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“Surround yourself with the dreamers and the doers, the believers and thinkers, but most of all, surround yourself with those who see greatness within you, even when you don´t see it yourself.”

(Edmund Lee)

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Abstract

Theories on management, organizations, strategy or innovation evolved over the last century and followed some basic rules to which managers, stakeholders and employees could stick and rely on. Due to exponential changes related to technology, data and thus society organizations are facing new trends, phenomena and challenges.

In the early 1990s the term Business Process Management developed out of different earlier approaches and since then, this management approach faces numerous evolutions. The management of business processes and value chains is vital for the sustainable market presence of organizations in different sectors.

The question about the effect and impact of different influencing factors on the processes within organizations and the extent to which that influences will require businesses to rethink their process management activities is answered with the help of an online survey where business process professionals world-wide were asked to provide their opinions and expertise.

The results of this research are that the factors “Innovation and Digitization” followed by “Strategy” and “Leadership and Management” have the highest level of influence for the future development of Business Process Management.

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Kurzfassung

Theorien über Management, Organisationen, Strategie oder Innovation entwickelten sich im Laufe des letzten Jahrhunderts und folgten einigen Grundregeln, auf die sich Manager, Interessengruppen und Mitarbeiter verlassen konnten. Aufgrund exponentieller technologischer Veränderungen, ständig verfügbarer Daten und der Gesellschaft stehen Organisationen neuen Trends, Phänomenen und Herausforderungen gegenüber.

In den frühen 1990er Jahren entwickelte sich der Begriff Geschäftsprozessmanagement (Business Process Management) aus verschiedenen früheren Ansätzen und unterliegt seither zahlreichen Entwicklungen. Das Management von Geschäftsprozessen und Wertschöpfungsketten ist entscheidend für die nachhaltige Marktpräsenz von Organisationen in unterschiedlichen Branchen.

Die Frage nach dem Ausmaß von Auswirkungen verschiedener Einflussfaktoren auf die Prozesse innerhalb von Organisationen und deren Einfluss auf die Prozessmanagementaktivitäten von Unternehmen wird mit Hilfe eines Online-Fragebogens beantwortet, in dem weltweit Business Process Professionals befragt wurden, um ihr Fachwissen zur Verfügung zu stellen.

Die Ergebnisse dieser Forschung zeigen, dass Innovation und Digitalisierung gefolgt von Strategie und Führung und Management die einflussreichsten Faktoren für die zukünftige Entwicklung von Geschäftsprozessmanagement sind.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
APQC PCF	American Productivity & Quality Centre Process Classification Framework
BPM	Business Process Management
BPM CBOK	Business Process Management Common Body of Knowledge
BPMN 2.0	Business Process Model & Notation version 2.0
BPM&O	BPM Consulting Company
BPMS	Business Process Management System
BPQL	Business Process Query Language
BPR	Business Process Reengineering
CEO	Chief Execution Officer
CMMI	Capability Maturity Model Integration
EFQM	European Foundation for Quality Management
ERP	Enterprise Resource Planning
IoT	Internet of Things
IT	Information Technology
KPI	Key Performance Indicator
MIT	Massachusetts Institute of Technology
OMG Group	Object Management Group
PEMM	Process Enterprise Maturity Model
PESTLE	Political, Economic, Social, Technological, Legal, Environmental analysis
SOA	Service-Oriented Architecture
SWOT	Strengths – Weaknesses – Opportunities – Threats analysis
TOWS	Threats – Opportunities – Weaknesses - Strengths analysis
VRIO	Value, Rareness, Imitability, Organization analysis
XPDL	XML Process Definition Language

1. INTRODUCTION

The 21st century has become known as the 4th Industrial Age. At the root of this term is the fast-changing world of both society and business, characterized by exponential development and use of digital transformation, Artificial Intelligence (AI), robotics and cloud technology providing information at any time anywhere supported by the Internet of Things (IoT).

Processes are a major success factor for traditional management forms and can be described as highly structured connections of organizational activities.

Experiences of the 4th Industrial Age and thus technological demands have led organizations to realise that conventional approaches to organizational design and management are too slow and laborious for this increasingly fast paced and connected world. To date many organizational alternatives are being tested to identify and verify new ways of working (Palkovits-Rauter, 2018).

Given the major role that 'processes' have in the success of current business models, a question arises as to what type of processes, if any, will be required for the new emerging and future organizational designs?

Numerous discussions and excurses can be found in the management press and academic sessions as to whether processes in their current form are, in the main, too rigid and slow for the emerging business demands (Marchand et al., 2002). However, there is too little empirical work in these important areas.

This research aims in identifying influencing factors of Business Process Management; the effect and impact of these influencing factors on the processes within organizations; the possible interdependence of the influencing factors under analysis on each other; and the extent to which potential influences will force businesses to rethink their Business Process Management activities (Palkovits-Rauter, 2018).

A study based on Information Orientation, conducted by Marchand et al. (2002) basically pointed out that the management of people, information and technology will improve business performance. Information Orientation measures the extent to which senior managers perceive that their organizations possess the capabilities associated with effective information use to improve business performance.

The roles of information and technology have tremendously changed since that time and were researched very well during the past decades. Business Process Management and Human Resource Management are almost the same and now struggle. It seems that processes and their management within organizations did not change since the nineties, nor did the management of human resources. Organizations have changed their recruiting processes from labour provider to applicant.

One starting point in connection with this research is provided by a survey on the importance of Service-oriented Architecture (business process-based execution of tasks that refer to

business rules within IT systems), Cloud Computing and Big Data for Business Process Management (BPM) for organizations worldwide in 2015. It shows that 31% of responding organizations focus on process work and are not too concerned with SOA or Cloud Computing. 20% of the participants are beginning to explore these technologies (BPTrends, 2018).

One very interesting finding, provided by Figure 1, is that Cloud Computing (10%), SOA (6%) or Big Data (6%) are important for the responding organizations, but they do not use these topics in conjunction with Business Process Management that much. Service-oriented Architecture ranges here with only 10%. iBPM (intelligent Business Process Management) is the combination of Business Process Management and intelligence capabilities like Artificial Intelligence or Internet of Things (Quirk, 2018).

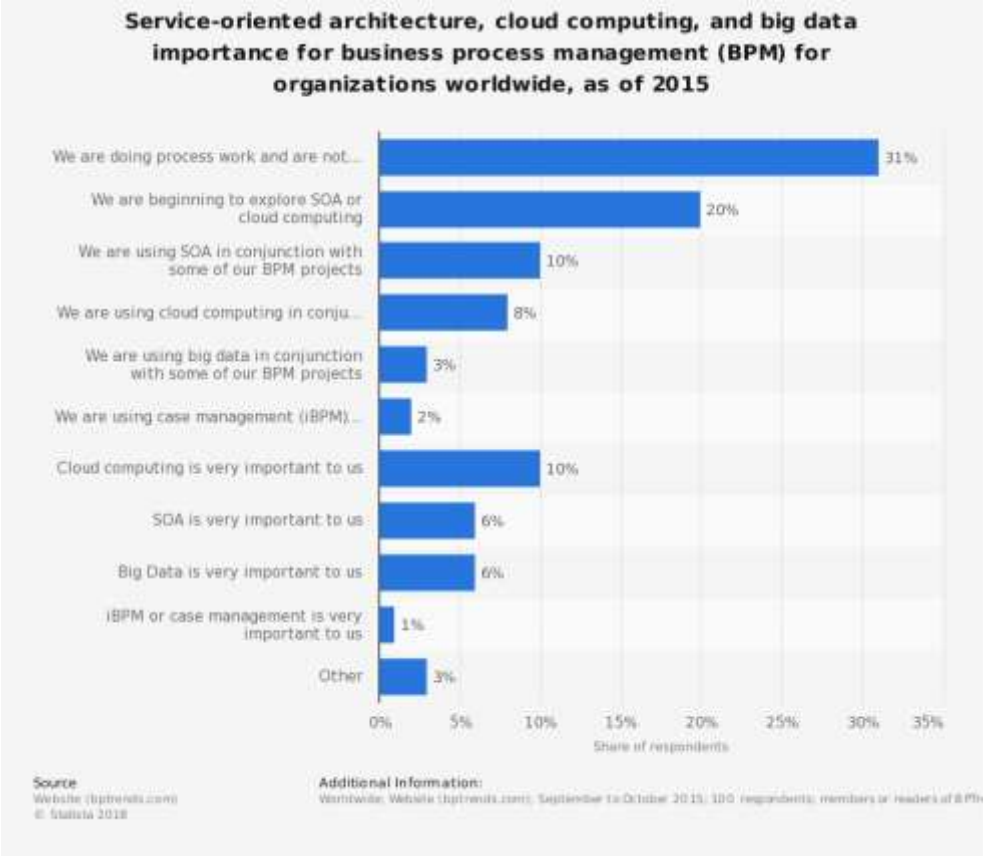

Figure 1 Importance of Technology for BPM, source: www.statista.de (2018)

Figure 1 shows that it seems that not trendy buzzwords are important for the future development of Business Process Management. Macroeconomic phenomenon, emerging organizational forms, diverging generations of workers, leadership models, physical space concepts, technology, strategies and the impact on financial performance all build a stakeholder landscape surrounding processes of an organization. The exploitation of their impact, influence and density will be the core research area of this thesis.

After this first chapter of a short introduction into the research topic the third chapter provides a holistic and critical literature review on Business Process Management as well as selected influencing factors under research. The following topics have been selected as they have interesting connections with each other and are all focussing on a process view found in some theoretical works by different authors:

- *Strategy* - An organization's strategy is directly linked to Business Process Management as processes should meet strategic goals in an operative manner.
- *Organizational Evolution* - The defined organizational structure determines the implementation of Business Process Management; the less hierarchy, the less processes.
- *Generational Workforce* - Different generations in the workplace need aligned conduits of communication related to process information.
- *Leadership & Management* - Agility in both leadership styles and management determines the structure of Business Process Management within an organization.
- *Innovation & Digitization* - Information technology and innovation are both boosting organizations, but still processes have to be defined to sustain in the market.
- *Supply Chain Management & Circular Economy* - Both are very process-oriented as new opportunities and sustainability can be derived from processes.

As one of the hypotheses of this research work is concerned with the level of influence of influential factors on the future development of Business Process Management, these topics are examined and treated in context with processes, Business Process Management and related management concepts.

The definition of these six topics, called influencing factors or also shaping forces in the third chapter of this thesis resulted from an expert workshop where different views on processes, management concepts and trends and hypes where extracted and discussed (Butterfield, 2017). These findings were sorted and categorized and finally ended in the definition of the shaping forces described above.

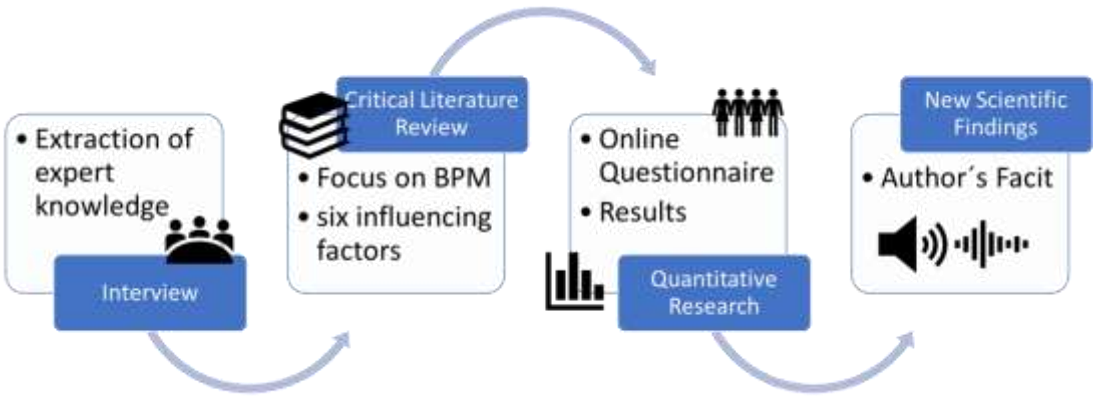

Figure 2 Structure of this thesis, own illustration

Chapter two provides theoretical insights on the research methodologies used for this thesis. These are the expert interview and the online questionnaire with statistical measures.

With the input of the critical literature review an online questionnaire was developed. The results of the survey are displayed and explained in chapter four.

Finally, new scientific findings are provided in chapter five. A brief summary as well as concluding words are forming the last chapter of this work.

2. RESEARCH QUESTIONS AND HYPOTHESES

The main question this thesis is dealing with is as to which extent the discipline of Business Process Management is exposed and thus open for changes by factors such as strategy, the generational workforce, developments in organization theory, new findings on leadership and management, exponential changes in innovation and digitization or new theories on Supply Chain Management and Circular Economy.

For a deeper analysis of these topics a comprehensive literature analysis is provided in chapter three of this thesis. The points of connection and potential interdependencies of the individual topics are analysed and depicted.

In order to gain direct insights into the topic of process management and current organizational challenges as well as to investigate previously established hypotheses based on the literature analysis, a survey was carried out in the form of an online questionnaire.

Four hypotheses have been formulated and are as follows:

H1 = the levels of influence on Business Process Management of influential factors are the same across knowledge-intensive business services in Europe.

Knowledge-intensive business services (KIBS) are defined as "*firms performing, mainly for other firms, services encompassing a high intellectual added-value.*" (Muller & Zenker, 2001) Organizations operating as a knowledge-intensive business service provider usually offer knowledge intensive services, problem-solving consulting and client-related interaction services. Thus, the definition of KIBS does not imply that one particular influential factor has more impacts on future developments on Business Process Management than others.

H2 = the size of the business does not influence the level of influence of the influential factors on Business Process Management

99,2% of organizations within European industries are small and medium sized enterprises (European Union, 2017). Literature does not exclude the implementation of Business Process Management in small and medium sized organizations and other factors such as strategy or leadership & management do apply for all types and sizes of organizations.

H3 = the age provide by the participant is significant for the level of influence of the influential factors on Business Process Management

Members of the Baby Boomer generation are still holding influential positions with authority within organizations and thus are strongly related to influential factors such as strategy or leadership and management (Anantatmula & Shrivastav, 2012). Innovation and digitization are more connected to Generation Y or also called Digital Natives or the Google Generation

(Meister & Willyerd, 2010), therefore the implication of different viewpoints on influencing factors is immanent.

H4 = the primary influencing factors on Business Process Management are the six provided (strategy, organizational evolution, generational workforce, leadership & management, innovation & digitization and Supply Chain Management & circular economy)

Chapter 3 provides a comprehensive literature review that already shows strong relations to Business Process Management. A quick check on all published papers in the Business Process Management Journal of 2016 and 2017 (Emerald Insight, 2017) showed that the main topics under research were Internet of Things, Data Analysis, Innovation, Supply Chain Management and Strategic Performance Management, see also Annex B of this thesis.

The results of this survey are analysed in detail using statistical methods and presented in chapter 5. In this case, special attention is paid to the validation or refutation of the hypotheses.

2.1 Methodology

This section of the thesis briefly describes the research methodologies used to proof the hypotheses defined. The described methods are extending each other through method triangulation.

2.1.1 Expert Workshop

An alternative form of an interview without a fixed set of questions and no obligation on both sides, the interviewer and the interviewee, is called open interview, guided conversation or intensive interview. This type of interview, not to be mixed up with “in-depths interviews”, provides especially high quality of information and is usually very intensive in contrary to standardized interviews (Stier, 1999). The collection of data with the help of such an interview or guided conversation is seen as a pre data set process to help with the follow-up process of quantitative research (Swetnam, 2006). This guided conversation was conducted with the author of this thesis as interviewer and an expert in this field as interviewee (Butterfield, 2017). Dr. Reginald Butterfield is lecturer at numerous national and international universities, he has an impressive track record of publications on topics such as new public management or modelling cloud application life cycles and he is working for several companies as consultant in organizational change projects. The main aim of conducting this guided conversation was to understand the world as the interview partner sees it. New relevant insights on experience and opinions can be gained instead of getting a right answer through such a research methodology (Adler & Clark, 2014).

The interview itself was not recorded and thus there is no transcript, but the essence of the two-folded interview was documented on flipcharts that are provided in the annex of this thesis (Annex C – Flipchart Transcript).

2.1.2 Literature Review

A critical literature review provides concepts, theories and arguments other researches already have found in the field of related topics. The state-of-the-art on the problem influential factors on future developments on Business Process Management is important to be analysed at first place. It also aims to show how far different research is related and to identify areas that can be built on the basis of past findings. Existing knowledge and experience will be presented in order to show where further research should be done. Thus, the analysis represents a pure summary of existing working papers (Webster & Watson, 2002).

Cooper (1988) describes three major goals of a literature review: criticism on determined criteria to compare existing works, identification of vital challenges to analyse earlier papers and their research questions, to analyse future research works or identify methodical problems and integration to compare a number of papers from different authors. The focus of this thesis is on the identification of vital challenges. The author also expects to explore gaps of research related to different topics of the literature review. These gaps will be detected and stressed out.

Important factors while conducting a literature review are the position of the author that can be either neutral or biased, the degree of coverage – either complete or representative – and the organization that is either historical, conceptual or methodical. Last but not least the target group has to be determined. Cooper (1988) distinguishes between experts, general science and general public.

The literature review within this thesis is a representative and biased work that is focussing on a historical presentation of the results for interested experts, scientists and the general public. The literature review is done separately topic by topic with the aim to find interdependencies with the main topic of Business Process Management.

In the first step an historical overview is provided, followed by related theories, development waves the current status quo as well as trends and perspectives. Figure 3 explains the research fields of the literature review with the connection to Business Process Management.

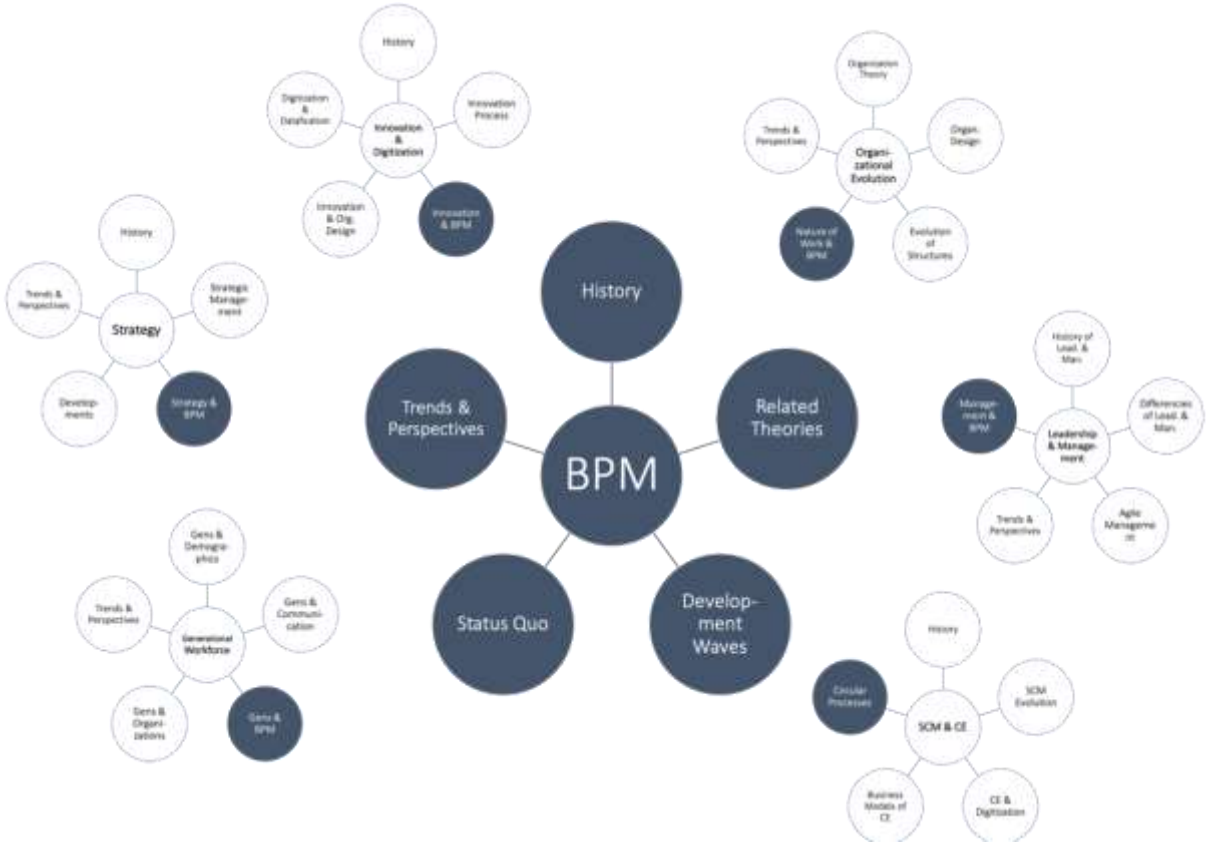

Figure 3 Literature Review of this thesis, own illustration

2.1.3 Quantitative Research

The main aim of conducting quantitative research methods is to collect and to analyze structured data to build accurate and reliable measurements in statistical analysis. While qualitative research answers the "Why" of a given situation, quantitative research provides answers to the "What" and "How". With questions like to what extend? (with the help of for example a Likert scale) this type of research uncovers behaviors and thus highlights trends across data sets, but not the motivation behind observed groups (Goertzen, 2017).

The literature review conducted in chapter 3 of this thesis observed facts and findings of researches. This data is measured and quantified in an objective way with the help of the provided questionnaire and finally evaluated using statistical analysis. As a result of quantitative research, the data can be summarized and used for further scientific findings.

Fricker (2008) distinguishes between internet-based surveys and traditional surveys in the context of data collection, where sampling is the means of selecting a subset of a larger population to study. Internet surveys are run at almost zero cost and can collect data in millions. Representative surveys conducted in this context do not mean that the sample corresponds to the population in terms of observable characteristics, but that the results collected from these data would be consistent with those we would have collected from the entire population.

Sampling methods for internet-based surveys are based on probability or non-probability. The types of probabilistic sampling methods are simple random sampling, stratified random

sampling, cluster sampling and systematic sampling. When selecting non-probability samples participation is left up to any individual.

The sampling method used in this thesis is a sampling mix based on a list and unrestricted self-selected samples. A prerequisite for simple random sampling based on a list is a kind of contact information, for example an email address to access the sampling frame (Fricker, 2008). In this particular case, the contact details were the registration to specialized and professional groups within a social media network called LinkedIn. The unrestricted self-selected sample was made on the same social network by posting an article with the link to the questionnaire within the author's profile on social media, where 587 people viewed the post, see Figure 4 (Palkovits-Rauter, 2018).

The recruitment of the study participants was exclusively based in the investigator's personal social network (LinkedIn), with no financial incentives or any other form of compensation for participation. The questionnaire was posted as article within the social media profile as well as in different LinkedIn-groups, specialized in Business Process Management, see a screenshot in Figure 5. Prerequisite to post something in a professional group is the permission to become a member.

Figure 4 Unrestricted self-selected sampling with LinkedIn; source: www.linkedin.com

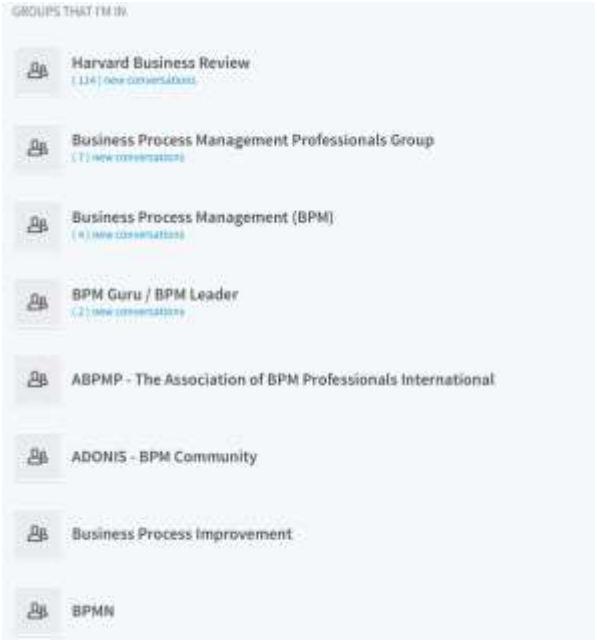

Figure 5 LinkedIn Groups for participant recruitment, source: www.linkedin.com

2.1.4 Measures

The questions in the online survey were designed with simple language, without the use of abbreviations or foreign language idioms. The sentences were very specific with precise scales and clear wording avoiding vague terms. Since the subject is very specific and the target group is limited to Business Process Practitioners, the questions included all the necessary information and were formulated in a not too precise manner (Taylor-Powell, 1998). The first question of the questionnaire intended to be a filter question as the type of knowledge-intensive services the respondent is working for is important for hypothesis 1 of this thesis. The type of this specific question was multiple choice with only one possible answer (single choice).

The second part of the questionnaire contained closed questions with a clear choice of answers, examples here being the size of the business in which the respondent works or the age range to which the participant belongs (Palkovits-Rauter, 2018).

The third, most informative part of the questionnaire, introduced six shaping forces with short and precise sentences. The survey respondents could choose up to six given factors within a partially closed question. The indication of at least three other factors was also possible. After this question, for each of the six influencing factors provided, a closed question with ordered responses and a Likert scale with five options requesting agreement or disagreement concluded the questionnaire. With these six scales, 30 different statements were asked to be scored “strongly disagree” to “strongly agree”, see Figure 6.

Please indiciate your agreement or disagreement on the following statements on strategy and BPM.

	Disagree strongly	Disagree	Neither agree nor disagree	Agree	Agree strongly
A competitive strategy is the perfect fit of business process activities to succeed on the market.	○	○	○	○	○
Core processes influence strategic goals and vice versa.	○	○	○	○	○
The digital age influences strategies in many ways (networked customers, data generated in all processes or rapid experimentation in innovation).	○	○	○	○	○
Platform businesses such as Apple´s iPhone and App Store do not optimize business processes but use other metrics to measure success.	○	○	○	○	○
Having a digital strategy is essential for staying competitive.	○	○	○	○	○

Figure 6 Example Likert Scale Question, source: online questionnaire

The detailed information on respondents are described in the next chapter, the complete questionnaire is listed in Annex D – Questionnaire.

For the analysis of several categorical variables in the questionnaire, such as age group, firm size or industry region, descriptive statistics such as frequencies were performed in the tool SPSS v.24. The outputs of descriptive statistics are for example the minimum and maximum values, the mean or the standard deviation (Palkovits-Rauter, 2018).

For some analyses, the underlying data file has been split to get results for different groups separately. Individual elements can be combined with data sets to avoid a large number of individual results. A major issue before the collected data can be analyzed in depth is the error checking in the data sets. A quick summary is provided by the codebook of the tool SPSS v.24, see Annex E – CodeBook. To obtain descriptive statistics for categorical variables, frequencies are used. This statistical method tells the researcher how many participants gave each answer (Pallant, 2010).

Special attention was given to analysing the data on the thirty different statements provided to respondents asking for agreement or disagreement within Likert scales. To be able to identify groups or clusters of these variables, the factor analysis was performed. This technique of the factor analysis has three different applications: understanding the structure of a set of variables, measuring specific variables with a survey and reducing the data set to a size that is more manageable (Field, 2005).

For an efficient and focused evaluation of the required target value sets, the method of exploratory factor analysis was conducted. The manifest variables retrieved in the questionnaire are therefore attributed to a smaller number of latent factors (Palkovits-Rauter, 2018). In accordance with the underlying basic assumptions of the factor analysis, the expression of a fixed variable can be decomposed additively into a weighted sum of the factors:

$$x_{im} = \sum_{j=1}^{f} \xi_{ij} \lambda_{mj} + \varepsilon_{mi}$$

where x_{im} is the observed expression of the questionnaire participant i for the characteristic m, ξ_{ij} the expression of the participant i for the factor j, λ_{mj} represents the factor loading of the observed feature on the latent factor j. f describes the number of occurrences x_{im} the underlying factors and ε_{mi} an error item (Moosbrugger & Hartig, 2002).

Results on the factor analysis are presented in upcoming chapters 4.4 Factor analysis and 5.5 Results on Factor Analysis.

3. LITERATURE ANALYSIS

3.1 Business Process Management

A current survey on Business Process Management, conducted by BearingPoint and BPM&O in 2017 found out that 77% of companies in Germany, Switzerland and Austria think that sustainable and holistic Business Process Management is the basis for the challenges of digital transformation. Another two thirds estimate that customer orientation is still not within the focus of Business Process Management, while cost cutting, more transparency, harmonized and standardized processes, higher quality and digital processes are the aims of Business Process Management for organizations (Bearing Point & BPM&O, 2017).

Before explaining what business processes and the management of these processes are, the basic underlying theory should be explained. Many available definitions on business processes are provided by literature today, but nearly all of them are originated from the simple explanation provided in Figure 7. Every system has a defined input that is transformed and produces a desired output (Von Bertalanffy, 1969).

Figure 7 System Theory,
own illustration, source: von Bertalanffy (1969)

With the General Systems Theory comparative similarities between different systems and hierarchical levels can be explained, where *"a system is a set of interacting units or elements that form an integrated whole intended to perform some function"* (Skyttner, 1996). A more pragmatic way of defining a system in the context of management is any structure that has an order, patterns and a certain purpose. A very basic concept of the General Systems Theory is the one of order and the presumed existence of a law of order. Important theorists on General System Theory are Von Bertalanffy (1969), Litterer (1969), Churchman (1979), Bowler (1981) and Boulding (1985).

The connection between General Systems Theory and Business Process Management can be derived from the features of the described theory: systems have objects and attributes with interrelationships and interdependences, systems should be holistic and consider the entire biosphere, systems are goal seeking, systems must transform inputs into outputs, systems are either closed with determined inputs or open with inputs from outside, systems have a certain

amount of disorder or randomness (entropy), systems must regulate its interrelated objects, systems consist of hierarchies, systems that are complex have specialized units that perform specialized functions (division of labour) and systems can reach objectives through alternative ways (divergence) or obtain different objectives (convergence) (Von Bertalanffy, 1969).

When giving an historical overview of Business Process Management, see also Figure 8, the first ones to mention are Adam Smith (1723-1790) with his division of labour approach, Frederik Taylor (1856-1915) with Scientific Management and Henry Ford (1863-1947) with the creation of production lines for mass production. All three ideas are used in today's Business Process Management systems. Taylor (1914) and his colleagues started a revolution in manual work by splitting working units to small entities and so developed modern industrial engineering. The result was process improvement for production processes. Taylor believed performance will increase when the worker is isolated. These efforts can be assigned to the 2nd Industrial Revolution. At about the same time Alan Turing (1912-1954) described his Turing machine with a kind of process model. Carl Adam Petri (1926-2010) introduced Petri nets in 1962 which were adopted by most of the still available Business Process Management modelling notations (Van der Aalst, 2013).

Both Davenport (1993) and Drucker (2001) researched and explained the evolution of management within Bell Laboratories back in the 1930s, where a second approach to business improvement was implemented. While Taylor introduced product inspection as a means of quality assurance at the end of the production line without influencing the process itself, Shewart, Deming, Juran and others stipulated strict analyses and control – so-called quality controls - of the production process.

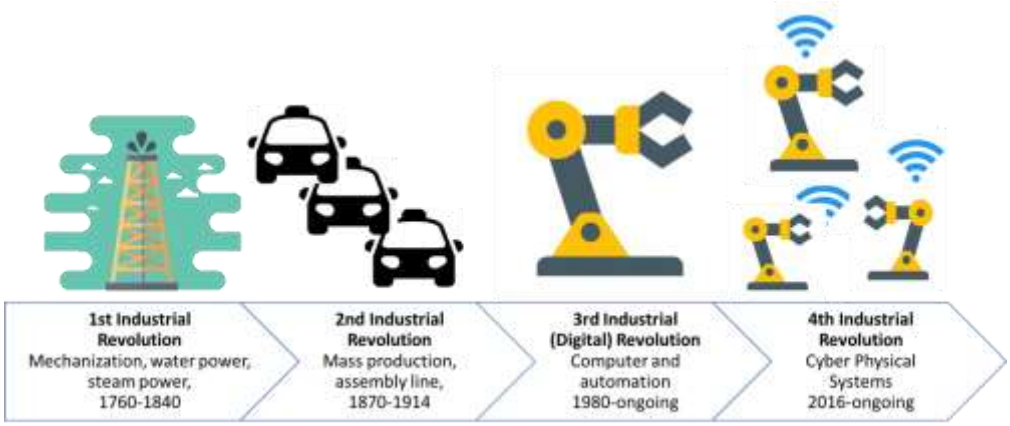

Figure 8 Industrial Revolutions, own illustration

The next great addition to process management connected to the stages of industrial revolution´s 3rd stage, the initial term, not yet called a business process, could be named workflow. Workflows are automated business processes. One easy implementation example is the automated routing of documents from one person to another through a determined process

map. This was back in the early 1980s where IBM closely followed by other product vendors started to invent a new vision of office information systems (Van der Aalst, 2013).

Computer systems were new to the working people at that time. Typically, different organizational units used different electronic systems. Scanning a document was only to archive the document, not to send it around electronically. Interfaces to integrate systems directly were expensive and inflexible. The Office Automation Group at MIT (Massachusetts Institute of Technology) built integrated office application systems after intense research activities that consisted of document production, database management, image handling and communications (Perepa, 2011).

New management approaches focusing on quality like Total Quality Management, Six Sigma, ISO (International Organization for Standardization) or Kaizen added value to management executives and thus became fashionable. First Davenport (1993) and then Hammer & Champy (1993) described Business Process Reengineering as a more holistic approach in contrast to by then task-centric organizations. To Reengineer an existing process means to analyse inputs and outputs and brainstorm on the tasks executed in between to achieve vast improvements in cost, service and quality (Klun & Trkman, 2016).

Hammer & Champy (1993) created five guidelines by this time for a redesign team: 1. Use brainstorming to focus on a specific outcome, 2. Think on the possibility that one single person can handle the whole process, 3. Dump not necessary assumptions, 4. Use technology and 5. Use the viewpoint of your customers. The redesign team had assigned roles like the leader, process owner, a set of reengineering team members and a czar. Dumas et al. (2013) tried to explain why the hype of Business Process Reengineering ended at the turn of the century. They stated that the concept of BPR was often misused in a too radical way and sufficient tools and techniques were practically missing to succeed.

With technological innovations and the need to measure performance, the importance to manage business processes increased in many organizations. The Association of Business Process Management Professionals defines a business process as

"a set of activities that transform one or more inputs into a specific output (product or service) of value to the customer" (ABPMP, 2013)

The need for products and services of high quality and for the achievement of strategic goals boosted the development and implementation of business processes. Managing processes by using Key-Performance-Indicators (KPIs) in order to use these processes as control mechanisms as one can quantify and measure and adapt them if appropriate can be summarised under the term Business Process Management (BPM). BPM is defined as *"a management discipline that integrates the strategy and goals of an organization with the expectations and needs of customers by focusing on end-to-end processes. BPM comprises strategies, goals, culture, organizational structures, roles, policies, methodologies, and IT tools to a) analyse, design, implement, control and continuously improve end-to-end processes, and b) to establish process governance"* (ABPMP, 2013).

A very clear and distinct definition on Business Process Management is given by Jeston & Nelis (2014): „*A management discipline focused on using business processes as a significant contributor to achieving an organization´s objectives through the improvement, ongoing performance management and governance of essential business processes."*

Zairi (1997) stated that *"BPM is concerned with the main aspects of business operations where there is high leverage and a big proportion of added value"* and provides some rules to govern Business Process Management: mapping and documentation of main activities, horizontal linkage between activities to focus on customers, quality performance to ensure discipline, consistency and repeatability by relying on systems and procedures, assessment of performance of individual processes, optimisation as continuous approach to gain extra benefits, guarantee of competitiveness by best practices and establishment of culture change.

A structured literature review on process management with 41 selected articles conducted by Palmberg (2009) draws a gross process definition shown in Figure 9. The author stresses out six components commonly found in most of the given definitions on process management in literature: processes have inputs and outputs, the activities are interrelated, processes are horizontal and cross-functional within organizations, the main purpose is the generation of value to customers, processes use resources and processes are usually repeated.

The categories commonly found and for example also given by Davenport (1993) are strategic management processes, operational delivery processes and supportive administrative processes.

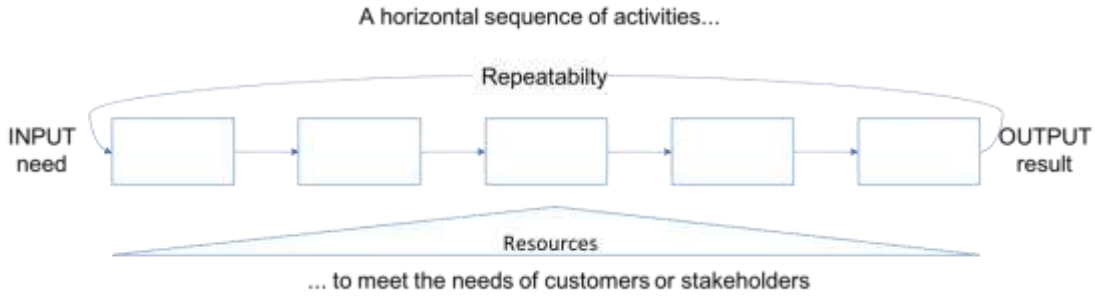

Figure 9 A gross process definition,
own illustration, source: Palmberg (2009)

Business Process Management can best be described and understood with the help of the BPM life cycles designed and described by numerous researches. These life cycles are derived from Fayol's process of management (Fayol, 1949). The Business Process Management Common Body of Knowledge (BPM CBOK®) provides a life cycle that is derived from the Plan, Do, Check, Act Cycle by Edwards Deming, see Figure 10. Processes should therefore be managed in a closed-loop cycle that comprises the planning, design, implementation, execution, measurement, control and continuous improvement of business processes (ABPMP, 2013).

