitoring the external job market</th>
<th>Decrease in the numbers of applicants</th>
<th>Pool of qualified workers</th>
<th>Lay-offs carried out as part of downsizing measures</th>
<th>Trainees taken on permanently</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ageing workforce</td>
<td>0.197*</td>
<td>-0.025</td>
<td>0.118</td>
<td>0.087</td>
<td>0.148</td>
<td>-0.023</td>
<td>0.056</td>
<td>-0.046</td>
</tr>
<tr>
<td>Fewer applicants for free positions</td>
<td>0.229**</td>
<td>-0.134</td>
<td>0.260**</td>
<td>0.090</td>
<td>0.344**</td>
<td>0.054</td>
<td>0.069</td>
<td>-0.016</td>
</tr>
<tr>
<td>Unsuitable applicants for free positions</td>
<td>0.064</td>
<td>0.070</td>
<td>0.223**</td>
<td>-0.042</td>
<td>0.071</td>
<td>-0.124</td>
<td>0.170*</td>
<td>-0.017</td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td>0.055</td>
<td>0.129</td>
<td>0.076</td>
<td>-0.054</td>
<td>-0.009</td>
<td>-0.044</td>
<td>0.015</td>
<td>0.000</td>
</tr>
<tr>
<td>Retirement in large numbers</td>
<td>0.139</td>
<td>-0.018</td>
<td>0.070</td>
<td>-0.082</td>
<td>0.089</td>
<td>-0.045</td>
<td>0.079</td>
<td>-0.087</td>
</tr>
<tr>
<td>Current knowledge cannot be secured</td>
<td>0.209*</td>
<td>0.063</td>
<td>0.168*</td>
<td>0.066</td>
<td>0.097</td>
<td>-0.074</td>
<td>-0.021</td>
<td>-0.076</td>
</tr>
</tbody>
</table>

**The correlation is significant at the 0.01 level (two-tailed).

* The correlation is significant at the 0.05 level (two-tailed).

Table 30: Correlation Research proposition 1 – Questions 3 and 5

It can be seen from Table 30 that there are significant associations at the p<0.01 level (two-tailed) between the decline in applicants and competition with the private sector, as well as between the disadvantage in attractiveness as an employer and the decline in applications. There are also correlations at this level of significance with unsuitable applicants and with the disadvantage in attractiveness compared with the private sector. These correlations are a clear sign that local authorities are already noticing signs that it will be more difficult to recruit trainees in the future. This is frequently attributed in particular to the general perception of the private sector as a competitor.
There are also interesting correlations at the \( p < 0.05 \) level, for example a positive correlation between competition with the private sector on the one hand, and the ageing workforce and knowledge insecurity on the other. The variable knowledge retention also correlates with the disadvantage in attractiveness compared to the private sector.

5.4.1.2 Results based on the linear regression

Out of eight variables concerning the effects of demographic change on HRM, the linear regression revealed three significant positive correlations: between the number of employees on the one hand and interest in the external labour market, the intake of trainees, and being a municipality (‘Gemeinde’) on the other. The decline in applicants and the decline in applications for trainee positions are also significantly positively correlated. These results are shown in Table A3 in the appendix.

In summary, as was expected, the decline in applicants in particular is frequently correlated with other variables. The fact that the ageing workforce and waves of retirement nonetheless show no significant correlations demonstrates that the effects of demographic change have so far had only an indirect impact on HRM. It is also clear that local authorities are competing with the private sector for trainees and see themselves as at a disadvantage as regards to their attractiveness as an employer, but are not yet watching the external labour market. Whether or not a local authority watches the external labour market appears to depend on the number of employees, such that the larger the local authority the more it takes an interest in the external labour market.

5.4.1.3 Analysis with cluster results

The interpretation of Table A10 in the appendix shows no significant associations between the clusters ‘negative effects on workforce
and 'negative effects on recruitment'. The results can be found in the appendix.

5.4.1.4 Summary of the findings for Research proposition 1

It is clear that there is no direct significant relationship between above average effects of demographic change and the negative effects on recruitment. If the descriptive statistics are integrated with these results it becomes clear that local authorities feel themselves to be at a disadvantage compared to the private sector, or are in competition with it, in particular with respect to recruitment and attractiveness as an employer. Local authorities also see themselves as the underdogs in the so-called 'war for talent', but success in recruiting trainees is so far only indirectly influenced by demographic change. The results of the analysis do not show a direct and statistically significant relationship between the effects of demographic change and trainee recruitment. Overall, German local authorities are still in the early stages of implementing a strategic plan for recruitment; however, the regressions do show some significant individual correlations and relationships. They are therefore only just beginning to address the challenges arising from demographic change. The statement in Research proposition 1 cannot be completely confirmed. Local authorities clearly see themselves as engaged in competition with the private sector over potential trainees. Some significant correlations are already recognisable. However, so far these are only due to the indirect effects of demographic change. Direct influences, such as the ageing workforce or waves of retirement, are not yet correlated with the effects on recruitment. One possible reason for the finding that the link is so far only indirectly perceived could be that local authorities anticipate seeing the effects of demographic change on workforce potential only in about 6 to 10 years time (see Table 14). At the time of the survey almost every respondent was aware that demographic change has an effect on workforce potential. However, what the results seem to suggest is that they do not as yet know what form this effect will take, or local authorities had not yet addressed this question.
The aim of the next research proposition is to determine whether age structure analysis is being employed for HR development, on the basis of general recognition of demographic change and its effects.

5.4.2 Research proposition 2 – If an age structure analysis is in place in local authorities then it serves as a foundation for HR development

The aim of Research proposition 2 was to demonstrate the association between the presence of an age structure analysis and its usefulness for HR development. The independent variable is Question 12 regarding the presence of an age structure analysis, and the dependent variable is Question 10 regarding the presence of an HR development system. It is assumed that an age structure analysis is in place (see Section 3.4.1.4).

It was expected that local authorities that have an age structure analysis would also have developed an HR development concept.

5.4.2.1 Results based on a cross-classified table

Since these are nominal data, the relationship between the presence of an HR development system and an age structure analysis was first examined in table format (see Table 31).
Do you have an HR development system?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have an age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>structure analysis?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>N54</td>
<td>N23</td>
</tr>
<tr>
<td>%</td>
<td>74</td>
<td>41.8</td>
</tr>
<tr>
<td>No</td>
<td>N19</td>
<td>N32</td>
</tr>
<tr>
<td>%</td>
<td>26</td>
<td>58.2</td>
</tr>
</tbody>
</table>

Pearson Chi\(^2\) Test

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Asymptotic standard error (a)</th>
<th>Approximated T(B)</th>
<th>Approximated significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kendall-Tau-b</td>
<td>0.325</td>
<td>0.085</td>
<td>3.809</td>
<td>0.000</td>
</tr>
<tr>
<td>Kendall-Tau-c</td>
<td>0.315</td>
<td>0.083</td>
<td>3.809</td>
<td>0.000</td>
</tr>
<tr>
<td>Gamma</td>
<td>0.596</td>
<td>0.123</td>
<td>3.809</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 31: Correlation between age structure analysis and HR development system

From Table 31 the gamma test is used to analyse the results, showing a significant positive correlation: local authorities that have an age structure analysis are also likely to have an HR development system.

### 5.4.2.2 Logistic regression results

This logistic regression model tested the relationship between the use of a staff development system as a dependent variable and the presence of an age structure analysis as an independent variable (as previously discussed). Number of employees and type of local authority are used as covariates (see Table 32).

<table>
<thead>
<tr>
<th></th>
<th>significance</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age structure analyse</td>
<td>0.003</td>
<td>3.479</td>
</tr>
<tr>
<td>Number of Employees</td>
<td>0.000</td>
<td>2.395</td>
</tr>
<tr>
<td>County</td>
<td>0.169</td>
<td>0.450</td>
</tr>
<tr>
<td>municipality</td>
<td>0.404</td>
<td>0.642</td>
</tr>
<tr>
<td>Nagelkerkes R(^2)</td>
<td>0.228</td>
<td>0.228</td>
</tr>
<tr>
<td>Cox&amp;Snell R(^2)</td>
<td>0.228</td>
<td></td>
</tr>
</tbody>
</table>

Table 32: Binary logistic regression age structure analysis and HR development system

It is clear from Table 32 that the independent variable of age structure analysis is positively related to the presence of an HR development system.
5.4.2.3 Summary of the findings for Research proposition 2

The results support Research proposition 2; if an age structure analysis is in place it forms the basis of an HR development system. In addition, it can be concluded that the use of an HR development system is correlated with the size of the local authority.

After establishing in this section that a strategic tool for HR development is in use, the following research proposition aims to clarify which tools show significant correlations with the effects of demographic change, if any.

5.4.3 Research proposition 3 – The effects of demographic change are positively associated with the deployment of instruments for HR development

A significant relationship is expected between the effects of demographic change and the instruments employed in HR development systems. In order to generate results for confirming the research proposition, the following variables were used:

- Independent variables: Demographic change, Question 3
- Dependent variables: HR development systems, questions 7, 8, 10, 22, 24, 26 and 34

5.4.3.1 Bivariate analysis results for Demographic change and fields / tasks of HRM

The bivariate analysis revealed correlations between ageing workforce and a decline in applicants. The correlation coefficient for ageing workforce and age structure analysis is 0.264 (see Table A4 in the appendix) representing a weak correlation. Local authorities which feel the effects of an ageing workforce as a result of demographic change tend more often to have an age structure analysis in place. The fields of operation for a demography-oriented management culture and the
development of employee skills are both positively associated with a decline in applicants. The correlation coefficients are 0.181 and 0.252 respectively, both showing weak positive correlations (see Table A5 in the appendix).

In addition, local authorities in which there are fewer applicants for vacant positions also tend to be more concerned with employee development and retention. The correlation coefficients are also weak and positive, 0.178 and 0.204 respectively. Full results of the correlation analyses can be found in Tables A4 and A5 in the appendix.

5.4.3.2 Results based on the t-Test for Demographic change and knowledge transfer / knowledge profile

Table 33 shows the significant results of the t-tests concerning how knowledge is transferred. The analysis examined a range of sets of variables, with only those that were significant being presented here. The t-test determines whether the means of two groups are significantly different. In each case the groups are dichotomous, for example in the present case according to whether the administration carries out team meetings or not. If the difference is significant then it is by scientific standards improbable that this difference is purely the result of chance. The results are interpreted as follows:

- Local authorities that are already affected by an ageing workforce place greater importance on knowledge transfer through team meetings and external working groups.
- Local authorities in which the number of applicants is declining consider individual knowledge exchange among employees to be more important.
- Local authorities in which employee productivity is declining see external working groups as a suitable method for knowledge transfer.
- Local authorities that are unable to secure knowledge because of demographic change have no knowledge profile of employees.
These results suggest that local authorities where effects of demographic change already exert an influence on workforce place more importance on measures for knowledge retention and transfer. However, it is generally clear that this correlation analysis reveals a large number of non-significant correlations. Out of 20 correlation tests, only five were significant (see Table 33). Taken together, this is a weak association for this result.

<table>
<thead>
<tr>
<th>T-Test</th>
<th>Team meetings</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Older employees</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>3.53</td>
<td>3.08</td>
</tr>
<tr>
<td>Individual exchanges between employees</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>Fewer applicants</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>3.07</td>
<td>2.36</td>
</tr>
<tr>
<td>External working groups</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>Older employees</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>3.68</td>
<td>3.41</td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>2.63</td>
<td>2.14</td>
</tr>
<tr>
<td>Knowledge profile is in place</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>Knowledge can't be secured</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>2.15</td>
<td>2.67</td>
</tr>
</tbody>
</table>

Table 33: t-test Research proposition 3 – Question 3 (Demographic change) and questions 22 (Knowledge transfer) / 34 (Knowledge profile)

5.4.3.3 Results based on the linear regression for Demographic change and fields of HRM

In addition, it was investigated whether the effects of demographic change were associated with the number of issues being addressed. Here, one positive and significant correlation of 0.194 at the 0.01 level (two-tailed) was assessed. The smaller the number of applicants, the larger the number of issues (strategic HRM, age structure analysis, demography-oriented management structure, development of employee
skills and knowledge management) were being addressed as part of the local administrations' HRM.

In a further step, all independent variables for Question 3 regarding the effects of demographic change were used in a linear regression analysis with the dependent variables for Question 7 regarding the fields of operation of HRM. It can be seen that the independent variable 'fewer applicants' and the covariate 'number of employees' are significantly associated with new fields of operation (see Table A6 in the appendix).

The higher the number of employees in a local authority, the more frequently the following tools are deployed:

- strategic HRM
- age structure analysis
- development of employee skills.

When there are fewer applicants for free positions the following tools are deployed more frequently:

- a demography-oriented management culture
- cultivation of employee skills.

Full results of the correlation analyses can be found in Table A6 in the appendix. Tables 8 and 9 in the appendix show the results of the logistic regression. This analysis is not discussed further here, since it does not directly address the research proposition.

5.4.3.4 Analysis using the cluster results

Section 5.3.2 presented the results of the cluster analysis. To test Research proposition 3 the statistically significant influences from clusters 3 (see section 5.3.2.1) and 19 (see section 5.3.2.5) were analysed in a table. Since the results of the cluster analysis give the
best representation of the analysis with regards to confirming the statement in the research proposition, these results are provided here in detail.

Cluster 3_2 includes respondents reporting above average negative effects of demographic change, while cluster 3_1 includes respondents reporting below average negative effects.

Respondents in cluster 19_1 are characterised by high agreement with the strategic use and analysis of further training measures. Those who reported low agreement with the strategic use and analysis of these measures belong to cluster 19_2.

It is therefore predicted that cluster 3_2 has a significant positive influence on cluster 19_1. The aim is to test the research proposition that demographic change is related to HR development systems. It was hypothesised that local authorities in which the effects of demographic change are already being felt are those that have set up HR development systems that take into account employee skills (see Table 34).

<table>
<thead>
<tr>
<th>Strategic use and assessment of training measures</th>
<th>1-high importance</th>
<th>2-low importance</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative effect on workforce potential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-below average</td>
<td>N 13</td>
<td>50</td>
<td>63</td>
</tr>
<tr>
<td>% 20.6</td>
<td>79.4</td>
<td>100.00</td>
<td></td>
</tr>
<tr>
<td>2-above average</td>
<td>N 25</td>
<td>28</td>
<td>53</td>
</tr>
<tr>
<td>% 47.2</td>
<td>52.8</td>
<td>100.00</td>
<td></td>
</tr>
<tr>
<td>Total N</td>
<td>38</td>
<td>78</td>
<td>116</td>
</tr>
<tr>
<td>% 32.8</td>
<td>67.2</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

Pearson Chi² Test 9,201: Asymptotic significance 0.002 (two-sided)

| Kendall-Tau-b | -0.282 | 0.089 | -3.102 | 0.002 |
| Kendall-Tau-c | -0.263 | 0.085 | -3.102 | 0.002 |
| Gamma         | -0.549 | 0.145 | -3.102 | 0.002 |

Table 34: Cluster analysis question 3 (Demographic change) and 19 (Training activities)
This statistical analysis of Table 34 supports the predicted associations. In local authorities in which the effects of demographic change are above average, for example through an ageing workforce or a decline in applicants, more importance is placed on strategic deployment and analysis of further training measures.

5.4.3.5 Summary of the findings for Research proposition 3

The significant results can be summarised as: for local authorities with fewer applicants and older average employee age there is a positive relationship with the new fields of operation in HRM. In addition, it is clear that the number of employees is significantly positively associated with the use of HR development systems. It is important to highlight here that, in particular, the use of an age structure analysis, the fostering of employees' skills, and various possibilities for knowledge transfer between older and younger employees are being deployed against the negative effects of demographic change. This conclusion is supported by the results of the cluster analysis.

Research proposition 3 is therefore confirmed; local authorities in which the effects of demographic change are already exerting an influence on workforce potential are making more use of the new fields of operation in HRM and of HR development. It should be noted here, however, that the predicted waves of retirement specifically do not yet show any significant associations. Table 17 shows the development of average age, and it is clear that it is rising. For this reason, the influence of waves of retirement should be brought to the forefront in HR development plans. In addition, the results show that the use of new HRM tools that are strategically oriented for the future depends on the size of the local authority. It can be concluded that larger local authorities are better able, or perhaps more willing, to implement new tools and policies.

The following research proposition aims to establish whether the strategic deployment of further training measures is being pursued,
along with the use of new tools for HR development, in order to secure knowledge.

5.4.4 Research proposition 4 – Demographic change will influence the strategic direction of training activities

It is expected that training measures are being employed strategically and that they are being monitored as they are carried out. The investigator assumes that training measures are being analysed according to the four key competencies (specialist, methodological, social and leadership skills) and that there is a positive linear relationship with the effects of demographic change.