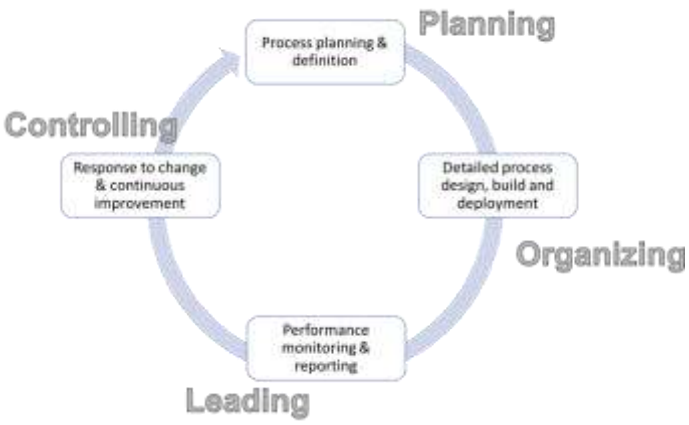

Figure 10 BPM Life Cycle,
own illustration, source: Fayol (1949), BPM CBOK V3 (2013)

Business Process Management, as a management discipline, guides organizations across all functions and roles through the management of business processes. There is no difference between for-profit, non-profit or governmental organizations or executive management to operational staff. Barriers between silo functional groups should be removed by process management and thus control the processes of the entire organization to improve the quality of the organizational output (products and services), to identify opportunities to create new business models, to use improved technology to support business, to align business processes with strategic objectives and customer needs and to improve effectiveness and performance of the organization (Palmberg, 2009).

Forces for the implementation of Business Process Management are important issues on globalization (market expansions, disruptive businesses), changing technology (internet of things, personal computers, social media, etc.), regulations (Sarbanes Oxley, Basel I & II), active and connected stakeholders and the extension of business boundaries (means of transportation like Uber, hotel rooms like AirBnB, etc.) (Armistead & Machin, 1997).

Many stakeholders within an organization benefit directly or indirectly from Business Process Management. Table 1 provides a summary of these benefits for customers, management, acting process roles and the enterprise itself. Business Process Management itself does not guarantee the lifting of all listed potentials as the methodology is not properly implemented within an organization to for example guarantee continuous improvement or performance measurement.

Table 1 Benefits of BPM to Stakeholders, own illustration, source: BPM CBOK (2013)

Enterprise	Customer	Management	Acting Process Role
Clear ownership for continuous improvement	Improved processes will positively impact customer satisfaction	Making sure that all the activities realized along a process add value	Security and awareness for actors
Agile response to measured performance	Mobilizing staff on stakeholders expectations	Optimizing performance all along the process	Better understanding of 'the whole picture'
Performance measurement benefits cost and quality	Keeping control on commitments to the customer	Improved planning and projections	Clarifying the requirements of a workplace
Monitoring improves compliance		Overcoming the obstacles of departmental boarders	Defining precisely the appropriate set of tools for actors
Visibility, understanding and change readiness improve agility		Facilitating internal and external benchmarking of operations	
Access to information simplifies process improvement		Organizing alerts levels in case of incident and analysing the impacts	
Assessing process costs facilitates cost control and reduction			
Competence, consistency and adequacy			
Sustaining the knowledge			

Students ask from time to time how many business processes have to be managed within any organization. Hammer & Champy (1993) stated that not more than ten principal processes should be managed, examples are customer communication, strategy development or order fulfilment. Davenport (1993) in his process innovation concept stated that innovation will be greater the fewer processes are examined. The context for these two statements is the re-invention of business and not the reengineering of business processes. Smith & Fingar (2003) provide a concept – The Third Wave Business Process Management – that includes hundreds of supporting organizational processes, including industry best practices and processes to ensure compliance with standards or legal requirements. The complete list provided by Smith & Fingar is given in the Annex A – Enterprise processes.

The ability for an enterprise to support Business Process Management can be defined by its process maturity. This process maturity can be assessed with the help of reference maturity models. The current baseline of the process capability of an enterprise is defined and identified gaps are addressed. More than 30 different process maturity assessments can be found in literature and this list is continuously growing (ABPMP, 2013). Two de-facto standard assessment models are shortly described here. The Capability Maturity Model Integration (CMMI) can be used to assess a process, a project or an enterprise on five defined classification stages. Starting with stage 1 with unpredictable processes that are poorly controlled moving up to stage 5 where the focus of an organization is totally on its process improvement. Hammer (2007) defined the Process Enterprise Maturity Model (PEMM) in his Harvard Business Review article "The Process Audit". This framework allows organizations to assess the maturity for any particular process and the maturity of the enterprise as a whole.

Sustainable process improvement along business objectives and the assurance that these improvements are maintained are governed by defined goals, roles, responsibilities and instruments along the organizational strategy in the form of Process Governance Models. Process Governance comprises the *"definition of overall guidelines of the process management model, the process control model and the activities of the various organizational units, and involves mainly the distribution of Process Management-related responsibilities within the organization. Briefly, it involves fostering the definition of overall guidelines to orient what should be done in Process Management and how it should be done"* (Paim, et al., 2009). To summarize, Process Governance clarifies what should be done by whom and how involving the entire organization.

The relation between Process Management – the design of processes -, Process Governance – the alignment of processes with the strategy – and the strategy itself has to be made clear within organizations, see Figure 11 (Paim & Flexa, 2011).

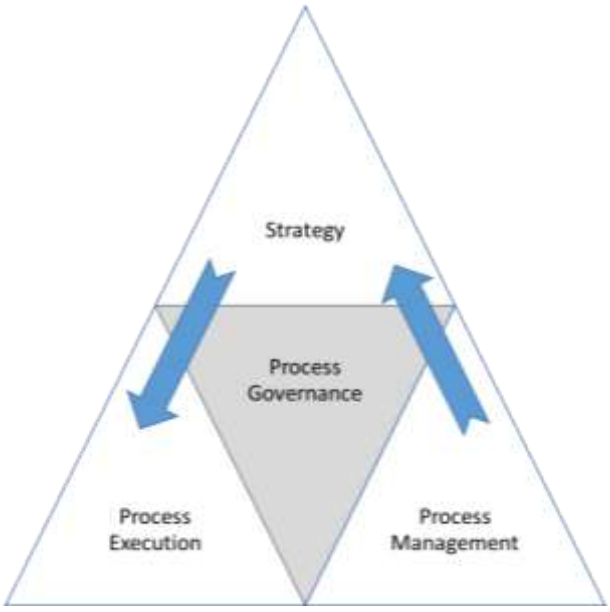

Figure 11 Relation Strategy - Governance - Process Management, own illustration, source: Paim & Flexa (2011)

3.1.1 Business Process Management and Related Theories

Starting from the quality thinking perspective this section describes all influencing parts of the term Business Process Management, see Figure 12. What these terms all have in common is the process focus.

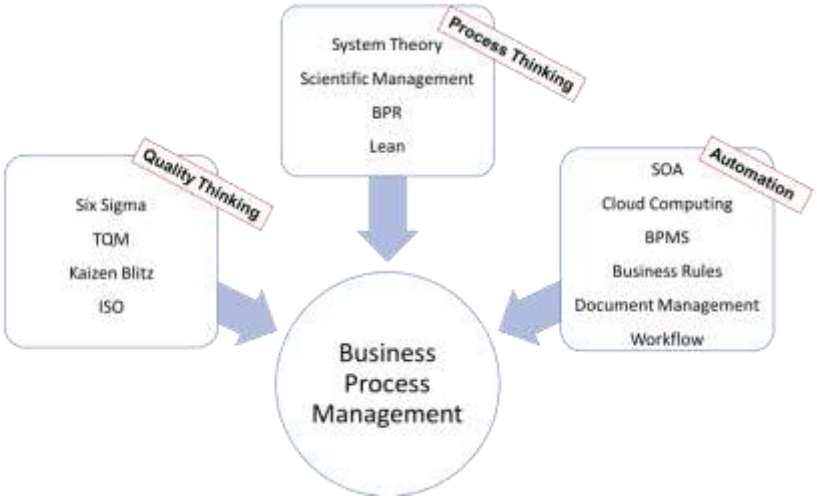

Figure 12 Where does BPM come from?
own illustration, source: Jeston & Nelis (2014)

Six Sigma identifies and removes the causes of defects and minimizes variability within manufacturing processes to improve the quality of those processes. It was invented by Motorola back in 1986 and identifies a direct correlation between the number of defects, wasted costs and the level of customer satisfaction (Harry, 1998). Later Six Sigma was extended to business processes other than production processes. An error in Six Sigma is described as process output that does not meet specifications. The approach is implemented with five phases: define, measure, analyse, improve and control.

The concept of Total Quality Management (TQM) emphasizes quality as central part of an organizational philosophy. That means that every source involved in a process has the major task to focus on quality. The realization of a quality control is a discrete goal. Total Quality Management has its origin in researches of Edwards Deming and Joseph Juran, earlier mentioned at Bells Laboratories (Laudon et al., 2010). The European Foundation for Quality Management (EFQM) defines the "Model of Excellence" consisting of nine elements for excellence as the basis for the implementation of Total Quality Management (Armistead, 1996).

Kaizen itself can be directly translated as ongoing improvement. Sometimes it is referred to as continuous improvement too. Kaizen originated in Japan and its strategy is to bring management and workers to automate improvement thinking. All undertakings should lead to improve processes and thus create a process-oriented way of individual thinking (Imai, 2012). Kaizen Blitz is a workshop for rapid improvement within a few days. It is structured to carry out creative but fast problem solving and process improvement (Improvement Skills Consulting Ltd., 2009).

ISO (International Organization of Standardization) is an independent, non-governmental internationally operating organization that brings together experts on different topics to share knowledge and develop international standards that support innovation and provide solutions (International Organization for Standardization, 2017). In this case the ISO 9000 family

addresses various aspects of quality management to guide organizations to consistently improve quality for their products and services.

Process thinking led Taylor (1914) develop the idea of Scientific Management (testimony about scientific management before the American congress in 1912), where specialization and the division of labour were fundamentals, but the well-being of the workforce was also considered. Taylor was followed by Adam Smith in his book "The Wealth of Nations" published in 1950 (Gönroos, 1994). In front of the American congress in 1912, Taylor stated: *"... in its essence, scientific management involves a complete mental revolution on the part of the working men engaged in any particular establishment or industry. ... And it involves the equally complete mental revolution on the part of those on the management's side. ... And without this complete mental revolution on both sides scientific management does not exist."* (Taylor, 1914)

Business Process Reengineering was already discussed earlier in this thesis.

Lean, lean manufacturing, lean enterprise or lean production originate from the Toyota Production System. Lean focuses on improving process cycle times and quality through reduction of non-value-added process activities. The Toyota´s lean thinking does not only include processes of the shop floor, but also management principles up to executive management, sales and of course also product development processes (Liker & Morgan, 2006).

Lean management is a bunch of tools that helps identify and eliminate process waste (or muda). The presumption of this methodology is that if waste is eliminated, quality can be improved, and production time and costs will decrease. *"Lean is about getting the right things to the right place at the right time in the right quantity to achieve a perfect flow or work; all while minimizing waste and maximizing flexibility and the ability to change."* (Jeston & Nelis, 2014)

Business Process Management is also about automation. Workflow management is the explicit representation of the business process logic with automated support of IT systems (Van der Aalst, 1998). The Workflow Management Coalition (WfMC) defines workflows as *"the automation of a business process, in part or in whole, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural roles."* (IBM developerWorks, 2011). The main difference between Business Process and Workflow Management is that the first is a process-oriented management discipline and the latter is a flow management technology found in Business Process management Systems (Ko et al., 2009). Public administrations were leaders in transforming business processes into workflows as service orientation was a strategic goal in 2001. Documents were forwarded automatically and processed electronically according to predefined business rules (Palkovits et al., 2004). Document management has to be considered when automated processes are implemented. If this is not the case, paperless tasks will be executed extremely fast and then next steps will have to wait for the physical paperwork to catch up (Jeston & Nelis, 2014).

A workflow is a process that is composed of separate activities that relate to parts of a business process or other organizational processes. In this case, a workflow - in contrast to the process - describes in detail the operational level; ideally in such a precise manner that the following activity is determined by the outcome of each preceding one. The individual activities are therefore dependent on each other (Laudon et al., 2010).

Business rules are part of business processes and are critically important as various technology systems that are integrated shall have the same valid information which is only entered once, avoiding outdated or incorrect rules (Jeston & Nelis, 2014). For workflows business rules work as dynamic and operational game changers and thus provide the ability to tune workflow parameters steadily to suit changing business conditions without necessary code changes within the workflow solutions (IBM developerWorks, 2011). The Business Rule Group published a Business Rules Manifesto with 10 articles on principles of rule independence (Business Rules Group, 2003)

A Business Process Management System (BPMS) is defined as process-aware system that exploits and explicitly describes business processes in the form of a process model to coordinate that process (Dumas et al., 2013). A Business Process Management System can coordinate an automated process so that all the work is done without mistakes in time and with the most effective resource allocation. The main components of such a system are the execution engine for case creation, a process modelling tool to design the processes, a worklist handler to handle the back log, external services to integrate other information services outside the Business Process Management Systems, and administration and monitoring tools to keep the process information updated.

As rapid developments in information technology such as Cloud Computing or the Internet of Things (IoT) are driving organizations to refurbish their IT infrastructure, business processes are influenced to a high extent, not always in a positive way. The main business processes affected by IoT and Cloud Computing are customer services and support, product and services development, data management and analysis as well as logistics and Supply Chain Management (Ferretti & Schiavone, 2016).

A Service-Oriented Architecture (SOA) is a group of self-contained services that can communicate with each other to build a working software application based on it (Laudon et al., 2010). A set of web services is orchestrated to improve and coordinate different types of information systems within an organization. A web service is a piece of functionality that can be easily integrated in executable business processes. This kind of software architecture paradigm is the so-called Service-Oriented Architecture, which allows a business process-based execution of tasks that refer to the business rules (Dumas et al., 2013). Linking web services and thus enabling the coordination of distributed systems that support business processes should not be confused with business processes themselves (Ko et al., 2009).

A timeline for influencers of Business Process Management would look like represented in Figure 13.

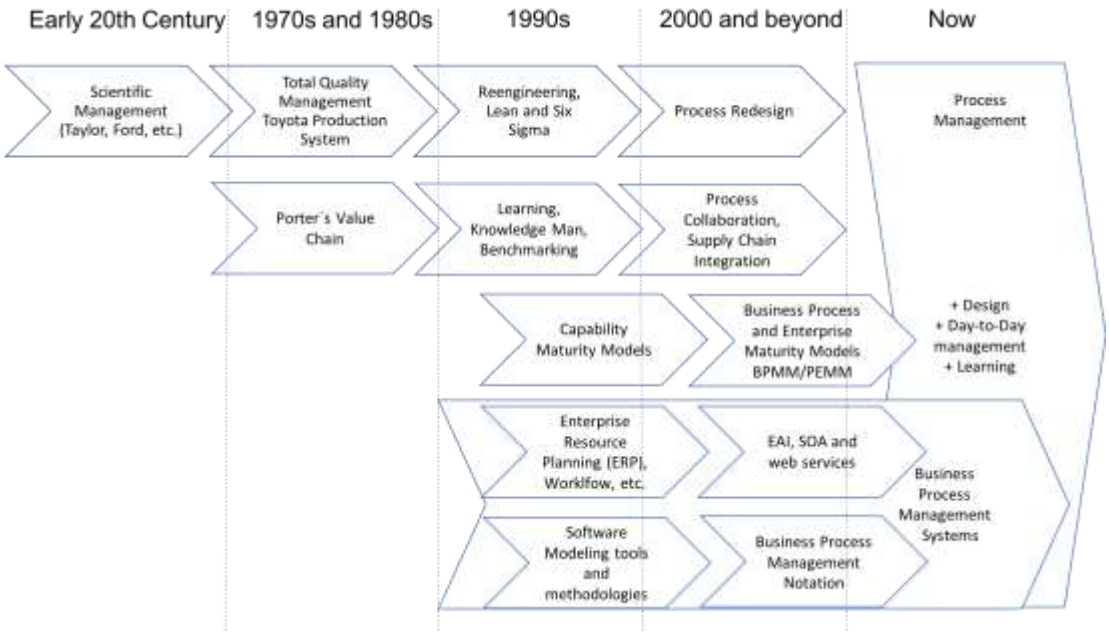

Figure 13 Conceptual Timeline,
own illustration, source: Paim et al. (2008)

Porter´s value chain theory is discussed in more detail in chapter 3.2 when exploring strategic management approaches.

3.1.2 Development waves of Business Process Management

Armistead (1996) presented ten principles of managing business processes, based on several approaches mentioned above like service processes, Supply Chain Management (SCM), Total Quality Management (TQM) or Business Process Reengineering (BPR) that emphasize on the management by business processes with some organizational changes. The author believed that Business Process Management is only working when the attention is drawn on people, processes and systems in combination with organizational structure and culture. These ten principles are summarized to: defining a process responsible, exploring the process through process mapping, undertaking value analysis and failure mode analysis, understanding the linkages between processes, discussing functional versus process trade-offs, training and developing new process skills, taking learning opportunities for others within the organization, implementing measurement instruments, building specialist expertise in combination with managing careers and continuously improving processes.

Based on these ten principles and the complementation of the principles mentioned in the current body of knowledge (ABPMP, 2013), vom Brocke et al. (2014) researched on additional principles of good Business Process Management to serve as implementation guide. The output of Business Process Management literature research and focus group discussions with Business Process Management Professionals is summarized in Table 2.

Table 2 Principles of good BPM, own illustration, source: vom Brocke (2014)

Principle of BPM	Description
Principle of context-awareness	Distinction between organizations (e.g. size, strategy, industry, market or objectives of BPM) and within organizations (e.g. types of processes, available resources) BPM must be adapted to suit the existing circumstances
Principle of continuity	Creation of an organizational culture to support continuous BPM and establish a process mind-set BPM should be permanent to facilitate continuous gains in efficiency and effectiveness
Principle of enablement	Enablement of individual and organizational BPM capabilities BPM training to build sustainable capabilities to respond effectively to future contingencies
Principle of holism	Establishment of a holistic scope of BPM including factors such as strategic alignment, governance, methods, IT, people and culture BPM not in isolated processes or organizational functions, but holistic
Principle of institutionalization	Deployment of BPM in the organizational structure to avoid silos Business Process Governance and the definition of process owners and their role
Principle of involvement	Involvement of all affected stakeholder groups to gain true commitment Design process is a collaborative effort by actively involved groups
Principle of joint understanding	Creation of common process understanding with process models as communication means BPM conceptualizes processes in terms of events, tasks, actors, etc.
Principle of purpose	Creation of the purpose of BPM being a method to achieve organizational change and to create value BPM creates transparency and value
Principle of simplicity	Economical investment of resources (effort, time, money, etc.) to balance inputs against output Organizations should look for the simplest way to achieve BPM-goals
Principle of technology appropriation	Business-IT-Alignment to drive progression of value creation with BPM IT should support the enterprise and not single departments

Like innovation cycles, Business Process Management comes in waves. Jeston & Nelis (2014) draw a Business Process Management hype cycle that should work as starting point and leads to the current acceptance level and understanding of Business Process Management.

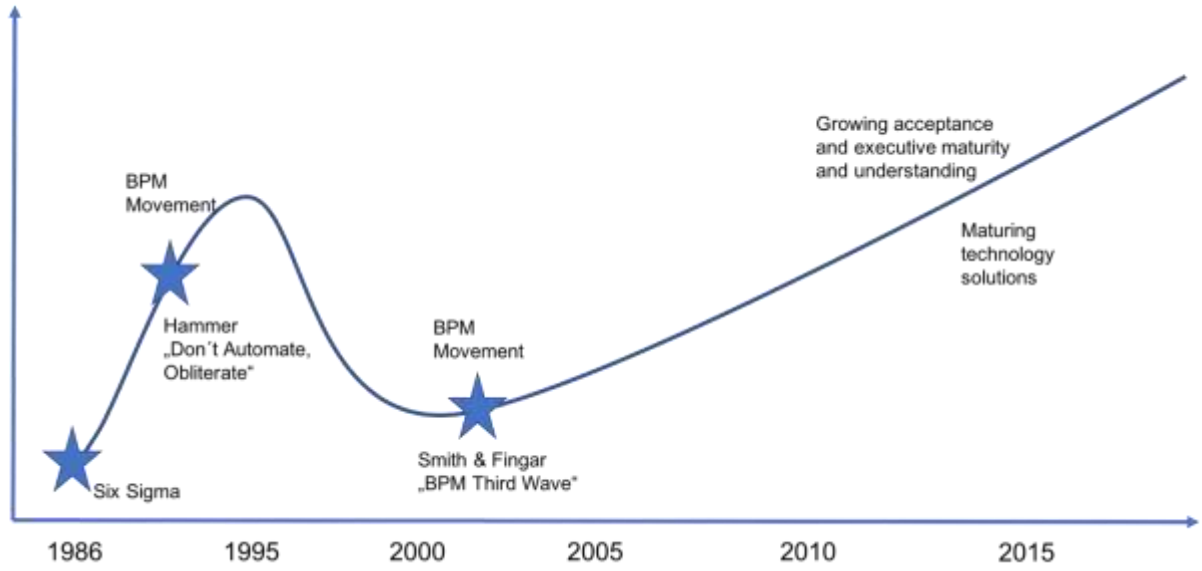

Figure 14 BPM hype cycle,
own illustration, source: Jeston & Nelis (2014)

Six Sigma´s invention in 1986 created awareness for processes. The concept behind was already discussed earlier in this thesis. With the Harvard Business Review article "Reengineering Work: Don´t Automate, Obliterate" by Hammer (1990) Business Process Reengineering was born. At the time when the article was published organizations thought that huge investments in information technology will boost their businesses. The major problem that Hammer stated was that technology was used to mechanize old business processes – so-called process automation, without rethinking those processes. His suggestion was to reengineer businesses by a radical redesign of their processes with the help of technology to achieve vast performance improvements (Hammer, 1990). Another important statement in this article is the focus on innovation and quality. The author stated that work structures and processes were not able to keep pace with changes in technology, demographics and business objectives. Employees were trained to execute a sequence of separate tasks and complex mechanisms were employed to track their progress. *"Businesses disaggregated work into narrowly defined tasks, reaggregated the people performing those tasks into departments, and installed managers to administer them."* (Hammer, 1990)

Smith & Fingar (2003) stated in their book "The Third Wave" that with the historical evolution of process management and the development of information technology, business people no longer own their business processes. As soon as a business need is formulated, the IT code, often implemented within Enterprise Resource Planning systems (ERP), is written and activated without even knowing the business impact of that process. The authors propose a new integrated way of managing business processes with introducing different views on the same process: a dashboard with key performance indicators for top management, a high-level process map for the business analyst, an interactive interface for the employee and a technical process language for the programmer. All views are based on the same underlying business process. The key factors for business innovation, which should take place not only in IT departments through the introduction of new software, are process visibility, agility and accountability.

To explain the term Third Wave, Smith & Fingar (2003) describe Taylor´s theory back in the 1920s as the first wave of Business Process Management and Davenport and Hammer´s introduction of Business Process Reengineering (BPR) and the implementation of ERP systems as the second wave. The implication that business processes always have to be automated and executed by integrated IT systems excludes all processes without any IT interaction. The issue of the authors is that IT is not managing data but processes data, so why not use processes as applications instead of data? The Third Wave Business Process Management and the introduction of a BPMS – Business Process Management System – is the balanced combination and extension of Business Process Reengineering (BPR), Enterprise Application Integration (EAI, the integration of technologies and services of systems and applications across an organization) and Workflow Management (WfM). It should be possible to have a business process language that is able to describe the management of an event for team building in the same precise way as to describe how computer system A is talking to computer system B. Business processes should become a new information type next to data, procedure, workflow or distributed communication (Smith & Fingar, 2003).

Business Process Management standards to describe business processes in models have developed over the past few decades. They can be classified into graphical standards for

expression of processes in possible flows, execution standards for process deployment and automation and interchange standards for portability of data within and between Business Process Management systems. As already mentioned above, Business Process Management Systems also imply diagnosis standards to administer and monitor business processes. Just to mention one Business Process Management standard for each category: BPMN 2.0 – Business Process Model and Notation by the OMG Group for the graphical representation, XPDL – XML Process Definition Language - for execution and interchange and BPQL – Business Process Query Language - for diagnosis (Ko et al., 2009).

The graphical representation of business processes is the highest level of expression and the most natural to humans. Process modelling can be seen as a design activity using graphical icons, basic geometric shapes and textual information, all representing tasks, events, states and business rules that constitute a business process (Curtis et al., 1992). In their research on how novice analysts represent business processes, Recker et al. (2012) investigated five different process design archetypes: textual design (only text, no use of graphics), flowchart design (text and abstract graphics, no concrete graphics), hybrid design (text and graphics, some of them concrete), storyboard design (less text, mostly concrete graphics) and canvas design (no text, full use of concrete graphics).

In 2004 The Business Process Management Initiative first presented the Business Process Model and Notation. The Object Management Group took over the de-facto standard for process modelling in 2010 (Object Management Group OMG, 2010). Figure 15 shows a sample business process model designed with BPMN 2.0 notation, modelled with ADONIS®[1].

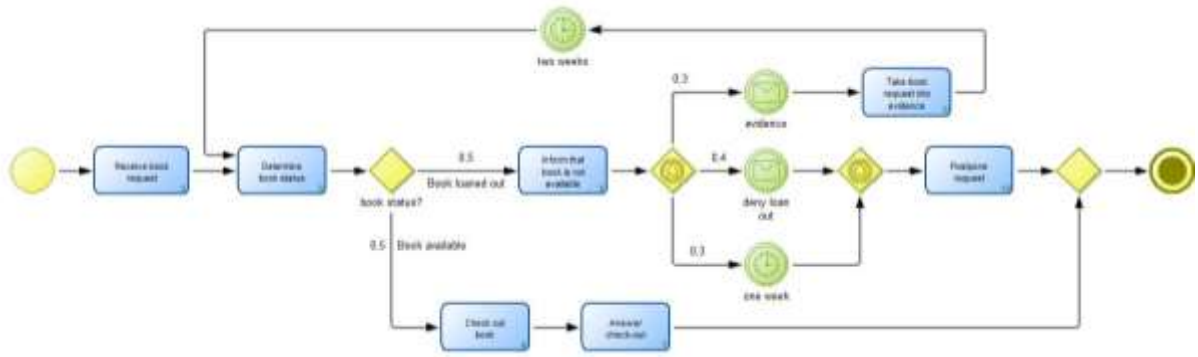

Figure 15 Business Process Model "Borrow a book", own illustration with ADONIS®

The sample process in Figure 15 describes how a book can be borrowed from the library. The view on the business process is a simple flow chart without responsibilities, roles and IT systems. The process generically shows tasks that have to be fulfilled to get a book or if it is not available which time frames are kept.

[1] ADONIS® is a BPM suite offered by BOC Ltd. since 1995, www.boc-group.com

Standardization cannot be applied to all parts of Business Process Management, but most organizations benefit from utilizing a process framework or industry reference when starting with BPM. A brief classification of such process frameworks is given by the BPM CBOK – Business Process Management Common Body of Knowledge (ABPMP, 2013). These frameworks are generally applicable for different organizations, industry specific, specific to a process area or technology.

The American Productivity & Quality Process Classification Framework (APQC PCF) can be used by different industries to define their Enterprise Process Model – business processes over the whole value chain - to see their activities from a cross-industry process viewpoint on a very high level. Another example for a generally applicable framework is the Value Chain Operational Model (VRM) that integrates the three domains of the value chain on three levels: product, operations and customer. The SCOR Model (Supply Chain Operations Reference Model) representing the industry specific frameworks focuses on end-to-end processes along the supply chain for enhanced communication and process-centricity (ABPMP, 2013).

The question whether the management discipline of business processes can be listed under being a trend or not often can be found in literature. According to the Cambridge Dictionary a trend is *"a general development or change in a situation or in the way people are behaving."* (Cambridge University, 2017). When connecting the term trend to the definition of a process which is *"a specific ordering of work activities across time and place, with a beginning, an end, and clearly identified inputs and outputs: a structure for action"* (Davenport, 1993), it gets clear that Business Process Management is not underlying any trends. Business Process Management is multi-disciplinary with many views, definitions and perspectives. The issue here is where, how and to which extent Business Process Management is implemented together with other management approaches.

One example of perfectly matching management approaches is my research on the Siamese twins project and process management. The decoupled implementation of project and process management leads to duplication, overlapping, misunderstanding and power struggles within these activities. Modern management approaches already provide improvement processes, which sometimes even end up in projects in order to develop, implement and sustain the desired optimization measures within the company. At the same time, various processes are taking place in projects which are intended to ensure progress, target achievement and compliance with the planned resources in the given time and the required quality. Interactions of this kind require a coordinated structural organization and a harmonious interdependent procedural organization. The recommendation based on the research finding was to install a joint project and process management office to function as a link between line organization, projects, processes and the top management (Palkovits-Rauter, 2017).

A literature review on all published papers in the Business Process Management Journal of 2016 and 2017 (Volume 22 and 23), accessed via Emerald Insight (Emerald Insight, 2017), results in the topic map shown in Annex B - Literature Review on BPM Journal 2016 & 2017.

The main topics under research are the Internet of Things, Big Data Analysis, Innovation, Supply Chain Management and Strategic Performance Management in combination with Business Process Management. Other relevant issues are new methods like Lean Deployment

or Critical Process Targeting and of course customers and employees that are affected by market or leadership changes.

For chapter 9 “Enterprise Process Management” of the BPM CBOK®, Version 3.0 (ABPMP, 2013) Peter Fingar wrote the foreword explaining the time after the Third Wave Business Process Management. Within the third wave itself, Fingar (2003) imposed to free business processes from technology and to start managing the whole value chain through Business Process Management, the so-called Enterprise Process Management. Enterprise Process Management means spanning the entire process over suppliers, organization and customers by kind of ignoring the traditional organizational structure. It includes all work performed to deliver the product or service, regardless of what business unit, performer or location is involved. This broader view includes all aspects of the process, its costs, problems, systems, quality and even performance. With meaningful key performance indicators for management´s view on the process, even internal competition and thus better performance can emerge (ABPMP, 2013).

Drucker already stated in “Management Challenges of the 21st century”, summarized in “The Essential Drucker” (2001) that no one company owns the whole value chain. Cloud computing could close the gap between Enterprise Process Management to Value Chain Business Process Management. Moving Business Process Management Systems into the cloud, shared Business Operations Platforms (BOPs) or Business Networks can be established and dynamically managed by companies and their suppliers and customers (ABPMP, 2013).

Figure 16 shows global expenditures for Cloud Computing Services from 2010 to 2017 with a prediction until 2021. The overall Cloud Computing Service expenditures for 2017 are 153,4 billion US-Dollar, where Cloud Business Process as a Service (BPaaS) sums up to 42,6 billion US-Dollar (Gartner, 2018).

Cloud Computing allows a very agile handling of resources and scaling up or down infrastructures. Business Process Management profits from cloud services by providing on-demand platforms and services, but resource elasticity or own cloud-enabled BPM systems are not easy to find (Schulte et al., 2015). Cloud-based Business Process Management Systems are just one possible application of Cloud Computing. The challenges of the 21st century, where business processes are not located in single organizations, but on a corporate network level, are the orchestration and the choreography of these value webs (instead of value chains) via multiple cloud services. Service-Oriented Architecture enables business process components to be grouped, ungrouped, and consolidated into a fully integrated mix of on-premise and cloud environments. These processes are called end-to-end situational business processes (Fingar & Stikeleather, 2012).

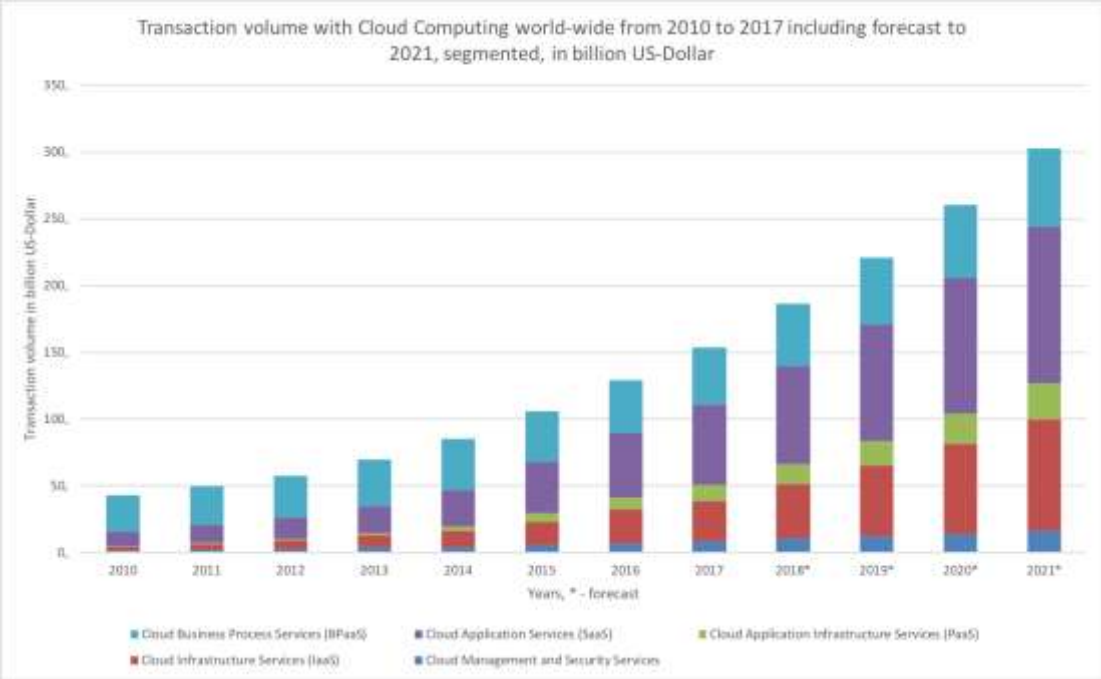

Figure 16 Global Expenditures on Cloud Computing Services, source: Gartner (2018)

The combination of Artificial Intelligence (AI) or machine learning as the most commercial application of AI and business processes was surveyed by Accenture Research including 1.075 business process professionals (Shukla et al., 2017). Machine learning employs an algorithm to sort data, make decisions and improve functionality. The study showed that almost half of the participants have a ten times improvement on processes where machine learning is implemented. Artificial intelligence can be integrated into processes with three different strategies: redesign of existing processes to enlarge competitive advantage and raise customer value, improve interaction between human workers and machines and to establish a data strategy to unlock hidden value from data. One example on reimagination of business processes is given by the concept of the digital twin by General Electric. This organization that is one of the world´s largest and oldest industrial conglomerates, copies its windmill farms in a virtual model where all machines, parts and processes are digitized in the cloud to be able to collect relevant data and instantly optimize the real world.

According to a KPMG survey about leading capabilities organizations need to be successful in their business from 2015 to 2017, 56% of respondents, who are senior professionals, executives at leading global business, IT and cloud service providers worldwide, think that smart and innovative management & management practices are required (KPMG, 2017). A significant group of people, 45% of the participants, stressed out that process automation with basic and advanced Robotic Process Automation (RPA) is necessary to reduce costs, to provide improved customer services, to further develop process efficiency and effectiveness and to address talent shortages. In 2015 the percentage rate was only 8% (Brown, 2017).

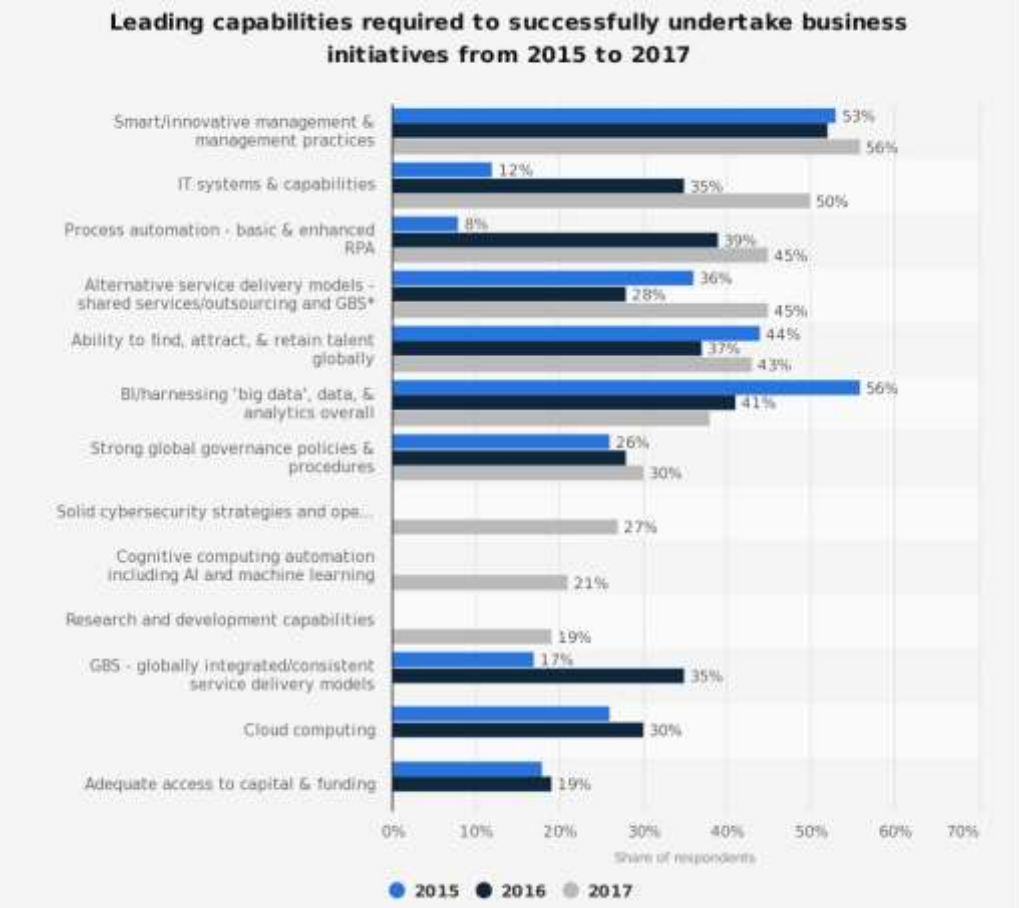

Figure 17 Leading capability required to successfully undertake business initiatives, source: KPMG (2017)

Robotic Process Automation is usually mentioned together with the term Digital Labour. In an increasingly fast and global business environment, businesses need to make their business time and cost effective. Digital Labour enables the optimization of individual business areas through the intelligent automation of work processes. This helps pressurized companies reduce their costs and achieve or maintain their budgeted values. At the same time, automating tasks provides an alternative to mitigate the need for skilled labour, or more effectively use existing resources and more easily adapt to rapid changes in the environment and technology. Challenges of such organizational changes are the right tool set, the knowledge of complex implementation and processes of the organization, the costs of system integration and the training of the employees. Robotic Process Automation solutions are branch independent and can range from simple automation like workflow orchestration to cognitive automation like predictive analysis and decision automation (Schirmbrand, 2018).

Robotic Process Automation is not about to replace Business Process Management. When there is a need for fast and effective results in order to continue operations, RPA is a fitting solution for businesses. Usually businesses discover the need for process improvement and of getting rid of legacy systems that hinder innovations. At this stage Business Process Management is the right choice. Architects and developers who engage in exploring business processes while

planning and developing their innovative business applications are able to boost businesses (Quirk, 2018).

Newspapers, blogs or scientific publications today are full of promotive articles about the advantages of combining Artificial Intelligence, Cloud Computing, Machine Learning, Robotics or the Internet of Things with Business Process Management. None of these articles have the ambition to change the core elements of key issues of Business Process Management. BPM is just a vehicle to execute the mentioned technological evolution.

A hundred years ago, when changes happened gradually and linear due to industrialization and globalization developments. Nowadays, changes are exponential. Well-known examples are the information and data explosion, the vast increasing number of mobile devices or internet connections and also growth rates of human population. Exponential change within organizations means pressure on the management due to shorter product life cycles, increasing and disruptive competition, vast amounts of manageable data and also a persistent demand for higher quality and productivity. Fingar & Stikeleather (2012) describe the changes work-related to structure, content and processes as follows:

- Less rigid process routine - more creativity to perform
- Less focus and direction - more collaboration and teamwork
- Fewer silos of knowledge - more social skills and information sharing and spreading
- Fewer unskilled workers - more technological expertise
- Less fixed working hours - more pressure on time
- Less geographic dependence - more mobility (availability anywhere, anytime) ...

Organizational characteristics will be agile, lean and client-focused. Organizations will force preparation rather than planning, flat hierarchical structures and continuous reinvention of networks of partnerships to gain a competitive advantage (Fingar & Stikeleather, 2012).

These findings and the interrelations between them are explored in the upcoming chapters of this theses. An overview is given in Figure 18, illustrated as an “old” map where definitions, connections, dependencies or preclusions are not known yet.

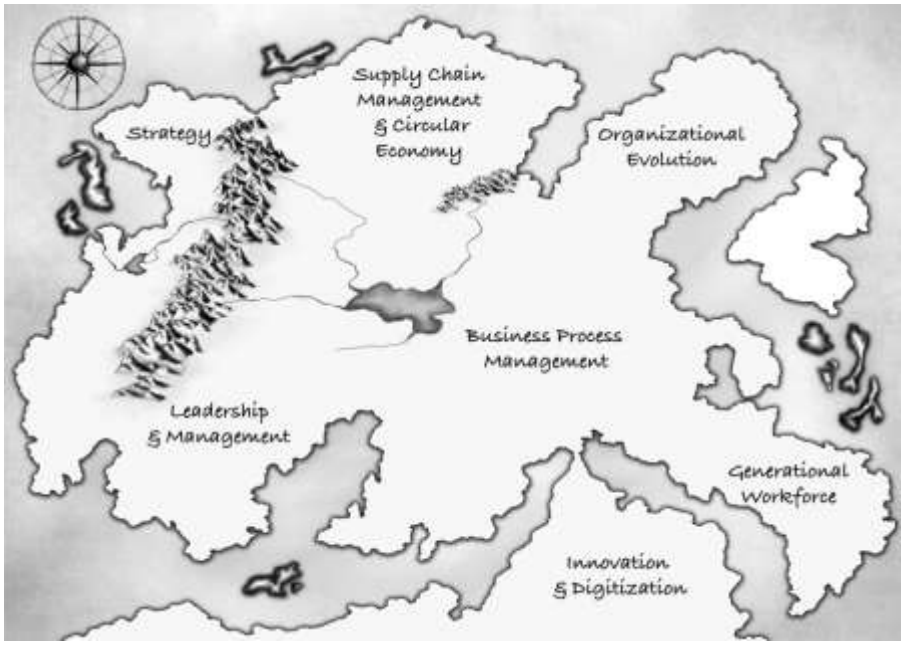

Figure 18 Map of influencers of BPM,
own illustration

3.2 Strategy

The borders of the 20th century are challenges of industrialization at the beginning and the ones of globalization at its end. Numerous theories on strategy and the process of implementing a strategy have been formulated during this time and still have universal validity and can be applied to various industries (Hax & Majluf, 1991).

Mintzberg (1987), Porter (1996), Chandler (1962) and other authors researched numerous dimensions within the context of strategy: as decision patterns, as a set of long-term objectives, task and resource allocation programs, as the definition of important competitive domains of an organization, as response to achieve and hold competitive advantage by analysing external opportunities and threats and internal strengths and weaknesses (SWOT analysis), as conduit to abstract managerial tasks on different levels or as a carta of contributions a company wants to provide its stakeholders (Hax & Majluf, 1991).

Organizational strategies are built on an enterprise level, most commonly initiated by shareholders and owners and executed by Chief Execution Officers (CEOs) and their teams. As discussed earlier in this thesis, Business Process Management influences the business strategy. Figure 19 expresses that vision, goals and strategy are on the same organizational level than Business Process Management.

In earlier stages of Business Process Management organizations focused on single processes instead of the complete set of processes of the company. When these processes were not working, responsible persons changed or improved them to make them work again. To achieve a competitive advantage all processes that make up a common value chain should be integrated and support each other. The focus should be on organization-wide process concerns. An organization that has business models with perfectly fitting processes, business-wide process measures for process support of business strategies, goals and initiatives and models that provide a picture of aligned processes and sub processes are called process-centric organizations with a fitting business process architecture (Harmon, 2014).

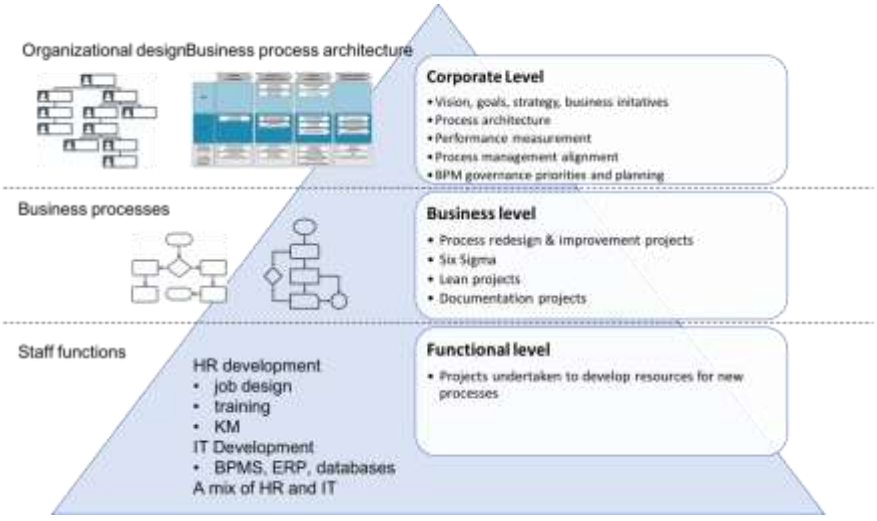

Figure 19 Business process pyramid, own illustration, source: Harmon (2014)

"*A company´s strategy describes how it will create value for its customers, its shareholders, and its other stakeholders*." (Harmon, 2014). From the definition of a business process, given earlier in this thesis, strategy and business processes have the value creation in common.

Defining a strategy according to Porter´s (1980) well-known Competitive Strategy approach means to go through three process phases. The first phase relates to the determination of the current position of the company including the identification of the current strategy. The second phase looks at the environment of the organization. What are competitors doing, are there any political or societal changes or what are my success factors or weaknesses relative to competitors? In the last phase the new strategy is formulated.

Historically this approach was working fine for organizations as competitors were rare and capital investment for production lines were too high for new entrants and competitors were geographically not relevant (Harmon, 2014).

Knowing exactly what the value for the customer is and organization is offering, means having a competitive advantage. A shoe store for example offers shoes to walk, so its competitors seem to be other shoe stores. But with a deeper look, the value for the customer is not a shoe, but a way to move forward. This way to move forward could be running, walking, rolling or skating, so possible other competitors are also sports equipment stores. The value for a single customer can be different to another, when for example wearing a sports shoe in the office.

For giving an explanation on the term competitive advantage, Porter´s theory on the value chain must be mentioned. According to Porter (1996), a value chain includes every activity involved in adding value to a product or service sold by an organization. Porter´s value chain could be seen as the pendant to Hammer´s (1990) core process, as Porter also distinguishes between primary processes like logistics, operations or marketing and support processes like procurement, technology or human resource management. Thus, a competitive advantage can be achieved by executing the value chain more efficiently than competitors do, meaning selling a product or a service with a higher profit to the customer. Competitive advantage does not mean being the largest company but defining a strategy or position that the organization can occupy. This could be the satisfaction of needs of customers ignored by other organizations, offering products to customers in a specific geographical area or selling products at a price other companies don´t choose to provide.

Coming back to value chains, competitive advantage is something not stable or lasting due to rapid competition or market changing. Competitors can easily copy any market position by copying the lean processes and speed up with efficiency. Porter (1996) in his essay about "What is Strategy?" stresses out the difference between operational effectiveness and strategy. On one hand operational effectiveness means executing similar activities better than others, by producing faster, having better personnel or using modern technology. Competitive strategy on the other hand means performing activities in a different way or performing different activities. Strategy involves a kind of positioning that in the end leads to a perfect fit of strategic activities. Porter describes three different kinds of positioning: variety-based positioning focuses on the variety on different services or products rather than customer segments, needs-based

positioning emphasizes on meeting most or all needs of a specific customer group and access-based positioning to reach customers in different ways or channels. But positioning also means to strategically find activities that are not executed, the so-called trade-offs. Strategists have to decide what not to offer to customers in order to keep their market position.

Porter (1996) summarizes the answer to his question on what strategy is as follows: "*Strategy is creating fit among a company´s activities. The success of a strategy depends on doing many things well- not just a few – and integrating among them. If there is no fit among activities, there is no distinctive strategy and little sustainability*." This definition of a strategy closes the loop back to the process-centric organization mentioned above.

3.2.1 Strategic Management

Strategic planning as one central task within Strategic Management was mainly driven and developed by Ralph Cordiner, a Chief Execute Officer at General Electrics between 1950 and 1963. Within this era, he made General Electric the most valuable company worldwide, according to an issue of *Business Week* in 1997 (Vaghefi & Huellmantel, 1998).

Gluck et al. (1982) vaguely describe Strategic Management as a management approach that *"should refer to some special kind of management process or system, one that links strategic planning and decision making with the day-to-day business of operational management"* and additionally provide a four-phases approach. Basic financial planning includes the budget forecasts for investments and projects for the following year. The forecast-based planning emerges naturally from the basic financial planning and includes multi-year budgets (usually known as five-year plans) that are planned with different sources of information and data and are sufficient to extrapolate current trends. A step ahead phase 2 is the externally oriented planning including deep analysis of external environmental factors and emerging market trends as well as analysis of customers and competition. The fourth phase – Strategic Management – represents an evolutionary improvement in relation to the phases one, two and three. Strategic Management consists of input and commitment including top management down to lower-level managers. Special planning groups are implemented to focus on the company´s real competitive advantage. Figure 20 illustrates these four phases in the evolution of strategic decision making.

Figure 20 Phases in the evolution of Strategic Decision Making, own illustration, source: Gluck et al. (1982)

Wheelen et al. (2018) introduced a "Strategic Management Model" in the early 1980s with four basic elements of the strategic management process: environmental scanning, strategy formulation, strategy implementation and evaluation and control. Based on Mintzberg's modes of strategic decision making (entrepreneurial, adaptive and planning mode), the authors provide a more comprehensive eight-step strategic decision-making process for strategic decision improvement. Hax & Majluf (1991) identified necessary tasks conducted in a formal business strategic planning process. Both inputs are combined and thus define fundamental elements of a business strategy, shown in Figure 21.

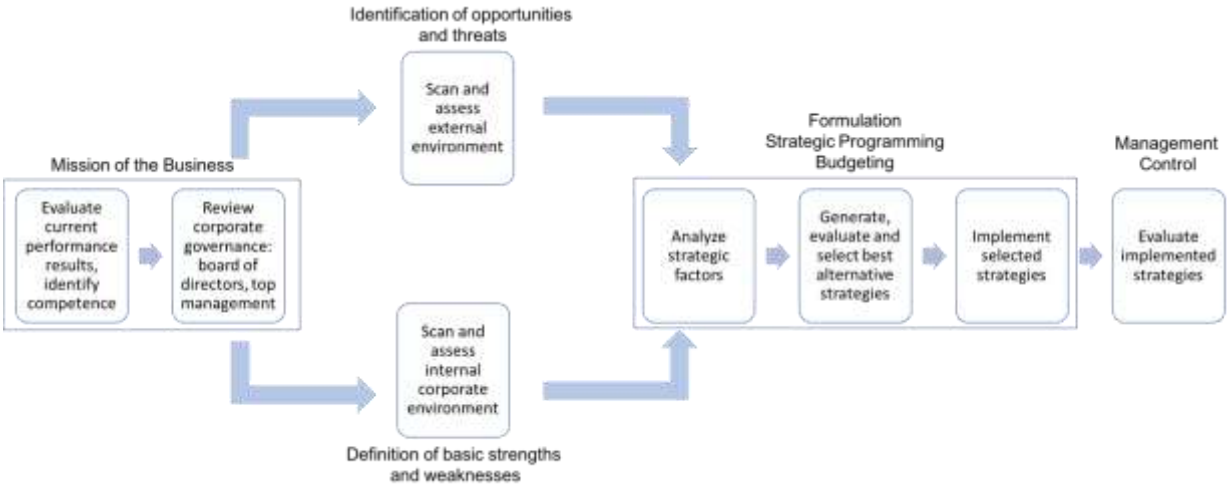

Figure 21 The Strategic Management Process,
own illustration, source: Hax & Majluf (1991), Wheelen et al. (2018)

A structured and quite clear guidance model of steps corporations should go through in the strategic management process explicitly reveals the importance of Business Process Management within this process. In the phase of Strategic Implementation, where strategy is put into action, the sequence of steps needed to do the job are highlighted, shown in Figure 22.

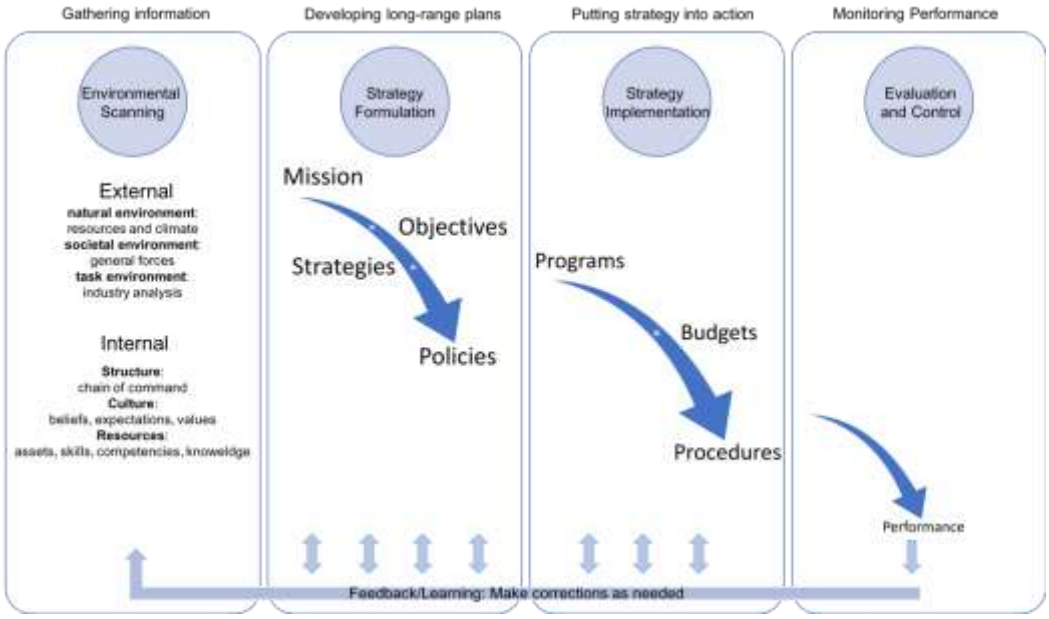

Figure 22 Strategic Management Model,
own illustration, source: Wheelen et al. (2018), originally from 1981

Main theories and teachings of early and significant thinkers of business strategy, Peter F. Drucker and Henry Mintzberg, formed the basis for further works of important authors like Ansoff, Chandler, Argyris, Porter and of course Kaplan & Norton.

These mentioned major theories were designed in the 1960s. They have not been replaced but still exist and stand beside theories developed later on. A review on Strategic Management theory must therefore identify those key theories developed over the years to build a comprehensive theory of Strategic Management.

In order to gain a broader view on the theories of Strategic Management some of the key contributors are briefly presented within Table 3.

Table 3 Theories on strategic thinking, own compilation

	TIME PERIOD	MAIN FOCUS RESEARCH ACTIVITIES
Ansoff	1918 - 2002	"Strategy is a common thread among an organisation´s activities, products and markets; the rule for decision making that links an organisation´s key elements." (Ansoff, 1965)
Argyris	1923 – 2013	"The belief is that all people utilize a common theory-in-use in problematic situations. This they describe as Model I – and it can be said to inhibit double-loop learning. Model II is where the governing values associated with theories-in-use enhance double-loop learning." (Smith M. K., 2001, 2013)
Chandler	1918 - 2007	"An organisation should build and develop capabilities unique to the organisation, through investment in human capital and technology." (Silverthorne , 2007)
Drucker	1909 – 2005	"Strategic Planning Process is the continuous process of making present entrepreneurial decisions systematically and with the greatest knowledge of their futurity; organising systematically the efforts needed to carry out these decisions; and measuring the results of these decisions against the expectations through organised, systematic feedback." (Drucker, 1973)
Hamel	1954 -	"Strategy is a revolution and everything else is tactics" (Hamel, 1996)
Kaplan **Norton**	1940 - 1941 -	"We have now formulated the architecture for a comprehensive and integrated management system that explicitly links strategy formulation and planning with operational execution." (Kaplan & Norton, 2008)
Kim **Mauborgne**	1952 -	"High growth organisations all understood and applied the logic of value innovation, whilst less successful organisations only followed conventional strategic lines." (Kim & Mauborgne, 1997 (2008))
Mintzberg	1939 -	"Strategy is not just a notion of how to deal with an enemy or a set of competitors or a market, it draws us into some of the most fundamental issues about organisations a instruments for collective perception and action." (Mintzberg, 1987)
Porter	1947 -	"Competitive strategy is about being different, deliberately choosing a different set of activities to deliver a unique mix of values" (Porter, 1996)

Four newer research works that are based on the already mentioned authors' theories are the knowledge-based view on Strategic Management, the TOWS analysis, the wicked problems analysis and sustainability. Grant (1996) describes his theory as the analysis of organizational capabilities with insights into the linkage between these capabilities and competitive advantage. The more a firm is accessing and integrating the specialized knowledge of its employees the more distinctive capabilities are available. Two relevant factors within this analysis are the level of hierarchy, where Grant proposes employees with multiple organizational roles moving around multiple teams, and the distribution of decision making, where decisions have to be made where the knowledge is.

TOWS (derived from SWOT) framework with focus on external environment combines analytical techniques such as competitor analysis, PESTLE (Political, Economic, Social, Technological, Environmental analysis) or the Delphi method to create forecasts on opportunities and threats; the value net, value chain VRIO (Value, Rarity, Imitability, Organization) and other techniques then identify strengths and weaknesses. These analyses are then matched (Prescott & Herko, 2010).

Camillus (2008) describes how to deal with wicket strategies when organizations are coping with wicket problems. These sorts of problems occur when companies are facing constant changes or unprecedented challenges. By using social-planning processes such as stakeholder involvement, communication or a simple focus on action corporate strategies can be aligned to occurring challenges.

In their book "Cradle to Cradle" the authors describe the involvement of environmental thinking into every aspect of an organization. Entire life cycles of our products are paid attention to (Braungart & McDonough, 2002). Sustainability and Circular Economy are further discussed in chapter 3.7 Supply Chain and Circular Economy.

3.2.2 Strategy and Business Process Management

The link between strategy and Business Process Management starts with Porters fit of activities, expressed by so-called Activity-System maps to "*show how a company´s strategic position is contained in a set of tailored activities designed to deliver it*." (Porter, 1996). The example shown in Figure 23 describes the strategy of Southwest airlines to become a low-cost carrier, where the rectangles are themes and circles are activities supporting those strategic positions.

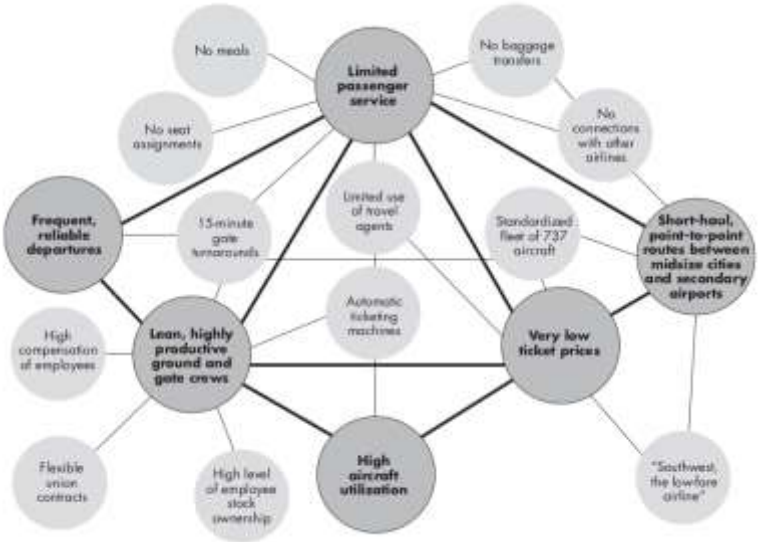

Figure 23 Porter´s strategic activity-system map, source: Porter (1996)

We know that senior executives are not the ones designing or managing processes within an organization. This Activity-System map is also not supposed to be drawn by these executives and handed over to process responsible to create processes around the given themes. Porter suggests that senior executives think in terms of processes, so that one strategic goal creates a value chain to create a clear competitive advantage for the organization (Harmon, 2014). The process manager then "reverse engineers" his processes to check if the core processes are supporting the themes and activities of the strategy map.

Balanced Scorecard (BSC) is a management information system that combines both financial and non-financial metrics into one comprehensive system. The BSC approach translates the vision and the derived corporate strategy into goals and key performance indicators in four areas: financial perspective, customer perspective, internal process perspective and learning and development perspective (Thommen & Achleitner, 2012). Harmon (2014) criticizes Kaplan and Norton's Balanced Scorecard approach in a way that the assumption of that approach is that any organization has just one single strategy, neglecting marketing strategies or technology strategies and the vertical business alignment lacks a truly process-oriented perspective. The author together with BPTrends (2017) propose a comprehensive approach where strategists and enterprise process managers use the same tool set, which is described in Figure 24.

The strategy group does the work on creating an organizations' strategy by for example following Porter´s three phases approach, described earlier in this thesis, but in a process-oriented way. Instead of thinking about products and services, the strategy group already describes value chains. To do so the strategy group must have access to process metrics, performance measurement tools and data. By handing over these value chains to the enterprise process managers these value chains are described in a more specific way and performance and process metrics are assigned. The mentioned business process architecture used by the process management group is the business process management and government system of an organization where core and support processes are aligned to fit together and work correctly (Harmon, 2014).

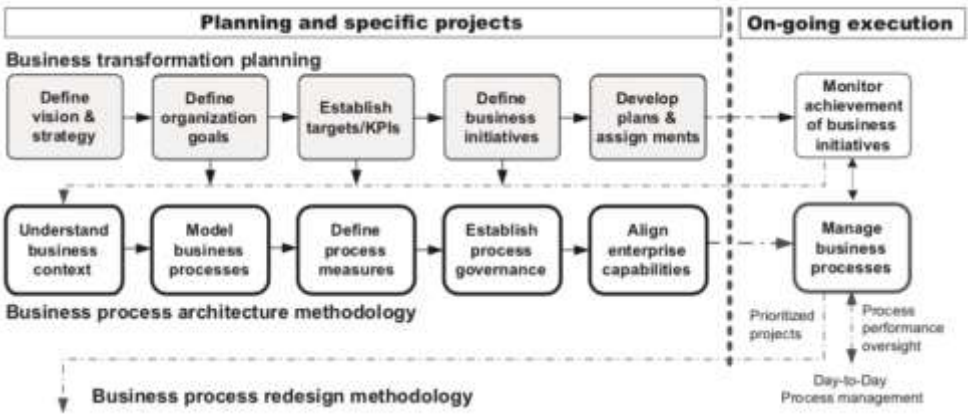

Figure 24 Co-working of strategists and process managers, source: (Harmon, 2014)

Van Alstyne et al. (2016) give an explanation on how Apple's competitive advantage developed with the introduction of its iPhone. The authors explain that establishing a platform rather than a business pipeline is more successful. A platform usually has an owner that controls intellectual property and governance and providers that interact with users. In addition, producers create content to be sold and consumers using these products or services. In Apple's example the producers are application developers and consumers are buyers of these apps. If Apple's iPhone would only be a mobile phone the business would be a pipeline business – a classic value chain model.

Organizations that are highly competitive as pipeline businesses – these are traditional businesses with value chains from suppliers over product or service provision to customers - loose when a platform business enters the same market. Therefore, companies will transform their pipeline business to platforms if possible. Well-known examples of platform businesses are Uber, Alibaba, Airbnb or Nike. The chief asset of platform businesses is the network of producers and consumers.

In regard to Business Process Management the major distinction of pipeline and platform businesses is the view on business processes. Pipeline firms orchestrate their internal labour and resources to optimize the entire value chain. The main focus is performance increase through efficiency. Platforms simple facilitate interaction between producers and consumers.

Performance maximization of the lifetime value of individual customers at the very end of a linear process in pipeline businesses is facing total value maximization of an expanding ecosystem in a circular, iterative, feedback-driven process in a platform business (Van Alstyne et al., 2016).

Traditional pipeline businesses can also start a platform business if they manage to handle the new business rules. Porter´s five forces model is applicable for pipeline industries, but for platform industries the model must be extended (Harmon, 2014). Customers for example can swap roles on a platform as being providers like app developers and consumers buying apps. Platforms are usually not seen as competitors as they aggressively enter the market. Swatch is now not only competing with Timex, but also with Apple (Van Alstyne et al., 2016).

Other rule-changers in Strategic Management are interactions on the platform that create value to producer and consumer, instead of growing sales like in traditional pipeline industries. Interactions often do not generate great value in the first place, but the quality of interactions and the number of fits is essential for success. Access and governance must be set smart. Rules and open architecture are the instruments of platform owners.

Platform businesses need other metrics than pipeline industries. Instead of optimizing processes and discovering bottlenecks, platform owners measure interaction failures, user engagement, match quality or negative network effects (Van Alstyne et al., 2016).

Strategic decisions on running either a pipeline or a platform business imply that the organization has to manage digital assets. A so-called digital strategy is not only concerned with the management of these assets, but includes the entire process, starting from information collection, see Figure 25. The interchangeability with the term online-marketing strategy is not

given as this is just a step in the process as subcategories of the digital strategy such as the digital-marketing strategy are created (Rauser, 2016).

Figure 25 Digital Strategy Process, own illustration, source: Rauser (2016)

The purpose of having a digital strategy is to create value more efficiently. Knowing and defining the organization's challenges and opportunities, the creation of adequate guidelines, measurements and road maps to face these factors and a step by step roll out with achievable goals will help sustaining in the market (Rauser, 2016).

One term that at first glance is not perfectly fitting to the traditionally slow function of strategy is agility. Leberecht (2016) in his Harvard Business Review article "Make Your Strategy More Agile" connects the tool 'sprint', derived from agile software development, to the definition of strategies as times became more volatile, uncertain and complex for organizations. Sprints break down complex processes into sizable and achievable parts that can be accomplished much faster than the complete process. The basic concept of an organizational vision that is described as long-term or permanent purpose and principle of an organization faces the new suggestion of improvisation as suggestion for fundamental openness and flexibility of the entire company.

Rogers (2016) proposes a more holistic approach for organizations – he calls it digital playbook - to address the competitive challenges of digitization. Organizations see themselves trapped and forced to move into the digital age, but digital strategies should not be results of random processes. Rogers therefore describes five domains of strategy that digitization is changing.

Customers as one domain of digital transformation were served by mass production and mass communication in traditional theory. In the digital age customers form networks that strongly interact with each other to share knowledge, experience and product usage. A networked customer can become a heavy influencer and a partner in innovation phases as he acts like a node within dynamic networks. Such connected customers have five core behaviours businesses have to manage: access (be faster and easier, be always available), engagement (become a source of valued content), customization (offer products or services adaptable to customers' needs), connectivity (be part of customers' conversations) and collaboration (invite customers to help shape your enterprise) (Rogers, 2016).

Mass-marketing and mass-production to binary customers – buy or not buy – have been the pillars of businesses of all kinds in the twentieth century. In the digital age organizations need

to engage with customers within a network as these customers can become brand champions, influencers, partners or co-creators of value (Rogers, 2016). The relationship between businesses and customers can be described as one similar to stakeholders in project-oriented organizations, while customers within the network become end users, business partners, investors, press, government regulators or even employees.

A second domain is competition. Industries become fluid in the digital age, partners can become rivals and vice versa. As already stated by Van Alstyne et al. (2016), platform businesses are allowing one business to create value by facilitating interactions between other businesses or customers through digital technologies. Not only platform businesses are concerned, every relationship within or outside one's industry can shift from competition to cooperation, influencing one single service or product or the whole enterprise. The concept of co-opetition means competing in some areas but cooperate in others where it is valuable to act like partners for gaining success (Rogers, 2016).

Data, as the third domain, generated from business processes was used mainly for forecasting or decision making in traditional businesses. Data was expensive to produce and even more expensive to store. The primary use of data out of measuring and managing business processes was to optimize existing operations. In the digital age data is not only generated by for example market survey but is generated in outrageous amounts from every interaction in processes inside and outside the businesses. Social media, mobile devices, sensors within the supply chain are providing vast amounts of data each second. Data now is available seemingly limitless, but the real strategic asset generated from data can only be generated by seeing data as source of value creation (Rogers, 2016).

The forth domain is innovation which will be discussed in detail in chapter 3.6 of this thesis. The changes from traditional innovation management to innovation in the digital age is the approach of continuous learning through rapid experimentation. Faster testing of ideas is possible with the help of digital technologies. With active involvement of customers, market feedback can be gained very early in the innovation process, during the launch phase and afterwards (Rogers, 2016).

The last domain is the value provided to customers. Businesses used to deliver a constant value to customers with improved updates from time to time. By adapting one´s value proposition by making use of emerging opportunities such as technology, the effects of an eventual entry of disruptive businesses can be limited to organizations. Connecting this last domain to the changing customer behaviours from the first domain, organizations have to face customers' ever-changing needs by exploring new technologies for opportunities of creating new business models instead of just supporting existing ones.

This chapter provided an overview of the evolution of the theories of Strategic Management over time and ended up with digital and agile strategies in relation to technological developments. Not only strategies are facing such new developments, the evolution of organizations, organization theory as well as the nature of work are subjects of emerging theories.

3.3 Organizational Evolution

Daft et al. (2010) picture organizations as *"(1) social entities that (2) are goal-directed, (3) are designed as deliberately structured and coordinated activity systems, and (4) are linked to the external environment."*

Organizations can be seen as open systems with people to perform some specific purpose, encouraging interaction with the environment (Robbins & Coulter, 2005). Especially this interaction with the surroundings of an organization forces changing parameters that form organizations. Such parameters are e-business, technology or employee expectations.

Starbuck (2003) historically clarifies that organizations themselves were created thousands of years ago, but definitions on general rules about organizations that would contribute to organization theory are results of only the last half of the 20th century. Developments related to changes forced by industrialization and globalization during the last half of the 19th century and the first half of the 20th century let theories emerge as many more people were concerned. By the 1920s the term organization became a formal term describing "*a formally constituted medium-sized social system*" (Starbuck, 2003).

Hatch & Cunliffe (2006) provide a very comprehensive timeline overview of theorists on organization theory, that is summarized in Table 4.

Table 4 Historical Overview on Organization Theory, own illustration, source: Hatch & Cunliffe (2006)

Prehistory 1900 - 1950s	Modern 1960 - 1970s	Symbolic-Interpretive 1980s	Postmodern 1990s
Smith (1776)	Von Bertalanffy (1950)	Schütz (1932)	Saussure (1959)
Marx (1867)	Trist and Bamforth (1951)	Whyte (1943)	Foucault (1972)
Durkheim (1893)	Boulding (1956)	Selznick (1949)	Bell (1973)
Taylor (1911)	March and Simon (1958)	Goffman (1959)	Jencks (1977)
Follett (1918)	Emery (1960)	Gadamer (1960)	Derrida (1978)
Fayol (1919)	Burns and Stalker (1961)	Berger and Luckmann (1966)	Lyotard (1979)
Weber (1924)	Woodward (1965)	Weick (1969)	Rorty (1980)
Gulick (1937)	Lawrence and Lorsch (1967)	Geertz (1973)	Lash and Urry (1987)
Barnard (1938)	Thompson (1967)	Clifford and Marcus (1986)	Baudrillard (1988)

Adam Smith, a Scottish political economist (1723-1790) was the first author to publish a formal theory on organizations in 1776 in "An Inquiry into the Nature and Causes of the Wealth of Nations". In his work Smith explained how division of labour creates economic efficiency. Durkheim (1858-1917, a French sociologist) added the need of hierarchies and task interdependence to Smith's theory and thus opened the way for the concept of the informal

organization next to the formal one. The research field of organizational culture emerged (Hatch & Cunliffe, 2006).

Work specialization as we use the term today describes the degree to which activities are divided into separate jobs within an organization. Taylor (1914) created the theory of Scientific Management with four groups of new duties for management, as enhancement of his earlier findings on management of initiative and incentive. The first group consists of the gathering of all traditional knowledge from the workmen and translate and calculate it to laws, rules and formulae. The second group of duties is formed by the scientific selection of workmen with the progressive development of these employees. The third group, for this thesis the most interesting one, intends to bring together science and workmen, meaning that the management that performs scientific management should align the employees with their laws and rules. Taylor does not speak about working or business processes yet but meant it. The last group explains the division of work between employees and the management, so the employees are not interrupted in their work to sell products to customers.

Performance and satisfaction decreased, and a new philosophy was created after World War I. by rethinking the manufacturing process and team working, implementing quality circles and thus adding knowledge to work (Drucker, 2001).

Grouping jobs together to be able to coordinate common tasks is called departmentalization. Organization theory, mainly driven by Fayol (1949), describes five different forms: functional departmentalization clusters jobs by function performed (functions are accounting, manufacturing, purchasing, etc.), geographical departmentalization clusters jobs on geographical basis (countries, regions, continents, etc.), product departmentalization clusters jobs by product lines (rail, road, car, etc.), process departmentalization clusters jobs on the basis of product or customer flow (assembling, finishing, inspection, etc.) and the customer departmentalization clusters jobs on the basis of customer segments (retail, wholesale, government, etc.) (Robbins & Coulter, 2005).

The chain of command represents the continuous line of authority that spans from upper organizational levels to the lowest. This concept became more and more obsolete as employees are empowered to act, make decisions and have access to more information about the organization thanks to technology. The chain of command is relevant in governmental areas and especially in ministries of defence.

The span of control within an organization is the number of employees one manager can handle. The wider this span of control the more efficient an organization as less managers are needed. There is no perfect span of control as this number depends on managerial techniques and skills as well as on employees´ skills, organizational culture and technology used. The trend towards larger spans goes hand in hand with cost reduction efforts, speeding up decision making, increasing flexibility, getting closer to customers and empowering employees (Fayol, 1949).