In testing this research proposition, the following answers were used:

- Independent variables: demographic change, Question 3
- Dependent variables: processes for knowledge sharing and knowledge retention, questions 19, 20

5.4.4.1 Results based on the bivariate analysis for Demographic change and training activities

As shown in Table A7 the appendix the independent variables fewer applicants for free positions, declining potential productivity of employees and knowledge cannot be secured show correlations to specific training activities.

5.4.4.2 Results based on the bivariate analysis for Demographic change and Key skills

The next correlation test gives a very clear result, in which only the independent variable ‘fewer applicants for free positions’ shows significant relationships with the key skills in specialist skills, methodological, social and leadership skills (see Table 35). These key skills are analysed in the context of training activities (Question: “Are
training and development activities analysed according to the context to the following skills: professional expertise, methods, social and leadership skills?

<table>
<thead>
<tr>
<th>Competencies</th>
<th>Fewer applicants for free positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist skills</td>
<td>0.236**</td>
</tr>
<tr>
<td>Methodological skills</td>
<td>0.232**</td>
</tr>
<tr>
<td>Social skills</td>
<td>0.215*</td>
</tr>
<tr>
<td>Leadership skills</td>
<td>0.237**</td>
</tr>
</tbody>
</table>

**The correlation is significant at the 0.01 level (two-tailed).

* The correlation is significant at the 0.05 level (two-tailed).

Table 35: Correlation Research proposition 4 – Question 3 (Demographic change) and 20 (Key skills)

A search for significant relationships between the effects of demographic change and the people who identify knowledge deficits were also carried out, but correlation results showed no significant associations.

5.4.4.3 Results based on the linear regression for Demographic change and Training activities and Key skills

Table A8 in the appendix presents the results of the linear regression with the variables from the questions about training measures and analysis of skills as part of further training.

The dependent variable knowledge management system is in place shows significant associations with the number of employees and fewer applicants. The other dependent variables, such as training assessments, lifelong learning or balancing of employee and organisational needs, show no significant relationship to demographic change and are therefore not shown here.

The picture is somewhat different for further training measures from the perspective of different skill sets. There was a significant relationship between number of employees and leadership and social skills. Leadership skills were also significantly related to the decline in
employees. Where employee productivity declines, a significant relationship emerges with analysis of the effectiveness of training methods.

5.4.4.4 Summary of the findings for Research proposition 4

The aim of the research proposition tests is to establish whether German local authorities are already deploying strategic training measures in order to mitigate the negative effects of demographic change, in particular knowledge loss through employee departure. In this research proposition test it is clear that, in particular, the variable ‘decline in applicants’ is significantly related to other factors. Local authorities in which the number of applicants is already declining are more likely, among other things, to have a further training policy and to analyse training measures according to their focus on specialist, methodological, social and leadership skills. These relationships make sense; if there are fewer applicants then current employees need to be better trained. The covariate of number of employees also shows the aforementioned significant associations, so that the strategic direction of training programmes also depends on the size of the local authority.

A concentration on only one independent variable is not sufficient to assert a significant link between the effects of demographic change and approaches to training. The research proposition that the demographic change influences training measures cannot be positively answered.

The aim of the following research proposition is to establish whether processes are already in place that address knowledge retention. Even where further training measures still lack strategic direction, it may be the case that particular isolated processes are being made use of to secure knowledge.
5.4.5 Research proposition 5 – Local German authorities will engage in a number of separate processes with regard to knowledge sharing and preservation

Research proposition 5 states that:

*Local authorities have implemented processes that secure knowledge.*

The results of the factor analysis show which processes are used in which local authorities. Table 22 shows that there are three factors concerning knowledge use and knowledge retention:

- Factor 1: Understanding of approaches to knowledge. This process involves German local authorities analysing knowledge needs and identifying sources of knowledge, so as to create an overview of the areas in which new knowledge should be generated.

- Factor 2: Use of training to fill knowledge gaps. This factor includes knowledge retention processes that fill knowledge gaps by taking employees' own requests for training into account.

- Factor 3: Support for knowledge transfer. This process focuses on knowledge retention. This factor involves an understanding of the difference between explicit and implicit knowledge and an understanding of how to deal with these two forms of knowledge.

Regarding Research proposition 5, it can be concluded that HR managers in German local authorities make use of three processes to use and preserve employee knowledge. The following proposition asks whether these processes are significantly related to the effects of demographic change.
5.4.6 Research propositions 6 – The implementation of workforce planning processes to facilitate the management of knowledge depends on how well HR managers know the topic, the location and size of the local authority

In summary, this research proposition aims to test whether the empirical investigation reveals relationships between the awareness of knowledge transfer measures and the various independent variables. The aim of the regression analysis is to test which variables determine whether the following are present in the local authorities:

1. Understanding of knowledge requirements and gaps.
2. Importance placed on training with regard to knowledge.
3. Understanding of importance of tacit knowledge.

5.4.6.1 Considering the results from the factor and cluster analyses

This regression analysis is based on the results of the factor analysis of question 37 and of the cluster analyses of questions 3, 5, 7 and 19. As described in 5.3.1, all variables load positively onto the factors. For the following regression this means:

Q37_1: a higher value implies a higher understanding of knowledge.
Q37_2: a higher value implies a higher likelihood of dealing with knowledge gaps.
Q37_3: a higher value implies a higher support for knowledge transfer.

The regression with the factors from question 37 as named above aims to determine whether the extracted clusters are significantly related, as well as testing whether variables linked to authority and/or size:

Q3
Above average negative effect on workforce potential _2
Below average negative effect on workforce potential _1
Q5
More negative effects of demographic change on recruitment_1
Below average negative effects of demographic change on recruitment_2

Q7
Frequent use of new perspectives in HR management_1
Limited use of new perspectives in HR management_2

Q19
High importance accorded to the strategic use and assessment of training measures_1
Low importance accorded to the strategic use and assessment of training measures_2

Along with statistical significance, the possibility of multicollinearity was also taken into account. In the following linear regression analyses the Variation Inflation Factor (VIF) was used to test whether explanatory variables were strongly correlated with one another. These factors were almost all very close to 1 and therefore, according to Urban and Mayerl (2006), indicate almost complete independence. Only in the case of VIF values above 5 is it necessary to consider the problem of multicollinearity.

5.4.6.2 Results for factor 1 – understanding of knowledge

The results of the first linear regression concerning understanding of knowledge (Q37_1) show the following significant relationships (see Table 36):
These results therefore support the following relationships:

Q3: The lower the negative effect of demographics on workforce potential the higher the understanding of knowledge.

Q5: The greater the negative effect on recruitment in HR the lower the understanding of knowledge.

Q7: The more frequent the use of new perspectives in HRM the higher the understanding of knowledge.

Q19: The greater the strategic use and assessment of training measures the higher the understanding of knowledge.

5.4.6.3 Results for factor 2 – further training measures against knowledge gaps

The results of the linear regression with the factor concerning further training measures against knowledge gaps (Q37_2) are provided in Table 37.
Training measures against knowledge gaps Q37 Factor 2  

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
<th>Significance</th>
<th>Coefficient</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3</td>
<td>Negative effect on workforce potential</td>
<td>0.101</td>
<td>-0.44</td>
<td>1.183</td>
</tr>
<tr>
<td>Q5</td>
<td>Negative effect on recruitment</td>
<td>0.491</td>
<td>0.188</td>
<td>1.143</td>
</tr>
<tr>
<td>Q19</td>
<td>Strategic use and assessment of training measures</td>
<td>0.043</td>
<td>-0.586</td>
<td>1.287</td>
</tr>
<tr>
<td></td>
<td>East/West</td>
<td>0.759</td>
<td>-0.114</td>
<td>1.089</td>
</tr>
<tr>
<td></td>
<td>Number of employees</td>
<td>0.942</td>
<td>0.014</td>
<td>2.908</td>
</tr>
<tr>
<td></td>
<td>Number of inhabitants</td>
<td>0.863</td>
<td>-0.028</td>
<td>3.029</td>
</tr>
<tr>
<td>R²</td>
<td></td>
<td>0.083</td>
<td></td>
<td></td>
</tr>
<tr>
<td>adjusted R²</td>
<td></td>
<td>-0.001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 37: Linear regression factor Q37_2

These results therefore show the following relationships:

Q19: the greater the strategic use and assessment of training measures the higher the likelihood of dealing with knowledge gaps through training.

5.4.6.4 Results for factor 3 – support for knowledge transfer

The following linear regression concerns the independent variable support for knowledge transfer (Q37_3). The following significant relationships were found (see Table 38).

Support for knowledge transfer regarding tacit knowledge Q37 Factor 3  

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
<th>Significance</th>
<th>Coefficient</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3</td>
<td>Negative effect on workforce potential</td>
<td>0.111</td>
<td>-0.408</td>
<td>1.213</td>
</tr>
<tr>
<td>Q5</td>
<td>Negative effect on recruitment</td>
<td>0.105</td>
<td>0.444</td>
<td>1.280</td>
</tr>
<tr>
<td>Q7</td>
<td>Use of new perspectives in HRM</td>
<td>0.041</td>
<td>-0.561</td>
<td>1.417</td>
</tr>
<tr>
<td>Q19</td>
<td>Strategic use and assessment of training measures</td>
<td>0.016</td>
<td>-0.697</td>
<td>1.351</td>
</tr>
<tr>
<td></td>
<td>East/West</td>
<td>0.277</td>
<td>0.397</td>
<td>1.166</td>
</tr>
<tr>
<td></td>
<td>Number of employees</td>
<td>0.172</td>
<td>-0.254</td>
<td>2.967</td>
</tr>
<tr>
<td></td>
<td>Number of inhabitants</td>
<td>0.174</td>
<td>0.213</td>
<td>3.089</td>
</tr>
<tr>
<td>R²</td>
<td></td>
<td>0.243</td>
<td></td>
<td></td>
</tr>
<tr>
<td>adjusted R²</td>
<td></td>
<td>0.153</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 38: Linear regression factor Q37_3

These results therefore show the following relationships:

Q7: The more frequent the use of new perspectives in HRM the higher the support for tacit knowledge transfer.
Q19: The greater the strategic use and assessment of training measures the higher the support for tacit knowledge transfer.

5.4.6.5 Summary of the findings for Research proposition 6

The results described above for research proposition 6 show that there is no significant association between the size and location of a local authority on the one hand, and its approach to knowledge preservation on the other. It is, however, very clear that local authorities that strategically use and assess further training measures also show a greater understanding of knowledge and approaches to managing it. These local authorities support knowledge transfer and take measures to remedy knowledge gaps. The importance of supporting knowledge transfer and an understanding of knowledge in general are also recognised most clearly in those local authorities that already make use of new HRM tools, such as age structure analysis or managing knowledge. The effects of demographic change on workforce potential and recruitment have a positive influence on the approach to knowledge.

However, Research proposition 6 cannot be fully confirmed. The extent to which knowledge retention is being addressed is not dependent on the size of the local authority or the federal state in which it is located. The significant results show that the deployment of workforce planning policies to facilitate the management of knowledge probably depends on which knowledge HR managers have access to. Particularly notable is the strategic direction of further training measures, and the increased use of HRM tools. If HR managers are familiar with these tools and measures then they tend also to have a good understanding of managing knowledge.

5.5 Summary Results of the Empirical Investigation

A total of 51% of local authorities will have to deal with a decline in workforce potential due to demographic change within 5 to 10 years. At
the time of the survey the ageing workforce, decline in applicants and waves of retirement are seen in particular as concrete consequences. Almost all respondents (94%) report already having to deal with demographic change. This confirms the urgent relevance of the present study.

The results of the study also show that there is no difference in approach to demographic change across federal states. The size of the local authority, however, does play a role; it is clear that the larger local authorities are better able to take on these challenges and implement new HRM tools. The results also permit the conclusion that German local authorities need to take approaches to the consequences of demographic change for HRM, such as knowledge security, more seriously. The important conclusions with respect to the stated research propositions are as follows:

**As employers, local authorities see themselves as being in greater competition with the private sector. Direct significant relationships to the effects of demographic change are, however, not yet apparent:** The results of the study show that the decline in applicants/suitable applicants and the size of the local authority show significant correlations, albeit only regarding the extent to which local authorities compare themselves to private sector employers. This is not yet a clear indication that these relationships are perceived as being brought about by demographic change; rather they may, for example, be the result of attractiveness as an employer.

**There is so far only isolated deployment of strategic instruments for employee development:** Local authorities that have an age structure analysis are more likely to used it as a basis for employee development. These local authorities know exactly when their employees will reach retirement and which positions need to be filled. As a result, they can put in place, in advance, effective measures for replacement. Age structure analyses were, however, in place only in 55% of participating local authorities at the time of the survey. In
In addition, it can be concluded that the effects of demographic change have a positive influence on the use of tools for employee development. Strategic instruments for HR development, such as age structure analysis, skill development and possibilities for knowledge transfer between older and younger employees are of particular importance. These tools are, however, not related to all possible effects of demographic change, rather mainly to the ageing workforce and the decline in applicants.

**Conservative training measures predominate:** It has been established that demographic change does not yet significantly influence the strategic direction of further training. Only one variable (decline in applicants) shows significant relationships. Although the use of traditional training methods is increasing in local authorities, there are no significant associations between demographic change and training evaluation. Quality and results objectives adapted to the knowledge needs of the specific local authority have not been set. Only five local authorities use a system to manage knowledge.

**Procedures for knowledge use and knowledge retention are becoming increasingly important, but are still almost unknown in local authorities:** Local authorities are already aware of the importance of managing knowledge, but the specific processes involved in this management, such as dealing with knowledge gaps and knowledge transfer, do not yet show any significant correlation with the negative effects on workforce potential.

Diagram 12 provides a graphical representation of the most important research results. This diagram is based on the two most important and fundamental facts and shows which courses of action regarding each RP can be derived from the results of the research in order to achieve the goals.
The following chapter sets out the results of the study analysed here in the context of the existing literature on the subject. The aim is to determine to what extent the conclusions reached on the basis of the primary research agree or disagree with those of the existing research, and to discuss possible differences, through which to establish contributions to knowledge. In doing so, concrete recommendations for action can also be presented, representing contributions to practice. Finally, the processes by which the data were generated will also be examined with regard to a contribution to methodology.
Chapter 6 - Discussion: Comparison of Survey Results with
Existing Literature and Identification of Contribution

Section 4 described the aims and methods of the primary research, and the rationale for the research propositions. Section 4.2 gives an explanation of the aims of the research propositions and which new theories the survey aimed to test.

Section 5 presented the results of the survey. Section 5.2 dealt with descriptive statistics, and Section 5.3 reported the results of the bivariate and multivariate analyses, as well as factor and cluster analyses. In the following sections the research propositions stated earlier are evaluated in light of the survey results and compared with relevant literature, identifying research contributions.

The literature review and Figure 13 clearly show that demographic change in local authorities is a relevant issue for the future strategic positioning of HRM. The effects of demographic change are especially severe in Germany, as Germany has by world standards the oldest population (Konzelmann, Bergmann and Rattinger, 2014). As the largest employer in Germany, the civil service cannot escape these changes. The German ‘Statistische Bundesamt’ (Office for Statistics) published on 18 November 2009 its 12th coordinated population projections through to 2060. On 23 June 2014, the Office also produced an overview of the development of employee demographics over the ten-year period from 2003 to 2013. As in the present study, a clear decline in labour force potential is discernible. In November 2014 Prognos AG concluded in an article that “we only have the power to shape the workforce of the future” and “only adjustments to demographic change are possible in the short term” (Knittel, 2014, p. 20-21). The current ageing of the workforce is a long-term foreseeable development, the effects of which cannot be negated by an increase in fertility, which has been estimated in Germany in 2014 as 1.47 children – the highest since reunification (Destatis, 2015). HR managers must
therefore make use of new tools for HR development in order to avoid being faced with a massive staffing problem.

![Population in age cohorts](image)

The following discussion aims to compare the results of the present study with the existing literature and to make a new contribution to theory in the field. It also contributes practical policy recommendations. In addition, the study procedure makes a contribution to methodology.

### 6.1 Research proposition 1: Demographic change is hindering the acquisition of new junior employees

Based on the findings from the literature analysis, it is reasonable to infer that demographic change is actually having an impact via increased competition with the private sector for labour, and an ageing workforce. The results of this chapter bring German results up to date and contribute the understanding that whilst local authorities are aware of demographic change they currently still do not perceive the effects of this. This can be measured as correlations, with the ageing workforce,
the decline in applicants and the inability to safeguard knowledge correlating with the state of competition with the private sector. This state of competition and the significant association between the decline in applicants – and particularly in suitable applicants – is, however, not perceived by the respondents to be caused by demographic change. Rather, the cluster analysis shows no significant associations between the perceived negative effects of demographic change and negative trends in recruitment. The result of this research proposition also deepens the analysis and contributes that local authorities’ attention is focused on competition for labour with the private sector.

The following sections provide a detailed account of the results and draw out suggestions and contributions, both theoretical and practical.