The organizational structure is created by management and defines which job tasks are divided, grouped and coordinated within this framework. The creation of such an organizational structure is called organizational design that is a process with six key elements, some are derived from Fayol’s 14 principles of management, shown in Figure 26.

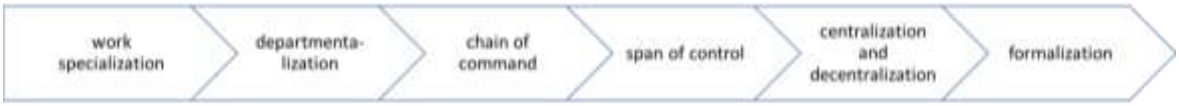

Figure 26 Organizational Design,
own illustration, source: Fayol (1949), Robbins & Coulter (2005)

Barnard (1938) stressed out that the communication of goals and the development of an organization depends on cooperation and thus enhanced the theories of Follett and Taylor.

Weber (1947) was interested in a new kind of authority structure and effects of industrialization on society. He defined the new order of organizing societies in industrialized organizations as rational-legal authorities. Compared to traditional authority based on inherited status and charismatic authority executed by exceptional individuals, rational-legal authorities bind themselves and their people in charge to strict established rules and laws to ensure appropriate behaviour by all persons involved. This structure of rules and laws also implies that everyone can become a leader by following those rules and laws. Weber proposed the theory of bureaucracy in his book "The Theory of Social and Economic Organizations" in 1924.

Centralization and decentralization are the degree to which decision-making is either concentrated at a single top point in an organization or spread down to lower-level employees that are closer to action. Younger organizations are more decentralized as more flexibility is provided. Formalization describes the degree of which instructions, processes, etc. are written down and thus the degree of freedom how a job can be done (Pugh, 1973).

3.3.1 Organizational Design

One major task of management is to decide on the right organizational structure. Taking both extremes, mechanistic and organismic organizations (Burns, 1963), shown in Figure 27, that do not really exist in practice, management has to find the perfect mix considering four contingency variables: organizational strategy, size, technology and degree of environmental uncertainty.

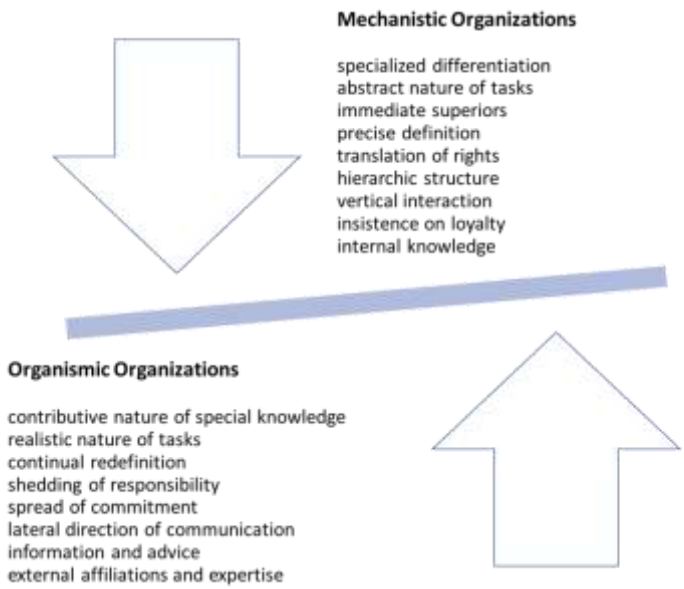

Figure 27 Mechanistic versus organic organizations, own illustration, source: Burns (1963)

From the organizational design simple, functional and divisional structure tend to be mechanistic organizations while contemporary structures such as team-based, matrix or project structures, autonomous internal units, boundary less organizations or the learning organization are more organically oriented (Robbins & Coulter, 2005).

The concept of organizational forms was employed by Marschak & Radner (1972), explaining two functions of organizations: the clean information function to describe rules used to obtain, process and transmit information and the activity function to clarify rules used to act on received information. Hannah & Freeman (1977) extended these two functions by a formal structure of an organization, the archetypes of activities and the normative order.

A simple structure is fast, flexible and inexpensive but usually relies on only one person who is the boss. Organizations with a functional structure have cost-saving advantages because of specialization, but with the departmental segmentation functional managers have little understanding of what other units do. Multi-divisional structures, developed in the 1920s but ignored until the 1960s and observed by Chandler (1962), focus on results of entire products and services, but often activities and resources are duplicated in some divisions what makes the organization inefficient.

Drucker (2001) already mentioned team-based structures in his research on management in 1999, but contemporary organizational designs focus on self-managed teams with team leaders who form a team with other team leaders that themselves have a team leader. A team, organizationally speaking, is a position whose tasks are handled jointly and largely autonomously by a group of persons (Thommen & Achleitner, 2012). Teams can be implemented complementary to the existing organizational culture as constitutive element where the organization only consists of teams.

The matrix structure sends specialists from functional departments to work in projects. With this organizational form these specialists have two managers, the head of the functional department and the project manager. A more advanced form of a matrix is the pure project structure, where employees are assigned to projects because they have special needed skills. Managers in such a structure simply serve as resource providers and bureaucracy eliminators.

Similar to divisional structure, organizations with autonomous internal units operate with own products, customers, competitors or profit goals, but the key is that they operate autonomously from the global organization. This kind of structure allows high flexibility in exploring new business models, adapt to new market situations and exploit market opportunities (Robbins & Coulter, 2005).

A boundaryless organization is a non-structured, weakly defined but flexible organization that is working on a team basis and is getting rid of tight connections like customers or suppliers. Vertical boundaries are removed by working in teams instead of a divisional separation and horizontal boundaries are eliminated by working in cross-functional teams around work processes instead around functional departments.

The learning organization practices knowledge management by steadily acquiring and sharing new knowledge and applying this information directly to work performance. As knowledge sharing and information acquisition needs collaboration throughout the entire organization, learning organizations usually get rid of functional or divisional structures and move to boundaryless organizations. Culture and leadership are important factors for learning organizations as leaders have to facilitate knowledge creation for the overall vision and employees need to build strong communities by sharing, communicating and learning for the common goals along organizational processes (Senge, 1990).

A network organization consists of relatively autonomous members (individuals, groups, companies) linked by common goals and contributing complementary know-how to joint service delivery (Thommen & Achleitner, 2012). Network organizations can be internal or external and will be further discussed in chapter 3.6 on Innovation.

Robertson (2007) published a vision of an organizational structure what he called Holacracy™. By knowing all the strengths and weaknesses of democratic and autocratic organizational structures, Robertson and his company tried to establish an integral approach. This approach works with self-organizing teams, so-called circles that are connected with sub-circles via a double-link. The aim is to improve decision activities and encourage to take individual action.

Miles et al. (1997) describe a structure composed of cells that could operate alone or interact with other cells. Cells could be self-managing teams, autonomous business units and the like, having an entrepreneurial responsibility to the larger organization. This allows the achievement of a level of know-how well beyond that of earlier organizational forms.

A historical perspective on organizational design is depicted in Figure 28 (Palmer, 1997).

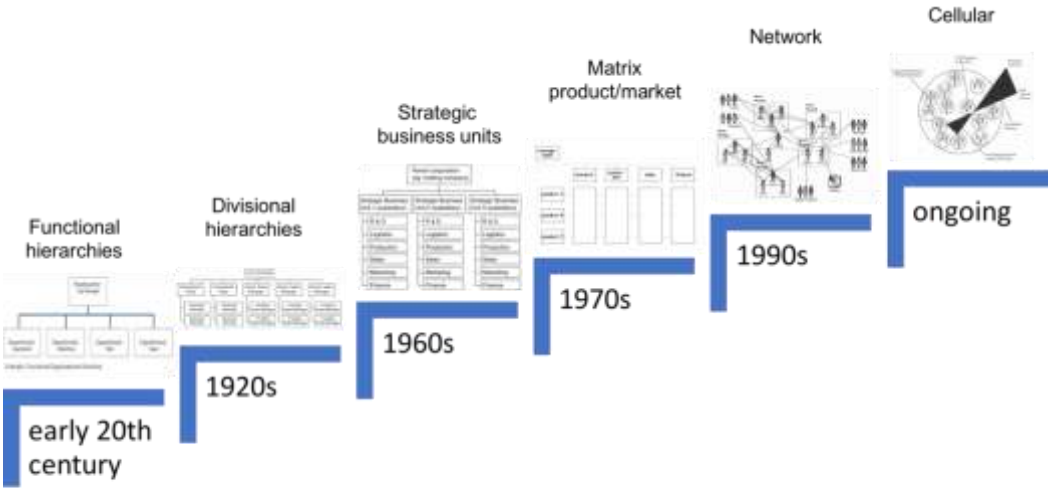

Figure 28 Timeline of organizational design, own illustration, source: Palmer (1997)

Mechanistic organizations and their organizational structures are often referred to traditional organizations while organic ones are called new organizations. Interesting to investigate from Table 5 are two characteristics. Traditional organizations tend to use job positions to define work, while new organizations prefer a task definition which is more process-oriented. Relationships in traditional companies are hierarchical due to the organizational structure while relationships in new organizations seem to be lateral and network-based. The next chapter will focus on the correlation of organizational design and process management to research the impact of work description and types of relationships on business processes.

Table 5 Traditional vs. New, own illustration, source: Robbins & Coulter (2005)

Traditional Organization	New Organization
Stable	Dynamic
Inflexible	Flexible
Job-focused	Skills-oriented
Work is defined by job positions	Work is defined in terms of tasks to be done
Individual-oriented	Team-oriented
Permanent jobs	Temporary jobs
Command-oriented	Involvement-oriented
Managers always make decisions	Employees participate in decision making
Rule-oriented	Customer-oriented
Relatively homogeneous workforce	Diverse workforce
Workdays defined 9 to 5	Workdays have no time boundaries
Hierarchical relationships	Lateral and networked relationships
Work at organizational facility during specific hours	Work anywhere, anytime

In the context of traditional and new organizations, Drucker stated that any existing and thus traditional organization will not survive without practicing innovation and any new organization will not succeed without knowing how to manage (Drucker, 2001)

3.3.2 Evolution of Organizational structures

Frederic Laloux researched the evolution of organizational structures along numerous findings of other researches and explores this evolutional theory with the help of human consciousness and colour labels (Laloux, 2014). The given timeline shown in Figure 29 helps understand the influence of organizational design on Business Process Management.

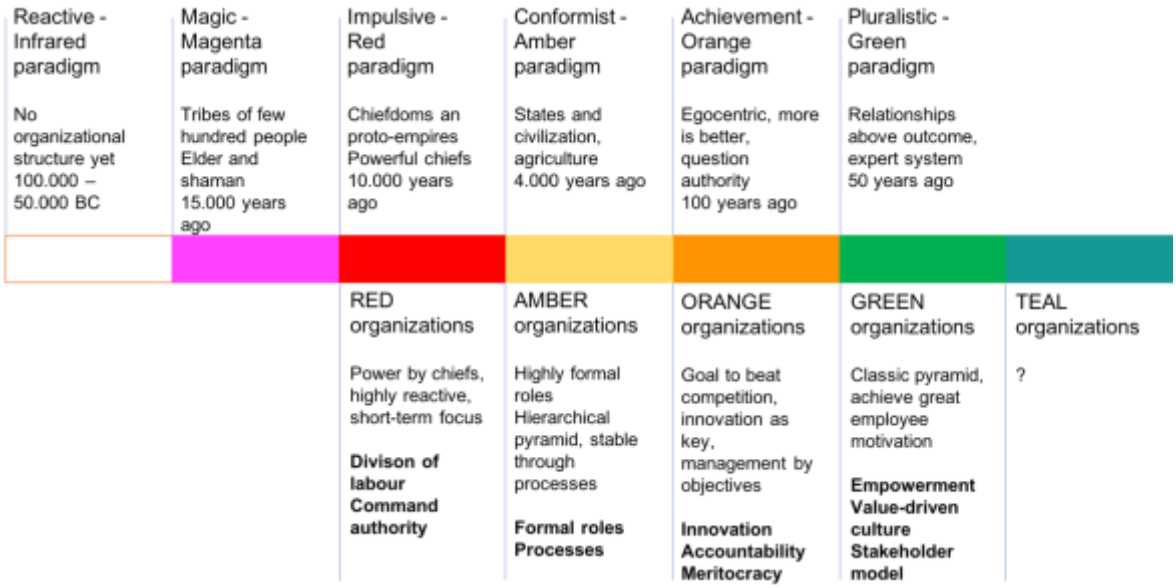

Figure 29 Timeline of Organizational Evolution, own illustration, source: Laloux (2014)

While reactive-infrared and magic-magenta paradigms are no longer existing in a modern worldview, the impulsive-red, conformist-amber, achievement-orange and pluralistic-green paradigms are coexisting, each with different characteristics. While red organizations are usually present on the fringes of society, examples are street gangs or mafia-like constructs, representatives of amber organizations are the catholic church, militaries, most governmental agencies or public schools. Amber organizations work within a hierarchical pyramid with well-defined roles and structured processes. The main difference between amber organizations that are totally process-driven, and orange organizations is that orange organizations are project and process-driven with the paradigm that innovation and change are opportunities (Laloux, 2014).

Orange organizations answer the question of empowerment and trust with the paradigm of management by objectives. Top management formulates an overall strategy and communicates corresponding objectives down the cascade. Already familiar management processes like strategic planning, budgeting cycles, balanced scorecards and also incentive processes to motivate employees are practiced within orange organizations. Talking about incentive processes, in orange organizations resource planning, leadership training and succession planning are also implemented which allows employees to move up the hierarchy as the right skills and talents are in place. This is called meritocracy within orange organizations.

Laloux also stresses out some negative sides of orange organizations. Working within an achievement-orange paradigm firm means running for success, growth and well-being. Doing this for several years can yield in un-success or depression. Additionally, some scandals of the past few years where a small number of CEOs grant themselves ever higher salaries, lobby for favourable rules or even corrupt regulators, not to mention worldwide economic crisis and abuse of their power over suppliers, customers and employees (Laloux, 2014).

Green organizations try to eliminate power and hierarchy that are not easy to handle and are not successful. The pluralistic-green paradigm adds three practices to orange organizations. Giving decision-making power to frontline works helps solving problems faster and more efficient. Leadership in green organizations should be of a servant leadership style, that will be further discussed in chapter 3.5. Servant leaders listen to their subordinates, empower and motivate them and help them develop their career. Servant leaders are also carriers of the company's culture and values. Drucker (Drucker, 2001) already discussed the topic of trade-offs to keep organizations successful. The role of servant leaders within green organizations is to manage a wider set of stakeholders like management, employees, customers, suppliers, local authorities, society itself and also environment and to make the right trade-offs so that all stakeholders are well managed and get value out of the organization.

Figure 29 shows the term teal organization. Laloux (2014) describes teal organizations with the new evolutionary-teal paradigm of human consciousness. Teal organizations will be discussed later in this chapter.

3.3.3 Nature of Work and Business Process Management

Performance improvement is discussed widely from different perspectives. Two process-oriented approaches are mentioned in this thesis. Using Business Process Management as a management philosophy, involving doing everything to improve performance, practitioners will start by creating an organization-wide strategy to define its core strengths. Having a strategy allows managers to create a business process architecture by defining core processes that support the strategy. Managers or process owners are assigned to be responsible for the core processes while their rewards are tightened to process success. Process incentives are set for all employees to ensure that the value generation is understood by every participant. Common processes that are used for similar work have to be identified to ensure efficient technology use for these common processes within the entire organization (Harmon, 2014).

Rummler & Brache (2013) draw a broad picture of organizations, that focuses on the organization itself, the included processes and the jobs or performers executing these processes. Organizations are systems where all system components are strongly dependent on each other. Like Porter´s (1979) five forces (threat of disruptive entrants, bargaining power of customers and suppliers, threat of substitute products or services and the industry running for positions among existing competitors), the comprehensive system 'organization' that has to be adaptively managed consists of environmental influences, shareholders, resources, competition, the market and not to forget customers, shown in Figure 30.

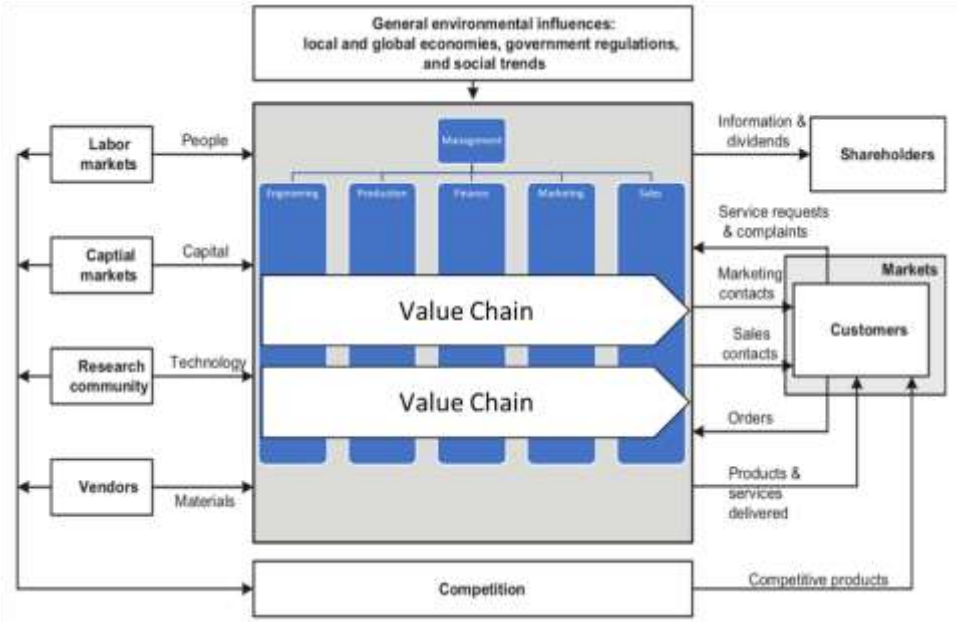

Figure 30 Organizations as a system,
own illustration, source: Harmon (2014)

The Rummler & Brache approach basically assumes that nine performance variables are improving an organization´s performance. These nine variables are directly linked to each other and are thus dependent. On the organizational level – one of three levels – organization goals (goals and strategy are articulated, the strategy is validated, outputs are determined), organization design (design follows strategy, resources are necessary and in place) and organization management (interfaces are managed, resources in place and measured, goals are set) are balanced. The second performance level is the process level, where again three needs are determined and managed: process goals (goals of core processes are linked to customer and organization requirements), process design (processes are most efficient and effective to meet process goals) and process management (process performance is managed, resources are allocated to each process, interfaces between process steps are managed). The third level is the job/performer level with job goals (job outputs are linked to process requirements), job design (process requirements are reflected in appropriate jobs, job steps have logical sequence, supportive policies and procedures are developed) and job management (performers understand job goals, performers are adequately rewarded and have necessary knowledge and skills) (Rummler & Brache, 2013).

The fact that the process level is the most important component in this performance improvement approach becomes obvious quite quickly. A well-defined and communicated strategy and reporting relationships as well as skilled, enthusiastic people are not able to compensate unstructured or badly automated business processes (Rummler & Brache, 2013).

Rummler & Brache (2013) and Harmon (2014) do not link organizational design with business processes. They assume that the view on an organizational structure should be horizontally, so

from the process or value chain point of view, but both do not suggest the perfect organizational structure.

Schwartz et al. (2017) identify 10 human capital trends in their 2017 global survey. One of these trends is the pressure and need to build the organization of the future without structural hierarchies and with networks of empowered teams. This is not only relevant for new organizations. Established companies also become more digital and start the fuzzy project of organizational redesign to facilitate speed, agility and adaptability. Team-centric structures with no leaders or servant leaders and a network of teams become highly effective and stay agile. Organizational network analysis as a tool for building the organization of the future can help to find out already existing networks within the organization and facilitate a company-wide establishment of networks.

Teams focusing on team excellence and outcomes need rules to become effective. According to Northouse (2016) teams need a clear, elevating goal, a results-driven structure, competent team members, a unified commitment, a collaborative climate, standards of excellence, external support and recognition and a principled leadership. Taking the generational workforce into account, Anantatmula & Shrivastav (2012) suggest assigning mentors to assist Generation Y to bridge the knowledge gap between representatives of other generations to the young Millennials within a team. For leaders, generation-specific information in leadership seminars would help to learn how to manage a multi-generational team. Leadership is therefore also affected by these changes of organizational structure and will be further discussed in chapter 3.5.

Laloux (2014) uses colourful paradigms and powerful analogies for organizational evolution. Achievement-orange organizations work like machines or pluralistic-green function like families. Teal organizations, first introduced in Figure 29, with the three major breakthroughs self-management with no hierarchy needed, wholeness stressing out all skills of an employee and the evolutionary purpose of the organization itself see themselves as living organisms or living systems. Holacracy™, described earlier, is one organizational operating model that is based on evolutionary-teal paradigms.

It is worth to take a closer look on how a teal organization is structured and how processes are established within such organizations. Teal organizations do not have hierarchies and thus no different levels of power. The typical staff functions of human resources, strategic planning, finance, internal communication, training, public affairs, information technology services or knowledge management are executed by the workforce themselves. A comparison of business process architectures of an achievement-orange and an evolutionary-teal organization is given in Figure 31.

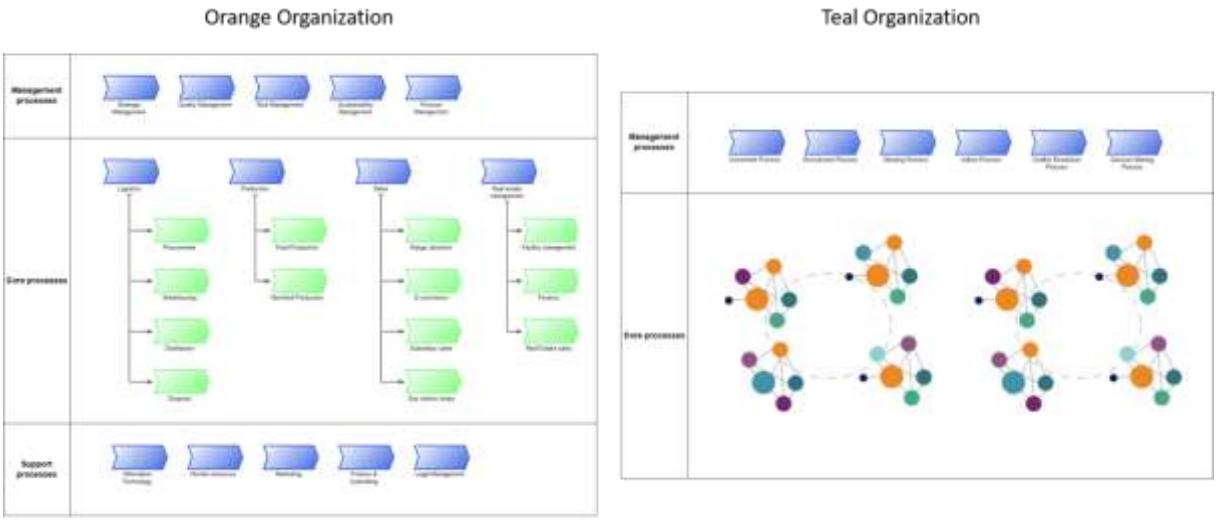

Figure 31 Comparison of Process Architectures, own illustration

As typical staff functions are eliminated or better integrated within the team structures, the processes are set up in a different way. A typical client order process in an orange organization involves several departments and people working within these departments. The ones processing the order are not involved in the process, they only receive directions on how to do the job. Teal organizations integrate typical staff functions within their team-based structures and manage the order within the team. Job titles, roles or departmental structures are typically erased within teal organizations. The example of the order process differences is shown in Figure 32.

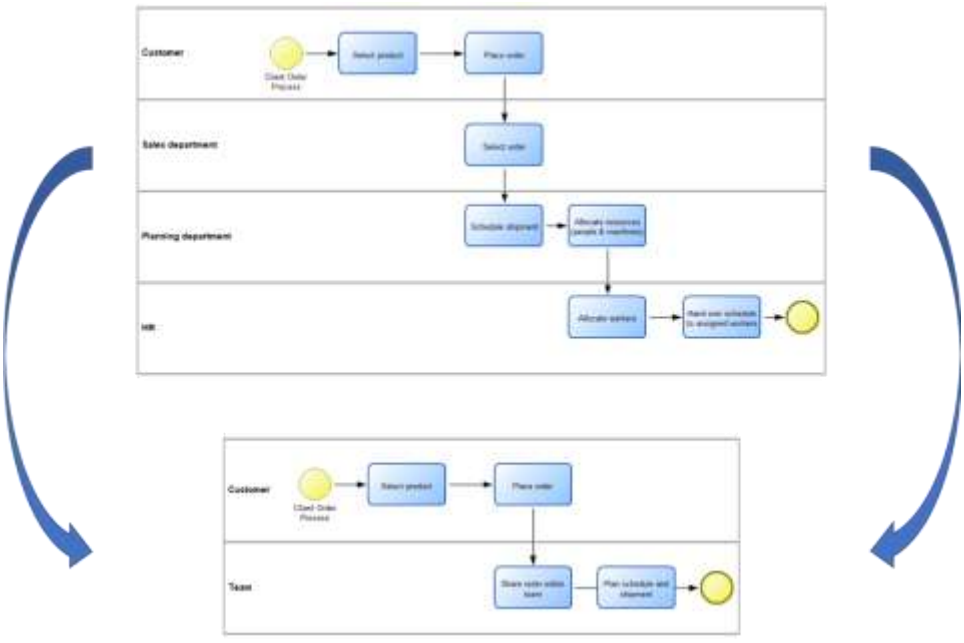

Figure 32 Client order process, orange to teal, own illustration, source: Laloux (2014)

Teal organizations do not have complex and hierarchically followed meeting structures. Meetings are just held on an irregular basis within the teams, no bigger than 35 employees. Knowledge management and thus information flows are executed by volunteers helping team members from other teams to learn from each other. Budgeting is executed on realistic numbers by the team and no reports on current sales numbers are produced for a Chief Executive Officer. Another interesting issue is the way project management is executed within teal organizations. Project groups find themselves, work together when they find it important or interesting, there are no project management documentation rules or software implemented and no one is the project manager. Projects are based on the trust of the collective intelligence of the system (Laloux, 2014).

The conclusion of the structures and rules of teal organizations could be that no Business Process Management is needed in team-based, network operated teal organization. This is not true as processes are still necessary and worth describing. Processes just look different. Decision making in teal organizations is not done by hierarchy or consensus but with the help of an advice process. Everyone who wants to make a decision has to ask for advice from affected people. Sahota (2016) describes the advice process as a means to balance speed and quality of decisions and illustrates the advice process in Figure 33.

Figure 33 Advice Process, source: http://agilitrix.com/2016/11/advice-process/

A second example is the compensation process. In orange organizations the one higher in the hierarchy decides on how much money an employee is earning. Teal organizations implement a peer-based process where once a year, workers fill out a two-question survey on all their colleagues to state if he or she contributes more or less than others (Laloux, 2014).

Table 6 summarizes the main findings on the evolution from orange organizations, that are most represented nowadays, to teal organizations.

Table 6 Practices in orange and teal organizations, own illustration, source: Laloux (2014)

Practices	Orange Paradigm	Teal Paradigm
Organization Structure	Hierarchical pyramid	Self-organizing teams
Staff functions	HR, IT, purchasing, finance, controlling, quality, risk, etc.	Most functions performed by teams themselves; staff remaining have only advisory role
Coordination	Fixed meetings at every level	Ad hoc meetings when needed
Projects	Heavy machinery	Radically simplified
Job titles & descriptions	Every job has title and description	Fluid and granular roles, no job titles
Decision making	High up in pyramid	Based on advice process
Crisis management	Confidential on top level	Transparent information sharing
Information flow	Information is power	All information available
Performance management	Focus on individual performance	Focus on team performance, peer-based process

Schwartz et al. (2017) create a rule set for old and new ones. Old rules for traditional organizations, or in terms of Laloux's colour coding, achievement-orange paradigm organizations, are discussed at the beginning of this chapter. Such organizations are built for efficiency and effectiveness, have hierarchical decision rights, structure and leadership progression, function with a structure based on business function, people become leaders through promotion, have cultures ruled by fear of failure, work on a rule basis with job titles and roles clearly defined and are typically process-based.

Agile, team-centric, network-based or teal organizations are created for learning, innovation and customer impact, are viewed as an agile network, empowered by team leaders and function through collaboration and knowledge-sharing. The structure is based on work and projects and people create followers to lead by orchestration. A culture of safety with defined teams and responsibilities instead of defined roles and job titles allow a project-based work (Schwartz et al., 2017). Processes are more like a playbook with defined starts and ends but loose activities.

The organizations map introduced by Circle43 (2017), assesses an organizations level on consciousness. It is a four-quadrant grid along the axes of interior-exterior and individual-collective. The quadrant exterior-collective, shown in Figure 34, displays the evolution of the components "organization structure" and "process" along the colour coded paradigms presented in (Laloux, 2014). Starting from autocratic organizations with division of labour and provisional processes in red organizations to industrial organizations with divisions and formal roles and standardized processes in amber organizations and matrix organizations with flexible processes with goal focus in orange organizations to network organizations with cross-organizational processes with culture focus in green ones. Teal organizations concentrate on fractal or holarchy organizational structures with free cross-disciplinary process networks.

Figure 34 Organization map, exterior-collective quadrant, source: http://www.reinvorgmap.com

Organizational structures are evolving and become more team-based and agile. The question of how employees are working with these changes and how they want to be treated by their colleagues and managers is explored in the upcoming chapter. Special attention is drawn on the way how processes should be communicated to different generations.

3.4 Generational Workforce

Examining organizational forms from a workforce perspective means finding four generations working side by side. Research in this area started back in the 1940s and there has never been such a situation. It is not unlikely that representatives of the Traditionalists, Baby Boomers, Generation X and Millennials or Generation Y are team members (Effrom et al., 2003). By 2020, five generations, including Generation Z, will work together, according to predictions of Shah (2015).

Literature is not clear about a consistent classification of the different generations according to the year of birth. A generation itself is defined as a group of people born within twenty years or within a period with shared social experience like wars or economic depressions (Lewis & Wescott, 2017). What is very well defined are the core issues and descriptions of all the listed generations. Figure 35 represents the most common use of definitions beginning with the Traditionalists or also called Silent Generation or Veterans heading up to Generation Z.

TRADITIONALISTS	BABY BOOMERS	GENERATION X	GENERATION Y	GENERATION Z
Age 73 - 90	Age 54 - 72	Age 39 – 53	Age 23 – 38	Age 9- 22
1928 – 1945	1946 – 1964	1965 – 1979	1980 – 1995	1996 - 2009

Figure 35 Demographics of generations,
own illustration, source: Abel-Lanier (2016)

McCrindle & Wolfinger (2009) are not conform with the definition of the generations given above. Of course, earlier generations were shaped by a particular span of time or events that happened during this time phase, but this is no longer applicable to today's generations. These have the same global, cultural and socioeconomic experiences, so the authors define a generation *"as a group of people born in the same era, shaped by the same times and influenced by the same social markers – in other words, a cohort united by age and life stage, conditions and technology, events and experiences.*" (McCrindle & Wolfinger, 2009).

More important than years of birth are attitudes related to management styles, organizational forms, technology, leadership, communication and innovation. The next paragraphs are focussing on these characteristics and values for each active workforce generation.

Still very active, the group of Traditionalists is formed by the most experienced employees within organizations. Traditionalists or also called the Silent Generation or the World War II Generation have faced different influences like the Great Depression, World War II, the invention of colour television or free education. One popular description of this workforce generation comes from Brokaw (1998), stating that Traditionalists fought in the war, came home and immediately started to build up the lives they wanted. Characteristics and values describing are dedication, loyalty, respect for authority or team orientation, just to name a few of them (Lewis & Wescott, 2017). Traditionalists are formal in their attire and formal in their

communication. Handwritten or typewriter letters, faxes or telegrams are familiar ways of communication. They need motivation through valuation of their experience. Their preferred leadership style could be described as military or chain of command which matches their workplace behaviour with strong work ethic, respect and authority (Anantatmula & Shrivastav, 2012).

By 2020 Traditionalists will be 75 years and up, so why examining this age group? Inventions like the personal computer in 1981, the first mobile phone in 1987 or the internet in 1991 happened during the active work period of this workforce. Google, Facebook, Twitter or YouTube are also familiar to Traditionalists, either through their time with their grandchildren or even through active work life. Examples of retired Traditionalists employed as consultants for their former companies or self-employed offering IT services to customers are very well known. In 2015 seven million people or 4% of the American workforce were born before 1946 (Arellano, 2015).

Private lives of the Baby Boomer generation were heavily influenced by television and the events that could be watched by then. Examples are the assassination of Kennedy in 1962, Woodstock in 1968 or the landing on the moon in 1969. With the invention of the personal computer in 1981 also working habits have changed dramatically. Access to a workplace computer became day-to-day business (Meister & Willyerd, 2010).

As the number of Baby Boomers is the highest amongst workforce, the representatives of this generation usually hold positions of influence and authority. They act as mentors due to their interpersonal and great communication skills. On one hand Baby Boomers define their private lives through their working lives what makes them hard working and loyal (Anantatmula & Shrivastav, 2012). On the other hand, due to that fact they tend to work for their own self esteem rather than for the wealth of their organization. Baby Boomers are not digital natives and thus disadvantaged compared to other generations which engages their competitiveness (Lewis & Wescott, 2017).

In 2016, the International Public Management Association for Human Resources published a report on opinions about government and motivations for working in the public sector (IPMA-HR, 2016). The top three motivations for seeking public sector employment are good benefits, job security and pension. These facts correspond with the attitudes of the Baby Boomer generation as they are significantly less likely to change the job when they have a boss they can respect, when effective communication and teamwork are in place and when the job provides an income that is needed and funds retirement.

Fishman (2016) provides some strategies on how to deal with the Baby Boomer generation. It is important to value their working experience and not their age. As Baby Boomers handle their grandchildren, jobs and aging parents, companies should try to make work trouble-free. Managing this generation means giving them the feeling of having control. Historic events made Baby Boomers a self-absorbed generation, so they value individual growth rather than of the group. Learning new things like acronyms, emoticons or tech-talk helps Baby Boomers to catch on. In 2015 35% of the workforce were born between 1946 and 1964, so are of age between 55 and 72 (Arellano, 2015).

The children of the Baby Boomers are influenced by Tom Peters manifesto that described the "Me Inc." organizations, where the importance of self-branding is described (Meister & Willyerd, 2010). Key factors like "latchkey kids", dual income families, high divorce rates, layoffs and inflation are often associated with people of the Generation X. Major events of this generation are for example the Persian Gulf War, the Fall of the Berlin Wall, the Fall of the Iron Curtain, Women's rights, AIDS, computer games and technology usage (Anantatmula & Shrivastav, 2012).

Members of this generation are highly adaptable to technology and therefore know how to use it, have a realistic and practical approach to solving problems and try to manage their work-life balance. This fact together with job security and the positive reputation in the community are also key issues for the appeal of working for the government. One essential output of the benchmarking report of IPMA-HR was that members of the Generation X want to learn as many skills as possible at their current job as they realize that having skills that are portable is important for getting a better job in the future (IPMA-HR, 2016).

From an American perspective, Fishman (2016) states that Generation X is the first generation that will not live a better life than their parents. As there are so many Baby Boomers active in the workforce, there is a little chance to get a higher position or even a job. This generation learned early not to trust older people and institutions. People of this generation need companies that have systems in place that let them live their lives. They seek the experience of Baby Boomers and the technological skills of Generation Y.

Representatives of Generation X are the ones facing Business Process Management for the first time in their work place. By 2015 29% of the workforce were Generation Xers (Arellano, 2015).

Representatives of Generation Y are also called Millennials, Digital Natives, the Net or Google Generation. They are "wired" as they are used to computers or digital devices from their early years on and have been living on the web since ever (Meister & Willyerd, 2010). Millennials are witnesses of the rise of Google, Facebook, Twitter or YouTube, but also of 9/11 or the election of Barack Obama. Social networks and the use of technology allows working when, where and how they like. Characteristically they are ethnically diverse, independent, confident and adaptive to various situations, but also depressive, anxious and have a lower need for social approval (Anantatmula & Shrivastav, 2012). Millennials prefer to work in teams and want work that really matters to them. Being opinionated and expecting to be heard are also traits of this generation described in literature (Kaifi et al., 2012).

Millennials are seen being confident in what they do, and they want to have fast and early leadership positions. For representatives of this generation it is not necessary to learn how the company works in detail first and then become a manager. This behaviour appeals to both men and women as females are profiting from the feminist movements of the Baby Boomers and Generation X. For Generation Y diversity topics like gender, age or race issues are something normal and not worth thinking about. This work was done by their grandparents. Women control their own lives, stay at home or earn money for their families. This generation is also called the Trophy Generation as they were given batches, prices and medals for simply joining competitions like team sports, what made them team-taught and team-graded (Fishman, 2016). In 2015 32% of the workforce were Millennials (Arellano, 2015; Armistead & Machin,

Implications of business process management for operations management, 1997; Armistead & Machin, Implications of business process management for operations management, 1997).

Literature about Generation Z, also called the Überconnected, the Gamer Generation or Generation 2020, is rare from the workforce perspective. Authors are also not clear about the time frame of this generation. In any way, members of this generation are entering the workplaces in millions each year (Lanier, 2017). Members of the Generation Z are wired from their early baby stage. As Koulopoulos & Keldsen (2014) call it: "*These kids are not just digital natives, they are hyperconnected junkies whose expectations will radically change business forever*." One example for this is often heard. Little toddlers trying to wipe a newspaper page just like photos in a mobile phone. Gen Z members do not remember times without internet or social media, they expect objects to have certain behaviours or even personality.