6.1.1 Research results for proposition 1: Demographic change is hindering the acquisition of new junior employees

Research proposition 1 is based on the observation that demographic change is characterised by a shrinking of the workforce as a result of declining fertility rates: where fewer children are born and more and more people enter retirement there are fewer recruits available for employers. The survey results show that demographic developments have an effect on workforce potential and that in 2020 workforce potential in local authorities will be noticeably reduced (see Table 14).

Competition with the private sector for new employees and low attractiveness as an employer relative to the private sector are two effects of demographic change that survey respondents rate as decisive. In view of the significant results regarding competition with the private sector it should be noted that there are indeed significant correlations between these two effects and the ageing workforce. Local authorities see the decline in applicants in particular as an effect of private sector competition and the oft-cited 'war for talent'. There is, however, no significant association between local authorities reporting
above average effects of demographic change and negative effects on recruitment.

The survey results show that a clear state of competition exists between local authorities and the private sector. However, no direct effects were found such that demographic change actually impedes trainee recruitment. The retirement wave, for example, shows no significant correlations at all.

A positive point that should be highlighted regarding recruitment competition is the fact that the retention of trainees into full employment is almost always successful, with mean agreement at 3.49 (from a maximum of 4). On a critical note, it should be added that there is a significant association between number of employees and monitoring the external labour market. It seems that only the larger local authorities have the time and resources to monitor the regional labour market and record, for example, numbers of students at schools.

6.1.2 Discussion and identification of contributions to knowledge for research proposition 1: Demographic change is hindering the acquisition of new junior employees

Existing publications by Kühnert (2009), Bossaert, Demmke and Moilanen (2012), Sotirakou and Zeppou (2004), Sands (2012), Wolf and Amirkhanyan (2010), Moseley et al. (2008), and Goodman, French and Battaglio (2015) have already concluded that the public sector in EU member states will feel the effects of an ageing workforce sooner than the private sector. The reason given is that the public sector employs more people from the baby-boomer generation, who will reach retirement age in the next 10 years. The two latter authors are particularly important, as they have emphasised that demographic changes will take on increasing importance in both the UK and the USA. In addition, based on the comparison of figures made in Section 2.1, it can be concluded that Germany in particular will have to meet
new strategic challenges that are closely linked to employer responsibilities (Stock-Homburg, 2009).

On the issue of trainee recruitment, the present research contributes the new finding that German local authorities are particularly conscious of competition with the private sector. These local authorities can no longer rely on their own job pool for recruitment, and must therefore compete with the private sector for labour. German local authorities are faced with the need for a rethink on their management of HR. The research also extends the German case and contributes that local authorities consider themselves at a disadvantage in terms of their attractiveness as employers. However, the results also show that there is, as yet, only an indirect link between demographic change and trainee recruitment in German local authorities. The current general awareness of demographic change is not yet specifically focused on the effects of the anticipated waves of retirement from 2020 (see Table 14, showing that 51% of survey respondents expect a decline in workforce potential in 6–10 years). In order to help local authorities prepare for this phenomenon, the next section provides practical examples and details the possible courses of action.

6.1.3 Contribution to practice for research proposition 1: Demographic change is hindering the acquisition of new junior employees

According to Kersten, Neu and Vogel (2014), no other employer in Germany has such a complex and varied portfolio of job types as public administration. The Robert Bosch Foundation (2009) and Behrens and Zempel (2012) have already concluded that public administrations need to develop unique selling points and particular attractions as employers in order to compete with the private sector. Recommendations can be found in Section 6.7.2. The present research contributes to a specific understanding of the situation in Germany by demonstrating that larger local authorities have the potential to monitor the labour market and to adjust to competition with the private sector. In practical terms, this
means that the overall structure of the system of local authorities should be examined and revised.

6.1.4 Summary for research proposition 1: Demographic change is hindering the acquisition of new junior employees

The results for Research Proposition 1, that demographic change is hindering the acquisition of new junior employees contributes to knowledge by adding to the existing general body of literature, in the specific German public sector context, that demographic change-driven increased private sector competition is hindering the acquisition of new employees in the public sector, and that the public sector feels disadvantaged in this competition. The results also imply, however, that the link between demographic change and increased competition for labour is perceived only indirectly. This is important because the German demographic situation is in many ways more acute than for other countries, and the lack of explicit recognition of the demographic drivers of increased competition for labour may imply a lack of long term strategic planning to overcome this problem in German local authorities.

6.2 Research proposition 2: If an age structure analysis is in place in local authorities then it serves as a foundation for HR development

The results of the present research deepen previous analysis and contribute that an age structure analysis is positively associated with the use of an HRM system. The correlation analysis also shows, however, that both of these factors are correlated with the size of the local authority. So far, there is no statistically significant tendency to use an HR development system as a direct response to demographic change, rather its use depends on the capacity of the local authority (i.e. its size). Given that demographic change is clearly occurring, and age structure analysis is a strategy that is relevant (Morschhäuser and Matthäi, 2011), these results suggest that it would be advantageous for all authorities to use age structure analysis (its current use being only 55%). This should be put into practice while also taking into account the
state of competition with the private sector for skilled labour as mentioned above. Only once basic data are compiled on the available human resources can recruitment initiatives and strategic tools and policies regarding workforce planning be implemented.

6.2.1 Research results for proposition 2: If an age structure analysis is in place in local authorities then it serves as a foundation for HR development

The results of the survey regarding average age in the years 2008 (=44 years), 2013 (=47 years) and 2018 (=48 years) show that an increase of 4 years is expected. Of 156 respondents, however, 54 did not answer or only partially answered this question. Answers for the year 2018 are especially few. Answers to the question about new fields of HRM suggest that age structure analysis and skill development are among the most important aspects of HRM. This stands in contrast to the responses to the question about whether an age structure analysis is actually in place to assist HR development. Only 55.1% responded yes. In smaller local authorities with up to 300 employees this level of use is currently only at 28%.

6.2.2 Discussion and identification of contributions to knowledge for research proposition 2: If an age structure analysis is in place in local authorities then it serves as a foundation for HR development

The most important findings from the academic literature are summarised here. From these results, it is then determined how the use of an age structure analysis should be assessed.

As concluded in the literature analysis, age structure analysis serves as a systematic approach to identifying current and future age structures, which are shaped by the effects of demographic change (Kreutle, 2010; Kiessler and Wiechmann, 2009; Sotirakou, 2004; Pynoos, 2004). In the USA and in the UK, emphasis is placed on workforce planning as an
HR management process (Goodman, French and Battaglio, 2015, Sullivan, 2002, Baron et al., 2010). The age structure analysis provides an empirical basis for this process, one that highlights gaps between current staffing and future staffing needs. This helps in developing further measures to address the consequences of demographic change.

Hence, in relation to the existing literature every administration, independent of their size, should have an age structure analysis in order to obtain reliable data on HR development (Behrens and Zempel, 2012). These research results bring German results up to date and contribute the conclusion that local authorities that have an age structure analysis use it to create an HR development system. However, the results also show that strategic use is not widespread. Due to the lack of clear targets, HR managers often cannot develop strategic initiatives. This strategic aspect should be taken into consideration when introducing an age structure analysis.

6.2.3 Contribution to practice for research proposition 2: If an age structure analysis is in place in local authorities then it serves as a foundation for HR development

Harz University published in December 2013 a study of management of knowledge in public administration (Hochschule Harz, 2013). In relation to these studies there are some parallels with the current findings. Use of an age structure analysis was unfortunately not considered. The results of the present research therefore make a contribution to practical policy regarding the use of age structure analysis in German local authorities.

The results of the research contribute that the presence of an age structure analysis is associated with higher implementation of HRM policies. The Federal Interior Ministry (‘Bundesministerium des Innern’) issued a recommendation in 2012 to use an age structure analysis.
Local authorities that have not done so already should follow this advice and implement an analysis as soon as possible.

In light of the finding that smaller local authorities currently only rarely use an age structure analysis, the present study is able to offer an up-to-date conclusion that for smaller local authorities setting up a forum for exchange of experience may be useful. This provides a contribution to practice that supports the earlier work of Kißler and Wiechmann (2009), as a first step towards making use of the knowledge and synergy effects from bringing multiple authorities together. Section 6.7.2 gives further recommendations on this topic.

6.2.4 Summary for research proposition 2: If an age structure analysis is in place in local authorities then it serves as a foundation for HR development

The results for Research Proposition 2, that age structure analysis is used as a basis for HR development contributes to knowledge by adding to the existing general body of literature, that local authorities without an age structure analysis maybe lacking long-term and strategically-important decisions in a specific German local authority context. Given that demographic change is leading local authorities to compete with the private sector and given that HR managers are aware of this situation, it is especially important to have a quantitative description of staff demographic development, in order to inform public sector HRM policy.

6.3 Research proposition 3: The effects of demographic change are positively associated with the deployment of instruments for HR development

As a brief summary of the results regarding this research proposition, it can be concluded that HR development tools are significantly positively associated with the decline in applicants, such that where there are fewer applicants more HR development tools are deployed. The same correlation was found as before with the size of the local authority: the
larger the local authority the more HR development tools it deploys. These tools in particular focus on the strategic use and monitoring of training measures that aim to develop and consolidate employees' key skills. Again, the research results contribute to the German case: the size of the local authority and the decline in applicants have an influence on new strategic directions for HR managers, and there is no significant perceived direct link to demographic change. This makes sense, since without access to the data described above for all local authorities it cannot be established which human resources require development and therefore which tools need to be deployed in order to meet the challenges of demographic change.

6.3.1 Research results for proposition 3: The effects of demographic change are positively associated with the deployment of instruments for HR development

This research proposition is derived from the notion that demographic change and its effects in the form of an ageing workforce, fewer applicants for free positions, unsuitable applicants for free positions, decrease in workforce productivity, waves of retirement, and inability to safeguard current knowledge influence HR development strategies. In particular, it aims to test whether statistically significant associations can be shown.

HR development strategies as a dependent variable take the specific form of:

- new responsibilities and fields of operation for HRM
- the presence of an HR development system
- the transfer of experiential knowledge/support for knowledge transfer
- the use of a system to manage knowledge.

In the correlation and regression analyses it was concluded that significant associations exist between an ageing workforce and an age
structure analysis, as well as between a decline in applicants on the one hand and a demography-oriented management culture and development of employee skills on the other. In addition, a decline in applicants has a significant influence on HR analysis and the number of special fields of action of HRM.

Along with a decline in applicants, the number of employees plays an important role in the regression analysis: the higher this number the more HR development tools are used (see Section 5.4.3).

The cluster analysis for this question gave the positive result that local authorities experiencing above average negative effects of demographic change on workforce potential also report an above average importance placed on the strategic use and analysis of further training measures. In this way, the use of HR development systems is positively influenced; however, where no knowledge profile is present, knowledge cannot be secured.

The results of the present research therefore clearly show that the decline in applicants – which may be taken to be an indirect effect of demographic change – and the size of the local authority are significantly related to the use of HR development tools.

6.3.2 Discussion and identification of contributions to knowledge for research proposition 3: The effects of demographic change are positively associated with the deployment of instruments for HR development

Existing studies (Sotirakou and Zeppou, 2004; Jorgensen, 2004; Pinnow, 2005) have concluded that administrative structures in local authorities are resistant to change, and that short-term expedients in HRM do not contribute to a demography-conscious HRM.

Consequently, Beattie and Waterhouse (2007) identify a pressure on the part of administrations to move away from the bureaucratic system
to the NPM approach. Administrations can only overcome this pressure if they apply modern and flexible tools in dealing with employees. In preparing a new approach, German local authorities can make use of two central concepts from the American tradition (Michigan/Harvard-model), both of which aim to orient strategy towards company goals (see chapter 3.2., Felger and Paul-Kohlhoff, 2014). After selecting a particular framework, the special conditions in German local authorities should be taken into account. The American study by Brewster (2007) contributes the differences in HR management approaches between the USA and Europe. This is important for German local authorities, as they need to take special cultural differences into account. The German authors Köttet et al. (2001), Stock-Homburg (2008) and Kißler et al. (2009) also call for a new direction for HR management in Germany, one that could be based on the path dependence models. It is important also that this new direction take into account the assertion by Truss et al. (1997) and Gill and Meyer (2011) that either the Michigan or the Harvard model should be used as path dependence model.

The present research investigated this strategical aspect under consideration of workforce planning processes empirically and contributes an updated German-specific conclusion: that the decline in applicants, the ageing workforce and the size of the local authority are all significantly correlated with the use of HR development tools. This contribution is confirmed by the fact that the negative effects of demographic change on workforce potential are below average in local authorities that already recognise the importance of strategic deployment and assessment of training programmes. The present research was able to explore this problem in more depth and, as such, contributes new directions beyond a general formulation and statement of the existing challenge. The key contribution of the results is to show which dependent variables (decline in applicants and size of local authority) are currently associated with the use of new tools and policies. Based on these findings, German local authorities can better plan their implementation of demography-oriented policies.
6.3.3 Contribution to practice for research proposition 3: The effects of demographic change are positively associated with the deployment of instruments for HR development

Although the results of the present study broadly confirm those of Freiling and Geldermann (2011), Hochschule Harz (2013) and the Robert Bosch Foundation (2009, p. 13), it should also be noted that the present research brings German results up to date and shows that practices in local authorities have still not changed. Performance-based, long-term HRM policies that take demographic change into account have still not been implemented.

Based on the finding that the practical implementation of new HRM tools has not yet been updated or adapted to new conditions in all local authorities (especially in the smaller ones), various courses of action can be recommended. These are outlined in more detail in Section 6.7.2.

6.3.4 Summary for research proposition 3: The effects of demographic change are positively associated with the deployment of instruments for HR development

The results for Research Proposition 3, that the effects of demographic change are positively associated with the deployment of instruments for HR development contributes to knowledge by adding to the existing general body of literature but in the specific German local context, that only through a strategic reorientation will it be possible for the German local authorities to meet the new challenges and to overcome the resistance to change. The research results suggest that larger local authorities are in a better position to implement this strategic reorientation in the use of HR management tools. This is also an important result, since it may justify restructuring or collaboration among local authorities in order to ensure that they can implement suitable HR management policies in future.
6.4 Research proposition 4: There will be an influence from the demographic change to the strategic direction of training activities

These initial conclusions deliver a basic starting point: local authorities’ HRM initiatives currently lack strategic direction. A strategy is also needed for a targeted implementation of further training measures. Again, the survey results show that the decline in applicants and the size of the local authority are significantly correlated with all four key skills (specialist, methodological, social and leadership skills), as well as with the presence of a further training concept. In view of the state of competition, this reflects a rational response on the part of HR managers, as existing staff must be trained to deal with daily working challenges at short notice and at all levels. Based on the correlations mentioned in section 5.4.4, the results of the study support the conclusion that demographic change does not yet have an influence on strategic further training plans in German local authorities. Rather, it is a reaction to the decline in applicants brought about by competition with the private sector. The significant correlations with the decline in applicants are so far indicative only of an indirect link to demographic change.

6.4.1 Research results for research proposition 4: There will be an influence from the demographic change to the strategic direction of training activities

As discussed in the introduction to this chapter, decline in applicants and number of employees again show statistically significant associations with the analysis of the four key skills (specialist, methodological, social and leadership) as well as with the presence of a further training policy. From the study results it can be concluded that local authorities are attempting to prepare for the decline in applicants, securing knowledge through strategic planning, particularly the use of a further training policy based on the four key skills.
The literature generally concludes that management of human resources should be directed strategically towards the overall management strategy (Jorgensen, 2004; French and Goodman, 2011; Ringlstetter and Kaiser, 2008). HR management should incorporate a workforce planning process that shows what challenges (both qualitative and quantitative) human resources will need to meet in the future (Sullivan, 2002; Baron et al., 2010;). The American study by Goodman, French and Battaglio (2015) contributes an important empirical basis for German local authorities. These authors also see the workforce planning process as a guiding principle in strategic direction. This study supports the conclusion that cultural differences do not amount to completely contradictory results. Beer, Boselie and Brewster (2015) take this issue a step further and show in their US/UK study that the pioneering Harvard model for strategic direction needs further development. The cultural difference from Germany is clear, as German local authorities have not yet even discussed the Harvard or Michigan models, and have hardly mentioned them in the research literature. German local authorities are still at the very beginning of their strategic deliberations for HR management. The current study therefore represents an important new contribution to this early stage in the discussion about strategy. Sections 3.2, 3.3 and 3.4.1 offer conclusions on the two most important models of HR management (the Harvard and Michigan models) as well as on the workforce planning process. These are all important to the question of strategic direction. As well as the research results on age structure analysis reported in section 6.2.2, the workforce planning process also involves training programmes and processes for securing knowledge.

The aim of the present research, however, was to contribute concrete empirical conclusions on the extent to which demographic change in
Germany is influencing the strategic deployment of training programmes. The results show that strategic direction for ongoing training measures is currently only influenced by the decline in applicants and size of the local authority, and that they also only affect certain training measures. The study found a significant correlation with the use of a further training concept, but no correlation with training assessments. However, training assessments are also vitally important for strategic direction, as a monitoring mechanism is needed in order to assess the effectiveness of training programmes and link them to current management goals (North, 1999).