As Generation Z is more connected than Millennials they are used to cultural, racial or gender diversity and so they are the first generation to expect diversity at work (Lanier, 2017). This fact leads to the described Gen Z effect in (Koulopoulos & Keldsen, 2014), where the authors state that people can chose to become part of the Generation Z as technology simplicity and affordability unites generations more than divides them. Attitudes like starting a new career as Baby Boomer instead of retirement or being a leader who wants to stay young in the way of thinking.

Generation Z also saw failures of Millennials what makes them more pragmatic and traditional with opportunities for advancement and development. Security, personal benefits, learning opportunities, flexibility and a creative and challenging working environment are expectations of this generation (Abel-Lanier, 2016). Although Generation Z is said to be constantly connected, almost half of this generation prefers face-to-face communication with leaders and regularly desired feedback should be delivered in-person in meaningful conversations (Lanier, 2017).

Table 7 Distinguishing factors of Generations, own illustration, source: Abel-Lanier (2016)

Traditionalists (Veterans)	Baby Boomers	Generation X	Generation Y (Millennials)	Generation Z (Gamers)
• National values • Civic pride • Loyalty and dependability • Respect for authority • Disciplined: obedience over individualism • "An honest day's pay for an honest day's work" • Conformists	• Passionate about participation in the workplace • Belief in civil rights, empowerment and diversity • Pursuit of personal gratification • Ambitious • Relationship driven	• Edgy and sceptical • Change masters • Tech-savvy • Self-reliant • Private • Unimpressed by authority • Non-conformists • Appreciate flexibility	• Hopeful and optimistic • Coddled and nurtured • Tech-savvy • Resist traditional categorization by race, religion and sexual orientation • Non-traditional views • Multi-taskers • Bored easily • Expect flexibility	• Demand flexibility • Expect diversity • High self-esteem • Tech-savvy • Social and connected • Emotionally attached to digital habits

What all generations have in common is that they want to feel valued, empowered, engaged at work and last but not least trusted at work (Meister & Willyerd, 2010).

In 2012 a global survey of "The Generations @ Work" asked 2200 members of four generations about their values, behaviours and mind-sets (Meister & Willyerd, 2010). The five key findings are:

- all four generations are contributing to the web, but in different ways; Millennials are making content, Baby Boomers are consuming
- Boomers and Generation Xers prefer a balanced work and private live while Millennials see work as part of their lives, through connecting via social media, being "friends" is just linking two internet profiles
- Millennials and Generation Xers want to be trained by company-funded training and development programs (learning generations)
- Millennials select an employer by the provision of tools and latest technology at work; often they want to bring their own device as it is of a higher standard than the IT equipment provided by the employer
- Traditionalists and Boomers want to have a manager who is able to cope with all four generations

3.4.1 Communication and Business Process Management

The main output of the process of communication of humans is making a meaning together, no matter if the communication is verbal, non-verbal, face-to-face or digital (Venter, 2017). But how do different generations preferably communicate? Deloitte Consulting and the International Association of Business Communicators conducted a survey to identify the optimal communication style throughout four generations, which is summarized in Table 8 (Reynolds et al., 2008).

Table 8 Communication patterns, source: Reynolds et al. (2008)

	VETERAN (born before 1946)	BOOMER (1946–1964)	X'ER (1965–1981)	Y'ER (1982–2000)
STYLE	Formal	Semiformal	Not so serious; irreverent	Eye-catching; fun
CONTENT	Detail; prose-style writing	Chunk it down but give me everything	Get to the point—what do I need to know?	If and when I need it, I'll find it online
CONTEXT	Relevance to my security; historical perspective	Relevance to the bottom line and my rewards	Relevance to what matters to me	Relevance to now, today and my role
ATTITUDE	Accepting and trusting of authority and hierarchy	Accept the "rules" as created by the Veterans	Openly question authority; often branded as cynics and skeptics	OK with authority that earns their respect
TACTICS	Print; conventional mail; face-to-face dialogue or by phone; some online information and interaction	Print; conventional mail; face-to-face dialogue; online tools and resources	Online; some face-to-face meetings (if they're really needed); games; technological interaction	Online; wired; seamlessly connected through technology
SPEED	Attainable within reasonable time frame	Available; handy	Immediate; when I need it	Five minutes ago
FREQUENCY	In digestible amounts	As needed	Whenever	Constant

Some authors argue that the differences of generations in the workforce are just a marketing invention. Still, a good leader strengthens the positive differences and neutralizes the negatives for a successful workplace. For the communication process it is important to use technology and team development and to establish trust, defining roles and responsibilities and enhance collaboration (Anantatmula & Shrivastav, 2012).

Murphy (2007) suggests a titanium rule when communicating with employees from all generations: *"Do unto others, keeping their preferences in mind."* This rule is based on the Golden Rule 'Do as you would be done by'. When communicating with a Traditionalist, be respectful, use good grammar, use formal and professional language. A conversion with a Baby Boomer should be more rational, when having lunch or dinner, always including personal interests, visions or values. Don´t waste the time of a Generation X, be direct and straightforward, leave a message on the phone or write an email with your clear statement what you want. Millennials prefer short text messages or face-to-face meetings, tie message to team goals or Millennial´s goals and don´t be cynic or sarcastic.

Looking back at Figure 15 Business Process Model "Borrow a book" in chapter 3.1, to whom would the type of process model visualization appeal? Literature does not really give an adequate answer to the question of how business process models are best communicated to the workforce, no matter which generation, despite standard business process modelling notations such as event-driven process chains (EPCs) or Business Process Model Notation (BPMN 2.0). According to Table 8, there are generational differences in communication needs. Venter (2017) conducted a literature review on the communication gap between Baby Boomers, who prefer formal, face-to-face communication, and the Generation Y, the first digital natives with highly interactive digital communication tools. In this relation Baby Boomers are usually the

teachers, bosses, parents facing communication problems as Generation Y sees Boomers as being resistant to technological change. The conclusion draws a picture of the combination of following the Titanium rule proposed by Murphy (2007) and the reverse mentoring approach described in (Koulopoulos & Keldsen, 2014), where Generation Y and Z are mentoring Generation X and Baby Boomers in how to communicate in the digital age.

Literature is quite clear about communication in Business Process Management projects or Process Transformation projects, often following change management rules (ABPMP, 2013). Communication should be direct, clear and using common language and terms. Nuances should be avoided, and all stakeholders are kept informed on a very regular basis. Communication in transformation projects means telling involved people how the transformation will look like for their own relevant business unit. But there is a dilemma in presenting someone a business process model who is not familiar with this notation and who is not directly involved in the business process group.

Presenting a complex, large end-to-end process improvement work or a new automation business model implementation is challenging (Leonardo Consulting, 2015). The same business process may be described with multiple model types to various audiences and stakeholders. Board members are usually not interested in detailed process flows and prefer coarse process descriptions facilitating fast and correct business decisions. Employees appreciate fine detail specifications to see the clear impact on their day-to-day business. The graphical representation of a process is the most challenging within a presentation. Storyboard style graphics like Figure 36 help to abstract the process model but keep the same information degree and process improvement factors can be easily highlighted.

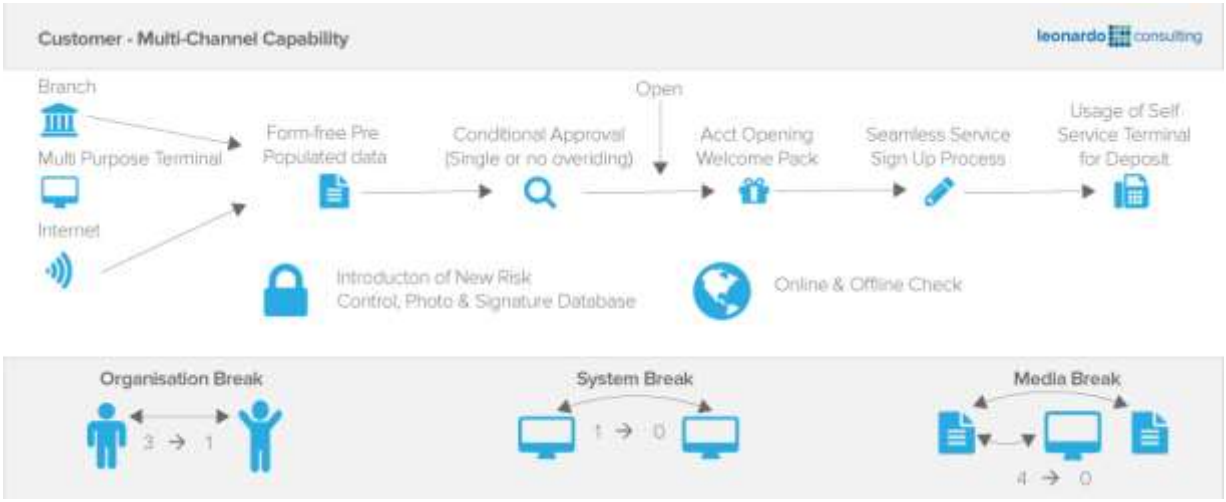

Figure 36 Storyboard style graphic of a business process, source: Leonardo Consulting (2015)

Difficulties arise when looking at onboarding processes. One major task of Human Resource Management is to get new employees productive as fast as possible. This task involves steps like strengthen engagement, stress out loyalty and commitment, transport mission, vision and

values, highlight expectations and performance standards, but also teach work processes and show how to get things done (Society for Human Resource Management, 2017). Addressing the different generations on the labour market, that also can be named stakeholders, for sure different ways of giving an overview of work processes, work flows, departmental structures or working rules should be considered.

Berinato (2016) provides a framework on information visualization stating that also information that is not statistical needs visual expression. Complex systems such as business processes or customer journeys are hard to understand if the listener is not familiar with the topic presented. The author defines four types of visual communication: idea illustration for explanatory and learning goals in presentations, idea generation for innovative strategies or new business processes, visual discovery for complex data-driven charts and everyday data visualization (dataviz) with context-driven goals in presentations, see Figure 37. According to this research business processes are a conceptual, exploratory idea generation, were not data is the focus, but design skills to make the concept clear to the audience.

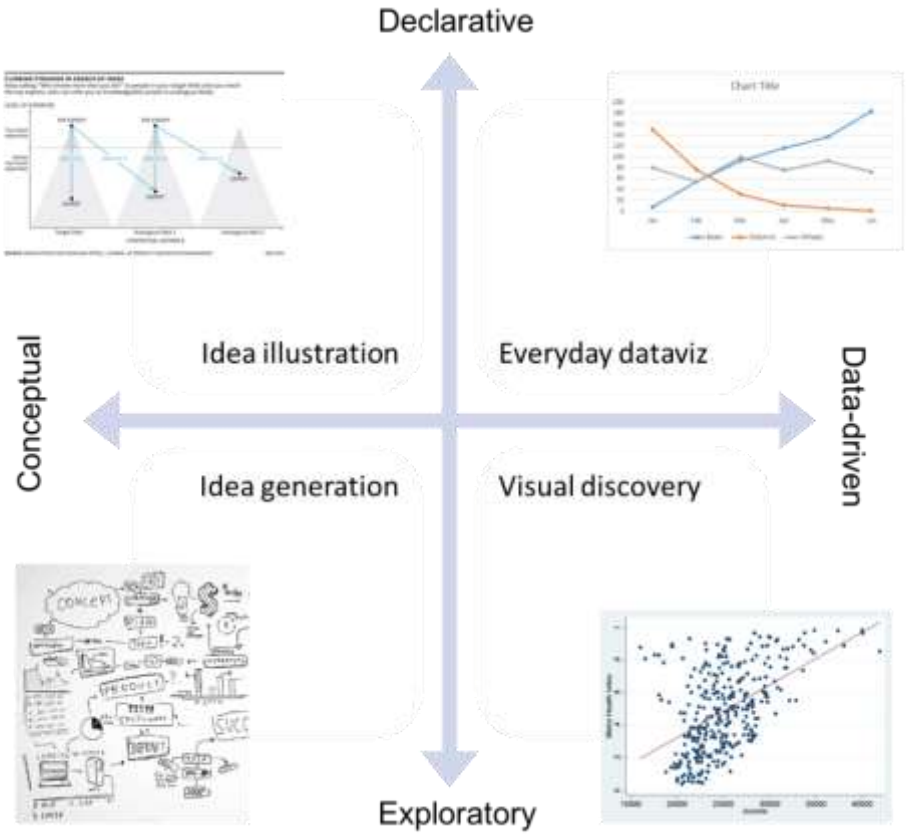

Figure 37 Information Visualization, own illustration, source: Berinato (2016)

Dur (2014) bases his research on visualization and infographics on the increasing amount of data. Data visualization and infographics have the common purpose to visually present complex and irregular information in a planned and comprehensible manner but have different meanings. Infographics use various elements such as images, illustrations, typography or maps to visualize certain subjects or processes in a storytelling manner. Data visualization demonstrates numeric

values with charts, tables or graphics by transforming raw data information to visual presentations.

Recker et al. (2012) and Mendling et al. (2012) conducted a series of experiments on how analysts are doing their process design activities, but their research did not include demographics such as age. Due to this lack of research in this area, but strengthened by close findings and university lectures, the following proposal on visualization types of business processes for different generations is given by the author of this thesis, see Figure 38.

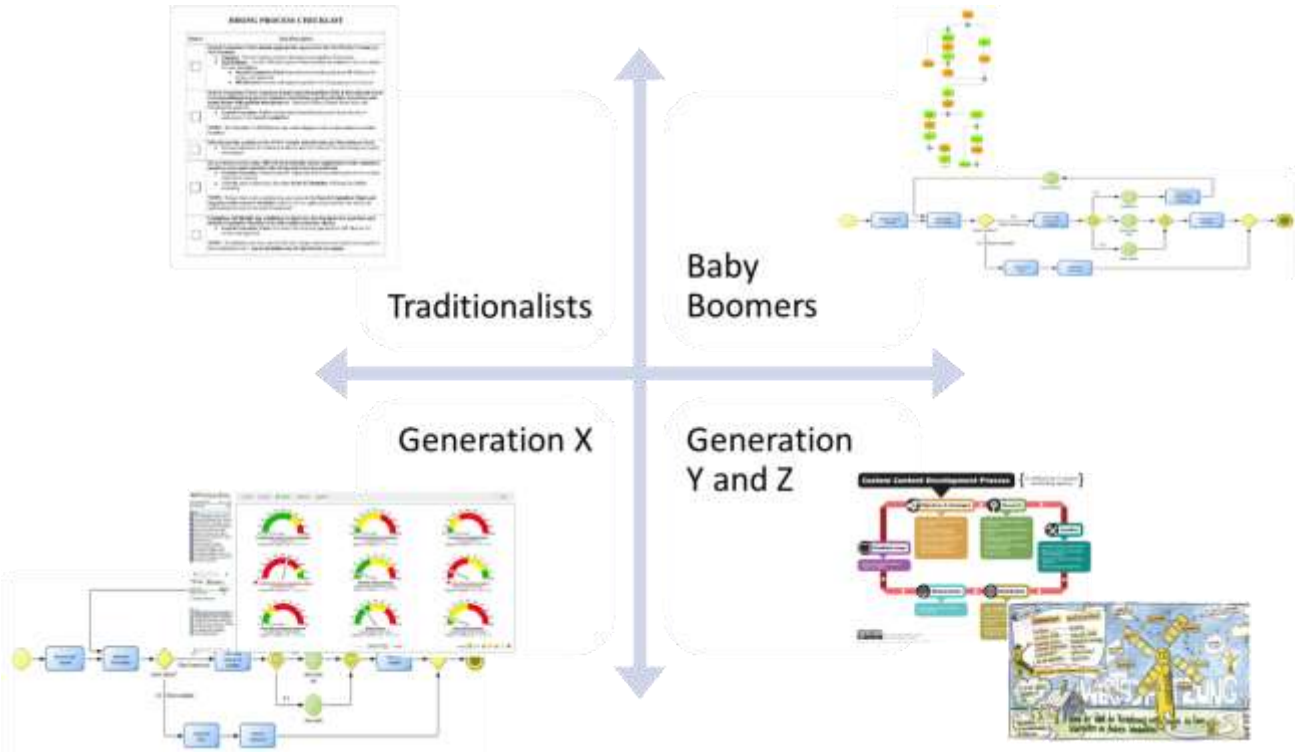

Figure 38 How to communicate business process models, own compilation

Traditionalists prefer formal, prose-style information, so checklists and written documents are the selected means of communication of process information. Regardless of new processes are defined or changes to existing processes are made, textual presentation reaches Traditionalists best. Baby Boomers invented or lived the rise of business process modelling in the 1990s, see chapter 3.1 of this thesis, and are thus familiar to business process models in their original presentation form. Either presented on huge process wall paper or electronically accessible in the intranet, the more detail and information, the better for Baby Boomers. Generation X added dashboards to the process models to directly monitor performance metrics. Information on these metrics were integrated manually, so forecasts were hard to deliver. Members of Generation Y and Z are typically digital natives and information should be provided in a funny, easy to understand but still informative way. Possible solution are infographics, also interactive or even

with real-time information, comics and of course videos, with YouTube being the second most frequented search engine after Google (McCrindle, 2016).

3.4.2 Workforce, Agile Organizations and Business Process Management

The Australian researcher McCrindle (2016) provides a very comprehensive infographic about Generation Z and the upcoming Generation Alpha, based on his research on generations. The graphic does not only provide information on characteristics of Gen Z, but also gives insights on preferred leadership styles or the shape of workforce predicted for 2025. According to McCrindle, the last member of Generation Z was born in 2009. By now there are 2 billion representatives of Gen Z globally.

The workforce by 2025 will consist of 8% Baby Boomers, 28% Generation X members, 33% Millennials and already 31% Generation Z employees. A very interesting finding on this infographic is the divergence between hours of face-to-face interaction and the preferred leadership style that moves from command & control to collaboration & contribution. The infographic can be found in Annex B – INFOGRAPHIC ON GEN Z AND GEN ALPHA at the end of this thesis.

Adding Millennials to the Generation Z workforce by 2025 means having two thirds of the workforce being digital natives. Schwartz et al. (2017) discovered the importance of the human resource department to develop from being a support function to leading digital transformation on different organizational levels. Answers to questions on digital workforce, digital workplace and digital HR have to be found quickly. The establishment of new management practices, a culture of innovation and new network-based organizations with a set of talented employees with digital facilities like communication tools and a working environment that enables productivity become major concerns of the HR department. HR functions themselves have to operate in a digital way. Implementing a digital HR department does not only mean to replace the focus on process design and process excellence with optimized employee productivity with the leveraging of artificial intelligence, chat, apps and other advanced technology. HR enables employees get work done in more effective and productive ways.

Leadership and management are key elements of successful organizations. Leaders are guiding their employees through changes within organizations and should therefore be prepared to managerial changes such as being agile or becoming digital.

3.5 Leadership and Management

Researching generations in the workforce, management and leadership are very important and related topics with connections to earlier chapters. The distinction between the terms ‘management’ and ‘leadership’ has to be made clear at this stage. According to Drucker (2001) the accurate function of management is the organization of the resources inside the organization for results provided to the outside of an organization. Management comprises the main functions of planning and budgeting, organizing and staffing and controlling and problem solving, while leadership is about providing direction, aligning, motivating and inspiring people. Organizations need both competent management and skilled and empathic leadership (Northouse, 2016).

The term leadership is around since more than a century and different researchers have different interpretations on the term. An evolutionary sequence of leadership definitions is summarized in Figure 39.

Figure 39 Evolution of Leadership definitions, own illustration, source: Northouse (2016)

Northouse (2016) provides a solid definition: “*Leadership is a process whereby an individual influences a group of individuals to achieve a common goal*.” From the process perspective given in the leadership definition, everyone can become a leader, as the process is defined. The term influence is the means of affection of followers. Every leader influences a group of individuals, otherwise he or she would not be a leader. As already stated, a group is influenced by one leader, that is where leadership takes place. Last but not least common goals of the leader and the group are essential as both have to work together toward a common good.

Based on the research of leadership styles in the public administration, Van Wart (2017) provides a more operational definition. Leadership is a complex process involving considering environment and constraints, developing leadership traits and skills, changing one´s style for different situations, achieving goals and evaluating performance and developing potentials continuously.

Daniel Goleman published "What Makes a Leader?" in 1996, reprinted in (Harvard Business Review , 2011), and stated that successful leaders have a high degree of emotional intelligence, accompanied by adequate IQ and technical skills. His study on how to measure emotional intelligence has five components as output: self-awareness, self-regulation, motivation, empathy and social skills. All of these components are free from gender, race, age or position in an organization. Four years later, Goleman (2000) introduced six leadership styles based on his research on emotional intelligence. According to Goleman, until then no quantitative research has demonstrated which precise leadership behaviours generate positive results for an organization. He found out that leaders with best results do not rely on only one leadership style. A perfect mix and match is the key for success.

From an executive perspective and the influence of a leadership style on the organizational environment, Goleman described six leadership styles, that managers adopt, with only four having a positive influence on climate and results (Goleman, 2000). The coercive leadership style is very negative as it kills motivation by extreme top-down decision making. Environment is destroyed, employees feel disrespected. This leadership style is often used, when huge organizational turnarounds have to be made or crisis management should work. The authoritative style is characterized by a leader´s enthusiasm and clear vision. The leader stands in front and takes his employees with him to achieve common goals which has a very positive impact on an organization´s climate. An affiliative leader´s main objective is to keep his employees happy and value their effort to strengthen loyalty. The idea of this style rises communication and innovation and also forces flexibility as no strict rules on how the job has to be done are set. A negative side of affiliative leadership is the lack of correcting poor performance. The democratic style emphasizes on consensus through participation. Decisions are made by including employees´ ideas, which drives up flexibility and responsibility. The pacesetting style demands high performance and fast goal achievement from both the leader and the employees. This style in fact destroys climate as work becomes task focused and routinized from a leader´s perception, so flexibility becomes impossible. Leaders with a coaching style pass on their experiences to employees and are excellent in delegating tasks. In Goleman´s research, the coaching leadership style is the least executed one as leaders have no time to coach or teach employees.

From a team and thus project and process-oriented point of view, Van Wart in (Chin, 2015) and Rattay in (Palkovits-Rauter, 2017) derive other leadership styles. Both have the laissez-faire with creative freedom at work and the neglecting responsibility of leaders in common.

Van Wart derives ten different leadership styles in his researches on leadership in public administrations. Chin (2015) provides a brief summary: laissez-faire, already described earlier, directive with clear rules and expectations, supportive with constant concerns for well-being, participative with consultations of leaders and subordinates and active participation, delegative

giving relative freedom, achievement-oriented setting challenging goals and showing confidence, inspirational with intellectual inspiration to produce new ideas, strategic with focus on organizational matters, collaborative with focus on networking and representation and last but not least a combined style where leaders use more than one style simultaneously, similar to Goleman´s approach.

Rattay (2013) describes his leadership styles according to four tasks: evaluate, decide, guide and monitor, see Table 9.

Table 9 Characteristics of leadership styles, own illustration, source: Rattay (2013)

Task Leadership style	Evaluate	Decide	Guide	Monitor
Autocratic	Subjective by leader	Leader makes decisions	Clear order	Detailed control mechanisms
Cooperative	Structured feedback	Team is part of process	Partial responsibilities delegated	Result and self-check
Democratic	Group process	Team decides on content and process	Cooperative consensus	Monitor according to agreed criteria
Laissez-faire	No rules for evaluation	Through group dynamics	Self-oriented on own wishes	No monitoring

Northouse (2016) offers three more interesting leadership styles worth mentioning here. Transformational leadership is a process to change and transform people. Treating followers as human beings having emotions, values, ethics and goals and assessing their motives provides an exceptional form of influence. The most recent researched leadership style is called authentic leadership and is defined from different viewpoints. An authentic leader practices genuine and real leadership coming from his own life experience, but also affected by his followers. Authenticity develops over a lifetime and can be triggered by major life events. Servant leaders concentrate on the followers' well-being by showing strong moral behaviour and placing the good of followers over his own self-interest. Servant leadership comes naturally, but it can also be learned.

Servant leadership is often referred to the successful leadership style in network and team-based organizations. Another leadership style related to teams like project management teams, task forces or innovation teams is called team leadership. Every member of a team can take on leadership behaviours for certain decisions and then step back to allow others to lead. This leadership style is very critical, and process-oriented as high communication skills and appropriate leadership tools are needed to improve team effectiveness. Example leadership processes in teams that have to be managed are interpersonal process for adequate team member motivation and provision of safety, feedback process, team composition process, team strategy process to establish team's mission and purpose and mission development and planning process

to measure team performance (Morgeson et al., 2010). Team leadership highly stresses out team excellence and team performance and ties the team to organization, industry or society (Northouse, 2016).

3.5.1 Management and Business Process Management

From a very traditional point of view, managers are persons within an organization whose activities are directly related to organizational goals by working with and through other people. A classification can be given with a four-level approach: top managers making organization-wide decisions, middle managers managing work of first-line managers, first-line managers managing employees directly involved in service or product creation and non-managerial employees. Project managers and team managers are job enlargements of traditional jobs as a result of the changing nature of organizations and work.

Management as such is the process of work activity coordination in a way that these activities are completed efficiently and effectively with and through people, while efficiency means doing things rights and effectiveness means doing the right things (Robbins & Coulter, 2005).

Drucker (2001) defines the fundamental task of management "*to make people capable of joint performance through common goals, common values, the right structure, and the training and development they need to perform and to respond to change*".

Functionally, managers define goals, establish strategies and develop plans to orchestrate activities or also called planning. All these activities can be summarized to strategic process design, that was already discussed in chapter 3.2. By equipping the process with resources and the setting of rules of what needs to be done and how it will be done a manager organizes a company. The leadership function includes giving direction and motivating involved parties and solving problems. Goal achievement is controlled by process performance monitoring and action taking when necessary. This cycle process of management was defined by Fayol (1949) and is illustrated in Figure 40.

Figure 40 Management functions, own illustration, source: Fayol (1949)

Fayol (1949, french original published in 1916), clearly distinguished between technical and managerial work and developed 14 principles of management to serve as guidelines for managers and managerial work: division of work (small tasks for better specialization of employees to improve efficiency), authority (power to take decisions with necessary responsibility), discipline (acceptance of rules and regulations of an organizations by every level of the organization), unity of command (employees have only one boss for effectivity improvement), unity of direction (work towards common goals of the organization), subordination of individual interest to the general interest (employees work towards the interest of the organization), remuneration (fair and adequate payment for maximum satisfaction), centralization (concentration on authority and power on top level), scalar chain (line of authority), order (orderly arrangement of men and material), equity (fair and just treatment of employees), stability of tenure of personnel (employees are kept when necessary abilities are gained), initiative (openness for employee initiatives) and esprit de corps (development of team spirit).

No matter on which level an employee manages, he can have different roles that are specific categories of managerial behaviour. Mintzberg categorized these managerial behaviours into three groups and listed ten managerial roles (examples are leaders, spokesman, entrepreneur or negotiator) that are primarily concerned with interpersonal relationships, the transfer of information and decision making (Robbins & Coulter, 2005).

Drucker (2001) stated in his book "Management Challenges for the 21st Century" in 1999, summarized in "The Essential Drucker", that management as social science deals with the behaviour of people and human institutions. Social sciences do not have rules like natural sciences, so practitioners have to rely on assumptions which are likely to change from time to time. One of these assumptions is that management is business management. Business management became fashionable after World War II as organizations were run successfully,

but management is not business management: "*management is the specific and distinguishing organ of any and all organizations*" (Drucker, 2001).

The second assumption is concerned with the one right organization. The history of organizational structures was already described in chapter 3.3 Organizational Evolution. Starting with Fayol´s functional structure followed by Du Pont´s and Sloan´s principle of decentralization followed up by teams as the one right organization and thus the end of hierarchy (Drucker, 2001). Drucker simply states in this context that there is no right organization but an organization that fits the task. An organization itself should follow some principles: transparency is essential; someone must have the authority to make the final decision and one person should only have one "master".

The last assumption focuses on the one right way to manage people. Drucker in this case stated that McGregor in his book "The Human Side of Enterprise" in 1960 and he himself were wrong with the assumption that there is one right way to manage people. Maslow wrote in his book "Eupsychian Management" in 1962 (later "Maslow on Management" in 1995) that different people have to be managed differently (Drucker, 2001) and Drucker instantly agreed. Roles of people within organizations have changed over the last decades from employees and subordinates to associates and volunteers. The final assumption on managing people is that the task is to lead people instead of managing them and to make specific strengths and knowledge productive (Drucker, 2001).

In the most simplistic way, management is what managers do when planning, organizing, leading or controlling. It is the process of work coordination so that activities can be completed efficiently and effectively (Robbins & Coulter, 2005).

As leadership is one major task within management a number of recommendations and rules can be found in literature. A familiar and widespread approach are management-by techniques that are briefly summarized in Table 10 (Thommen & Achleitner, 2012).

Table 10 Management-by techniques, own illustration, source: Thommen & Achleitner (2012)

Management by Objectives	Management by Exception	Management by Delegation	Management by System
Management with set targets and/or target agreements	Management with deviation monitoring and action only in exceptional case	Management by delegation of tasks, competences and responsibility	Management by holistic system control
Analysis of as-is necessary	System for exceptions necessary	Job descriptions necessary	Powerful integrated planning, information and monitoring system needed
Hierarchical system to measure goals needed	Clear structure of responsibilities	Towards participative leadership	Detailed execution processes needed
+ employee motivation	+ time saving	+ encouragement of self-responsibility	+ automated routine processes
+ balanced incentive-contribution	+ top management more effective	+ decision making on appropriate level	+ accelerated decision processes
- Operational formulation of all goals problematic	- No creativeness with employees	- Only vertical hierarchies are considered	- Not realistic due to lack of systems
	- Backward looking		- High implementation costs

Other well-known and established management techniques are Management by Results as a process management style where a set of objectives determines if the results are contributing to the mission and goals of an organization (Business Dictionary, 2018), Management by Participation where employees directly contribute in the formulation of goals and decisions on measurements to increase efficiency (Simon, 2006), and Management by Projects where projects are a direct means to manage organizations and follow strategic goals (Palkovits-Rauter, 2017).

Management by Motivation is closely related to the technique of Management by Objectives and is usually executed by transformational leaders, described earlier in this chapter. Management by Motivation means achievement of performance beyond expectations by using individualized consideration, intellectual stimulation, inspirational motivation and idealized influence (Gill, 2011).

The Management by crisis approach deals with a crisis as opportunities to manage the situation with ad-hoc solutions. As this approach mainly deals with symptoms rather than the root problems it only achieves short-term but quick successes (Kurian, 2013).

Along Mintzberg's organizational forms (1980) the author of this thesis found commonalities and differences for the possible implementation of Business Process Management, depicted in Table 11. Organizations with simple structure stand out for direct supervision and decision making, machine bureaucracies head for standardization of work, professional bureaucracies focus on the standardization of skills. Organizations structured in divisions put their effort in standardizing outputs while adhocracies emphasize on collaboration and decentralized power.

Table 11 Organizational design and BPM, own illustration, source: Palkovits-Rauter (2017)

Organization type	Application of BPM
Simple Structure	Tasks are assigned to top management and are executed in routines Consciousness about process management usually does not exist Implementation is not worth the effort
Machine bureaucracy	Excellent in standardization of tasks and processes Processes can be executed throughout the organizational structure and are daily business BUT long information flows and rigid processes are contra-productive
Professional bureaucracy	Can be seen as lean machine bureaucracy Essential differences are short communication flows and lean processes Positive effect on process management as core experts are responsible for organizational procedures
Divisionalized Form	Large companies are usually dividing their organizations into market segments to raise flexibility Rigorous advantages for process management above divisions BUT processes do not exist across divisions as they usually form closed systems
Adhocracy	This organizational form is flexible and dynamic Process management can profit from this diversity and dynamic BUT processes have a recurring aspect, so the organization usually does not define standardized processes with the help of process management

3.5.2 Agile Management

Appelo (2011) postulates three stages of management where hierarchies, representing the Scientific Management or the command-and-control approach, are called Management 1.0.

Organizations with Management 1.0 are still the most widespread version of management and are designed in a top-down fashion with power at the top level. Management 2.0 is described as Management 1.0 with some add-ons like Balanced Scorecard, Six Sigma, Theory of Constraints or Total Quality Management to ease the problems of the old system. Agility and complexity and the insight that all organizations are networks form the pillars of Management 3.0.

Agility or agile management is not the same than agile software development, like Scrum or Extreme Programming (Appelo, 2011), but still the fundamentals of Agile are the basis for Management 3.0. Such fundamentals are: people are unique individuals and not replaceable resources, customers are directly involved in the production process, focus on quality is crucial, tools are helpful but not necessary, timeframes are short and chosen by team, the environment is not static but subject to change and culture of conflict. In terms of processes, the agile manifesto (http://agilemanifesto.org) states the people over process paradigm. But still processes are needed, they are just different. Examples are the rolling-wave planning, daily face-to-face communication, measurement of progress and continuous improvement process (Appelo, 2011).

Agile values and principles have been adopted by several management approaches such as the Capability Maturity Model Integration (CMMI, already discussed in chapter 3.1) or the Guide to Project Management Common Body of Knowledge (PM CBOK), but usually they fit to project management rather than line management. From the organizational management perspective, the implementation of agile methods emphasizes a team-based search for opportunities to continuously achieve innovation for customers (Denning, 2017).

Agile is hard to explain outside the context of software development. According to Denning (2016) there are more than 40 known variants of Agile available with more than 70 different Agile practices. Lynne Cazaly illustrates this jungle of practices in Figure 41.

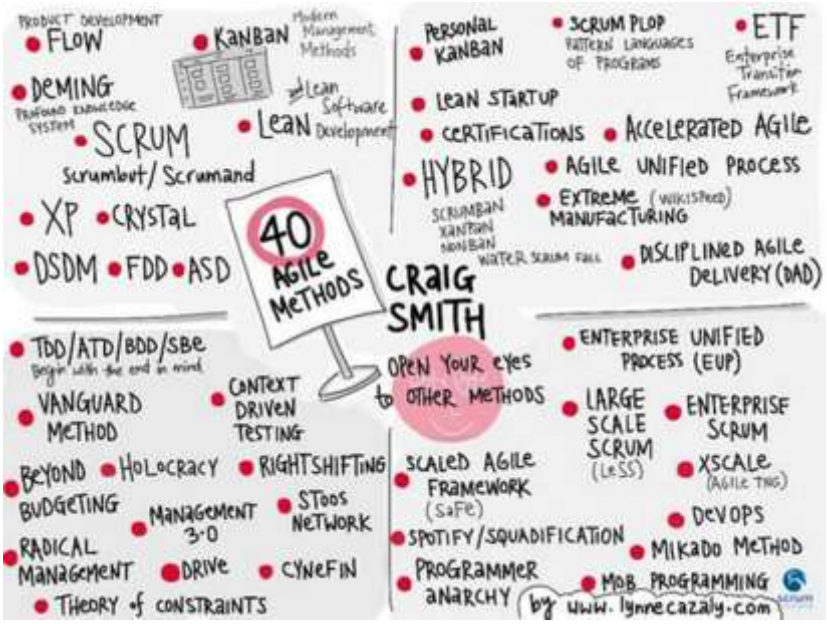

Figure 41 Practices of Agile, © Lynne Cazaly, source: Denning (2016)

Several other paragraphs throughout all chapters of this thesis deal with the issue that today´s organizations are facing severe problems to stay on the market. Due to a number of changes in organizational environments like customers, competitors, platform businesses, innovation or circular economy, sustainability can only be achieved by embracing Agile (Denning, 2016). Value for the organization and the customer can be created by overcoming hierarchies through self-organizing teams with continuous interaction with users. One of the three core characteristics of Agile organizations is the law of small teams that autonomously work in short cycles on small tasks to get instant feedback by customers. Agile teams do not have a leader, they work cross-functional with much interaction.

The second characteristic is the law of the customer where expectations and behaviours of customers are now priority and team members directly see the adding value for the customer. Agile in the customer context means adjusting everything in the organization – strategy, principles, values, processes, systems, data structures - to generate continuous new value (Denning, 2016).

The law of the network as the third characteristic of Agile organizations draws a fluid and transparent network picture of organizations. Hosting agile teams with customer focus in bureaucratic organizations will not work in long-run. Agile teams have to collaborate, and top-down dynamics will not ease these collaboration needs. Denning uses the metaphor of a giant warship for bureaucratic organizations that generate competitive advantage to maximize shareholder values. Agile organizations are like a fleet of tiny speedboats where the whole organization has a common mind-set and operates as a network of high performance teams (Denning, 2016). Laloux (2014) describes such organizations as teal organizations.

Rigby et al. (2016) critically state that managers should follow six rules when they want to take advantage out of Agile. First of all, managers should learn what Agile really is and how it really works. Agile works for complex tasks where the solution is unknown, work can be modularized,

and teams have to collaborate with end users. Such functions can be product development, strategic-planning activities or supply-chain challenges. Routine operations such as accounting, or maintenance are not applicable. So, the second rule is to know where Agile will work.

A third suggestion given by Rigby et al. (2016) is starting small within a certain group of people like in the IT department and let them spread the Agile idea. Stable teams as the forth suggestions, that are allowed to steadily customize their Agile practices so other teams can profit directly should be put in place. The top management team is also able to work Agile on several tasks like strategy development, resource allocation, cultivating innovation or collaboration improvement. Last but not least the leadership group of managers should catch up with the rest of the Agile organization not to hinder progress with out-dated reports and old-fashioned behaviours.