A lack of strategic direction can lead to knowledge gaps, and a “forward-thinking qualifications policy” is necessary (Luthe, 2009, p. 123). From a comparison of theory and practice it can be concluded that North’s (1999) knowledge retention targets cannot be reached. Knowledge targets are not known because there is a lack of reliable strategy statements by leadership. The results of the present research contribute an updated approach to strategic training programmes for local authorities in Germany, demonstrating that despite the challenges of demographic change there is still no targeted deployment, or assessment of impact or effectiveness, of ongoing training programmes. This contribution goes beyond that of previous studies, since previous studies (e.g. Freiling and Geldermann, 2011; Hochschule Harz, 2013) have only considered demographic change and its effects in general terms; the present study investigated specific relationships among these affects and training measures.

6.4.3 Contribution to practice for research proposition 4: There will be an influence from the demographic change to the strategic direction of training activities

In order to close knowledge gaps, local authorities have to expend more time, as well as human and financial resources. In order to avoid this it is important to generate strategic knowledge with a clear objective provided by the administration’s leadership and in agreement with sub-
departments, as recommended by the Robert Bosch Foundation (2009) and MacDougall et al. (1998). Although the aforementioned authors already identified a need for strategy coordination some years ago, the present research contributes an updated perspective for German local authorities in demonstrating that this coordination is still lacking. The research makes the new contribution that managers in local authorities need to be made aware of the strategic value of setting training goals. Gill and Meyer’s (2011) conclusion is important here. These authors conclude that HR management should be seen as a strategic business partner, and that when a company implements the soft approach both in theory and in practice, the result is positive outcomes.

On the basis of the significant survey results, especially the correlations between the number of employees and the presence of a further training concept, and the number of employees and the analysis of leadership and social skills, it is a result of the present research that the larger local authorities are in a position to lead a cultural change to a “demography-aware HR management” (Germany. Bundesministerium des Innern, 2012, p. 4).

Section 6.7.2 gives recommendations as to how local authorities can improve their ability to act strategically, for example by forming larger local authority groups.

6.4.4 Summary for research proposition 4: There will be an influence from the demographic change to the strategic direction of training activities

The results for Research Proposition 4, that the demographic change influence the strategic direction of training activities contributes to knowledge by adding to the existing literature that a comprehensive management strategy, including clear indications of workforce planning processes to facilitate the management of knowledge and knowledge goals, should be defined again in the specific German local authority context. Only on the basis of such a strategy will HR managers be in a
position to implement ongoing training measures in the form of training assessments or lifelong learning. The results also imply that a cultural change in local authorities maybe is necessary. On this issue, Beattie and Waterhouse (2007) recommend that local authorities should see themselves as change institutions, taking into account new and different values, cultures and methods. For the particular situation in Germany, the results also suggest that cultural change should also be accompanied by a consideration of mergers or collaborations among local authorities. Since the strategic direction of a local authority seem to depend, at least to so some extend on its size. A lack of awareness of strategic direction in training programmes can in turn lead to the loss of implicit knowledge. Without a strategic, future-oriented direction it will be difficult to identify potential knowledge gaps and implement knowledge preservation measures.

6.5 Research proposition 5: There will be a number of separate processes that local German authorities will engage in with regard to knowledge sharing and preservation within the organisation

Although the previous proposition concluded that a strategic direction is lacking in the implementation of training programmes, this research proposition shows that there are currently three processes in German local authorities for addressing the issues of knowledge use and knowledge retention. Factor 1, 'understanding of approaches to knowledge' explains the most variance, at 40%. The factor 'support for knowledge transfer' explains the least variance, with 12%. Based on these findings, the understanding of knowledge in local authorities should be extended and HR managers should learn about knowledge, its many forms (for example, the difference between tacit and codified knowledge) and its importance for maintaining a service-oriented approach to fulfilling the local authority's responsibilities. It is recommended that the approach to knowledge gaps and knowledge transfer as a strategic process be implemented as soon as possible in HR departments in local authorities. It should be recognised that further
training programmes for older employees are an investment for the future, because they enable the transmission of implicit knowledge. This conclusion can be taken as the starting point for further studies investigating the effectiveness of different forms of training in transmitting implicit knowledge.

6.5.1 Research results for proposition 5: There will be a number of separate processes that local German authorities will engage in with regard to knowledge sharing and preservation within the organisation

The factor analysis shows that at the time of the survey there were three processes in local authorities for dealing with knowledge use and knowledge retention: understanding of approaches to knowledge, filling knowledge gaps through training, and support for knowledge transfer.

6.5.2 Discussion and identification of contributions to knowledge for research proposition 5: There will be a number of separate processes that local German authorities will engage in with regard to knowledge sharing and preservation within the organisation

Seba and Rowley (2010), and Bossaert, Demmke and Moilanen (2012) concluded from their analyses that administrative culture needs to change so as to support the implementation of sustainable management of knowledge and learning in the workplace. Knowledge sharing should be taught by example so that it becomes commonplace. The results of the present factor analysis show that there are three processes for knowledge retention and knowledge use in German local authorities: understanding of approaches to knowledge, filling knowledge gaps through training, and support for knowledge transfer. Since the first of these three processes explains the most variance it can be concluded that, in Germany, the importance of knowledge in demographic change is the most understood of the three processes. It can also be concluded that the explanatory power of the two other
processes needs to be increased in the future in order to introduce workforce planning systems to facilitate the management of knowledge. HR managers' understanding of knowledge gaps and support for knowledge transfer should be improved.

6.5.3 Contribution to practice for research proposition 5: There will be a number of separate processes that local German authorities will engage in with regard to knowledge sharing and preservation within the organisation

The new contribution made here – that German local authorities use three processes for knowledge retention and knowledge use – supports the conclusion that the focus is currently still on a general understanding of approaches to knowledge. On the basis of these results, the following policy changes are recommended.

HR managers need to acquire a more detailed understanding of knowledge preservation processes. HR managers should therefore first address the five basic questions for knowledge-oriented business management posed by North (1999), in order to then implement the basic plan recommended by Probst, Raub and Romhardt (2010).

Gaps in HR managers' awareness could be filled with external support, as universities and other educational institutions have recognised the key role of managing knowledge as a process of workforce planning. Section 6.7.2 gives further recommendations.

6.5.4 Summary for research proposition 5: There will be a number of separate processes that local German authorities will engage in with regard to knowledge sharing and preservation within the organisation

Although there are three processes identified for addressing knowledge retention and knowledge use in German local authorities, a general understanding of approaches to knowledge is statistically the most
prominent. The research results contributes to knowledge by adding to the general existing body of literature that in the German context no overall strategic implementation processes for managing knowledge can yet be derived. Comprehensive plans for an approach to knowledge must be developed. These plans, however, require that the administration leadership and HR managers in local authorities bring about a cultural and conceptual change that shows all parties how important managing knowledge is. Any barriers should be broken down by open communication, trust and valuing each individual employee's work. Employees must be made more aware of the importance of knowledge retention so that they develop an intrinsic motivation. Once HR managers and administration leadership have achieved this and have defined strategic goals, the effects of demographic change on knowledge loss can be actively mitigated. There is also a need for an intensification of existing training programmes and support for these as an opportunity for knowledge exchange among younger and older employees.

6.6 Research proposition 6: The implementation of workforce planning processes to facilitate the management of knowledge depends on how well HR managers know the topic. The location and size of the local authority also have influence on the deployment of adequate measures.

The final research proposition is a summary of the five preceding ones. The regression analysis makes clear again how important an integrated understanding of knowledge is. The German labour market is shrinking, and the preceding conclusions have identified the state of competition and shown some of the possibilities for analysis (for example, age structure analysis with development of a knowledge map). The research findings make a contribution to current knowledge by highlighting that, for German local authorities, where strategic training initiatives have identified knowledge gaps and where knowledge transfer is better supported, there are more new HR tools in use. Therefore, a key conclusion is that a reorientation of HRM measures towards the effects
of demographic change can only succeed if carried out in a strategic manner like a workforce planning process. Ideas for new strategic directions can form the basis for further research.

6.6.1 Research results for research proposition 6: The implementation of workforce planning processes to facilitate the management of knowledge depends on how well HR managers know the topic. The location and size of the local authority also have influence on the deployment of adequate measures.

In light of the preceding conclusions, and given that a strategic direction from administration leadership is decisive for the implementation of demography-oriented HRM measures, the following significant conclusion can be drawn with respect to the last research proposition:

*The higher the value placed on strategic use and evaluation of further training measures, the greater the understanding of knowledge, the probability that knowledge gaps are met with further training, and the support for knowledge transfer.*

In addition, the following significant results were obtained:

*The more frequent the use of new perspectives in HRM the higher the understanding of knowledge and the higher the support for tacit knowledge transfer.*

*The lower the negative effect of demographics on workforce potential the higher the understanding of knowledge.*

*The greater the negative effect on recruitment in HR the lower the understanding of knowledge.*
6.6.2 Discussion and identification of contributions to knowledge for research proposition 6: The implementation of workforce planning processes to facilitate the management of knowledge depends on how well HR managers know the topic. The location and size of the local authority also have influence on the deployment of adequate measures.

In the existing literature there are not yet any comparable publications that have investigated in detail the relationships between knowledge retention and demographic changes in workforce potential and recruitment in German local authorities. Although Stock-Homburg (2008), Preißing (2010), Kirschten (2010a), and Bossaert, Demmke and Moilanen (2012) concluded that transgenerational knowledge transfer and exchange of experience is necessary, regardless of the size of a local authority (Salleh et al., 2013), the present research brings German results up to date and contributes the understanding that in German local authorities there are significant associations between the size of a local authority and its implementation of HRM measures.

Furthermore, the results clearly show that the higher the value placed on strategic use and the evaluation of further training measures, the greater the understanding of knowledge. Conversely, it can also be concluded that the negative effects of demographic change in local authorities are greater for those authorities whose leadership or HR managers show limited understanding of knowledge. The research therefore makes the contribution that it is important for local authorities to implement a strategic approach to workforce planning to facilitate the management of knowledge. This should occur regardless of the size and location of the local authority.

The present research brings the importance of a workforce planning system to facilitate the management of knowlegde again to the fore. The following section offers readers some contributions for practical implementation.
6.6.3 Contribution to practice for research proposition 6: The implementation of workforce planning processes to facilitate the management of knowledge depends on how well HR managers know the topic. The location and size of the local authority also have influence on the deployment of adequate measures.

According to the Federal Ministry for Business and Technology (Germany. Bundesministerium für Wirtschaft und Technologie, 2007), Freiling and Geldermann (2011) and Robert Bosch Foundation (2009), further training is the most frequently employed workforce planning measures to assist the management of knowledge. The results of the present research represent an update on previous studies, and contribute that, despite the intervening time, classic training measures continue to dominate as much as they did at the time of earlier surveys. In order to set new strategic directions, HR managers will need to acquire a much more detailed understanding of workforce planning processes to assist the management of knowledge, for example in order to produce a knowledge map. Recommendations on this issue can be found in Section 6.7.2. These recommendations highlight exemplary cases of German local authorities that have already actively addressed problems created by the need to manage knowledge.

Whereas previous studies by the Robert Bosch Foundation (2009), Bertelsmann Foundation (2010), KGSt (2009) and Freiling and Geldermann (2011) have concluded that the shortage of skilled labour would unfold differently in different regions of Germany, the present research makes a different contribution: the location of a local authority is not significantly linked to its approach to managing knowledge. Demographic change affects every region of Germany, and therefore HR managers in every federal state will need to acquire a sound understanding of how workforce planning measures can assist the management of knowledge preservation and methods of knowledge transfer in order to implement strategic measures.
6.6.4 Summary for research proposition 6: The implementation of workforce planning processes to facilitate the management of knowledge depends on how well HR managers know the topic. The location and size of the local authority also have influence on the deployment of adequate measures.

The results for Research Proposition 6 contributes to knowledge by adding to the existing general body of literature, in the specific German local authority context, that HR managers are aware of the strategic direction of training initiatives. But the results also imply, however, that this should not be confused with the strategic direction of workforce planning to facilitate the management of knowledge in general. Targeted further training initiatives are only a first step. New methods for HRM and recruitment measures are not yet fully recognised as factors in the approach to knowledge retention, and are not being deployed fully. This is a very important contribution because the German demographic situation requires HR managers to have a comprehensive understanding of workforce planning to facilitate the management of knowledge. The research results suggest that HR managers who have a good working and strategic understanding also tend to recognise the links between demographic change and the need for managing knowledge. The location of a local authority makes no difference in the present survey. However, local authority size as a significant factor should not be underestimated. As has also been concluded in some previous research propositions, the results of the present research suggest that HR managers in larger local authorities tend to be better able to mitigate the effects of demographic change using new strategic measures, including implementing a workforce planning system to facilitate the management of knowledge.

6.7 Summary of the Discussion

The preceding discussion clearly shows that local authorities in Germany have not yet perceived demographic change as an opportunity to give their work strategic orientation and to make efficient
use of the available (human) resources under consideration of a modern workforce planning system. The working paper by Bossaert, Demmke and Moilanen (2012) on the topic of demographic change and its effects on the workforce in European public administration concludes that a demography-oriented HRM has become much more important than it was at a time when staff structures were age-balanced. The present study instead supports the assessment that ‘... there is more than ample time for action, but the areas in which that action is crucial have been hitherto ignored’ (Gramke, 2013, p. 8).

Statistically significant relationships were established that suggest useful recommendations for best practice. The research makes the contribution that at the time the research was undertaken many things appeared to be uncoordinated and not sufficiently future-oriented with respect to demographic change. If the question is posed as to why some of the results imply such a great need for action, this seems to be due to the lack of strategic direction. The survey results show that HR managers are aware of demographic change, but that its effects manifest as ‘subtle, creeping changes’, as described by Freiling and Geldermann (2001, p. 13). German local authorities currently anticipate the effects of demographic change only in 5 to 10 years. Instead, in local authorities, daily work is given priority. As noted briefly in Section 3.4.1.1, HR managers tend to concentrate on potentially instrumentalist approaches, with an emphasis on solving problems over the short-term. These decisions may, however, lead to a path dependence. A future-oriented HR policy does not demand that HRM be completely invented anew, but it does entail adapting to “a process of comprehensive social and economic change” (Troger, 2015, p. 152). Local authorities must decide which new developments they will embrace and which established HR tools they will adapt to the long-term changes (Troger, 2015). The strategic HR management frameworks provided by the Harvard and Michigan models should be used as a basis and then adapted to the specific conditions of German local authorities (Felger and Paul-Kohlhoff, 2004 and Beer, Bodelie and Brewster, 2015).
Also important are the possibilities for implementation given in the workforce planning model outlined in chapter 3.4.1.3. According to Armstrong (2011), this model makes possible strategic analyses of personal challenges, of skills and of future staffing. The everyday tools for implementation include age structure analysis and workforce planning to assist management of knowledge.

This research contributes to our knowledge of local authorities in relation to organisational change with respect to HRM. The present study highlights the first steps for action in order to secure, support and spread knowledge as a factor of production, as well as to integrate HR work into the strategic goals of the administration management. The survey results contribute the important basic recommendation that age structure analyses should be introduced across the board. Following this, each administration must analyse for itself what combination of new HRM measures is best suited to counter the coming challenges (Beattie and Waterhouse, 2007). The results also support the conclusion that HR marketing and employer branding are perceived as important factors in successful HRM. This contribution is supported by the fact that the research results show that there is a situation of competition with the private sector, in which local authorities perceive themselves to be at a disadvantage. An attractive HR marketing approach would help local authorities to draw attention to themselves and attract potential new employees.

Another important contribution of the present study is to show that the correlations found here are significantly related to the size of local authorities. Depending on available human resources, it should be determined whether and to what extent cooperation with other local authorities is feasible in order to better deal with the effects of demographic change collectively. It should be borne in mind that, in the future, it will be “necessary to work more efficiently with fewer staff” (Flatz, 2012, p. 14). However, this aspect should also be regarded critically. Collaborations may also carry negative connotations, as they may be perceived as leading to a loss of control or to external parties
meddling in internal affairs. Smaller local authorities, however, have more restricted opportunities to take new directions, as they have very few resources. In these cases, local authorities may fall back on traditional approaches that have already been used successfully. This corresponds to the process model of path dependency, whereby a strategic direction has been established in the past and continues to determine present decisions.

Specifically for German local authorities, the present results show that strategies have not changed over many years. A comprehensive rethinking or redirection of HR policy specially adapted to the effects of demographic change has in some extent not yet been carried out. This is particularly apparent in the results for the smaller local authorities. Their human and financial resources and their time all appear to be more limited than those of larger local authorities. As a result, the smaller authorities stick to traditional HR management tools while larger authorities consider possible changes of direction.

Rethinking or redirection is supported by the advice of the Robert Bosch Foundation:

Public sector employers should use the development of their age structure as an impetus to prepare their HR management as quickly as possible for the challenges of demographic change. If they are successful in actively shaping HR policy, then opportunities and competitive advantages will follow for public administrations in the competition for the best minds. (Robert Bosch Foundation (2009, p. 105).

6.7.1 Summary of results in the form of specific conclusions

The most important results for the topic 'Effects of demographic change and the present challenges for HRM in German local authorities in relation to workforce planning to facilitate the management of knowledge' are summarised here:
1. The empirical investigation contributes the important general conclusion that the effects of demographic change, an ageing population and low birth rates are being felt in German local authorities. This detailed investigation also shows that competition with the private sector regarding skilled labour is currently perceived as the most important indirect effect of demographic change. The results support the recommendation that local authorities position themselves strategically in the labour market and offers some insights to shape those directions.

2. The present research brings previous results up to date, showing that traditional HRM systems have not yet been overhauled to the extent necessary for sustainable, future-oriented HRM in the light of demographic change. A fundamental change in direction is recommended, with the introduction of a workforce planning system and an age structure analysis as a first step.

3. The broader scope of the present research also contributes the new conclusion that local authorities are not yet coordinating their HRM strategy with their overall strategy. The research found no significant correlations between the strategic direction of HRM systems and the effects of demographic change. It is therefore recommended that German local authorities develop guidelines for managing changes in staff numbers and in the nature and distribution of staff responsibilities. These guidelines should be the basis for the implementation of HR policy. It is important to recognise that compiling a new strategy or revising an existing one is a challenging task, that has certain noticeable external effects and long-term consequences. An HR management strategy should always be an integral part of general strategic plans. When considering strategic direction, the American experience with the Harvard and Michigan models can be informative.

4. New contributions to workforce planning to facilitate the management of knowledge were made that have not yet been developed in
German local authorities providing a unique opportunity to shape HR policy with a strong and relevant evidence base. Human resources as an important factor of production do not yet take centre stage in service delivery. Knowledge retention findings uncovered gaps with respect to local authorities’ understanding of this issue, and HR managers are not yet fully aware of the importance of knowledge retention. Based on the results of the present research, HR managers in German local authorities are recommended to acquire an extensive understanding of knowledge preservation processes.

5. Further training measures are particularly important. These have tended to be used as a means of knowledge transfer. Ongoing training programmes as a sole knowledge preservation measure will not be sufficient.

6. The results of the present research also contribute the specific new conclusion that, in German local authorities, the use of new tools and the approach to managing knowledge depends on the size of the local authority. The principal conclusion is that larger local authorities are in a better position to deal with the issue.

6.7.2 Recommendations following from the empirical investigation

As well as the contributions to knowledge and practice already mentioned above, the results also suggest recommendations for HR managers in local authorities. These recommendations may be summarised in several important general guidelines for the working methods of HR managers. The following are particularly important:

1. Develop a positive image as an employer
Based on the results of the present study, it is recommended that local authorities develop a more positive image as employers and communicate this to potential employees. This means a rethinking of HR marketing practice. The situation of competition must, along with traditional methods of recruitment, be met with a proactive marketing
campaign using modern media, for example interactive online tests, weblogs and, as discussed earlier, social networks (Fischer, 2013). The positive aspects of a career in a local authority should be clearly spelled out (Werries, 2012, p. 23):

- “wide variety of tasks
- regular training
- opportunities for promotion
- family-friendliness
- flexible working hours
- job security”

To this should be added the present refugee crisis, which could be viewed as an opportunity to recruit new trainees. However, in order to realise this opportunity, it is absolutely essential to review and revise, as soon as possible, the political and social conditions for these groups' access to the labour market. As soon as an employment policy for refugees has been established, local authorities must act as quickly as possible. The skilled labour shortage also affects the private sector, which is experiencing intense competition and has already discovered the potential of well-educated refugees as new employees.

As well as the formal regulations governing access to the labour market in Germany, the language barrier also needs to be taken into consideration. Language should not be underestimated as an important factor, as public administrations deploy many specialist terms and expressions. Cultural integration should also not be overlooked. In recruiting refugees as potential employees, two factors need to be considered. One is general access to the labour market and integration into German society and the other is integration into the administrative structure and culture and its working methods.

Local authorities need to take up a strategic position in the labour market. They must also monitor the local labour market as well as their presence in local labour markets, whether real or potential (schools,
training centres, employment offices). They should quickly implement measures to secure a positive image as an employer and publicise these measures as soon as possible. It is already possible to establish a strategic position in the labour market, which will be urgently necessary after 2020.

2. Introduce age structure analysis across the board

Section 6.2 concluded that age structure analysis should be introduced across all local authorities. Among its recommendations for deployment was to first establish in which areas the analysis should be carried out. Given the results obtained in this research, the policy implications would appear to be as follows: HR managers should assess whether only particular spheres of responsibility should be analysed at first, or the entire administration. The results should be organised into age groups, so that cohorts of retirement are clear. Where possible, areas of expertise should be added, so that knowledge gaps can be pinpointed. Following this the results should be analysed and HR policies developed accordingly. Along with age structure and retirement points, fluctuations and incoming employees should be taken into account. This supports earlier work from the Bundeministerium des Innern (2012), that this instrument be used to periodically compare current age structure with age structure forecasts over the mid- or long-term so as to enable timely implementation of measures such as knowledge transfer. This is because the research results presented in this thesis show that, currently, 41.0% of local authorities carry out staffing plans over the short term of up to only 3 years. In view of the rapidly changing conditions this research makes the contribution for praxis to plan over the long term for staffing needs. This long-term use of age structure analysis is an essential component of HR management, because the workforce is getting steadily older. Local authorities will have more and more experienced employees with a high level of specialist expertise. In this situation, HR managers are responsible for deriving strategic plans of action from the age structure analysis. These plans can comprise two important directions. a) Securing an age-balanced staff structure in order to ensure that younger employees generate new knowledge
rather than simply relying on existing specialist experience. b) Replacing retiring employees in advance of their retirement in order to prevent knowledge loss.

3. Introduce/Implement new HR development tools
Section 6.3 provided evidence that local authorities are already making great efforts to use new HR development tools. However, in the future a focus solely on the decline in applicants and the ageing workforce will not be sufficient to deploy HR development tools that are adequate for the coming challenges that demographic change will pose. See also section 3.2, which introduces American and American-inspired strategic HR management models. In Germany too the choice of model should be the strategic basis of HR development in workforce planning. It is here important to take into account that the use of new tools should not be limited to larger local authorities. Instead, it should be made possible for all local authorities to have access to these tools. The possibility of creating an inter-authority department should be considered. This department would be responsible exclusively for the implementation of new HR tools. As the results of the study show, larger local authorities with more employees are more likely to implement a change in strategy for HR management. It is of course not feasible to simply increase the number of employees in a local authority. However, the time demands of existing employees can be lessened by building collaborations with other local authorities. Cooperation in HR matters could therefore be a quick and effective way of meeting the challenges of demographic change.

In addition, HR development tools should be continually developed and adapted. Leadership methods are required that address the direct consequences of demographic change in the form of the waves of retirement that are anticipated from 2020. HR managers should deploy results-based policies that also take management of knowledge into account. Workforce planning should be considered here as a possible HR management strategy.
In March 2013 the "Initiative for small firms – Good for Germany" ("Offensive Mittelstand – Gut für Deutschland") produced a checklist of 11 topics in order to provide a further impetus to the use of HR development measures. This "Checklist for HR management" enables small companies to self-assess and prepare for demographic change. This self-assessment should involve a systematic analysis of the quality of HRM and should help to identify where urgent action is required. It is recommended that local authority leadership carry out this praxis-related assessment as a first step. It can be found online at www.inqa-check-personalfuehrung.de. Because of its easy availability online this practical test can be accessed quickly. It should therefore be possible for any local authority to carry it out, regardless of size. The options for implementation could then be evaluated and discussed in a working group.

4. Workforce planning to facilitate the management of knowledge

Given that managing knowledge is an extremely broad field it may be worthwhile bundling measures together into work packages, in which each individual representative of a local authority develops a practical implementation plan, which can then be used by other members of the working team. In this way, the broad range of responsibilities can be spread out. Although each local authority must do the necessary data analysis for itself, the analyses can be the basis of comparison with other small local authorities. This may identify commonalities and shared steps for implementation. A prerequisite of this system is that employees' readiness to learn be increased through the cultural change described earlier, so that they are open to the oft-cited phenomenon of 'lifelong learning', acquiring "[…] new knowledge in the form of a future procedural knowledge" (Güldenberg, 1998, p. 212).

Local authorities should also consider appointing a knowledge manager. In 2004 this vocation was relatively unknown in Germany and Austria. By comparison, Milchrahm (2004) concluded in her study that the topic of standards for knowledge managers in the public sector has been discussed in the US since 2000 and that people in this position
are accorded a high status. The author of the present study wishes simply to note that such opportunities exist. The majority of local authorities will, however, not have the necessary financial and human resources to train a knowledge manager; HR managers must often therefore take on this role (Bünnagel, 2014). The person responsible should be somebody who has a long experience in the local authority and can therefore rely on a large network (Röllecke, 2014).

5. Take into account the new and qualitatively different demands placed on local authority employees and integrate these demands into training programmes
Demographic change not only has quantitative effects on staff numbers, but also qualitative effects on the nature of the responsibilities allocated to each staff member. Therefore, newly-developed strategies, such as those proposed by von Richenhagen and Seidel (2014), must also take into account these new responsibilities. Demographic change calls for a new direction in the range of specialised services local authorities offer, and a corresponding change in employees' responsibilities. The practical recommendation is that managers in German local authorities need to develop an overall strategy that takes into account changes in staff numbers as well as changes in staff responsibilities. This requires planning new training programmes.

6. Exemplary cases of local authorities that have already implemented a system to manage knowledge
The investigator recommends an exchange of experiences according to the guidelines provided by the following best-practice local authorities: Erlangen already makes use of a professional system to manage knowledge with knowledge maps, and Karlsruhe has put in place an information system for knowledge retention. Another example is provided by the region Hannover, which has produced a brochure explaining how to deal with employee knowledge and what possibilities exist for knowledge retention. The city of Munich is also a best-practice example; the city has “gathered, built and maintained successive structured demographic knowledge” (Wiechmann et al., 2010, p. 47).
The cities of Stuttgart, Bielefeld, Erlangen, Kassel and Potsdam can also be cited as good examples. In addition, a very concrete and practical example was found of a state-level administrative body (Baden-Württemberg police department) that is phasing in a structured knowledge and experience exchange. The plan is given in the practice report for the New Quality for Work Initiative (*Initiative Neue Qualität der Arbeit*; INQA, n.d.).

7. Collaboration/mergers among local authorities

The previous sections have emphasised the point that larger local authorities are better placed to mitigate the effects of demographic change with targeted HRM measures. They have the necessary staff to deal with new developments and are more likely to implement measures that go beyond traditional HRM approaches. It is possible that many of the smaller, resourced constrained authorities, cling to old views of HR, whilst those in larger authorities, with more resources, look to the new ideas more. These conclusions show that it may helps smaller local authorities to involve profound structural changes in the system of local authorities (i.e. fusions of groups of authorities). Fusing districts has occurred in isolated cases in all federal states over the last few years. In 2014, for example, five municipalities in Lower Saxony merged into the greater municipality of Hagen in Bremischen, and three municipalities became Eschede. In Saxony-Anhalt, two municipalities became the city of Quedlingburg (Destatis, 2014). The present study revealed significant differences in priorities according to the number of inhabitants. The aim of such a fusion would be to create larger administrations that would have the human resources to build up a working, future-oriented approach to HRM. Kettinger (2004) has shown that the issue of local authority mergers has been thoroughly researched, and that such mergers are especially likely to be considered as a strategic move when local authorities have an increasing workload and more demanding responsibilities, or are nearing the limits of their capacity. This is currently observable in the federal state of Brandenburg, where population decline has led to the development of a new plan that involves reducing the number of local authorities. The new local authority structure will include
only 11 rural districts (previously 14) and one municipality (previously four) (Blankennagel, 2016).

Because fusing further districts tends to require a long implementation process, connected with financial and time costs, cooperation is recommended. One person or department could be set up for several local authorities and be responsible only for the planning and practical implementation of HR development measures. This inter-authority body would be responsible for coordination and cooperation among the local authorities and would monitor the successful implementation of specific measures and efficient strategic orientation. Local variations in the implementation of such a policy, and its internal and external advantages and disadvantages, could also be investigated as part of future research.

6.7.3 Benefit of the empirical research for German local authorities

Without the present empirical study we would have remained unaware of the many significant links that exist between the various phenomena investigated, in particular those involving the decline in applicants and the association between the size of a local authority and its use of tools and policies to address the effects of demographic change. Local authorities now have a better knowledge base, and strategic and practical recommendations for their future strategy.

One particularly important finding is that many small local authorities in Germany are still using traditional HRM tools. New strategies regarding workforce planning, such as the use of an age structure analysis or the management of knowledge, are currently only in use in the larger local authorities. This means that those local authorities with the most human resources are more likely to have the information they need to make strategic policy decisions. In order to make this possible for smaller local authorities the present study contributes some initial recommendations for improving their situation, such as introducing formal cooperation and exploring the potential for undertaking mergers. This will enable smaller
local authorities to pool resources and to develop overarching, coordinated strategies for HRM. This recommendation is in line with the process model described in Section 3.4.1.1. If local authorities decide to merge, this decision also creates path dependence. A decision made now to merge as a response to the effects of demographic change would not be easily reversible, but would lead to a new stable situation in which local authorities would be able to profit from the advantages of larger administrative units as described in the present study.

Another important contribution is the present study’s identification of the state of competition for labour. The decline in applicants is currently the variable that local authorities perceive as linking demographic change and HR policy. The present study emphasises for local authorities the importance of developing a positive employer image, and offers recommendations for achieving this and communicating it effectively.

The following chapter summarises the most important conclusions thus far, identifies opportunities for further research and, finally, provides an outline of a sustainable HRM system.
Chapter 7 - Conclusion

7.1 Overview of Study Results

This study provides important contributions to the existing literature on HRM in German local authorities, most significantly by highlighting the current challenges for workforce planning to facilitate the management of knowledge. The results of the primary research support the following important conclusions, which build on those derived from the existing literature:

- A state of competition with the private sector exists, requiring an improvement in employer attractiveness and the use of age structure analysis
- A lack of strategic direction in the use of new HR management tools, and limited use of those tools
- A lack of an extensive understanding of managing knowledge, including knowledge use and knowledge preservation, and as a result of this lack, a concentration on traditional training methods
- New strategic directions seem to be limited to larger local authorities that possess the necessary resources, which supports the consideration of mergers or collaborations among smaller local authorities

Given the lack of information on managing knowledge practices in German local authorities, this study clearly shows that new instruments of HRM are already in use, but are in need of strategic direction in order to deal with the effects of demographic change in the form of the waves of retirement that will arrive in 5 to 10 years. It should be especially emphasised that a greater focus must be placed on knowledge retention and knowledge transfer measures. Furthermore, this study yields results that are congruent with existing literature, confirming that demographic change will have a great influence on existing labour resources in Germany. However, the study did not only investigate the effects in general, but also examined a more detailed understanding of
HR and workforce planning to facilitate the management of knowledge. Taken on their own, these individual results on demographic change and HR management are not new. Whilst the results regarding demographic change and new HRM practices aren’t new, the research extends the analysis of managing knowledge to the German local authority context, helping to close a gap in the literature for a nation specifically affected by demographic change. The study delivered new and up-to-date insights for practical application and for the theoretical literature, on topics that had not previously been researched. These new insights provide the foundation for the author’s recommendations for new strategic directions and HR policies in local authorities in Germany. It is also important here to compare the dominant HR management models, for example those in place in the USA, which may offer inspiration for the adoption or adaptation of their methods. The most important contributions from knowledge, practice and methodology are summarised below.

7.1.1 Contribution to knowledge

Demographic change is a central focus of the present study. The topic has recently gathered frequent mentions, and not only in Germany (as documented by Kröhnert, Medicus and Klingholz, 2006; Tatje, 2011; Bossaert, Demmke and Moilanen, 2012). This has not yet been addressed in any depth with practical recommendations for public sector organisations or for the implementation of strategic HR management with workforce planning and its key tools, age structure analysis and management of knowledge (Armstrong, 2011). In their approach to the problem, German local authorities have not yet drawn any comparison to potential strategic plans for HR management, such as the Harvard and Michigan models of Felger and Paul-Kohlhoff (2004) and Beer, Bodelie and Brewster (2015). By drawing attention to these models, the present study makes a novel contribution to the possibilities open to HR managers in German local authorities for future-oriented planning.
The results of the present research contribute that the effects of demographic change are so far only being perceived indirectly, via the decline in applicants for open positions. In German local authorities this problem currently manifests itself as competition with the private sector. In order to assess and take into account the other aspects of demographic change, an age structure analysis should be used. The present research contributes that where an age structure analysis is in place it serves as the basis for HR development. The recommendation for German local authorities is to introduce age structure analyses across the board. The research also contributes that a strategy is needed in order to be able to implement HR and workforce planning policies to facilitate the management of knowledge. HR managers must also address the issue of managing knowledge. On this topic, the study draws the general conclusion that HR managers’ approach to knowledge gaps and knowledge transfer is not yet linked to the effects of demographic change. This detailed empirical investigation supports the more specific new conclusion that the size of German local authorities has a significant influence on the use of new policies and tools.