3.6 Innovation and Digitization

When starting a research on what is innovation a jungle of explanations and definitions is showing up. That is due to the fact that innovation itself has so many facets and views what makes it difficult to find one right explanation.

Innovation comprises ability to identify connections and spot opportunities and take advantage of them. Innovation is making use of technology to enable radical new options. Innovation is also improving old products by using old technology in new ways. Innovation is changing services like finance and banking or public services (Tidd et al., 2013).

Writing about innovation, Drucker states that innovation is a specific function of entrepreneurship. Following this approach innovation is *"the means by which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth"* (Drucker, 1985).

A definition of entrepreneurship, referring to Drucker´s research is given by Tidd et al. (2013): *"Entrepreneurship is a human characteristic which mixes structure with passion, planning with vision, tools with the wisdom to use them, strategy with the energy to execute it and judgement with the propensity to take risk."*

This thesis already explained competitive advantage in earlier chapters. Innovation offers a variety of mechanisms to obtain such a strategic advantage, summarized in Table 12.

Table 12 Strategic advantages through innovation own illustration, source: Tidd et al. (2013)

Mechanism	Strategic Advantage
New product or service	No one else offers the same product or service (iPhone)
New process	Others cannot copy process quickly (internet banking)
Complexity	Others cannot handle product or service (complex machines)
Legal protection, intellectual property	Owning a licence, others have to pay (pill recipe)
Add/extend range of competitive factors	Moving base of competition (car industry)
Timing	First-mover advantage, fast-follower advantage (Amazon, Google)
Robust/platform design	Variations and new business generations (Uber)
Rewriting the rules	Offering something new, making the old redundant (Computers)
Reconfiguring parts of a process	Building networks, out-sourcing (Dell Computers)
Transferring across different application contexts	Recombination of established elements (iPhone as navi)
etc.	More is possible!

One way to structure innovation is offered by Tidd et al. (2013). Innovation is grouped into four dimensions and can be executed in two ways. An incremental innovation means offering something better than already existing and a radical innovation is doing something different and new. The four dimensions of innovation can occur in both ways, either by incremental or radical innovation.

Product or service innovation is changing products and services an organization is offering. When a car company decides to offer plug-in hybrid cars, the product palette is extended. Process innovation is changing the ways products or services are produced or created. Uber radically changed the process of hiring a taxi cab, still they provide paid car rides. Position innovation changes the context in which a product or service is introduced. Apple entered the watch market by introducing the Apple Watch with similar functionalities like the handheld phone. Paradigm innovation means changes in the underlying mental model that frames what the organization does. Cirque de Soleil radically redefined the circus experience (Tidd et al., 2013).

Davenport (1993) mainly focused on the process innovation and listed process time reduction, process cost reduction, customer-driven process change, financial-driven and process-based restructuring, process redesign before outsourcing activities are started, process change before new software systems are implemented and lean production as process redesign for cross-functional solutions as business drivers for process innovation. For Davenport the difference between process improvement and process innovation was clear. Process improvement causes a lower level of change and typically starts with the existing process in place. Process innovation is kin to Business Process Reengineering, causing radical change without having the existing process as starting point.

Davenports suggested high-level approach to process innovation is depicted in Figure 42. Although modern information technology and cloud computing were not developed yet, Davenport put a lot of research effort into these aspects by stressing out the importance of IT in process innovation.

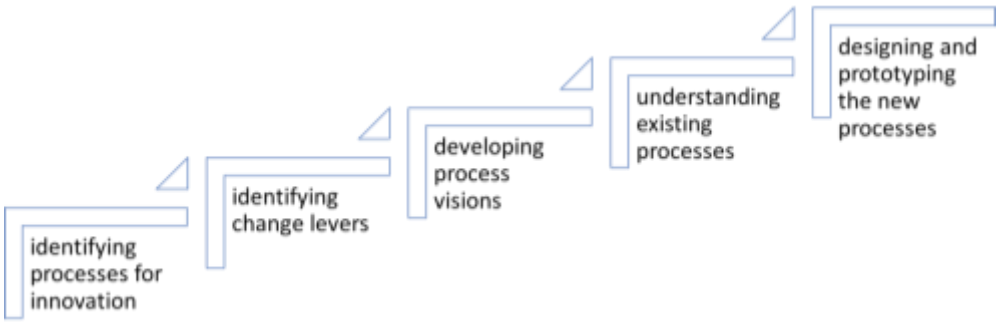

Figure 42 Davenport´s process innovation, own illustration, source: Davenport (1993)

Knowing how to handle innovation by managing (business) rules is not necessarily enough. Schumpeter described the creative destruction in his original theory (Schumpeter, 1942) and Tidd et al. (2013) illustrate what possibly can happen when the game is changing with discontinuous innovation.

Innovation and its emphases are coming in waves of competitive challenges. Innovative products and the era of information technology heralded the first wave in the late 1970s and early 1980s (Kanter, 2006). The second wave introduced process innovation forced by privatizations of state-owned companies and cost and performance pressures on traditional organizations in the late 1980s. Financial innovations and related information technology innovations flooded the markets at the same time. Davenport (1993) defines process innovation as the combination of *"the adoption of a process view of the business with the application of innovation to key processes".*

'Digital Mania' or the third wave in the 1990s had the focus on innovative business models, profits and e-commerce instead of the core business. In the fourth wave organizations refocused on organic growth, enhancing the existing business rather than finding new ventures. Developing new products with unknown and interesting new functionalities for customers such as the iPod by Apple are characteristic to this wave (Kanter, 2006).

Examples of discontinuity sources are emerging new markets (e.g. mobile phones, mobile applications), new technology (e.g. digital cameras), new political rules (e.g. free trade), running out of road (e.g. Kodak films), sea change in market sentiment or behaviour (e.g. music industry), deregulation (e.g. telecommunication industry), fractures along fault lines (e.g. smoking industry), unthinkable events (e.g. 9/11), business model innovation (e.g. Amazon, Uber), architectural innovation (e.g. digital camera in mobile phones) or shifts in techno-economic paradigms that are systematic changes impacting whole industries or even whole societies (e.g. single batch size production) (Tidd et al., 2013).

3.6.1 Innovation Process

A high-level process flow for activities within the innovation process is shown in Figure 43.

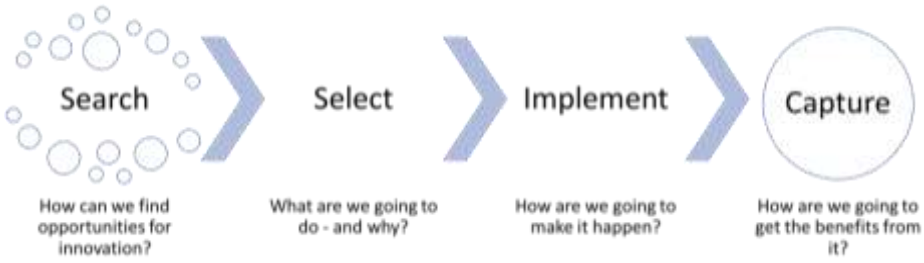

Figure 43 Generic innovation process
own illustration, source: Tidd et al. (2013)

Organizations in different branches and markets will face variations of this process, but the core elements will remain the same. Managers scan the internal and external environment for threats and opportunities. Taking the strategy into consideration, decisions on which opportunities should be selected are made. Implementing an innovation to an internal or external market usually means executing a project and not only one task. Managing the change due to the implemented innovation and gaining a new knowledge base can be summarized in the capture phase of the innovation process. As the given innovation process is described on a vary generic level, it simply can be applied to different sectors, company size, with steady-state or discontinuous innovations. The key issue for management is to configure this process for their own purpose (Tidd et al., 2013).

A similar innovation process is provided by the standard CEN/TS 16555-1:2013 innovation management (Austrian Standards, 2013), including also steps like the development of projects and the protection and exploitation of the innovation.

Many researchers struggled with the linear process provided and tried to offer a detailed guide for the process, built a framework around it or even introduced innovation journeys. Rothwell (1994) described a timeline of innovation models, depicted in Figure 44.

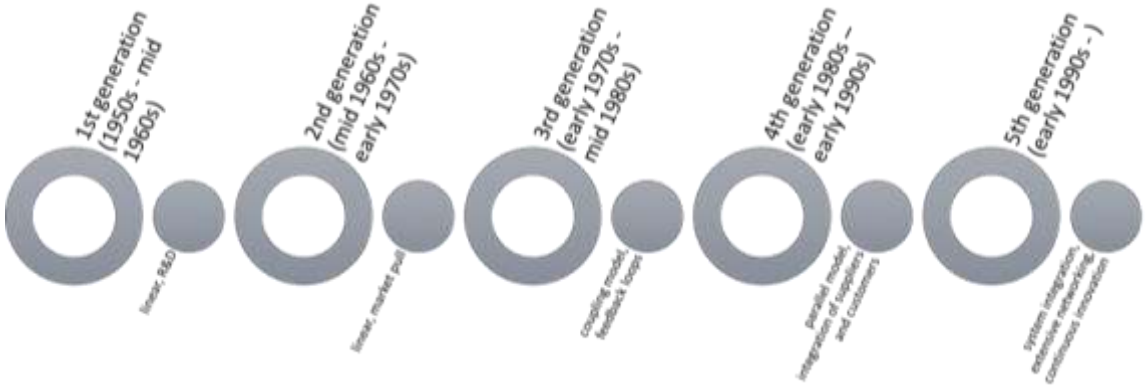

Figure 44 Five generations of innovation models
own illustration, source: Rothwell (1994)

The timeframe of the 5th generation of innovation is intentionally left open as information technology enables system integration on an inter-organizational level with cloud services and creative forms of innovation like open innovation and co-opetition allow extensive networking activities.

Innovation is not just a process flow, it happens with the right people in the right organization. Components of such an innovative organization are a shared vision and leadership that wants to innovate with a top management commitment and strategic alignment. Only an appropriate organizational structure will allow knowledge flows and the management of them. That does not mean simply a loose set of employees, but a balanced mix of organic and mechanistic options within the organization. Creativity, learning and interaction are key words for

innovative organizations. Leadership was already mentioned, but also other key individuals should be part of the innovation team to energize and facilitate innovation. The provision of appropriate team networking conditions on a local, cross-functional and inter-organizational level is essential for innovation processes (Tidd et al., 2013).

Drucker (1985) stated that the entrepreneurial and thus innovation team should be organized separately from the rest of the organization as the new team should not have the same burdens than the old and existing part of the organization. Govindarajan & Trimble (2010) propose a close working relationship between a so-called dedicated team responsible for innovation and the performance engine running the business. The example the authors are giving deals with the development of hybrid cars at BMW before 2007. Well-structured and established processes did not see any reason why battery experts should talk with brake specialists. A dedicated "energy chain" team found a way to use brake heat to charge batteries, while the performance team took care of design, engineering, sales or marketing of the hybrid cars. The difference between dedicated teams and the performance engine on a business process level is that dedicated teams do not underlie rigid process structures.

Innovation activities are not always unsuccessful because the idea was not good enough. Strategic, process-related, structural or skill-related failures are influencing an innovation's success. Not every innovation is a break-through idea. Small or incremental innovations can also lead to big profits. Process innovations as transformative ideas can be explored in any function of an organization, not only in product development. Tight controls and thus rigid processes strangle innovation. Planning, budgeting and other management processes should only be applied to existing businesses (Kanter, 2006). As Govindarajan & Trimble (2010) already stated, structures in innovation organizations have to be reconsidered. Dedicated innovation teams should have tight interpersonal relations to the rest of the organization. When innovations are crossing established business channels of the own business, existing business units will try to crush the innovation. A two-class structure of employees should therefore be avoided. Leadership with strong relationship and communication skills are essential for successful innovations. Leaders also should encourage collaboration to connect innovators throughout the organization (Kanter, 2006).

Nowadays high-involvement and creative climate within an organization are success factors for the innovation process. With an external focus, even innovation networks can successfully be established. Based on the organizational design innovation units or teams are differently located and managed within an organization. Following Mintzberg´s structural archetypes, Table 13 shows how innovation is usually embedded within an organization (Tidd et al., 2013).

Table 13 Innovation and Organizational Design, own illustration, source: Tidd et al. (2013)

Organization archetype	Key features	Innovation implications
Simple structure	Centralized organic with one key individual	"garage business", start-ups with high creativity
Machine bureaucracy	Centralized mechanistic, strong in handling complex processes	Innovation is concentrated with specialists
Divisionalized form	Decentralized organic with strategic business units and divisions	Innovation in central facilities like Research & Development department
Professional bureaucracy	Decentralized mechanistic; power within individuals but coordination via standards	Innovation with technical and specialist excellence like consulting activity
Adhocracy	Project type with high flexibility; team-based with little structure	Typical innovation teams for new product development and major process changes
Mission-oriented	Emergent model with shared common values	Continuous improvement aspects

Drucker (2001) explained the philosophy of Japan´s keiretsu that can be described as one type of innovation network, while Drucker postulates that William C. Durant, the founder of General Motors, invented keiretsu in America. Keiretsu is a management concept where supplier and customer are tied together for planning, product development, cost control and innovation. Keiretsu is not a partnership of equals, it is based on dependence of the suppliers. Usually smaller suppliers or even customers are bought by large organizations to bring in technology and know-how. Unfortunately, the keiretsu concept was not working for General Motors.

Innovation networks are working differently, partners are equals, they share creativity, knowledge, learning and risks. Rothwell´s vision of interactive fifth generation innovation (Rothwell, 1994) is now possible through network linkage acceleration by an intensive set of information and communication technologies.

Networks do not only operate externally by building spatial clusters due to geographical region like Silicon Valley or sectoral networks like business associations that share their members, but also internally by entrepreneurship or forming internal project teams. Communities of practice are both internal and external players sharing particular aspects or areas of knowledge (Tidd et al., 2013).

The major challenge of managing innovation networks is the management of knowledge and information flows. Another issue in building a network is to find the right partners that have the needed knowledge and skills to trigger innovation. One special form is open innovation where organizations open up their innovation process to trade knowledge like products and services. Even a new service sector was created by open innovation to serve as brokers finding the perfect match. Nambisan & Sawhney (2007) describe four different types of open innovation models. The orchestra model with several suppliers working autonomously and one organization retaining the final decision-maker, the creative bazaar working like a crowd sourcing approach where large organizations search for innovative inputs. The third model is called Jan central with the example of the Japanese 5th Generation Computer project where competitive alliances produced over 1000 patents during development and then equally shared

those patents. The fourth model is the Mod Station allowing customers to make modifications on for example computer software.

3.6.2 Innovation and Business Process Management

As stated in earlier chapters of this thesis, networks and team-based organizations need less process formalization to be successfully managed. In the operating stage some important processes have to be established and managed. Such example operating processes are network boundary management defining the membership of the network, decision-making managing the where, when and who within the network, conflict resolution, information processing, knowledge management, motivation, risk/benefit sharing and last but not least coordination defining how operations are integrated and coordinated within and outside the network (Tidd et al., 2013).

An interesting and process-oriented approach is called customer-centred innovation map (Bettencourt & Ulwick, 2008). If an organization understands that a customer buys a product or service to get a job done, the organization can map the customers job to analyse how the job can be done better. The differentiation from process mapping is that job mapping examines what a customer tries to make. The innovation then lies in finding a better solution for this trial. The authors state that every job is a process, and are going even further that every job has the same process steps, where organizations can innovate at any process step: define (helping customers understand their objectives), locate (helping customers to locate necessary inputs), prepare (helping customers make setup of resources less difficult), confirm (helping customers find information and feedback on readiness of resources), execute (helping customers automatically correct execution problems), monitor (helping customers monitor execution), modify (helping customers get execution back on track) and conclude (helping customers find job conclusion benefits earlier in the process).

3.6.3 Digitization and Datafication

Davenport (1993) describes the impact of information technology on process innovation with a presumption of the business objective to reduce costs and time. These impacts are elimination of humans from a process (automation), caption of process information (information), change of process sequence by parallelism (sequence), monitoring of process status and objects (tracking), analysis improvement of information and decision making (analysis), coordination of processes across distance (geography), coordination between tasks and processes (integration), caption and distribution of intellectual assets (intellectual) and elimination of intermediaries from a process (disintermediation).

The combination of innovation and information technology is often confused with the term disruptive innovation that was introduced in 1995. Disruptive innovation is not innovation by disruptive technology, but a process where a new and more agile small company successfully challenges an established business by simply serving their customers better according to their needs. Christensen et al. (2015) claim that Uber, the transportation company, is not a disruptive

innovator but a sustaining one. Uber did not create a market where none existed, the founders just added another way of offering paid rides to already existing taxi customers. One example for disruptive innovation is given by the invention of the personal home copier, disrupting the enterprise business of the print service provider for businesses called Xerox.

Disruptive innovations are cheap in the first place, customers do not easily adopt them, and established organizations sometimes oversee market entrants. Netflix entered the video renting market in the late 90s and attracted only a small segment of Blockbuster's customers. The possibility information technology offered to stream video content over the internet disrupted the old business model of the established organization. Another example of disruptive innovation is Apple's iPhone ten years ago. It was the disruptive business model, that challenged the computer industry and not primarily the mobile phone market. Providing access to the internet via the phone made it possible to get rid of personal laptops (Christensen et al., 2015).

An interesting view on information technology and automation evolution is given by Davenport & Kirby (2015) by reframing an automation strategy to an augmentation strategy. Automation is defined as the substitution of manual work with machine work, speaking of robots and code. Algorithms do this work and are "*a set of instructions designed to perform a specific task*" as either a simple process or a complex operation (Christensson, 2018). The dark side of automation is the fear of losing the job. Augmentation means to deepen the work that is done by humans with the help of machines. Davenport's example is the story telling component of Big Data analysis to deepen consumer insight reports. This approach requires skilled and educated workers to profit from work that is done by computer code.

Mayer-Schönberger & Cukier (2013) describe Big Data with the help of the process of datafication. Datafication in this context means putting together events in a quantified format and tabulating and analysing this huge amount of data. The means of finding patterns and calculating these seemingly unrelated data are algorithms. These algorithms are not neutral but influenced by the author itself or the requirements of the desired outcomes. They even can be discriminating when for example ethnic profiling is included in the algorithm code and force inclusion and exclusion. Thus, stakeholders are excluded from datafication when they do not have access to and use of technology (Holtzhausen, 2016).

In the Human Resource Management context, the term people analytics is on its way to become mainstream. New technical analytics solutions, embedded in cloud HR platforms, enable *"real-time analytics at the point of need in the business process"* (Schwartz et al., 2017). Major parts of people analytics are organizational network analysis and interaction analytics to study employee behaviour and connect it to performance measurements for business improvement. These predictive analyses towards pattern predictions like time management or effectiveness of the onboarding process are not HR driven anymore but are of interest to the entire organization as people data can leverage for a broad range of business problems. Privacy and anonymity policies have to be implemented within governance teams to protect people-related data from theft and abuse.

3.7 Supply Chain and Circular Economy

The concept of Supply Chain Management originates back in 1982 and was introduced by the authors Oliver and Webber as a fostered mission of logistics to become a top management concern (Stadtler & Kilger, 2008).

The Gabler Business Lexicon explains the term Supply Chain Management as the establishment and the orchestration of integrated supply chains (flows of material and information) along the complete value chain. Value chains include raw material production, the processing and the delivery of the final product to the end user (Wirtschaftslexikon, 2017). According to earlier given definitions on business processes and value chains, supply chains are processes that provide value to involved parties.

Stadtler & Kilger (2008) stress out – in a broader definition – that a supply chain is a network of organizations involved in different processes and linked by material, information and financial flows to deliver products or services to the customer. A supply chain typically includes suppliers, a manufacturing firm, distributors and customers. Figure 45 shows the house of Supply Chain Management with the two main pillars of integration and coordination and the main goal of competitiveness with the means of customer service.

Figure 45 House of SCM,
own illustration, source: Stadtler & Kilger (2008)

The integration pillar represents the management of the network of organizations and the coordination pillar stands for the information, material and financial flow orchestration.

What can be seen from these building blocks, the orientation outside the own plant is the main difference to logistics. The use of information and communication technology, advanced planning and a process orientation are key factors for the success and the alignment to the

organizational strategy. Focusing on the process orientation, the Global Supply Chain Forum identifies eight core supply chain processes (Stadtler & Kilger, 2008):

- Customer Relationship Management
- Customer Service Management
- Demand Management
- Order Fulfilment
- Manufacturing Flow Management
- Supplier Relationship Management (Procurement)
- Product Development and Commercialization
- Returns Management (Returns)

Processes are best modelled by flows of material, information and finances. The eight core processes are strongly interrelated with each other, therefore a strategic as well as an operational view on the processes is necessary. Several tools and languages have been developed to map supply chains such as the process chain notation or the concept of event-driven processes that can be simulated with key performance indicators. The most widespread model is the SCOR model.

In Business Process Management, a reference model is helpful to establish a standardized terminology, see chapter 3.1. For Supply Chain Management this standardization is provided by the Supply Chain Operations Reference Model (SCOR Model) – currently in its 12th version, developed by the Supply Chain Council (SCC), which merged with APICS in 2014, a community of supply chain professionals (APICS & SCC, 2018). Members of this council can use reference processes on three different levels to coordinate involved companies within their supply chains.

Logistics and distribution industries are struggling from economic changes like new production methods, changing relationships between customers and suppliers, increasing just-in-time procurement and delivery systems, increasing geographical complexity and changing consumer preferences. Usually a good´s shipment from producer to customer involves 25 different stakeholders, generates up to 40 documents, uses more than two transport modes and is handled in up to 15 physical locations (Dicken, 2011).

With the help of the SCOR-Model involved stakeholders speak a standardized process language to ease coordination and keep competitiveness. Members of the Supply Chain Council (SCC) can provide performance information on their own processes to an external benchmarking organization to compare their process performance with other members in the same industry. The SCOR-model provides reference processes on three levels, where level one is the supply chain process itself that can be described either as process for stocked products, make-to-order or engineered-to-order products, in other words Source, Make, Deliver and Return processes. Level 3 processes are sub processes for a single level 2 variation (Harmon, 2014). Figure 46 illustrates the five elementary process types plan, source, make, deliver and return with strategic as well as operational processes (Laudon et al., 2010).

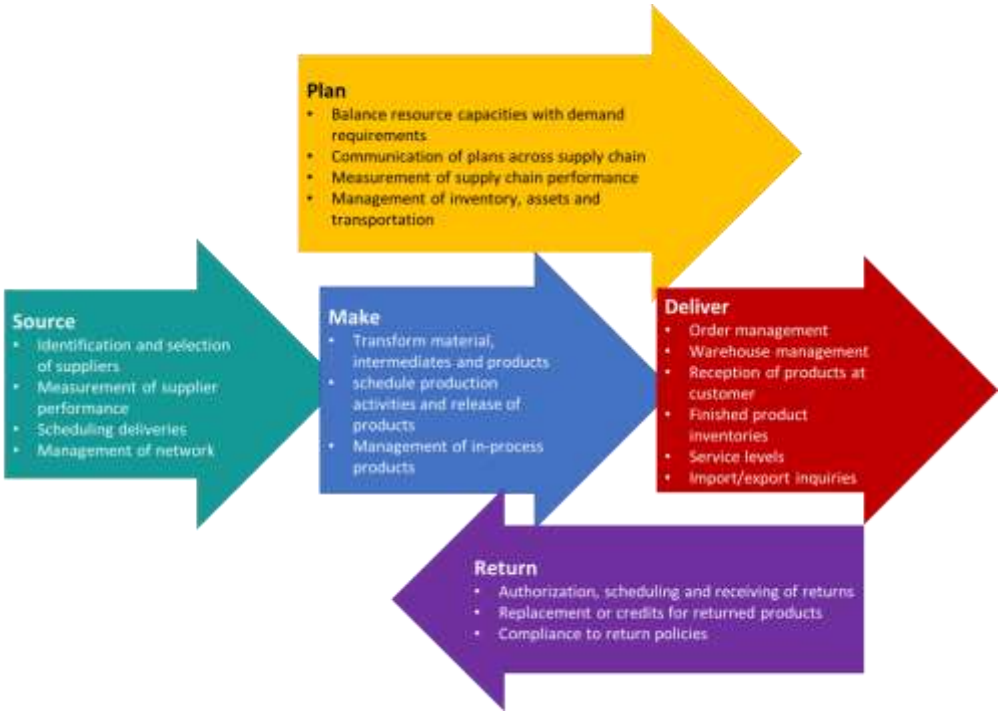

Figure 46 Five core process types,
own illustration, source: Laudon et al. (2010)

Network-like structures, as already discussed earlier in this thesis, may increase resources and capabilities of organizations. Networks in supply chains or also called supply chain networks (Sherif, 2003) can be seen as dynamic networks of interdependent organizations with efficient collaboration through information technology. Such networks include all value-adding stakeholders for the development, production and commercialization of a product or service (Leger et al., 2006).

The internet enables a shift from sequential supply chains, where information and material flow sequentially from business to business, to simultaneous supply chains, with parallel and multiple information flows between the members of a supply chain network. Members of the network can make immediate changes to schedules or jobs. At some point, the internet could become a digital logistics nervous system within the supply chain. This system would deliver simultaneous information about stocks, orders and capacities of participants in all directions and optimize the activities of individual companies and groups of companies working together on e-commerce markets (Laudon et al., 2010). Figure 47 illustrates a schematic supply chain network.

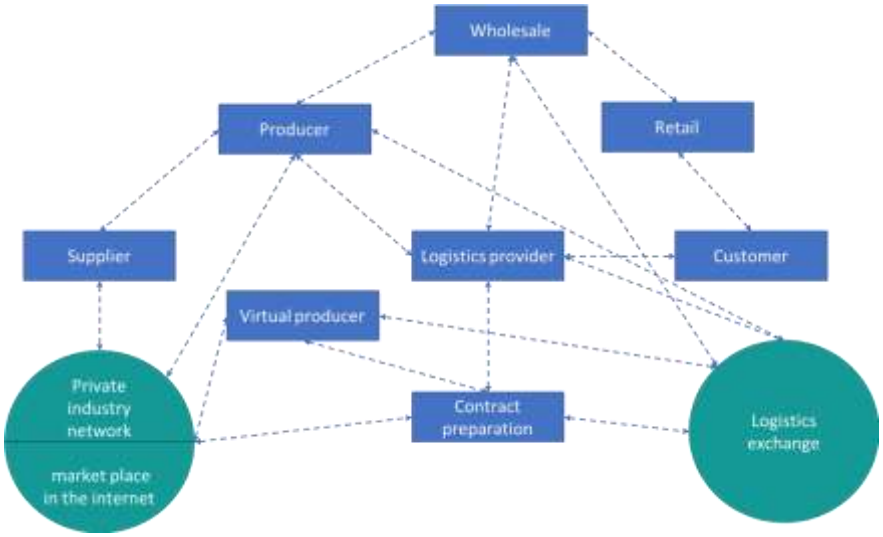

Figure 47 Distributed network of a supply chain, own illustration, source: Laudon et al. (2010)

The concept of agility was introduced to supply chains in the late 1990s as the ability to react to a continuously changing and unpredictable business environment (Baramichai et al., 2007). A strict distinction between lean and agile supply chains is made by the authors with lean meaning the elimination of all 'waste' along the supply chain and agility meaning the usage of market knowledge to explore profits in volatile markets. Lean practices are dominant cost saving and productive working relationships drivers along the supply chain (Sarkis & Talluri, 2001). Agility in the context of Supply Chain Management refers to agile processes as a way to adapt quickly to environmental changes and continuously improve through incremental change. Such agile processes are continuous learning, empowered individuals in teams, benchmarking, enterprise integration, distributed databases or knowledge-based systems (Gunasekaran, 2001).

Environmental awareness, sustainability and a lively academic and business discussion led to the development of green supply chain management. Back in 1995 green logistics were defined as "*a logistics system responsible for the environment, which not only includes forward logistics process from the acquisition of raw materials, production, packaging, transport, storage, to the delivery to end users' hands, but also includes the reverse logistics dealing with waste recycling and disposal*" (Cosimato & Troisi, 2015), which is close to the definition of the circular economy.

It is almost clear that green logistics includes a lot of different activities such as: green purchasing, green material management and manufacturing, green distribution and marketing, and reverse logistics, which can have a positive influence on different processes (e.g. purchasing, packaging and transportation) (Cosimato & Troisi, 2015).

The World Economic Forum published a report on responsible supply chains in 2015 (WEF, 2015) explaining new strategies for triple supply chain advantages and also providing the methodology how to build a responsible supply chain. The WEF identified 31 processes where organizations can achieve profitability while benefiting society and the environment.

Sustainability is one keyword where organizations can change their business strategy from cost leadership to differentiation. This offers more room for supply chain innovation. Another driver for sustainability efforts is supply chain maturity allowing strong tights and collaboration between partners.

Four possible sustainability strategies are proposed by the World Economic Forum (WEF, 2015): compliance-driven strategy representing the lowest sustainability standard by following laws and external standards on environment and society (e.g. no child labour or corruption), efficiency-driven strategy focusing on cost efficiency and process optimizations (e.g. green six sigma), legitimating strategy by creating credibility to the customer (e.g. integrating green organizations into the supply chain) and the holistic strategy where sustainability is everywhere to enhance overall performance (e.g. new business models with closed loops).

These sustainability strategies can be mapped to the already mentioned 31 processes along the complete supply chain, starting from product design, to sourcing, production, distribution to end-of-life accompanied by cross functional-practices related to technologies and labour standards. Figure 48 shows examples of operational processes that can build responsible supply chains.

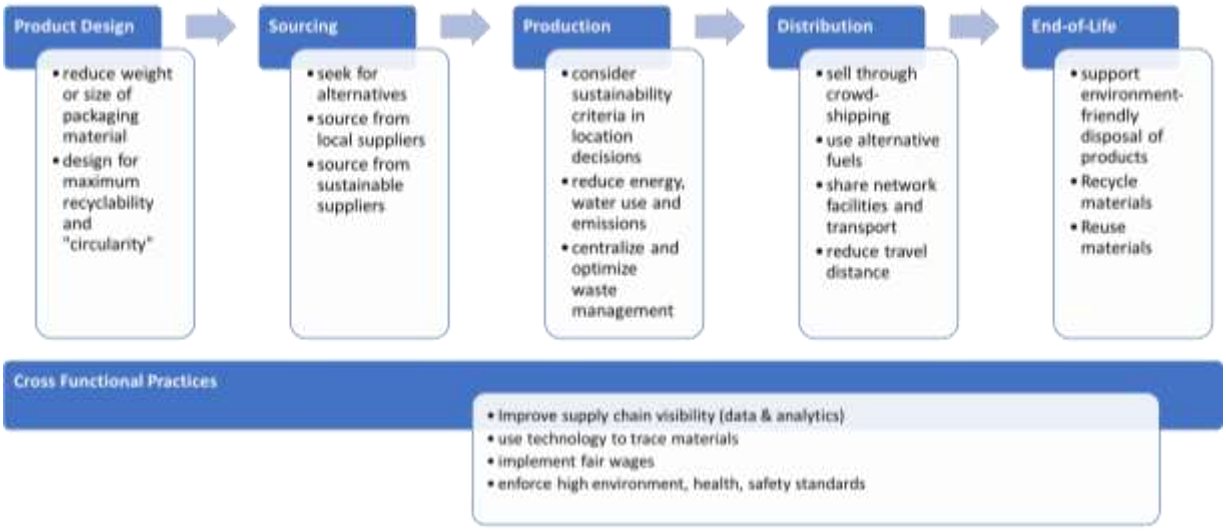

Figure 48 Sustainable supply chain practices,
own illustration, source: World Economic Forum (2015)

The Word Economic Forum uses the term circularity in the discussed report without explaining the term. Circular economy is one step ahead of responsible and sustainable supply chains and is discussed in the upcoming paragraphs.

3.7.1 From Linear to Circular Economy

Due to mass manufacturing starting over 150 years ago economy evolved to a linear system: take, make, waste. Society takes materials or resources, produces a usable product and then discards this product at the end of its use. This linear system, taking ecology into account, lets the world´s population consume at a level of 1,5 planets per year (Weetman, 2017).

Investigating on economy, environment and reusable resources directly leads to the concept of circular economy. The approach of circular economy bundles the attention of businesses, academics and the next generation of entrepreneurs as a new framework for re-designing of even re-inventing the current economic system. Instead of the linear philosophy of 'take, make, waste' circular economy goes beyond recycling and extends the value chain by redesigning the product, creating new by-products and co-products and recovering value from waste materials (Palkovits-Rauter, 2018).

The most renowned explanation on circular economy is provided by the Ellen MacArthur Foundation (2013). This foundation that is supported by McKinsey & Company describes the concept as "*an industrial economy that is restorative by intention*" aiming to "*enable effective flows of materials, energy, labour and information so that natural and social capital can be rebuilt*" (EMF, 2013). One important concept used in different contributions is 'closed material loops', which implies that materials are used more than once, either as bulk material, as products or components. Processes established for this approach of closed loops are refurbishment, recycling or up-cycling and remanufacturing (Wikner & Tang, 2008).

Circular economy is not new, it is a combination of different philosophies led by pioneers such as Williams McDonough and Michael Braungart with 'cradle to cradle', Amory B. Lovins and natural capitalism, Janine Benyus and biomimicry, Walter Stahel and the performance / sharing economy and including insights from industrial ecology (Webster et al., 2013). Figure 49 illustrates the differences between our take-make-waste linear economy with the emphasis on resource extraction to produce goods that are used and thrown away. We know the process of recycling, but this process currently focuses on the recycling of packages and not of the goods inside the packages. Main processes within the supply chain of a circular economy are the re-use, repair and recycle processes with an emerging recycling sector.

Figure 49 Linear to Circular Economy, source: Bradely (2015)

The concept of circular economy emerged in the latter part of the 20th century due to leading thinkers having limited resources, growing population and the preserving of important ecosystems in mind. Figure 50 shows the evolution of the circular economy with its influences and key elements.

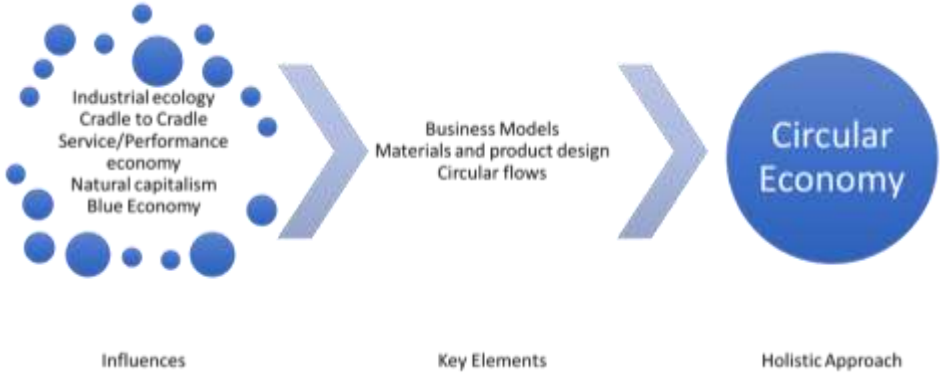

Figure 50 Evolution of the circular economy, own representation, source: Weetman (2017)

The International Society for Industrial Ecology describes industrial ecology as preserving materials and energy embedded in a product – such as raw materials, energy, water and other process aids. The usage of raw materials, recycling and upcycling processes as well as changes in consumption are key elements organizations must understand (International Society for Industrial Ecology, 2015).

The concept of Cradle to Cradle® (Braungart & McDonough, 2002) describes the usage of the intelligence of natural systems for the development of new products. This concept allows a peaceful coexistence of economy and nature. One important key aim is eco-effectiveness which replaces eco-efficiency.

Service or Performance Economy is described by Walter Stahel (2013) as an economy that focuses on selling performance (services) instead of goods, internalizing all costs. Five pillars of such a sustainable economy are nature conservation, limitation of toxicity, resource productivity, social ecology and cultural ecology (Weetman, 2017).

Natural capitalism as described by Hawken et al. (2013) heralds the next industrial revolution where businesses improve profits, help solving environmental problems and feel positive about their impacts. The four principles of natural capitalism are the increase of productivity of natural resources, the usage of biologically inspired production models and materials, service and flow business models and reinvestment in natural capital.

The development of the term blue economy was driven by Gunter Pauli in his book "The Blue Economy – 10 Years, 100 Innovations, 100 Million Jobs" (Pauli, 2010) and began with a project to find 100 of the best nature-inspired technologies effecting the economies of the world. The two themes of the blue economy business model are: substitution of something with nothing and cascading nutrients and energy (Weetman, 2017).

The definition of circular economy provided by the Ellen McArthur Foundation (EMF) and the consultants of McKinsey (EMF, 2013) became a de-facto standard. Additionally, the World Economic Forum (scaling up initiative, Project 'MainStream'), the European Union (action plan 'Closing the loop'), China and some global consultants (PwC or Accenture) are researching, investing and promoting the concept of circular economy (Weetman, 2017). Global partners and promotors of the Ellen McArthur Foundation researches are companies like Cisco, Google, H&M, Philips, Unilever or Renault (Ellen McArthur Foundation, 2016).

The inspiration for circular economy is taken from nature with four principles. There is no waste in nature, one's waste is someone else's food. Diversity helps fighting against shocks and builds resilience. Energy in circular economies is renewable and opportunities within such economies are found by looking at the connections between ideas, people and places that are seen as systems (Weetman, 2017).