It can be concluded that the effects of demographic change do not necessarily have to be dealt with using newly-developed HRM tools. As a first temporary step, it is enough to make use of workforce planning processes, like age structure analysis, managing knowledge with knowledge profiles/knowledge maps. Implementation should be pursued strategically with a long-term view. Making use of these opportunities does not entail any additional direct costs, only additional personnel costs. These personnel costs should be quickly offset as a result of the extra value added.

The following section outlines the most important conclusions regarding the current state of practice in reality and what contribution the study makes in the form of recommendations for future implementation.
7.1.2 Contribution to practice

The aim of the quantitative approach was to assess the current state of practice in German local authorities and to enable a comparison with similar practice reports.

Based on the results of the present analysis, it is recommended that HR marketing instruments be used to address the current state of competition with the private sector – in particular, through the development of a positive image as an employer and positioning in the labour market. The current refugee crisis will also have an impact on the German labour market and local authorities should make use of this potential for recruitment in line with the regulations governing the asylum process and the necessary specialist and linguistic skills available.

The research findings offer the wider, more detailed contribution that where an age structure analysis is in place it is used to develop HR development policy. German local authorities should introduce guidelines that recommend the implementation of age structure analyses for all local authorities. Based on the current and projected average age of employees, strategies should be developed for a new direction for HRM. Given that the use of demography-oriented tools is relatively new, and that larger local authorities are currently better placed to make use of them, the present study recommends that the geographical structure of local authorities be reformed and different forms of cooperation, coordination or even fusion should be tested, for example a system in which several local authorities set up a unit responsible for planning new HRM measures. The implementation of new process models, like workforce planning, that deploy existing HRM tools, as well as new action fields of managing knowledge, requires HR managers to possess not only a basic understanding of knowledge but also a more detailed, specific understanding of knowledge transfer and knowledge preservation. This research therefore makes the updated contribution that German local authorities must employ somebody who
has an extensive understanding of workforce planning to facilitate the management of knowledge and who can provide strategic direction in coordination with the overall management strategy. This includes not only the classic tools of training and further training, but also the tools of a modern system to manage knowledge (e.g. skill profiles, knowledge maps, lifelong learning, interactive exchange between young and old).

Finally, the detailed results of the research show specifically that German local authorities do not yet accord any significant importance to resourcing the management of knowledge despite the role it will play in the future (Probst, Raub and Romhardt, 2010). Based on the conclusions drawn from the literature so far, it is recommended that strategic leadership tools for HRM in local authorities should be deployed not only with consideration for the ageing workforce and the decline in applicants, but should also be developed as holistic approaches that reflect the real situation and expectations for the future, as well as for the labour market in general. The description of the Harvard and Michigan models in section 3.2 is important here. German local authorities should first decide on a guiding model and then use it to inform their strategy for translation. According to Truss et al. (1997) and Gill and Meyer (2011), models should not be mixed. This strategic approach could be, according to Baron et al. (2010), the workforce planning model.

Diagram 13 is derived from the literature analysis and from the results and discussion sections of the present study. The diagram shows clearly that strategic HR management plays a central role in managing demographic change. In order to implement this role, specific actions are required that only when taken together lead to strategic HR management. The initial actions that are required are general process steps (aims, responsibilities and situation analyses). Only after taking these initial steps can local authorities deal with concrete implementation. After implementation, the success of the plan should be assessed and if necessary actions and tools should be adapted.
Diagram 13 offers added value for everyday working operations, by describing a concrete plan of action.

Diagram 13: Policy steps for a strategic HRM approach in demographic change (compiled by present author)

7.1.3 Contribution to methodology

In order to examine the different tasks of a sustainable HRM approach, a quantitative study was carried out using a standardised questionnaire and six research propositions were formulated. In doing so, this study sets out a unique research procedure, which can be seen as a new methodological contribution with respect to the ageing workforce and the resulting challenges that it poses for demography-oriented HRM with a focus on managing knowledge. First, based on the analysis of the literature, research propositions were posed. Based on these research propositions and on the existing literature specific questions for each aspect of the topic were formulated. This procedure ensured that the individual questions served to answer the overall research
propositions and that it would be possible to bring in relevant information from the literature during the discussion. This procedure can be applied to further studies, since it has close links to the literature and to practice. The questionnaire could be used again at regular intervals for further investigations, even within the same population of interest, in order to make comparisons with the original results and, for example, to identify improvements and new implementations. It can therefore be used not only for a cross-sectional study such as the present one, but also for a longitudinal study (see Section 4.4.4).

7.2 Limitations of the study and further research

Before turning to the concluding discussion the study’s limitations must be reported. This investigation contributes important conclusions about managing knowledge in German local authorities, in particular giving a very clear picture of the overall deployment of HRM measures in this context. In addition, it delivers new approaches to research in this area that should permit more detailed and extensive conclusions. However, as with all studies, there are some limitations.

First, as explained in Section 4, a quantitative approach was chosen. The quantitative research method was chosen in part arbitrarily on the basis of time constraints, since the investigator is in full-time employment. However, the results of the study give a good picture of the effects and countermeasures in German local authorities. From these results, a clear impression can be derived of the extent to which local authorities are actually dealing with demographic change and its resultant effects in creating challenges in terms of the management of knowledge for HRM. However, this quantitative approach also has its limitations. No detailed background information could be gathered, which would have been possible, for example, by using a personal interview in a qualitative study. The study was only able to gather responses concerning how the participants see their administration in terms of three key topics: demographic change, HRM and managing of knowledge. This type of study has also been chosen by other research
institutes (see f-bb by Freiling and Geldermann, 2011; Hochschule Harz, 2013).

Second, the study was limited to German local authorities. This limitation was necessary because the investigator did not have the time alongside a full-time job to carry out an international survey on her own. For a study of this type a trained research team would have been needed. The conclusions are therefore only from the German perspective. However, demographic change affects other countries as well.

Third, the topic of managing knowledge was addressed specifically from the perspective of demographic change and as an instrument of workforce planning. Managing knowledge can, however, also be examined in its own right. There are various reasons why knowledge preservation is of particular importance. The questions formulated earlier on the subject of workforce planning to facilitate the management of knowledge provide the basis for this and can be used as a starting point for further research.

These points show that every investigation has its limitations. These are mostly due to the necessarily limited scope of the topic, but also to limits on the time the investigator can invest in the research. Every attempt was made to ensure that the research and the conclusions and recommendations derived from it are highly relevant to the theoretical literature and to everyday working practice.

### 7.2.1 Areas for further research

The limitations identified above also highlight areas for future research. The quantitative aspect of the study can be used as the starting point for further qualitative surveys. This would provide specific information on the study topic that could supplement the present quantitative results. Follow-up questions, for example about administrative structure,
mission statement or organisational objectives, could be added, from which objective indicators of organisational change could be derived.

The questionnaire could also be used in other countries to survey HR managers in other local authorities. The results of such studies could be used to make intercultural comparisons. Following the process of integration in the EU it may be interesting to know how the same challenges are being met in other European countries and whether new HRM tools are being used. With its practical research propositions the present research can be used to deliver comparative results.

Internal restructuring of administration may be necessary, in which employees must take over new or additional tasks or, as seen already in the last few years, smaller local authorities may be merged. These structural changes also make knowledge preservation necessary. Further investigations in this area would be a good way of raising awareness of the need for managing knowledge. The research propositions already developed for workforce planning to facilitate the management of knowledge can be applied again in these further investigations. In addition, the present study did not address opportunities for knowledge creation. This could also be taken up in future studies. The conclusions of the literature analysis could be used to derive new research propositions. A quantitative survey approach would be appropriate in order to identify relationships among the different processes of knowledge creation.

Based on the present empirical study, a need for further research especially in German local authorities in the following fields can be identified:

- HR marketing – how are local authorities increasing their attractiveness as employers?
- HR monitoring with a focus on training assessments and key data on HR marketing/recruitment.
• Development of a skill profile – which skills are needed for the future?
• Involvement of employees and IT in the reorientation of HRM's fields of operation.
• Demography-oriented further training for all age groups in local authorities – who needs what knowledge and how can implicit knowledge best be transferred?
• Comparison of best-practice examples from workforce planning systems to manage knowledge.

In comparison with the theory, the present results show that these issues have not yet come to the centre of focus. The conclusions drawn from the present study demonstrate that the effects of demographic change can only be mitigated if administration and HR heads in German local authorities engage more intensively with these issues and acknowledge their relevance in HRM approaches. Because of the current refugee crisis, these effects should be the focus of further research. Can refugees be trained in German local authorities such that they are able to bridge the recruitment gaps that will result from waves of retirement? What conditions need to be in place for refugees to access these positions and what intercultural challenges are involved?

It is clear that future research needs must be closely oriented towards collaboration with local authorities. Purely theoretical concepts are already available but are not being implemented; local authorities must be convinced to invest in their own sustainability and to reorient themselves. They must be motivated to take concrete action.
7.3 Concluding Comments and Forecast

We work within yesterday’s structures, 
with today's methods, 
on strategies for tomorrow, 
mostly with people who built yesterday's structures within cultures from 
the day before yesterday 
and who will no longer be around to experience life in the organisation the day after tomorrow.

(Franz Calzaferri, no date)

The abovementioned quote makes clear that actions of humans are often shaped by old patterns without strategic, future-oriented direction. There are parallels here with the findings drawn upon in the discussion of the present study. Demographic change should not be seen as a threat, but rather as an opportunity (see introductory quote to Chapter 1). According to Gourmelon, Mroß and Seidel (2011), demographic change (along with technological development, globalisation, market dynamics and organisational dynamics) is seen as a megatrend, one that influences the demands on modern management. The present research, however, contributes that the current threat is linked to a decrease of skilled labour and to knowledge loss. The findings support the notion that “demographic change is no longer only a projected social policy scenario, but a current reality” (Troger, 2015, p.151). The lack of skilled labour can only be addressed using the tools of modern HR marketing. The results of the empirical investigation support this conclusion in regards to the problem of competition with the private sector and underline the urgent need for positive positioning as an employer in the labour market. In the case of the threat of knowledge loss, the results of the current study contribute the new finding for German local authorities that they must implement the following specific strategic HRM policies over the next 5 to 10 years:
• Age structure analysis for the entire administration and an analysis of whether specific fields are particularly affected.
• Timely development of succession procedures.
• Balanced mix of ages in order to avoid waves of retirement and to link the experiential knowledge of older employees with the up-to-date knowledge and flexibility of younger employees.
• Targeted implementation and monitoring of further training measures.
• Implementation of a system to manage knowledge.

Local authorities in Germany cannot afford to ignore the effects of demographic change on workforce planning to facilitate the management of knowledge any longer. Four years remain until the widespread waves of retirement in 2020 arrive. Management of knowledge should come to the forefront of administrative strategy. Given the current staff age structure and the current state of competition for skilled labour, future-oriented and practical measures for workforce planning to facilitate the management of knowledge should be agreed upon and put into practice as soon as possible; only then can a citizen-centred and service-oriented administrative process be safeguarded beyond 2020.
Appendix

Research Questionnaire

Dear Sir/Madam,

As part of my dissertation on the topic of ‘The effects of demographic change and the present challenges for human resource management in German local authorities in relation to workforce planning to facilitate the management of knowledge’, I am writing to all municipalities with over 15000 inhabitants and to all rural districts regarding my empirical study. I consider this study to be of vital importance to the work of future HR managers. I aim to establish the extent to which local authorities are already dealing with this issue and how well they are aware of the problems it poses.

The current academic literature on this subject has highlighted a serious lack of research in German municipalities into the new challenges that HRM will face as a result of demographic change. The present empirical study will provide an analysis of the interactions between demography, HRM and managing knowledge.

The questionnaire that has been developed for the survey sample is divided into four sections. The first three are concerned with awareness of the issues and aim to establish whether local authorities have already approached this research topic, whether they have taken action regarding the coming HR challenges and whether they have developed concrete strategies. The final section concerns general information for statistical purposes.

Please read the following statements carefully and decide to what extent they apply. Please mark with a cross the answer that best corresponds to current policy in your organisation. The questionnaire contains questions with a fixed set of possible responses, as well as some open questions, to which you should answer with your own
opinion. There are no right or wrong answers; I am interested in the attitudes and policies of your organisation, whatever those might be.

If at any point you find it difficult to decide on an answer, please try to choose one of the alternatives, whichever one your instinct tells you fits best. Only if you answer can your information be of use in the analysis.

The aim of the study is to provide representative results. For this reason I would like to ask you kindly to take a little time and fill in the following questionnaire till 30th August 2013. I am relying on your responses in order to provide useful research. Please feel free to contact me by email with any questions: dana.noack@gmx.net.

In conducting this study I have undertaken full responsibility for your data protection rights. All the information you provide will be held in the strictest confidence and will be fully anonymised, so that nothing can be traced back to you or to your local authority.

Many, many thanks for taking the time to support my research.

Yours sincerely,

Dana Noack
I. Part - Demographic

The following is a series of questions and/or statements on the topic of demographic change. Please answer them as relates to your own public administration. Only circle one answer for each.

1. Have you addressed the topic of demographic change in your administration?
   Yes ☐ No ☐

2. In your opinion, does demographic change affect labour potential in your administration?
   Yes ☐ No ☐

3. If yes, what are the effects?
   
   not at all  not particularly  yes, to some extent  very much so

   Increasingly older average employee age
   Fewer applicants for new positions
   Unsuitable applicants for new positions
   Decreased employee Productivity
   Retirements in large numbers
   More difficult compatibility of family and work commitments
   Available knowledge cannot be retained

4. If yes, within what period of time will this decline take place?
   In 1 to 3 years ☐
   In 4 to 5 years ☐
   In 6 to 10 years ☐
   In more than 10 years ☐

5. The following questions relate to the specific effects of demographic change in the context of hiring and HR management.
In addition to the professional suitability of a candidate, does age also play a part in hiring? □ □ ☐ ☐ ☐

Does your organisation monitor the external job market for potential new employees? □ □ ☐ ☐ ☐

Is there a pool of qualified workers your organisation can turn to in finding replacement staff? □ □ ☐ ☐ ☐

Do you consider yourselves to be in competition with the private sector for new employees? □ □ ☐ ☐ ☐

Do you consider yourselves at a disadvantage in terms of the attractiveness of your organisation as an employer compared to private enterprises? □ □ ☐ ☐ ☐

Has there been a decrease in the numbers of applications for apprenticeships in your administrative district? □ □ ☐ ☐ ☐

Are trainees taken on permanently once they complete their training/ education? □ □ ☐ ☐ ☐

Has your organisation announced lay-offs carried out as part of downsizing measures? □ □ ☐ ☐ ☐

II. Part – Human Resource Management

The following questions relate to the topic of HR management and the current challenges facing HR managers.

6. Who, in your administration, is involved in forming strategies for HR management? (You may select several)

Top-level management ☐
The head of your local authority ☐
Head of HR ☐
Team/ Unit Management ☐
Other ☐
7. Which new fields of policy are part of HRM in your organisation?

<table>
<thead>
<tr>
<th>Field</th>
<th>not at all</th>
<th>not particularly</th>
<th>yes, to some extent</th>
<th>very much so</th>
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</thead>
<tbody>
<tr>
<td>Strategic HR management</td>
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<tr>
<td>Age Structure Analysis</td>
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<tr>
<td>Demographics-oriented administrative culture</td>
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<tr>
<td>Employee skills development Knowledge Management</td>
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</table>

8. What are the tasks of HR management in your local administration?

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<tr>
<th>Task</th>
<th>not at all</th>
<th>not particularly</th>
<th>yes, to some extent</th>
<th>very much so</th>
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</thead>
<tbody>
<tr>
<td>Assessment of staffing requirements</td>
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<tr>
<td>HR development</td>
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<tr>
<td>Employee retention</td>
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<tr>
<td>Head Count Analysis</td>
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<tr>
<td>Departing employees</td>
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<tr>
<td>Human Resource Deployment Management</td>
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</tbody>
</table>

9. What is the time frame for head count planning in your organisation?

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<tr>
<th>Time Frame</th>
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<tbody>
<tr>
<td>short-term (up to 3 years)</td>
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<td>mid-term (4-5 years)</td>
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<tr>
<td>long-term (over 5 years)</td>
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</table>

10. Does your organisation have an HR development system in place?
    Yes □  No □
11. Please describe the age structure (average employee age) in your administration

... five years ago ... years of age
... today .... years of age
... in five years ... years of age

12. Do you have an Age Structure Analysis in place for identifying HR development in your organisation?
Yes ☐ No ☐

13. If yes, not at all not particularly yes, to some extent very much so

...are the resulting prognoses used as the basis for new HR measures?
☐ ☐ ☐ ☐

...are these regularly updated?
☐ ☐ ☐ ☐

...are relevant targets set by administration management?
☐ ☐ ☐ ☐

...does the analysis provide an estimate of when an employee will leave?
☐ ☐ ☐ ☐

...have potential staff shortages become apparent?
☐ ☐ ☐ ☐

...have potential knowledge losses become apparent?
☐ ☐ ☐ ☐

14. What is the time frame of the age structure analysis used in your administration?
up to four years ☐ five to ten years ☐
longer than ten years ☐
15. In terms of HR policy decisions are the following external factors given consideration:

<table>
<thead>
<tr>
<th></th>
<th>not at all</th>
<th>not particularly</th>
<th>yes, to some extent</th>
<th>very much so</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Legislation</td>
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<tr>
<td>Economic developments</td>
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<tr>
<td>Developments in technology</td>
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</table>

III. Part – Managing Knowledge

16. The following section deals with the topic of managing knowledge and its implementation in your administration

<table>
<thead>
<tr>
<th></th>
<th>Very important</th>
<th>important</th>
<th>not of great importance</th>
<th>unimportant</th>
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</thead>
<tbody>
<tr>
<td>How important is knowledge to the</td>
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<tr>
<td>activities carried out by your local</td>
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<tr>
<td>authority?</td>
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<tr>
<td>What level of importance is given to</td>
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<tr>
<td>the knowledge of workers in your local</td>
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<tr>
<td>authority?</td>
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<tr>
<td>Do you have a strategic direction of</td>
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<tr>
<td>knowledge retention according to the</td>
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<tr>
<td>administration’s overall strategy?</td>
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</tbody>
</table>

17. What do you think is knowledge in relevance to your organisation?

18. How does your organisation seek knowledge?

19. The following questions relate to the provision of further training in your local authority

<table>
<thead>
<tr>
<th></th>
<th>not at all</th>
<th>not particularly</th>
<th>yes, to some extent</th>
<th>very much so</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there a training and development concept which acts as the basis for employee training and development carried out in your organisation?</td>
<td></td>
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</tbody>
</table>
Before training and development measures are authorised, does your organisation compare the needs of staff with organisational requirements?

☐ ☐ ☐ ☐ ☐

Are older staff discriminated against when it comes to authorising training and development?

☐ ☐ ☐ ☐ ☐

Is your training and development budget affected by cutbacks in your organisation?

☐ ☐ ☐ ☐ ☐

Are initial and further training currently on the increase in your organisation?

☐ ☐ ☐ ☐ ☐

Are continuing training measures subject to managerial supervision and analysis?

☐ ☐ ☐ ☐ ☐

Are initiatives for learning while working supported in your local authority?

☐ ☐ ☐ ☐ ☐

Has your organisation considered implementing measures for lifelong learning?

☐ ☐ ☐ ☐ ☐

20. Are training and development activities analysed according to the following skills/competencies?

<table>
<thead>
<tr>
<th>Professional expertise</th>
<th>not at all</th>
<th>not particularly</th>
<th>yes, to some extent</th>
<th>very much so</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of relevant methods</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Social skills</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Leadership skills</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
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</tbody>
</table>

21. Is the experiential knowledge of older employees transferred to younger workers?

Yes ☐ No ☐

22. If yes, then how is it transferred? (You may select several)

Team Meetings ☐
Mixed-age working groups ☐
Recorded information in a database ☐
Formation of internal networks ☐
Individual exchanges between employees
Targeted Succession Planning
External working groups
Other (mention…)

23. Is the up-to-date knowledge of young employees transferred to older employees?

Yes ☐ No ☐

We now come to the subject of the transfer and retention of knowledge in your local administration.

24. Is there support, alongside the classic training and development measures, for knowledge transfer between employees in your organisation?

Yes ☐ No ☐

25. If yes, then how does this occur?

horizontally ☐ vertically ☐ in both directions ☐

26. Has a knowledge management system been introduced?

Yes ☐ No ☐

27. Are you familiar with the following building blocks of knowledge management?

<table>
<thead>
<tr>
<th>Knowledge Targets</th>
<th>not at all</th>
<th>not particularly</th>
<th>yes, to some extent</th>
<th>very much so</th>
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</thead>
<tbody>
<tr>
<td>Knowledge Identification</td>
<td>☐</td>
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<tr>
<td>Knowledge Acquisition</td>
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<tr>
<td>Knowledge Development</td>
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<tr>
<td>Knowledge Use</td>
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<tr>
<td>Knowledge Distribution</td>
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<tr>
<td>Knowledge Retention</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Knowledge Analysis</td>
<td>☐</td>
<td>☐</td>
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</table>
28. If yes, then which of these components are used as a basis for the implementation of knowledge management (You may select several)

<table>
<thead>
<tr>
<th>Component</th>
<th>not at all</th>
<th>not particularly</th>
<th>yes, to some extent</th>
<th>very much so</th>
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<tbody>
<tr>
<td>Knowledge Targets</td>
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<tr>
<td>Knowledge Identification</td>
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<td>Knowledge Acquisition</td>
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<td>Knowledge Development</td>
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<td>Knowledge Use</td>
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<td>Knowledge Distribution</td>
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<tr>
<td>Knowledge Retention</td>
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<tr>
<td>Knowledge Analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following questions deal with selected components of knowledge management.

29. Are there plans in your organisation for the introduction of knowledge management?

Yes ☐ No ☐

30. What obstacles are there, in your opinion, to the introduction of a knowledge management system?

Yes ☐ No ☐

- Hierarchical obstacles (e.g. a lack of support from management)
- Functional obstacles (e.g. uncertainties about the issue itself and/or a lack of defined targets)
- Unconnected knowledge islands (e.g. lack of communication on both a horizontal and vertical level)

Other (please state) …

31. In your opinion, which methods can be used to overcome these barriers?

Material ☐ Non-material ☐
32. Are knowledge targets defined in your administration?  
Yes □  No □

33. In terms of defining knowledge targets, does your organisation make statements on the following:  
Knowledge Criterion (what?)  Yes □  No □
Achieving Targets (how?)  □  □
Relevant Time frame (when?)  □  □

34. Does your HR department have a knowledge profile of each employee?  
Yes □  No □

35. Does a visual knowledge profile for each employee exist in the form of a knowledge map?  
Yes □  No □

36. If yes, then what information does this reveal?  
Which knowledge carriers possess which knowledge □
The forms in which this knowledge exists □
(basic knowledge or professional expertise) □
The department in which the employee works □
How his or her knowledge can be accessed □

37. The following questions deal with knowledge sharing and knowledge retention in your local authority. Which are implemented in your organisation?  
Are you familiar with the division of knowledge into tacit and explicit forms?  □  □  □  □
Are measures for the explication of tacit knowledge supported in your organisation?  □  □  □  □
Are information sources (legislation, ordinances, working regulations, procedural instructions) identified and made accessible for employees in all offices/ departments?
Is there an analysis of knowledge requirements?

Is there an identification of relevant knowledge sources?

Does your organisation have an overview of the areas in which new knowledge needs to be generated?

Are knowledge gaps removed through training schemes?

Are employee requests for training and development supported by management staff?

38. How are knowledge deficits recognised? Via information from...
   ...employees
   ...department administrators
   ...heads of department
   ...other

Finally, the following questions deal with your local administrative district

39. Is your local administrative district a
   County
   Municipality
   Larger town/City
   Other

40. How many people are employed in your organisation?
   fewer than 50
   51-150
   151-300
   301-500
   over 500

41. How many people live in your local district?
   15,000-25,000
   25,001-50,000
   50,001-100,000
   over 100,000

42. Which state do you come from?
   Bayern
   Brandenburg
   Mecklenburg-Vorpommern
   NRW
   Saarland
   Sachsen-Anhalt
   Thüringen
   Baden-Württemberg
   Hessen
   Niedersachen
   Rheinland-Pfalz
   Sachsen
   Schleswig-Holstein

43. How old are you?
   under 25
   26-40
   41-55
   over 55
44. Are you Male ☐ Female ☐

45. What position do you have in your local authority?
☑ department head
☑ department administrator ☐ team leader
☑ clerical assistant ☐ other

Do you have any further questions or comments in relation to topics dealt with in this survey?
Figure A1: Use of an employee development system (number of respondents)

Figure A2: Use of age structure analysis for employee development (number of respondents)
Since the aim of the present investigation is to draw conclusions about whether the importance of knowledge preservation has already entered the awareness of local authorities, two open questions were posed regarding 'the meaning of knowledge' and 'knowledge transfer'. The aim was to find out how local authorities interpret knowledge for themselves. The following questions were posed:

a) What does knowledge mean in your organisation?

b) How is knowledge transmitted in your organisation?

The researcher coded and summarised the responses. From the 86 responses to question a) the following picture emerges:

**Knowledge means...**

...specialist knowledge / knowledge of methods / social skills / job experience / life experience (28 responses)

…a necessary condition for fulfilment of responsibilities (23 responses)

…basis for, among other things, appropriate and reliable decisions (12 responses)

…high importance / value, in particular the transmission and continued development of knowledge / indispensable resources (12 responses)
The 78 answers to question b), in which multiple answers from each respondent have been taken into account, can be summarised as follows:

**Knowledge transfer by ...**

...initial and continual training courses / seminars (40 responses)  
...team meetings / internal communication (15 responses)  
...evaluations (6 responses)  
...mentoring / project work / self-study (6 responses)  
...in daily work / through superiors (6 responses)  
...qualification assessments / skills analyses (4 responses)  
...not systematically (4 responses)  
...knowledge database / intranet (3 responses)  
...rapid replacement of vacant positions (3 responses)  
...industry publications and journals  
...working teams (2 responses)  
...surveys / observation (1 response)  
...specially qualified trainers (1 response)
Figure A5: Introduction of knowledge management in %
<table>
<thead>
<tr>
<th>Knowledge profile</th>
<th>Knowledge map</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>no answer</td>
<td>no answer</td>
</tr>
<tr>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>no</td>
<td>no answer</td>
</tr>
<tr>
<td>no answer</td>
<td>yes</td>
</tr>
</tbody>
</table>

Table A1: Presence of a knowledge profile and knowledge map by number of employees

<table>
<thead>
<tr>
<th>Knowledge deficits identified by...</th>
<th>employees</th>
<th>department heads / team leaders</th>
<th>administration heads</th>
<th>no answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of local authority</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rural district</td>
<td>93.80%</td>
<td>84.40%</td>
<td>71.90%</td>
<td>6.30%</td>
</tr>
<tr>
<td>municipality</td>
<td>73.50%</td>
<td>76.50%</td>
<td>67.60%</td>
<td>8.80%</td>
</tr>
<tr>
<td>town</td>
<td>88.50%</td>
<td>82.80%</td>
<td>77.70%</td>
<td>3.40%</td>
</tr>
<tr>
<td>Number of employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-150</td>
<td>71.40%</td>
<td>85.70%</td>
<td>57.10%</td>
<td>4.80%</td>
</tr>
<tr>
<td>151-300</td>
<td>87.20%</td>
<td>74.40%</td>
<td>82.10%</td>
<td>2.60%</td>
</tr>
<tr>
<td>301-500</td>
<td>82.10%</td>
<td>75.00%</td>
<td>71.40%</td>
<td>7.10%</td>
</tr>
<tr>
<td>over 500</td>
<td>92.30%</td>
<td>87.70%</td>
<td>75.40%</td>
<td>6.20%</td>
</tr>
</tbody>
</table>

Table A2: How are knowledge deficits recognised

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>dependent variable: monitor external job market</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>adjusted R²</td>
</tr>
<tr>
<td>0.143</td>
<td>0.06</td>
</tr>
<tr>
<td>Older average employee age</td>
<td>0.94</td>
</tr>
<tr>
<td>Fewer applicants</td>
<td>0.156</td>
</tr>
<tr>
<td>Unsuitable applicants</td>
<td>0.306</td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td>0.54</td>
</tr>
<tr>
<td>Retirement in large numbers</td>
<td>0.159</td>
</tr>
<tr>
<td>Knowledge can't be retained</td>
<td>0.658</td>
</tr>
<tr>
<td>Number of employees</td>
<td>0.032</td>
</tr>
<tr>
<td>Municipality</td>
<td>0.806</td>
</tr>
<tr>
<td>City</td>
<td>0.022</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>dependent variable: decrease in the number of applicants for apprenticeships</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>adjusted R²</td>
</tr>
<tr>
<td>0.164</td>
<td>0.084</td>
</tr>
<tr>
<td>Older average employee age</td>
<td>0.261</td>
</tr>
<tr>
<td>Fewer applicants</td>
<td>0.012</td>
</tr>
<tr>
<td>Unsuitable applicants</td>
<td>0.825</td>
</tr>
<tr>
<td>Decreased employee</td>
<td>0.282</td>
</tr>
<tr>
<td><strong>productivity</strong></td>
<td><strong>R</strong></td>
</tr>
<tr>
<td>------------------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>0.480</td>
</tr>
<tr>
<td><strong>knowledge can’t be retained</strong></td>
<td>0.676</td>
</tr>
<tr>
<td><strong>number of employees</strong></td>
<td>0.024</td>
</tr>
<tr>
<td><strong>municipality</strong></td>
<td>0.245</td>
</tr>
<tr>
<td><strong>city</strong></td>
<td>0.245</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>R²</strong></th>
<th><strong>adjusted R²</strong></th>
<th><strong>significance</strong></th>
<th><strong>Coefficient</strong></th>
<th><strong>VIF</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.141</td>
<td>0.060</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Independent variable**

**dependent variable: trainees are taken on permanently**

<table>
<thead>
<tr>
<th><strong>Older average employee age</strong></th>
<th><strong>Correlation after Pearson</strong></th>
<th><strong>Significance</strong></th>
<th><strong>Coefficient</strong></th>
<th><strong>VIF</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.266</td>
<td>-0.122</td>
<td>1.714</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>fewer applicants</strong></td>
<td>0.564</td>
<td>0.050</td>
<td>1.526</td>
<td></td>
</tr>
<tr>
<td><strong>unsuitable applicants</strong></td>
<td>0.731</td>
<td>-0.030</td>
<td>1.589</td>
<td></td>
</tr>
<tr>
<td><strong>decreased employee productivity</strong></td>
<td>0.471</td>
<td>0.074</td>
<td>1.228</td>
<td></td>
</tr>
<tr>
<td><strong>Retirements in large numbers</strong></td>
<td>0.428</td>
<td>-0.073</td>
<td>1.291</td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge can’t be retained</strong></td>
<td>0.361</td>
<td>0.059</td>
<td>1.388</td>
<td></td>
</tr>
<tr>
<td><strong>Number of Employees</strong></td>
<td>0.013</td>
<td>-0.516</td>
<td>1.975</td>
<td></td>
</tr>
<tr>
<td><strong>City</strong></td>
<td>0.299</td>
<td>-0.170</td>
<td>1.887</td>
<td></td>
</tr>
</tbody>
</table>

Table A3: Linear regression as defined in SPSS RP1 – Q3 and Q5

<table>
<thead>
<tr>
<th><strong>Older employees</strong></th>
<th><strong>Strategic HRM</strong></th>
<th><strong>Age structure analysis</strong></th>
<th><strong>Demographics-oriented administrative culture</strong></th>
<th><strong>Employee skills development</strong></th>
<th><strong>Knowledge management</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation after Pearson</td>
<td>0.071</td>
<td>0.264*</td>
<td>-0.012</td>
<td>0.062</td>
<td>-0.031</td>
</tr>
<tr>
<td>Significance</td>
<td>0.407</td>
<td>0.001</td>
<td>0.889</td>
<td>0.462</td>
<td>0.721</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Fewer applicants</strong></th>
<th><strong>Strategic HRM</strong></th>
<th><strong>Age structure analysis</strong></th>
<th><strong>Demographics-oriented administrative culture</strong></th>
<th><strong>Employee skills development</strong></th>
<th><strong>Knowledge management</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation after Pearson</td>
<td>0.009</td>
<td>0.018</td>
<td>0.181*</td>
<td>0.252**</td>
<td>0.14</td>
</tr>
<tr>
<td>Significance</td>
<td>0.912</td>
<td>0.83</td>
<td>0.039</td>
<td>0.003</td>
<td>0.102</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Unsuitable applicants</strong></th>
<th><strong>Strategic HRM</strong></th>
<th><strong>Age structure analysis</strong></th>
<th><strong>Demographics-oriented administrative culture</strong></th>
<th><strong>Employee skills development</strong></th>
<th><strong>Knowledge management</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation after Pearson</td>
<td>-0.084</td>
<td>-0.149</td>
<td>-0.002</td>
<td>-0.004</td>
<td>0.048</td>
</tr>
<tr>
<td>Significance</td>
<td>0.324</td>
<td>0.078</td>
<td>0.983</td>
<td>0.965</td>
<td>0.582</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Decreased employee productivity</strong></th>
<th><strong>Strategic HRM</strong></th>
<th><strong>Age structure analysis</strong></th>
<th><strong>Demographics-oriented administrative culture</strong></th>
<th><strong>Employee skills development</strong></th>
<th><strong>Knowledge management</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation after Pearson</td>
<td>-0.044</td>
<td>0.124</td>
<td>-0.021</td>
<td>-0.074</td>
<td>-0.044</td>
</tr>
<tr>
<td>Significance</td>
<td>0.608</td>
<td>0.147</td>
<td>0.816</td>
<td>0.389</td>
<td>0.612</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Retirements in large numbers</strong></th>
<th><strong>Strategic HRM</strong></th>
<th><strong>Age structure analysis</strong></th>
<th><strong>Demographics-oriented administrative culture</strong></th>
<th><strong>Employee skills development</strong></th>
<th><strong>Knowledge management</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation after Pearson</td>
<td>0.001</td>
<td>0.123</td>
<td>-0.046</td>
<td>0.038</td>
<td>0.011</td>
</tr>
<tr>
<td>Significance</td>
<td>0.991</td>
<td>0.15</td>
<td>0.606</td>
<td>0.66</td>
<td>0.901</td>
</tr>
</tbody>
</table>

Knowledge can’t be
secured
Correlation after Pearson  -0.122  0.096  0.005  0.036  -0.031
Significance  0.015  0.254  0.957  0.67  0.715

**The correlation is significant at the 0.01 level (two-tailed).
* The correlation is significant at the 0.05 level (two-tailed).