3.7.2 Case Study on Circular Economy

The food and agriculture sector are struggling with over-consumption, over-population and over-pollution. Global agriculture´s footprint in 2010 can be described with three figures: it is occupying 37 % of land mass, using 70 % of global water withdrawals and producing 24 % of greenhouse gas emissions (Weetman, 2017).

One very interesting case study deals with the circular economy efforts within the coffee industry. This case study is described in very detail by Weetman (2017) and clearly illustrates the key elements of for example closed loops and efficient supply chains. The supply chain of

coffee in a linear economy with around 100 million people involved worldwide could look like in Figure 51.

Figure 51 Supply chain of coffee,
own illustration, source: Weetman (2017)

Establishing a supply chain in a circular economy concept starts with four building blocks in the Circular Economy Framework provided by Weetman (2017), see Figure 52. The product design that is tightly interrelated with the block circular inputs is the starting point. This block is crucial for the resilience and agility of the supply chain. Main targets of this building block are resource efficiency meaning using less materials and reducing the use of virgin materials. Repairable parts or efficient disassembly are further goals. When products can be repaired rather than disposed, parts can be recovered or even upgraded. Recycling, re-usage or remanufacturing are processes to be considered during the product design phase. Continuous improvement of products supported by new materials and recycling innovations encourages additional value creation. Green chemistry or biomimicry allow innovations in material choice and product design (Weetman, 2017).

Main aims of the building block of circular inputs are the use of recovered or recycled materials rather than virgin materials, the use of renewable rather than finite materials and the use of materials that are safe for human health and all other living system.

During the process design embedded resources that help create a new product such as water or energy should be considered to be used less. Additional approaches are the recycling of process inputs to use them again and the creation of by-products for an additional value creation.

The fourth building block of circular flows includes the design of processes like how the end product can be reused after the product life cycle has ended, which parts could be refurbished or remanufactured and how the recycling process can be optimized.

Taking the circular economy framework, the following changes to the supply chain can be derived. To be able to rethink a supply chain for a product or a service, the process itself must be changed. Thinking on coffee again, circular inputs (meaning recycled, renewable, safe and secure) could be the establishment of permaculture (sustainable agriculture) or agro-forestry systems. For coffee plants this would mean changing from water intensive sunny coffee growing back to shadow-growing. The product design (meaning use less, use it more, use it again) means changes in the way we use coffee. Coffee cherries are usually thrown away, the

same happens to coffee grounds. These two side products could be reused or processes for other products. Examples for process design (meaning use less, waste = food, renewables and renewable energy) is the conversion of waste water on coffee farms into biogas to power machinery or stoves for drying coffee beans. Another example would be the usage of technology to measure ground hydration to save water for irrigation. Circular flows (meaning reuse, refill, recycle) include the reuse of coffee ground for producing pellets or even jewellery or closing the recycling loop of picking up coffee grounds from end users and transporting it to a recycling company.

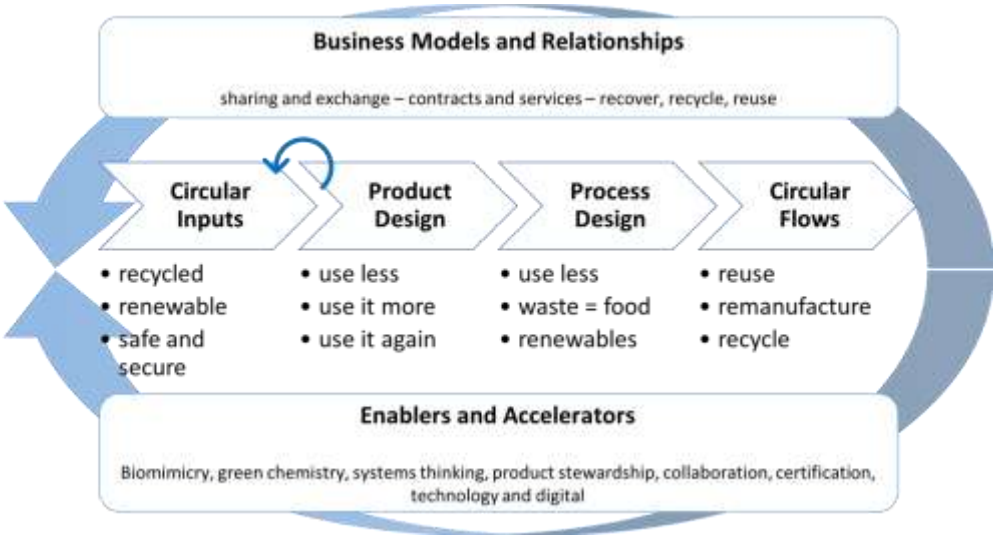

Figure 52 Circular economy framework (taken from LinkedIn Connection to Weetman)

The organization Greencup was founded in 2004 and deals with Fairtrade coffee. The supply chain of this organization and its circular economy network looks like depicted in Figure 53. In the growing phase chemical fertilizers were replaced by coffee pellets to keep the soil wet and shadow places for growing the plants have been reinstalled. Partnerships along the raw material phase became sustainable. Greencup offers a full service to their customers including coffee machines, fairtrade coffee beans, barrista training and the collection of waste coffee grounds. Out of the waste coffee grounds new materials for clothing, coffee machines or jewellery are generated. The case study is described in more detail in (Weetman, 2017) and (Good News Network, 2015).

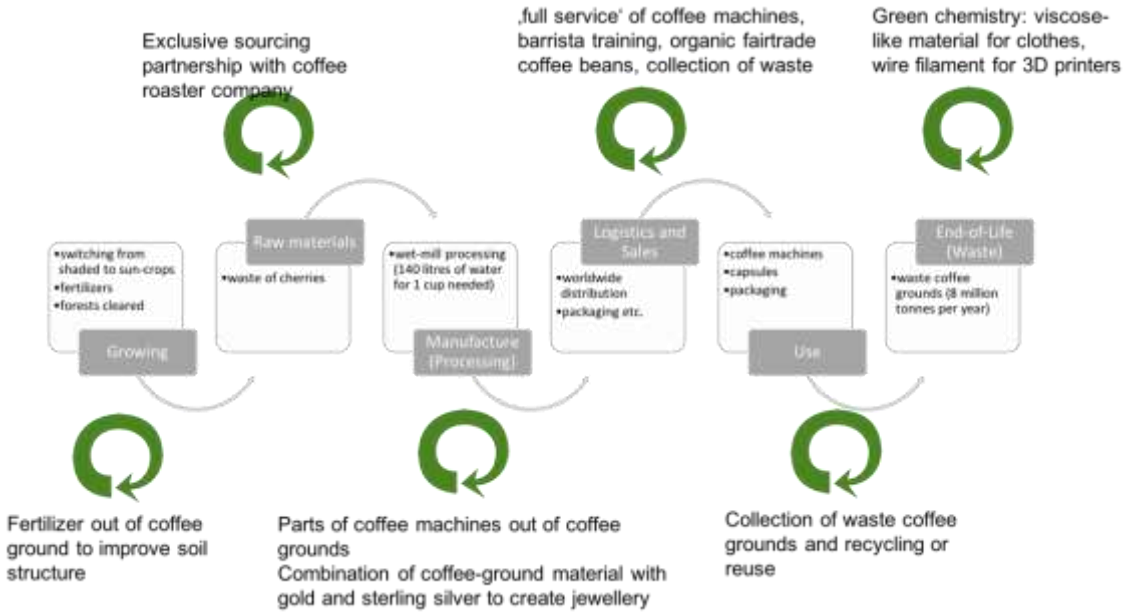

Figure 53 Supply Chain of Greencup, own illustration, source: Weetman (2017)

3.7.3 Business Models of a Circular Economy

Supply chains operating in a circular economy environment are also striving for added value and competitive advantages. Thus, the creation of a business model and the establishment of relationships is vital for the success of the supply chain. Fundamental to the business model is the business idea. The development of the business idea includes key activities such as trends analysis, already available service and product portfolio, the market and the competitors as well as a detailed SWOT analysis (Nagl & Bozem, 2018).

Supporting activities to develop a business model are for example the early recognition of megatrends and tipping points (irreversible "overturning" points) with the use of trendscouting (observation and recognition of trends through active participation to understand changes), the design thinking approach as creative method to develop innovative business ideas, open innovation to allow active participation of persons and institutions in the design phase of the product or service, the design of a customer journey or customer experience to enlarge customer loyalty, market research as empirical inquiry, the prototyping approach where a first increment of a product is presented to the end user who provides direct input for the further development of the product or service or agile development (Nagl & Bozem, 2018).

One out of several definitions for business models is provided by Linder & Cantrell (2000): "*When people speak about business models, they could be speaking about three distinct things: components of business models, real operating business models, and what we call change models. A business model, strictly speaking, is the organization´s core logic for creating value."*

Several authors defined several different business model frameworks with a set of characteristics. Elements of the business model according to Stähler (2002) are for example business structure, value proposition, revenue model and organizational culture. The value-

based business model approach according to Bieger & Reinhold (2011) proposes value proposition, value creation, value communication and transfer, value capture, value dissemination and value development as part of a business model. The most popular approach is provided by Osterwalder & Pigneur (2010) and is called the Business Model Canvas with nine elements: key partnerships, key activities, key values, customer relations, customer segments, channels, key resources, cost structure and revenue streams.

Lacy & Rutqvist (2015) describe five new business models for circular growth. The first one to mention is the circular supply chain business model that offers access to fully renewable, recyclable or biodegradable inputs as substitutes for finite materials. Visually the Circular Supply Chain Business Model looks like illustrated in Figure 54.

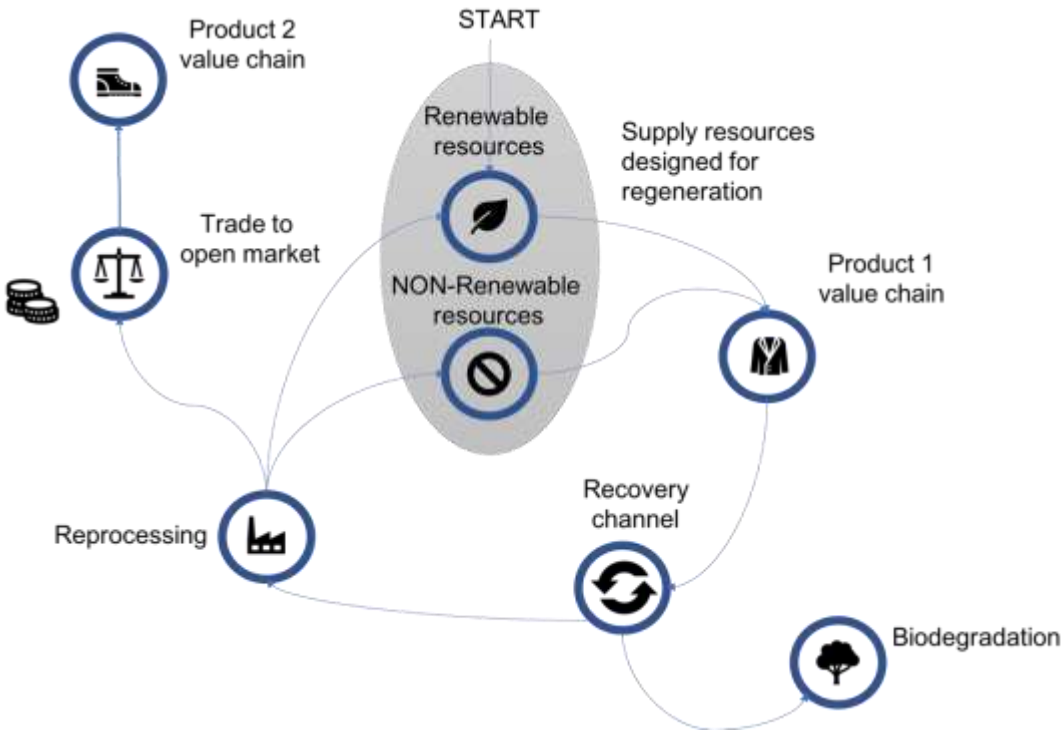

Figure 54 Circular Supply Chain,
own illustration, source: Lacy & Rutqvist (2015)

Other business models are the Recovery & Recycling Business Model with the concept of total waste elimination via resource return chains, the Product Life-Extension Business Model with the focus on concepts such as resell, repair/upgrade/refill and refurbish/remanufacture, the Sharing Platform Business Model that connects product owners via a platform with individuals or organizations wanting to use those products and the Product as a Service (PaaS) business model promoting the option of having access to a product or service rather than owning it (Lacy & Rutqvist, 2015).

3.7.4 Circular Economy and Digitization

As already described in earlier chapters, information technology plays a vital role in nowadays business world. Circular economy leaders are taking advantage of ten disruptive technologies, clustered in three categories: digital technologies, engineering technologies and hybrid technologies, see Figure 55 (Lacy & Rutqvist, 2015).

Digital technologies can transform value chains, so they no longer need additional resources to grow. Mobile technologies as means of access to data and applications reduces the need for physical resources such as paper. With the match of supply and demand by mobile availability of location, spare capacity and price of goods and the allowance to communicate with the supplier, circular business models are created. By sharing information via machine-2-machine communication with the manufacturers' management software, maintenance costs could be reduced, and product development enforced.

With the means of cloud computing, dematerialization, that is the replacement of something physical by a digital alternative, has shaken several industries. Cloud computing along with mobile and social technologies makes it easier to offer tailor-made products whenever the customer needs them. Big data analytics as 5th digital technology on the list supports circular economists by analysing consumer behaviour and thus by designing better tailor offerings.

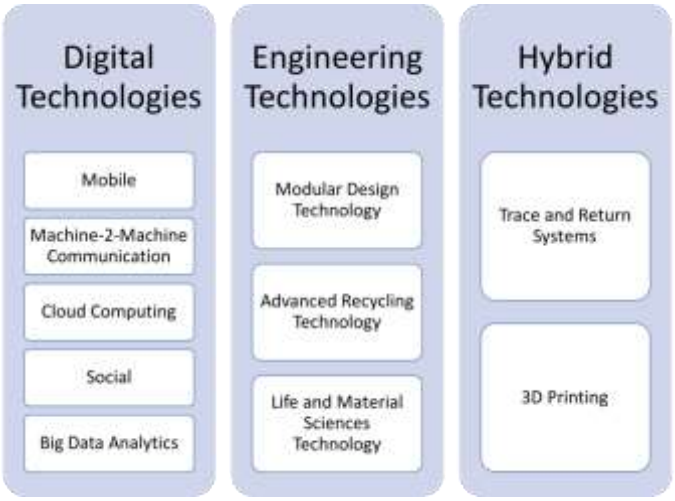

Figure 55 Driving Digital Advantage in Circular Economy, own illustration, source: Lacy & Rutqvist (2015)

Engineering Technologies are around since decades, but modular design technology (only defective parts of the product are replaced), advanced recycling technology (use of sensors to sort a product's various components and materials) and life and material sciences technology (input substitution at a large scale) allow new goods to be manufactured from regenerated resources. These goods offer cost-effective solutions for circular economy processes such as collecting, returning, recycling or remanufacturing.

Best of breed or hybrid technologies offer the best of both the digital and engineering technologies. Trace and return systems collect used products to service, repair, recover, reuse, refurbish or recycle them. 3D printing as a major driver for circular business models can directly print defect parts of a product. Even biodegradable plastics or infinitely recyclable fabrics are used within this technology. 3D printers can even become suppliers within the health sector for several fabrics such as heart stents (Lacy & Rutqvist, 2015).

Some of the main drivers for organizations to become agile, work in sustainable networks and implement information technology with all possible services like Internet of Things (IoT), robotics or artificial intelligence (AI) are complex global factors. Some of these factors have been already discussed in this thesis, like changing consumer behaviour, over-connected Millennials, the demand for more personalized products and the massive possibilities of technology, knowledge and data (Weetman, 2017).

Technology is also driving strategies for supply chains. Distributed networks, that were already described earlier, are listed as top 10 emerging technologies of 2015 by the World Economic Forum (2015). Circular economy supply chains will even move one step ahead and build industrial ecosystems with symbiotic flows allowing partners within these eco-parks to share technology, materials and input, to co-create energy and to recover value from outputs (Weetman, 2017).

According to Ellen McArthur Foundation (2016) the correlation between the evolution of technology and the development of circular economies is immense. The integration of sensors in products like car tires for example can change a company's business model from selling to renting tires as individual driving behaviours allow individual maintenance cycles. This is beneficial for both the customer and the organization.

3.8 Summary of Literature Review

The origins of Business Process Management with the division of labour approach, the Scientific Management and production lines for mass production in mind and the General System Theory as basic implication provide an historical overview of about 100 years. The discipline of Business Process Management became a management approach due to the theory of Business Process Redesign published by Hammer & Champy (1993). The term automation and thus process automation is part of the 3rd Industrial revolution that has started at about the same time.

Technologies like Internet of Things, Artificial Intelligence and Cloud Computing stress out the need for Business Process Management as for example the orchestration and choreography of so called end-to-end situational business processes that are spanned over several value webs is possible with cloud based services (Fingar & Stikeleather, 2012).

The connection between strategy and Business Process Management is described by Porter (1996) by reaching the perfect fit of activities to gain advantage. No fit among activities means no distinctive strategy. Process-centric organizations manage their fitting activities with business processes.

Organizational theory and design do have an influence on how business processes are implemented within an organization. Typically, the traditional organization is seen as hierarchical with silo departments where the processes are executed within those silos. Thanks to organizational evolution from functional hierarchies over divisional hierarchies, strategic business units and matrix organizations, newer forms such as networks, team-based or cellular organizations evolve where processes are executed without hierarchies in mind, but in team-based structures.

Bearing the generational workforce in mind, Business Process Management as a means of communication lacks conducted research to deal with. Generations prefer explicit communication patterns where a standardized business process notation is only one out of many. The question on how process information is best transmitted to the recipient needs further research, also in relation to different leadership styles.

The term leadership evolved over the past century from control and centralization of power to authentic, spiritual, servant and adaptive leadership. The distinction between leadership, that is defined as providing direction and motivating people (Northouse, 2016) and the term management can be found in the four management functions of planning, organizing, leading and controlling (Fayol, 1949). Management has to decide on how and if Business Process Management is implemented within an organization related to its organizational form. Simple structure organizations do not need Business Process Management while divisional forms profit from process management as core experts are responsible for organizational procedures (Palkovits-Rauter, 2017).

Innovation at the first glance seems to avoid rigid process definition as being innovative usually means being creative. The customer-centred innovation map describes a process-oriented innovation approach by mapping jobs instead of processes. This helps to innovate better jobs to serve the customer (Bettencourt & Ulwick, 2008). Emerging technologies and digitization – the use of gathered data – is a fast-growing industry in relation to Business Process Management. People analytics enabling real-time analytics at the needed point of action in the business process related to Human Resource Management is only one example (Schwartz et al., 2017).

Supply Chain Management and Business Process Management go hand in hand as the processes over a supply network can only be orchestrated when the same terminology is used. Developments towards circular processes with closed loops and accompanied new business models are a new trend of holistic and sustainable implementation of Business Process Management.

Concluding the literature review about Business Process Management and six influencing factors the statement is that all of these factors are interrelated and do depend on each other. The higher the level of digitization, the greater the possibility for innovation of circular economy strategies. The better the leaders the higher the motivation of employees. Many more examples could be listed here. In order to find out what exactly the shaping forces are and to which extent they will influence organizational decisions on Business Process Management incentives a quantitative research is described in the upcoming chapters.

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4. EMPIRICAL STUDIES / OWN RESEARCH

The questionnaire was structured in three parts with one filter question at the beginning. The first part contained four questions on demographics such as the size of the company the participant is working in and the region where the business is mainly operating, the roles within the organization and the age of the respondent according to the generations identified in chapter 3.4. The second part introduced the participant to the six influencing factors or also called shaping forces: Strategy, Organizational Forms, Workforce (generational perspective), Leadership & Management, Innovation & Digitization and Supply Chain Management & Circular Economy. The last and main part of the questionnaire asked the level of agreement or disagreement on selected statements for each of the six influencing factors on Business Process Management.

To obtain a feedback on the response time and usability of the questionnaire, as well as to improve the comprehensibility of the questions and to correct any errors, Business Process Professionals were selected according to the recommendations of Hienerth (2009) and pre-tests were conducted. The proposed improvements were discussed directly with the test persons involved. After validation of all suggested corrections, parts of them were incorporated and certain questions were modified.

A total of 288 participants voluntarily started the questionnaire. After elimination of incomplete entries, 111 complete and usable data were retained (n = 111).

The questionnaire was designed to separate respondents to workers in knowledge-intensive services (KIS) or knowledge-intensive business services (KIBS) in accordance with the NACE classification (Nomenclature statistique des activités économiques dans la Communauté européenne). This distinction corresponds with the following statement of the European Commission regarding innovation and growth.

"The economic importance of services means that improvements in European living standards are likely to depend more and more on productivity improvements in business services than in manufacturing" (European Commission, 2007). This statements closely follows *"[...] KIBS are likely to be one of the main engines for future growth within the European Union."* (European Commission, 2007).

For participant working in neither of the listed service sectors (selection of the answer “none of the above”) the questionnaire ended. 79 of 111 respondents indicated to work in knowledge-intensive services, market services, financial or business services, see Figure 56.

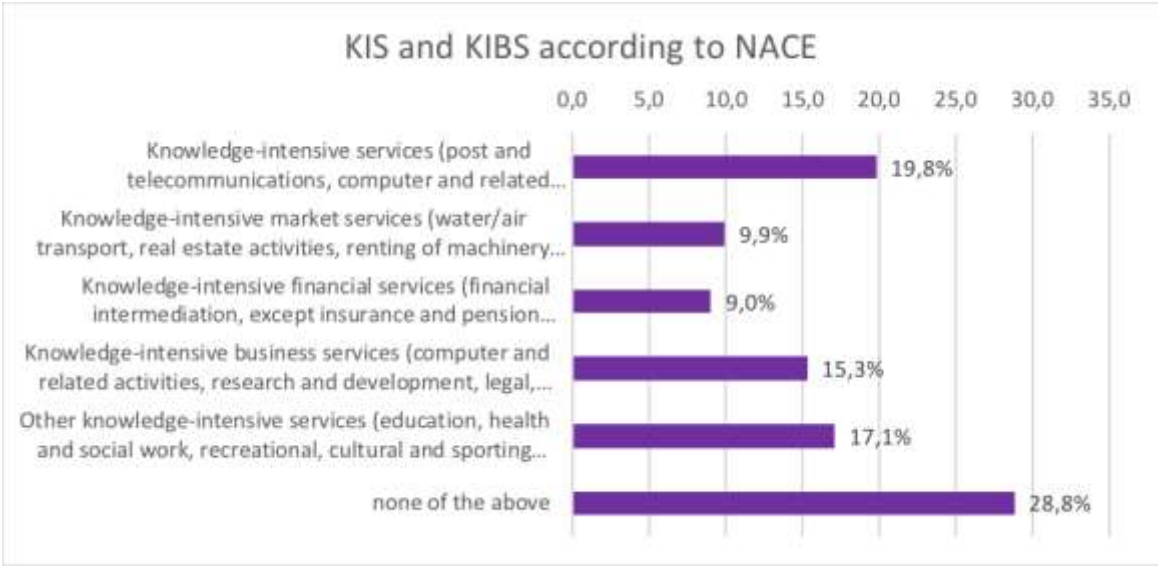

Figure 56 KIS and KIBS according to NACE

4.1 Demographics

Almost half of the participants are working in small organizations which are characterized by the number of employees under 500; 20% are working in medium sized companies (500 to 1999 employees) and 32% of the respondents are employed in large organizations with more than 2000 employees, see Figure 57.

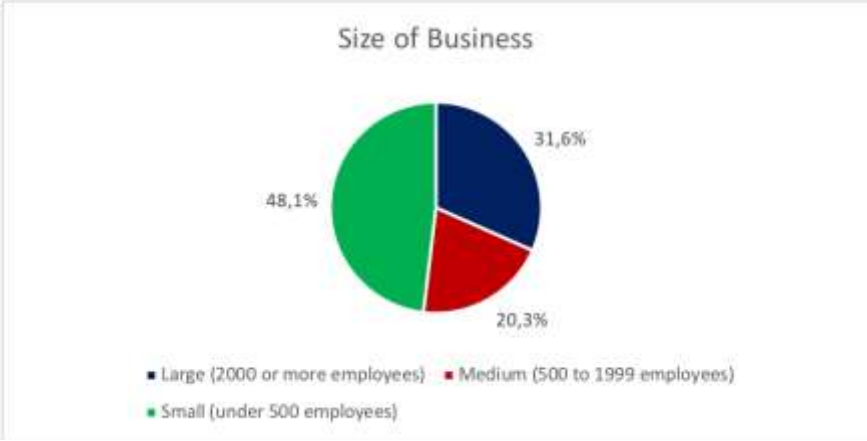

Figure 57 Size of Business

The categorization for the region where the businesses of the participants are mainly operating listed Europe, North America, Central & South America, India and South East Asia, North East Asia (China, Japan, Korea), Australia / New Zealand and Africa / Middle East. No respondent is running his business in India and South East Asia, Australia / New Zealand or Africa / Middle East and only one answered from North East Asia (China, Japan, Korea), see Figure 58. Therefore, the ten answers originating in North America, Central & South America and the one

from North East Asia are summarized to “Rest of the World” and are compared to responses from Europe. 86,1% of the participants are working in Europe, while 13,9% stated to run their business in the rest of the world.

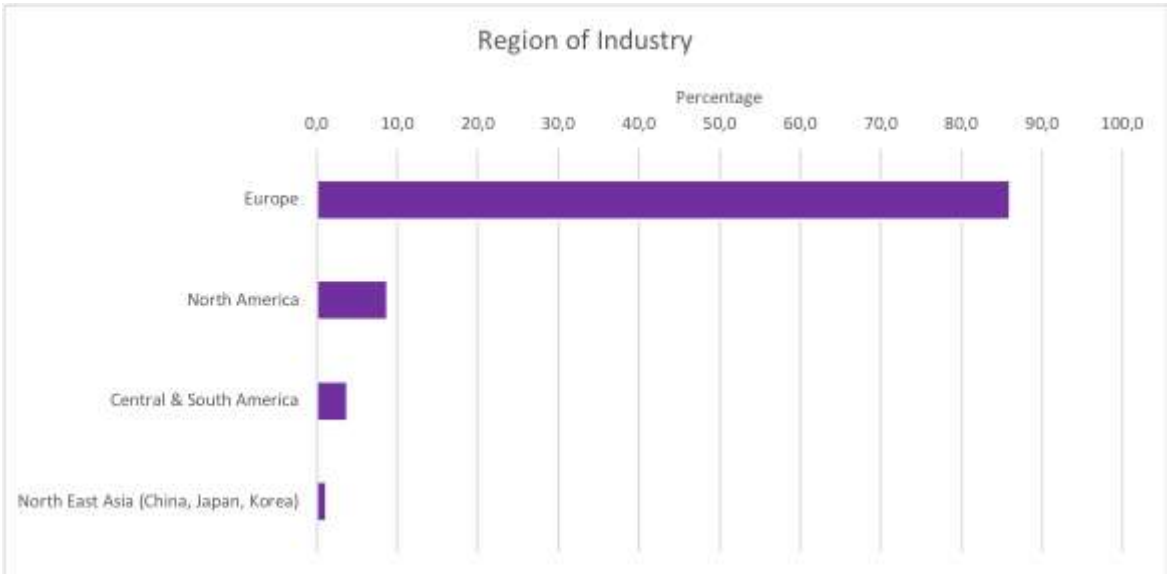

Figure 58 Region of Industry

Most of the participants own the role of an IT Manager within their organization (17,1%), followed by 10,6% Executive Managers. Only 9,8% of the respondents claimed to be Process Practitioners, see Figure 59.

Figure 59 Roles within Organizations

The range of age included participants between 23 and 72 years. These represent the three categories of Baby Boomers (15,2%), Generation X (45,6%) and Generation Y (39,2%), see Figure 60.

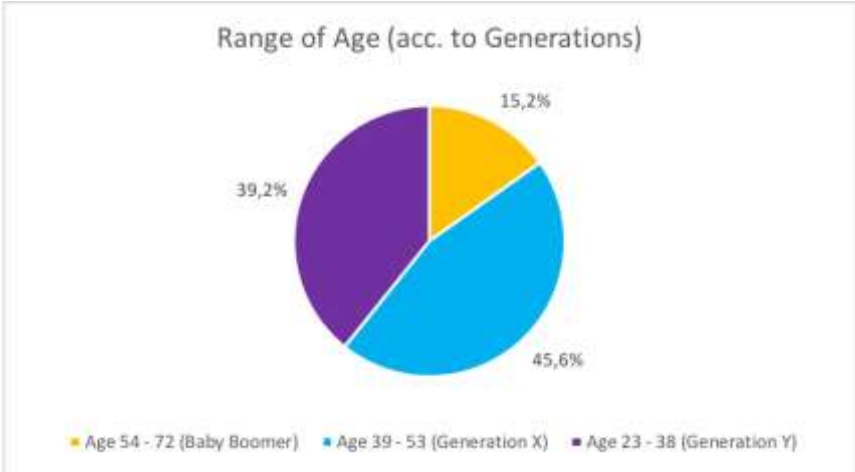

Figure 60 Range of Age according to Generations

From the generational perspective, 56,3% of the Baby Boomer Generation are working in Executive Management, as Business and Process Architects or BPM Consultants. Within Generation X most of the respondents (19,6%) are IT Managers, followed by Executive Management and others. Almost the same picture was drawn by representatives of Generation Y (Millennials) where 19,7% are IT Managers and 16,4% with other professions than the ones listed, see Figure 61.

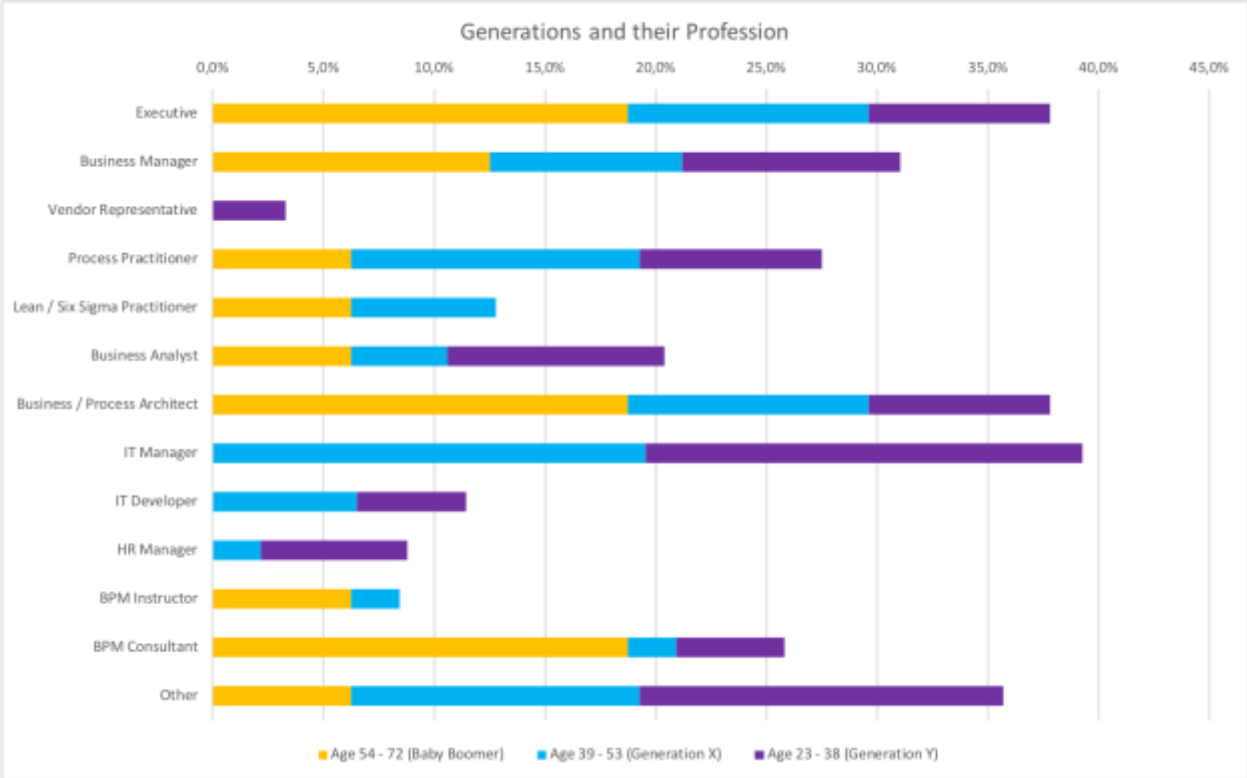

Figure 61 Generations and their Profession

4.2 Statistical Calculations

This thesis mainly focused on six factors that have potential influence on the future development of Business Process Management. Figure 62 shows that based on 259 answers 9,7% of the respondents see Supply Chain Management & Circular Economy as being influential, 10% state the Generational Workforce as important factor and 15,4% of the answers state that the Organizational Evolution has potential to influence BPM. Strategy with 22% and Innovation & Digitization with 25,1% are the most influential factors that will have an impact on future developments on Business Process Management.

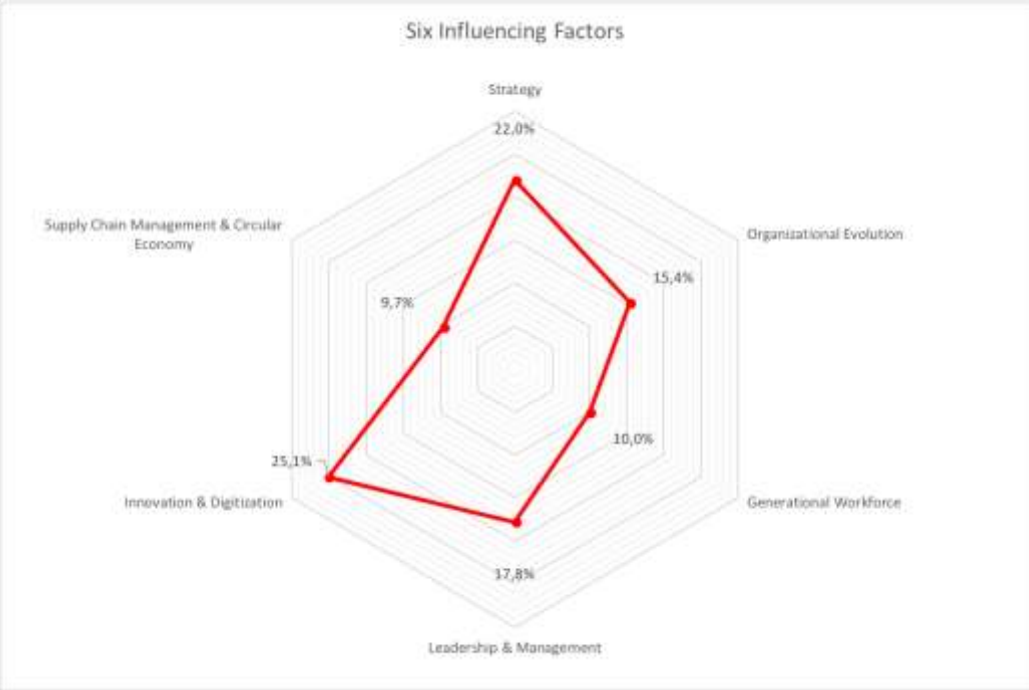

Figure 62 Influencing Factors

Taking also other listed influencing factors into account, the graphical representation looks like Figure 63.

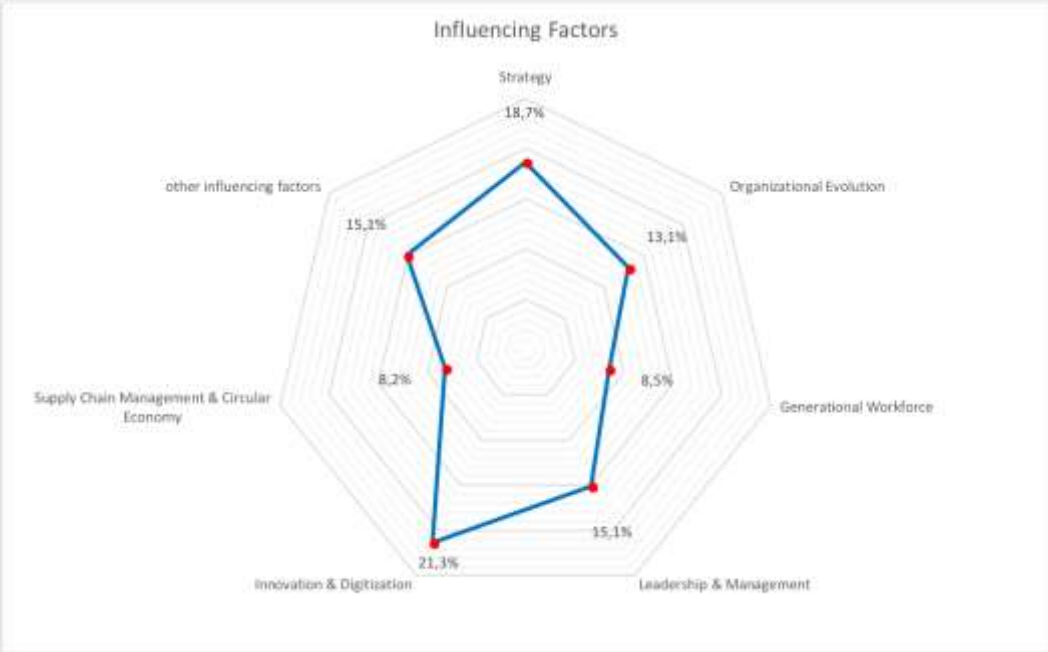

Figure 63 Influencing Factors plus others

From 259 answers, 15,1% of the respondents additionally provided other important influential topics related to Business Process Management (in total 46 items). The complete list of provided influencing factors can be read in ANNEX G – Other Influencing Factor. Very important to state here is that no additional item was listed redundantly. 14 of the additional influential factors can be added to the provided six shaping forces, for example the term "Technology" would add to the factor "Innovation & Digitization".