Table A4: Correlation Research proposition 3 – Question 3 (Demographic change) and 7 (Fields of HRM)

<table>
<thead>
<tr>
<th></th>
<th>Staff requirements</th>
<th>HR development</th>
<th>employee retention</th>
<th>Head count analysis</th>
<th>Departing employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation after Pearson</td>
<td>0.149</td>
<td>0.113</td>
<td>-0.005</td>
<td>0.181</td>
<td>-0.023</td>
</tr>
<tr>
<td>Significance</td>
<td>0.075</td>
<td>0.178</td>
<td>0.954</td>
<td>0.058</td>
<td>0.783</td>
</tr>
<tr>
<td>Fewer applicants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation after Pearson</td>
<td>0.125</td>
<td><strong>0.178</strong>*</td>
<td><strong>0.204</strong>*</td>
<td>0.081</td>
<td>0.105</td>
</tr>
<tr>
<td>Significance</td>
<td>0.136</td>
<td>0.033</td>
<td>0.015</td>
<td>0.34</td>
<td>0.217</td>
</tr>
<tr>
<td>Unsuitable applicants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation after Pearson</td>
<td>-0.061</td>
<td>0.022</td>
<td>0.009</td>
<td>-0.045</td>
<td>0.113</td>
</tr>
<tr>
<td>Significance</td>
<td>0.473</td>
<td>0.799</td>
<td>0.913</td>
<td>0.596</td>
<td>0.186</td>
</tr>
<tr>
<td>Decreased employee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>productivity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation after Pearson</td>
<td>0.051</td>
<td>-0.001</td>
<td>-0.136</td>
<td>-0.021</td>
<td>-0.034</td>
</tr>
<tr>
<td>Significance</td>
<td>0.547</td>
<td>0.989</td>
<td>0.109</td>
<td>0.812</td>
<td>0.689</td>
</tr>
<tr>
<td>Retirements in large</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>numbers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation after Pearson</td>
<td>0.08</td>
<td>0.07</td>
<td>-0.023</td>
<td>0.13</td>
<td>-0.014</td>
</tr>
<tr>
<td>Significance</td>
<td>0.346</td>
<td>0.41</td>
<td>0.789</td>
<td>0.131</td>
<td>0.872</td>
</tr>
<tr>
<td>Knowledge can't be</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>secured</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation after Pearson</td>
<td>0.149</td>
<td>-0.039</td>
<td>-0.006</td>
<td>0.147</td>
<td>0.125</td>
</tr>
<tr>
<td>Significance</td>
<td>0.075</td>
<td>0.639</td>
<td>0.947</td>
<td>0.082</td>
<td>0.141</td>
</tr>
</tbody>
</table>

**The correlation is significant at the 0.01 level (two-tailed).
* The correlation is significant at the 0.05 level (two-tailed).

Table A5: Correlation Research proposition 3 – Questions 3 (Demographic change) and 8 (Tasks of HRM)

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Significance</th>
<th>Coefficient</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older average employee age</td>
<td>0.093</td>
<td>0.003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent variable: strategic HRM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Older average employee age</td>
<td></td>
<td></td>
<td>0.332</td>
<td>0.128</td>
<td>1.719</td>
</tr>
<tr>
<td>Fewer applicants</td>
<td></td>
<td></td>
<td>0.771</td>
<td>0.03</td>
<td>1.502</td>
</tr>
<tr>
<td>Unsuitable</td>
<td></td>
<td></td>
<td>0.581</td>
<td>-0.06</td>
<td>1.245</td>
</tr>
<tr>
<td>Independent variable</td>
<td>Dependent variable: age structure analysis</td>
<td>R²</td>
<td>adjusted R²</td>
<td>significance</td>
<td>coefficient</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------</td>
<td>----</td>
<td>-------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Older average employee age</td>
<td>Decreased employee productivity</td>
<td>0.172</td>
<td>0.092</td>
<td>0.118</td>
<td>0.199</td>
</tr>
<tr>
<td>Fewer applicants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsuitable applicants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retirement in large numbers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge can't be retained</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependent variable: demographics-oriented administrative culture</th>
<th>R²</th>
<th>adjusted R²</th>
<th>significance</th>
<th>coefficient</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older average employee age</td>
<td>Decreased employee productivity</td>
<td>0.067</td>
<td>-0.03</td>
<td>0.966</td>
<td>0.006</td>
<td>1.751</td>
</tr>
<tr>
<td>Fewer applicants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsuitable applicants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retirement in large numbers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge can't be retained</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

288
<table>
<thead>
<tr>
<th>Number of employees</th>
<th>0.471</th>
<th>0.056</th>
<th>1.387</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipality</td>
<td>0.748</td>
<td>0.081</td>
<td>2.036</td>
</tr>
<tr>
<td>City</td>
<td>0.589</td>
<td>0.108</td>
<td>1.920</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R²</th>
<th>adjusted R²</th>
<th>significance</th>
<th>coefficient</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.143</td>
<td>0.06</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Independent variable**

**Dependent variable: employee skills development knowledge management**

<table>
<thead>
<tr>
<th>Older average employee age</th>
<th>0.635</th>
<th>-0.05</th>
<th>1.703</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fewer applicants</td>
<td>0.008</td>
<td>0.221</td>
<td>1.496</td>
</tr>
<tr>
<td>Unsuitable applicants</td>
<td>0.358</td>
<td>-0.08</td>
<td>1.221</td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td>0.961</td>
<td>0.005</td>
<td>1.230</td>
</tr>
<tr>
<td>Retirement in large numbers</td>
<td>0.573</td>
<td>0.046</td>
<td>1.579</td>
</tr>
<tr>
<td>Knowledge can’t be retained</td>
<td>0.672</td>
<td>-0.038</td>
<td>1.273</td>
</tr>
<tr>
<td>Number of employees</td>
<td>0.025</td>
<td>0.139</td>
<td>1.369</td>
</tr>
<tr>
<td>Municipality</td>
<td>0.439</td>
<td>0.153</td>
<td>1.978</td>
</tr>
<tr>
<td>City</td>
<td>0.979</td>
<td>0.004</td>
<td>1.916</td>
</tr>
</tbody>
</table>

Table A6: Linear regression Research proposition 3 – Questions 3 (Demographic change) and 7 (Fields of HRM)

<table>
<thead>
<tr>
<th>Is there a training and development concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation after Pearson</td>
</tr>
<tr>
<td>Significance</td>
</tr>
</tbody>
</table>

**Comparison staff with organisational requirements**

| Correlation after Pearson                  | 0.126 | **0.211** | -0.114 | 0 | 0.031 | 0.1 | 0.1 | 58 |
| Significance                               | 0.132 | 0.011 | 0.179 | 0.998 | 0.714 | 0.0 | 0.0 | 59 |

**Discrimination of older employees**

| Correlation after Pearson                  | -0.019 | 0.124 | 0.053 | 0.034 | 0.003 | **0.1** | 0.1 | 72 | * |
| Significance                               | 0.823 | 0.137 | 0.527 | 0.685 | 0.972 | 0.0 | 0.0 | 38 |

**Cutbacks in training budgets**

| Correlation after Pearson                  | 0.035 | 0.012 | 0.155 | -0.045 | 0.143 | **0.1** | 0.1 | 72 |

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**The correlation is significant at the 0.01 level (two-tailed).**

* The correlation is significant at the 0.05 level (two-tailed).

Table A7 Correlation Research proposition 4 – Questions 3 (Demographic change) and 19 (Training activities)

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependent variable: knowledge management system is in place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older average employee age</td>
<td>0.349 -0.143 1.784</td>
</tr>
<tr>
<td>Fewer applicants</td>
<td>0.015 0.293 1.547</td>
</tr>
<tr>
<td>Unsuitable applicants</td>
<td>0.386 -0.107 1.239</td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td>0.991 -0.002 1.243</td>
</tr>
<tr>
<td>Retirement in large numbers</td>
<td>0.34 0.113 1.627</td>
</tr>
<tr>
<td>Knowledge can't be retained</td>
<td>0.17 -0.173 1.301</td>
</tr>
<tr>
<td>Number of employees</td>
<td>0 0.321 1.386</td>
</tr>
<tr>
<td>Municipality</td>
<td>0.933 0.024 1.947</td>
</tr>
</tbody>
</table>

**The correlation is significant at the 0.05 level (two-tailed).**

Table A7 Correlation Research proposition 4 – Questions 3 (Demographic change) and 19 (Training activities)
<table>
<thead>
<tr>
<th>variable</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Significance</th>
<th>Coefficient</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older average employee age</td>
<td>0.246</td>
<td>0.192</td>
<td>1.673</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fewer applicants</td>
<td>0.173</td>
<td>0.176</td>
<td>1.410</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsuitable applicants</td>
<td>0.738</td>
<td>-0.045</td>
<td>1.165</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td>0.04</td>
<td>-0.317</td>
<td>1.220</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retirement in large numbers</td>
<td>0.381</td>
<td>-0.11</td>
<td>1.581</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge can't be retained</td>
<td>0.559</td>
<td>0.08</td>
<td>1.331</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of employees</td>
<td>0.201</td>
<td>0.127</td>
<td>1.430</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipality</td>
<td>0.875</td>
<td>0.051</td>
<td>1.860</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Independent variable: social skills**

<table>
<thead>
<tr>
<th>variable</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Significance</th>
<th>Coefficient</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older average employee age</td>
<td>0.926</td>
<td>-0.015</td>
<td>1.668</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fewer applicants</td>
<td>0.153</td>
<td>0.185</td>
<td>1.439</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsuitable applicants</td>
<td>0.985</td>
<td>-0.003</td>
<td>1.170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td>0.138</td>
<td>-0.225</td>
<td>1.207</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retirement in large numbers</td>
<td>0.763</td>
<td>-0.037</td>
<td>1.561</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge can't be retained</td>
<td>0.978</td>
<td>-0.004</td>
<td>1.329</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of employees</td>
<td>0.025</td>
<td>0.223</td>
<td>1.438</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipality</td>
<td>0.954</td>
<td>0.018</td>
<td>1.861</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Independent variable: leadership skills**

<table>
<thead>
<tr>
<th>variable</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Significance</th>
<th>Coefficient</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older average employee age</td>
<td>0.909</td>
<td>-0.018</td>
<td>1.682</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fewer applicants</td>
<td>0.035</td>
<td>0.258</td>
<td>1.396</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsuitable applicants</td>
<td>0.284</td>
<td>-0.136</td>
<td>1.148</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased employee productivity</td>
<td>0.136</td>
<td>-0.215</td>
<td>1.216</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retirement in large numbers</td>
<td>0.510</td>
<td>-0.078</td>
<td>1.581</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge can't be retained</td>
<td>0.749</td>
<td>-0.041</td>
<td>1.333</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of employees</td>
<td>0.011</td>
<td>0.240</td>
<td>1.451</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipality</td>
<td>0.806</td>
<td>-0.075</td>
<td>1.917</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table A8: Linear regression Research proposition 4 – Questions 3
(Demographic change) and questions 19 (Training activities) and 20 (Key skills)

<table>
<thead>
<tr>
<th>Independent Variable (iV)</th>
<th>Dependent Variable (dV)</th>
<th>Question</th>
<th>Research proposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic change</td>
<td>Effects with respect to recruitment and HR management</td>
<td>iV: 3 dV: 5</td>
<td>RP 1 Demographic change is hindering the acquisition of new junior employees.</td>
</tr>
<tr>
<td>Age structure analysis</td>
<td>HR development system</td>
<td>iV: 12 dV: 10</td>
<td>RP 2 If an age structure analysis is in place in local authorities then it serves as a foundation for HR development.</td>
</tr>
<tr>
<td>Demographic change</td>
<td>HR development systems</td>
<td>iV: 3 dV: 7,8, 10,22,24, 26,34</td>
<td>RP 3 The effects of demographic change are positively associated with the deployment of instruments for HR development.</td>
</tr>
<tr>
<td>Demographic change</td>
<td>Processes for knowledge sharing and knowledge retention</td>
<td>iV: 3 dV: 19,20</td>
<td>RP 4 There will be an influence from the demographic change to the strategic direction of training activities.</td>
</tr>
<tr>
<td>Demographic change</td>
<td>Processes for knowledge sharing and knowledge retention</td>
<td>iV: 3 dV: 37</td>
<td>RP 5 There will be a number of separate processes that local German authorities will engage in with regard to knowledge sharing and preservation within the organisation.</td>
</tr>
<tr>
<td>Results of the factor analysis regarding knowledge sharing and knowledge preservation</td>
<td>Results of the cluster analyses regarding to: effects of demographic change on workforce potential, recruitment, new fields of HRM, further training and also East/West, number of employees and inhabitants</td>
<td>iV: 37 dV: 3,5, 7,19,40, 41,42</td>
<td>RP 6 The implementation of workforce planning processes to facilitate the management of knowledge depends on how well HR managers know the topic, the location and size of the local authority.</td>
</tr>
</tbody>
</table>

Table A9: Research propositions – independent/dependent questions
Summary of those results that do not directly address the research proposition 1; results of the cluster analysis

The aim of the cluster analysis is to establish whether the two clusters, negative effects of demographic change on workforce potential are above average (3_2) and negative effects are below average (3_1), have statistically significant influences on clusters: more negative effects on recruitment (5_1) or negative effects on recruitment are below average (5_2) (see chapters 5.3.2.1 and 5.3.2.2).

The prediction here is that demographic change in local authority administrations effects recruitment. In local authorities in which the effects of demographic change are already being felt, recruitment will also be more difficult. There should therefore be a positive association between cluster 3_2 and cluster 5_1.

The matrix of correlations for questions 3 and 5 (see Table A10) gives the following result:

<table>
<thead>
<tr>
<th>Negative effects on demographic change on workforce potential (cluster 3)</th>
<th>Negative effects on recruitment (cluster 5)</th>
<th>1 (above average)</th>
<th>2 (below average)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (below average)</td>
<td>N</td>
<td>30</td>
<td>40</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>42.9</td>
<td>57.1</td>
<td>100.00</td>
</tr>
<tr>
<td>2 (above average)</td>
<td>N</td>
<td>19</td>
<td>40</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>32.2</td>
<td>67.8</td>
<td>100.00</td>
</tr>
<tr>
<td>Total</td>
<td>N</td>
<td>49</td>
<td>80</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>38.0</td>
<td>62.0</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Pearson Chi² Test
Asymptotic significance: 0.214 (two-sided)

<table>
<thead>
<tr>
<th>Value</th>
<th>Asymptotic standard error (a)</th>
<th>Approximated T (B)</th>
<th>Approximated significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kendall-Tau-b</td>
<td>0.109</td>
<td>0.087</td>
<td>1.255</td>
</tr>
<tr>
<td>Kendall-Tau-c</td>
<td>0.106</td>
<td>0.084</td>
<td>1.255</td>
</tr>
<tr>
<td>Gamma</td>
<td>0.224</td>
<td>0.175</td>
<td>1.255</td>
</tr>
</tbody>
</table>

Table A10: Matrix correlation between cluster 3 and cluster 5
References


und Integration durch neue Wege der Qualifizierung. Bielefeld: W. Bertelsmann Verlag GmbH & Co.KG, pp. 17-36.


Calzaferri, F. (no date)


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öffentlichem Sektor. Wiesbaden: VS Verlag für Sozialwissenschaften, pp. 73-94.