For Generation X and Generation Y, Innovation & Digitization (both 23%) was the most important factor related to Business Process Management. An interesting point in this insight given in Figure 64 is that for the Baby Boomers other influencing factors, that are listed in Annex F are more important than the ones provided to them in the questionnaire.

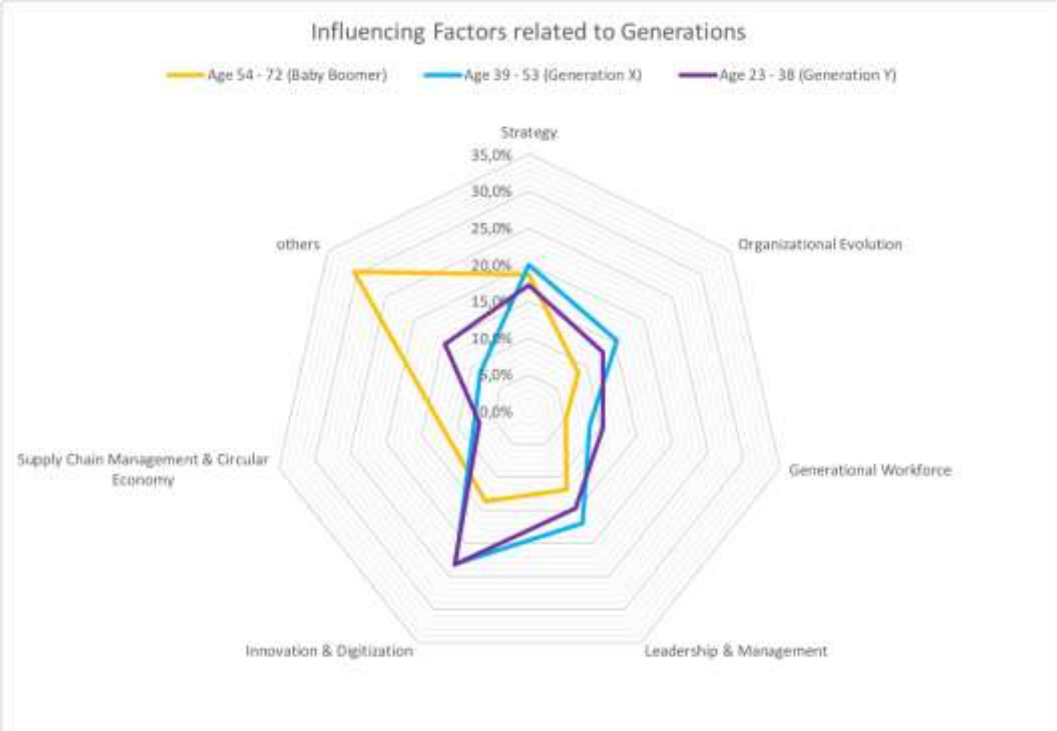

Figure 64 Influencing Factors and Generations

Relating the size of the business with the statements on influencing factors, the difference between large (more than 2000 employees) and small (under 500 employees) organizations is obvious. Large organizations see Strategy (19,6%), Innovation & Digitization (20,6%) and other influencing factors (22,5%) as more important than the other factors, while small organizations seem to heavily stress out Innovation & Digitization (23,2%) as most influential. For medium sized organizations Strategy (23%) has the highest influence on Business Process Management, see Figure 65.

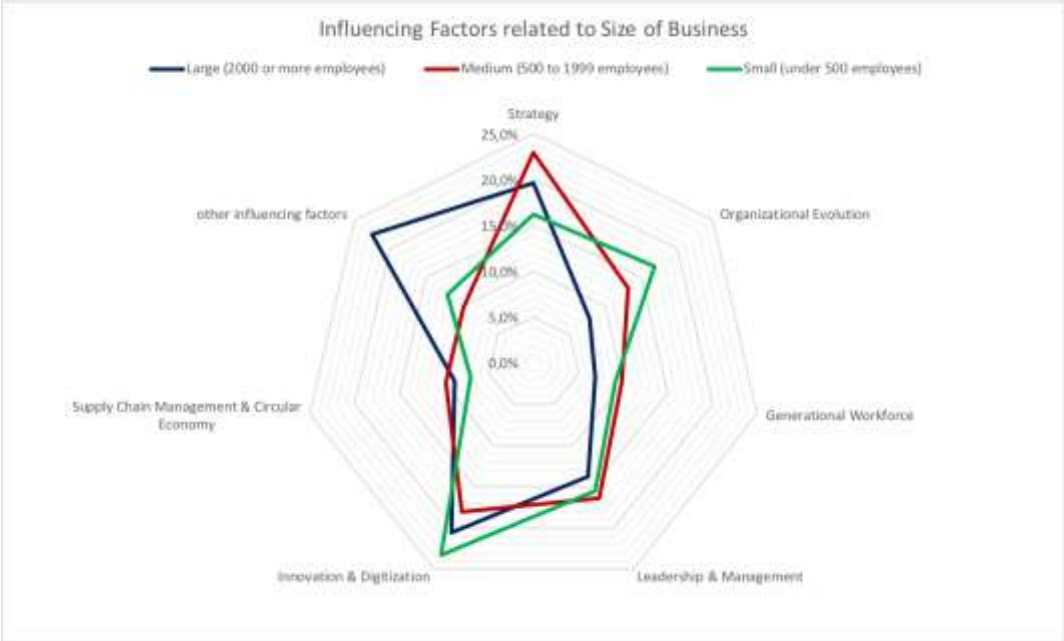

Figure 65 Size of Business and Influencing Factors

For European participants Innovation & Digitization (22,4%) and Strategy (18%) were the most important influencing factors on Business Process Management. Respondents from North America and other regions (summarized to "Rest of the World") stated that Strategy (24,2%) and Leadership & Management (21,2%) are more important than the other influencing factors, see Figure 66.

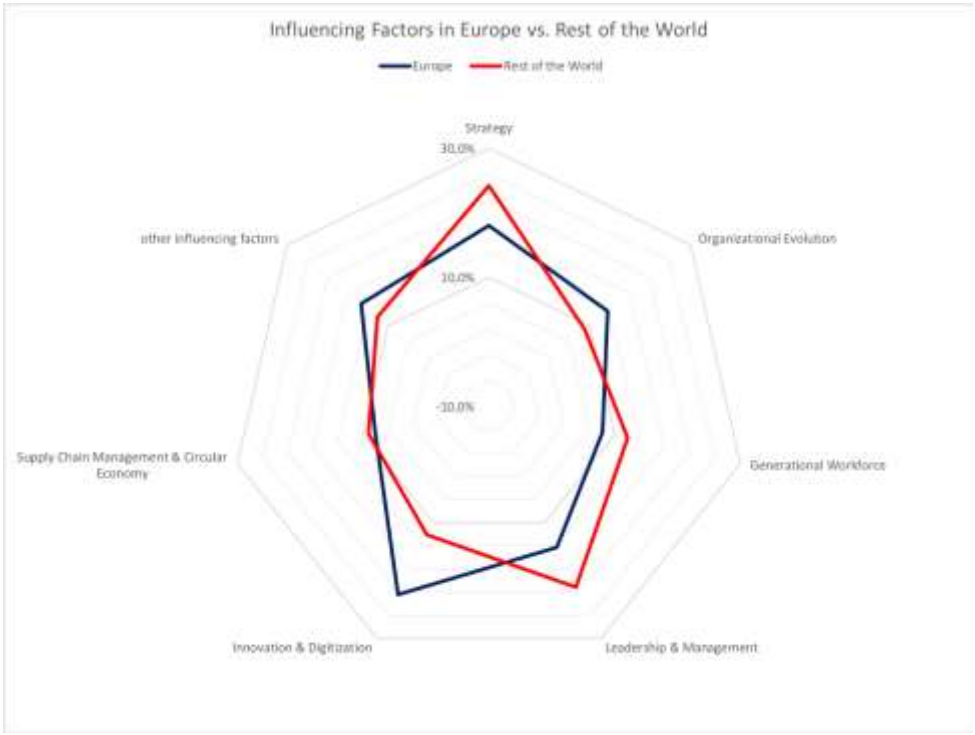

Figure 66 Influencing Factors in Europe vs. Rest of the World

Following the three top professions or roles the participants are owning, Figure 67 illustrates that for IT Managers all six influencing factors are very important and additionally other factors were added by this group of professionals with Strategy being most influential with 45,9%, while for Executive Management the most influential factor is the Organizational Evolution (33,3%). In the eyes of Business / Process Architects the Generational Workforce counts with 46,7% as being an important shaping force for Business Process Management.

Figure 67 Three main professions stating their most influential factors

17,6% of members of the Executive Management (CEO, COO, CFO, CTO, etc.) indicated other influencing factors on Business Process Management to be important:

- "*Cost reduction*" - this factor is a strategical decision when starting a Business Process Management initiative
- "*Gender and Diversity*" – here two influencing factors could be mentioned: Leadership & Management as well as Generational Workforce where gender and diversity were discussed in different generations
- "*Infrastructure of company*" - this factor provides a new insight of influencing factors
- "*Laws*" – every organization has restrictions like laws, etc., here the influencing factors Strategy and Organizational Evolution can be applied
- "*Service and quality orientation resp. customer orientation*" - this additional factor is an important issue of an organization`s strategy and thus is part of the influencing factor Strategy
- "*EcoLOgy and CSR*" – Corporate Social Responsibility and Ecology in the context of this thesis would count to the influencing factor of Supply Chain & Circular Economy

17,1% of the survey participants own the role of the IT Manager within their organization. For this group of persons 38,2% of other influencing factors are important to state in relation to Business Process Management:

- "*Courage*" - without context it is not quite clear what the participant of the survey meant with this factor, but as there is room for assumptions, courage could be seen in the context of being brave to face the challenges of the market and force an organizational evolution
- "*Cultural / environmental enablers / constraints*" - if this statement is well interpreted it can be assigned to Leadership & Management
- "*Internet of Things*" - the author of this thesis counts this additional factor to Innovation & Digitization
- "*Motivation of the workforce*" – one of the main aims of leaders is to motivate the workforce, so this is assigned to Leadership & Management
- "*Artificial Intelligence*" - the author of this thesis counts this additional factor to Innovation & Digitization
- "*Change Management Philosophy of the company*" – for this statement the influencing factor Strategy can be applied

For Business / Process Analysists the following additional factors are worth mentioning in this context. These factors mount to 44,1%, that is the second important influencing factor after the Generational Workforce to this group of participants:

- "*Accepting the factor that IT is (just) a tool and won't solve business problems without aligned processes*" - this statement is on the contrary to the influencing factor of Innovation & Digitization
- "*Cultural / environmental enablers / constraints*" – if this statement is well interpreted it can be assigned to Leadership & Management
- "*Motivation of the workforce*" – Leadership & Management is the influencing factor in place for this additional statement of the participant
- "*Real focus on customer requirements*" - this additional factor is part of the influencing factor of Strategy
- "*Shared aims*" – this additional factor is part of the influencing factor Strategy as well as Leadership & Management
- "*Change Management Philosophy of the company*" - for this statement the influencing factor Strategy can be applied
- "*Individual sensitivities can be road blocks for successfully running BPM*" - this statement is part of Leadership & Management
- "*Willingness to share knowledge*" - this additional factor fits to the influencing factor of Leadership & Management

4.3 Statements on Influencing Factors

Within this section, the level of agreement or disagreement of the given six shaping forces on the future development on Business Process Management is analysed. Figure 68 illustrates the agreement or disagreement on five given statements on the factor “Strategy” in relation to Business Process Management. More than half of the participants (55,7%) strongly agree that the digital age influences organizational strategies in many ways and that having a digital strategy is essential for staying competitive on the market (50,6%). 5,1% of the respondent strongly disagreed with the statement that platform businesses such as Apple`s iPhone and App Store do not optimize business processes but use other metrics to measure success. For this statement 43% of the participants did not have an opinion (neither agree nor disagree). A possible explanation could be that the term platform business is quite specific and not known by the respondents.

Corresponding to the high level of influence on BPM by Strategy (22%), 29,1% strongly agree and 50,6% agree with the statement that a competitive strategy is the perfect fit of business process activities to succeed on the market. No participant strongly disagreed. The correlation between core processes and strategy is proofed by the survey participants with 38% of strong agreement and 39,2% of agreement.

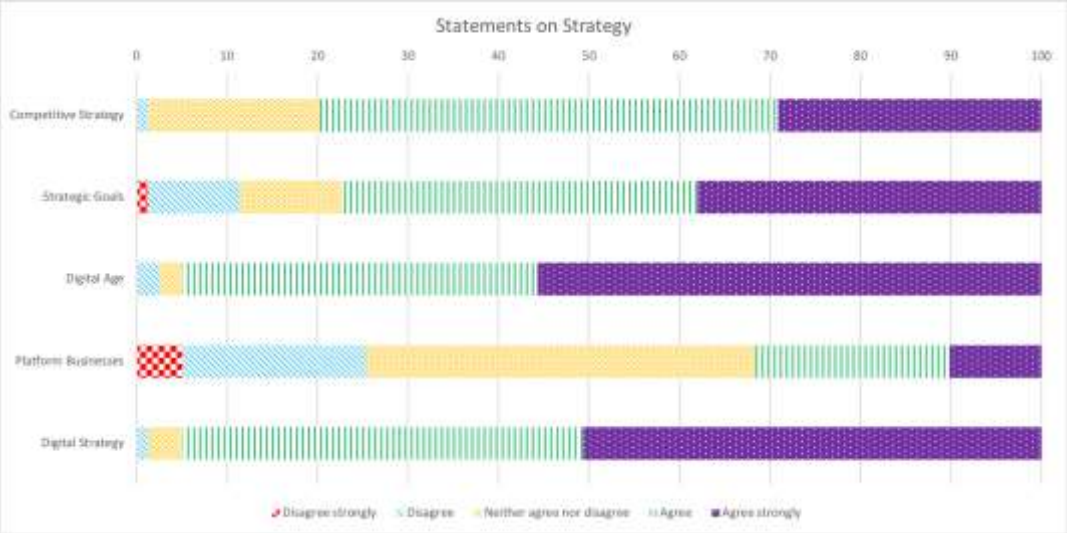

Figure 68 Statements on the factor "Strategy"

Table 14 Codebook for statements on influencing factor "Strategy"

Code	Statement
Competitive Strategy	A competitive strategy is the perfect fit of business process activities to succeed on the market.
Strategic Goals	Core processes influence strategic goals and vice versa.
Digital Age	The digital age influences strategies in many ways (networked customers, data generated in all processes or rapid experimentation in innovation).
Platform Businesses	Platform businesses such as Apple´s iPhone and App Store do not optimize business processes but use other metrics to measure success.
Digital Strategy	Having a digital strategy is essential for staying competitive.

The strongest agreement on statements related to Organizational Evolution and therefore organizational forms obtained the assumption that a well-defined and communicated strategy as well as skilled, enthusiastic people are not able to compensate unstructured or badly automated business processes with 26,6%. Worth to state at this stage is that 19% of the participants strongly disagreed (5,1%) or disagreed (13,9%) with this exact statement. The focus on the value chain and thus a sustainable competitive advantage for organizations found 54,4% of agreement and 24,1% of strong agreement, see Figure 69.

The opinions on organizations of the future built without structural hierarchies and with networks of empowered teams were diverse. 25,3% neither agreed nor disagreed. 31,6% of the respondents disagreed (25,3%) or strongly disagreed (6,3%), while 43,1% of the participants agreed (26,6%) or strongly agreed (16,5%) on this statement. Almost the same picture can be drawn with the statement on employees who follow rigid process descriptions become unmotivated and reluctant. More than half of the participants agreed or strongly agreed on this statement, while 21,5% had no opinion and another 25,3% disagreed or strongly disagreed.

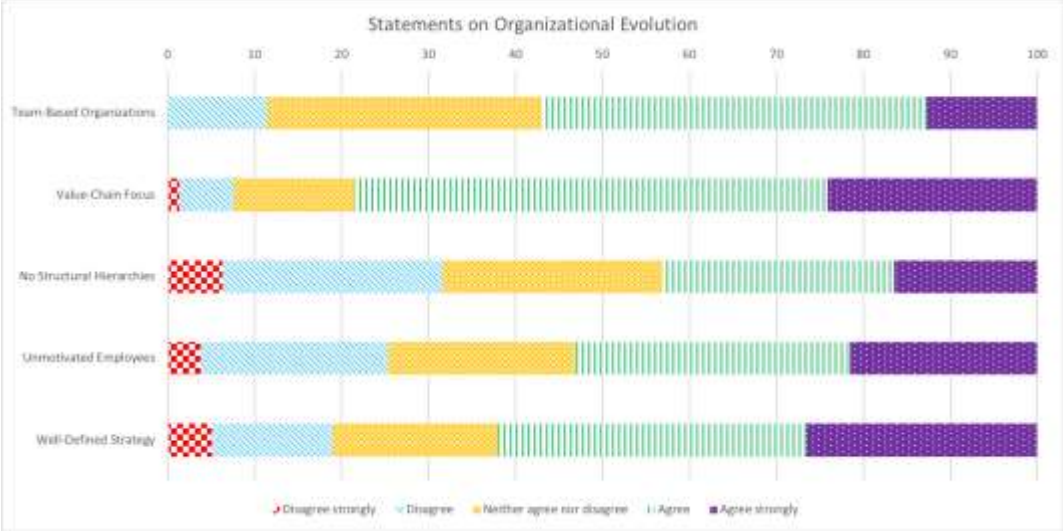

Figure 69 Statements on the factor "Organizational Evolution"

Table 15 Codebook for statements on influencing factor "Organizational Evolution"

Code	Statement
Team-Based Organizations	Team-based organizational forms have to reinvent organizational processes, with processes like playbooks with defined start and end but loose activities.
Value-Chain Focus	Organizations with focus on the value chain and the surrounding system are able to sustain competition.
No Structural Hierarchies	Organizations of the future are built without structural hierarchies and with networks of empowered teams.
Unmotivated Employees	Employees who follow rigid process descriptions become unmotivated and reluctant.
Well-Defined Strategy	A well-defined and communicated strategy as well as skilled, enthusiastic people are not able to compensate unstructured or badly automated business processes.

Figure 70 illustrates that strong agreement was obtained by the statement on different communication needs on process information with 34,2% (40,5% agreed on this statement) and on digital natives that force the development of technology and digitization within organizations with 24% (48,1% agreed on this statement).

On one hand, 11,4% of the participants strongly disagreed and 17,7% disagreed with the statement that a standardized process model notation is an adequate means of visualization for the younger workforce (Millennials) to communicate processes. On the other hand, more than half of the participants (53,2%) agreed or strongly agreed with this statement.

A high percentage of 39,2% neither agreed nor disagreed with the statement that flat organizational structures with adequate leaders are the key for the generational gap. 41,8% agreed or strongly agreed on this statement. The results on the statement that the generation gap can be closed by the workforce itself were also very diverse. 5,1% strongly disagreed and 17,7% disagreed with this statement, while 36,7% agreed or strongly agreed. 40,5% of the participants did not have an opinion on this statement (neither agreed nor disagreed).

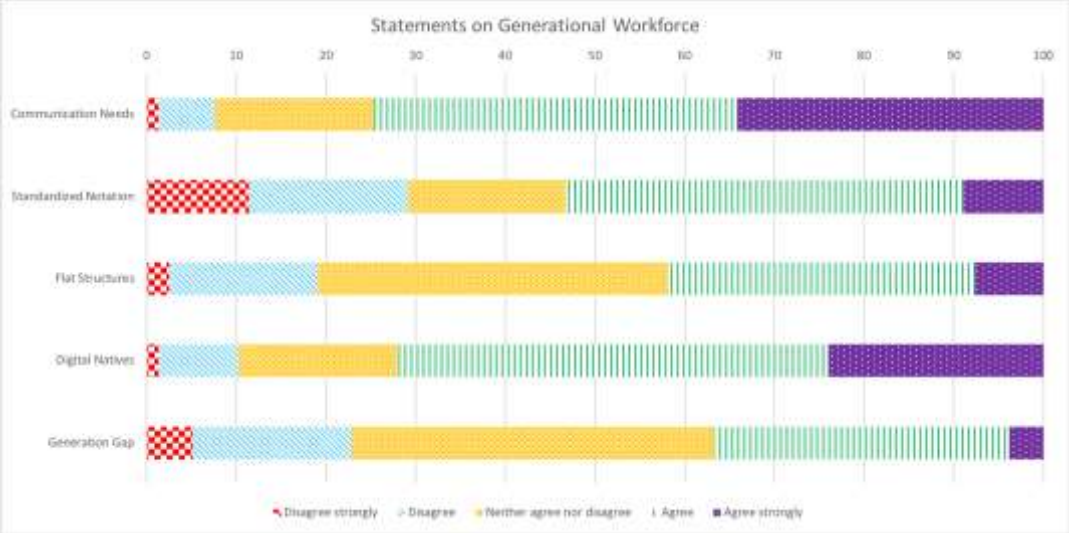

Figure 70 Statements on the factor "Generational Workforce"

Table 16 Codebook for statements on influencing factor "Generational Workforce"

Code	Statement
Communication Needs	The generational workforce within an organization has different communication needs on process information.
Standardized Notation	A standardized process model notation is an adequate means of visualization for the younger workforce (Millennials) to communicate processes.
Flat Structures	Flat organizational structures with adequate leaders are the key for the generation gap.
Digital Natives	Digital natives (Millennials and Generation Z) are forcing the development of technology and digitization within organizations.
Generation Gap	The generation gap can be closed by the workforce itself.

Strong disagreement by 22,8% and disagreement by 53,2% of the respondents (summing up to 76% of total disagreement) was discovered with the statement on leadership and leadership

skills that can be obtained by every employee, see Figure 71. A very high percentage of 68,4% agreed on the statement that a perfect mix and match of leadership styles helps managing a diverse workforce. In addition, 17,7% of the participants strongly agreed on this statement.

Surprisingly the opinions on statements about agile practices (agile in the customer context means adjusting everything in the organization) were diverse. 48,1% of the participants strongly agreed or agreed on this statement, while 24% neither agreed nor disagreed and 27,9% disagreed or strongly disagreed. No participant strongly disagreed with the statement on managing an agile organization means having an agile mindset and implementing agile methodologies, while 53% agreed and 22,8% strongly agreed on this statement.

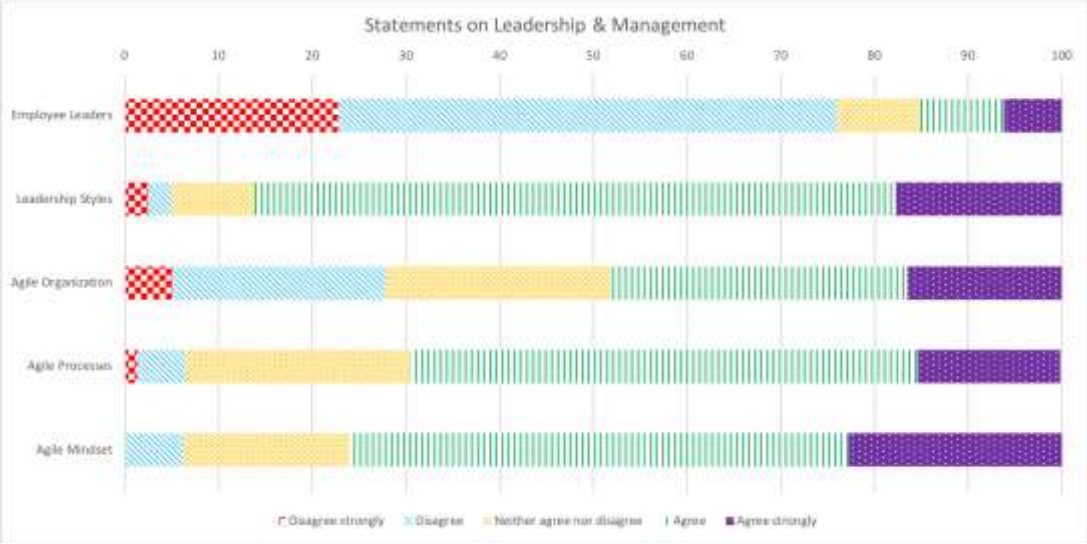

Figure 71 Statements on the factor "Leadership & Management"

Table 17 Codebook for statements on influencing factor "Leadership & Management"

Code	Statement
Employee Leaders	Every employee can become a good leader by obtaining leadership skills.
Leadership Styles	A perfect mix and match of leadership styles helps managing a diverse workforce.
Agile Organization	Agile in the customer context means adjusting everything in the organization – strategy, principles, values, processes, systems, data structures - to generate continuous new value.
Agile Processes	Business processes in agile organizations do exist but are designed differently (eg continuous improvement process).
Agile Mindset	Managing an agile organization means having an agile mindset and implementing agile methodologies.

Together with the influencing factor Strategy, Innovation & Digitization shows the highest levels of strong agreement and agreement on individual statements, stated in Figure 72. 40,5% of the participants strongly agree that innovation due to technology evolution will generate new working opportunities. Adding 45,6% of agreeing answers, this sums up to 86,1%. No participant disagreed on this statement.

The same strong agreement can be found with the statement on process innovations as transformative ideas that can be found in any function of an organization. Together with respondents who agree on this statement, 88,6% are conform with the author in this point. The same percentage of participants, in numbers 70 persons, agree that the provision of appropriate team networking conditions is essential for innovation processes.

2,5% strongly disagree and 16,5% disagree with the statement that innovation networks need process structures to work properly, while 49,4% of the participants agree or strongly agree. A high percentage of 31,6% of respondents neither agree nor disagree on this statement. 56,9% of participants strongly agree or agree on the statement that dedicated innovation teams should be freed from structured organizational processes. 21,6% of respondents disagree on this statement.

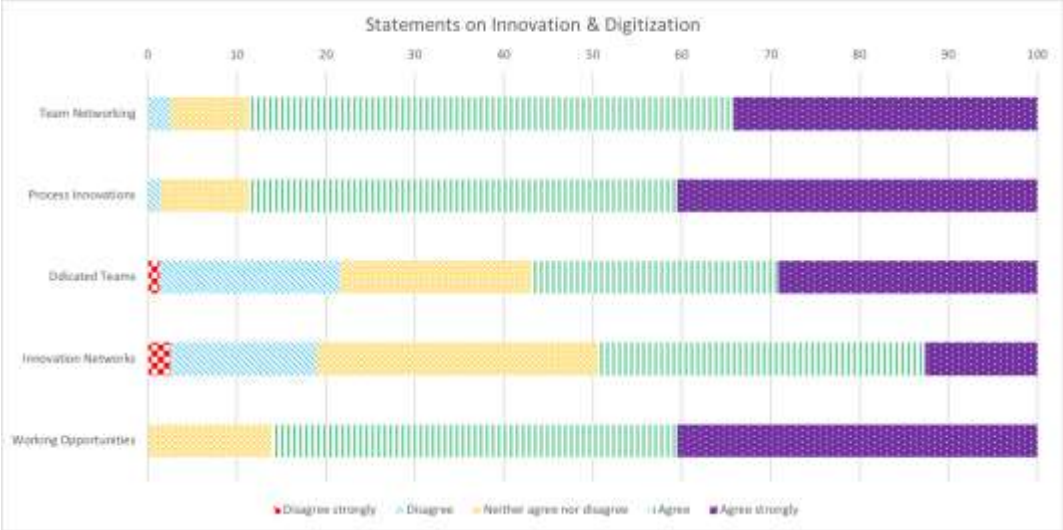

Figure 72 Statements on the factor "Innovation & Digitization"

Table 18 Codebook for statements on influencing factor "Innovation & Digitization"

Code	Statement
Team Networking	The provision of appropriate team networking conditions is essential for innovation processes.
Process Innovations	Process innovations as transformative ideas can be explored in any function of an organization, not only in product development.
Ddicated Teams	Dedicated innovation teams should be freed from structured organizational processes.
Innovation Networks	Innovation networks need process structures to work properly.
Working Opportunities	Innovations due to technology evolution will generate new working opportunities.

Many participants did not have any opinion on three statements of the influential factor “Supply Chain Management”: 39,2% of the respondents neither agreed nor disagreed on supply chain networks as a sustainable alternative to sequential supply chains, 57% did not have an opinion on processes in circular economies and the high percentage of 65,8% neither agreed nor disagreed on circular economy as becoming the new de-facto standard for economies. This may

result from the fact that the term circular economy is new to the participants. A high number of 68 participants (86,1%) strongly agreed or agreed on the statement on the better all participants within the supply chain know the processes the more successful the supply chain, see Figure 73. No participant disagreed on this statement.

72,2% of the participants strongly agreed or agreed on the statement that Supply Chain Management is defined by a very structured and detailed business processes framework. 24% of the respondents did not have an opinion on this statement and only 3,8% disagreed.

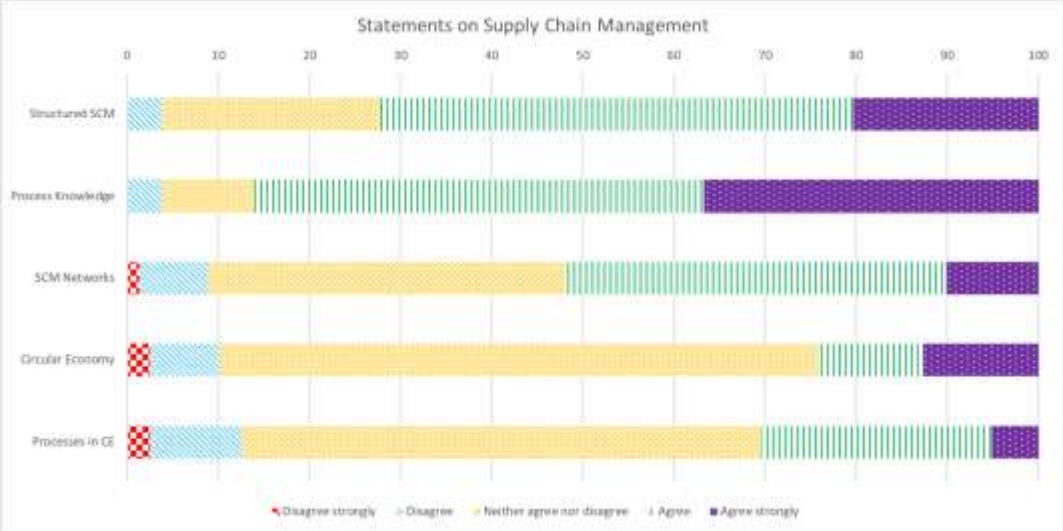

Figure 73 Statements on the factor "Supply Chain Management"

Table 19 Codebook for statements on influencing factor "Supply Chain Management & Circular Economy"

Code	Statement
Structured SCM	Supply Chain Management is defined by a very structured and detailed business processes framework.
Process Knowledge	The better all participants within the supply chain know the processes the more successful the supply chain.
SCM Networks	Supply chain networks are a sustainable alternative to sequential supply chains.
Circular Economy	Circular economy has the potential to become the defacto standard for economies.
Processes in CE	Processes in circular economies have to be derived from sequential supply chains to be able to understand possible improvements.

4.4 Factor analysis

The literature analysis of this thesis already stressed out that the six discussed influencing factors on Business Process Management strongly interrelate with each other. In order to test these findings, the exploratory factor analysis as a technique to summarize a large set of variables by grouping intercorrelations of a smaller set of variables is used (Pallant, 2010).

The factor analysis is executed in three steps. The first and most important analysis includes the assessment of data suitability under research. For the underlying data set, the KMO index (Kaiser-Meyer-Olkin) ranges at 0,569. Thus, it is suggested to be sufficient for this factor

analysis. The Bartlett´s test is significant (p = 0,000). With the factor extraction as second analysis the number of factors that are used to best represent possible interrelationships between variables is determined.

This so-called principal components analysis revealed the existence of ten components with eigenvalues higher than 1. These components are explaining a total of 67,18% of the variance (ranging from 14,3% to 3,8%), see Figure 74. The third analysis within the conducted factor analysis is the factor rotation and finally its interpretation. The extracted factors were subsequently rotated with the Varimax method for reasons of easier interpretability. The interpretation of the latent variables was made on the basis of those items that show correlations (charges) $| \lambda_{mj} | > 0.3$ with the latent variable j (Bortz, 1999).

Total Variance Explained
Method of Extraction: principle component analysis

	Initial Eigenvalue			Sums of quadrated factor loading for extraction		
Component	Total	% of Variance	Cumulated %	Total	% of Variance	Cumulated %
1	4,305	14,349	14,349	4,305	14,349	14,349
2	2,760	9,201	23,551	2,760	9,201	23,551
3	2,580	8,598	32,149	2,580	8,598	32,149
4	1,931	6,437	38,586	1,931	6,437	38,586
5	1,843	6,142	44,728	1,843	6,142	44,728
6	1,683	5,608	50,336	1,683	5,608	50,336
7	1,389	4,629	54,965	1,389	4,629	54,965
8	1,332	4,438	59,404	1,332	4,438	59,404
9	1,191	3,970	63,373	1,191	3,970	63,373
10	1,142	3,806	67,179	1,142	3,806	67,179
11	,987	3,290	70,469			
12	,928	3,093	73,562			
13	,858	2,860	76,422			
14	,794	2,648	79,069			
15	,717	2,389	81,459			
16	,693	2,310	83,768			
17	,595	1,983	85,751			
18	,573	1,910	87,662			
19	,551	1,838	89,499			
20	,452	1,508	91,007			
21	,398	1,327	92,334			
22	,372	1,241	93,576			
23	,327	1,091	94,667			
24	,307	1,022	95,689			
25	,269	,897	96,587			
26	,256	,853	97,440			
27	,241	,803	98,243			
28	,205	,683	98,925			
29	,169	,563	99,488			
30	,154	,512	100,000			

Figure 74 Total Variance Explained, principle component analysis

To determine the number of retaining factors that will be examined, the parallel analysis is used. Parallel analysis compares the size of already generated eigenvalues from the principle

components analysis with randomly generated data sets of the same sample size (Pallant, 2010). According to the scree plot, see Figure 75, as well as the parallel analysis which presented only six components with eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of the same size (30 variables and 111 respondents), six components are seen to be relevant for further analysis.

The six-component solution explains a total of 50,35% of the variance, ranging between 14,3% at component 1 to 5,6% at component 6.

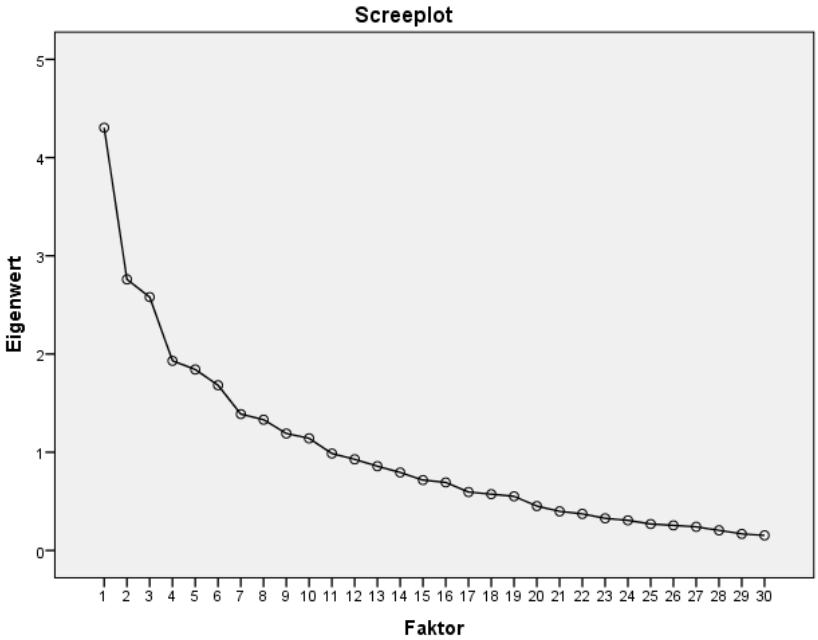

Figure 75 Screeplot for factor analysis

Figure 76 shows parts of the component matrix with Varimax rotated solution. The full matrix is shown in the Appendix. What can be seen in this matrix are positive affect items loading strongly on for example component 1 and 2. The prose interpretation of the gathered results can be found in the next chapter.

	1	2	3	4	5	6
Core processes influence strategic goals and vice versa.	,718					
Employees who follow rigid process descriptions become unmotivated and reluctant.	-,626					
Organizations with focus on the value chain and the surrounding system are able to sustain competition.	,609	,379				
A competitive strategy is the perfect fit of business process activities to succeed on the market.	,533					
Managing an agile organization means having an agile mindset and implementing agile methodologies.		,745				
Business processes in agile organizations do exist but are designed differently (eg continuous improvement process).		,650				

Figure 76 Rotated Component Matrix, Varimax rotated solution

5. RESULTS

Chapter 2 of this thesis describes the research question as well as the hypotheses of the quantitative analysis. The hypotheses are listed below:

H1 = the levels of influence on Business Process Management of influential factors are the same across knowledge-intensive business services in Europe

H2 = the size of the business does not influence the level of influence on Business Process Management of the influential factors

H3 = the age provide by the participant is significant for the level of influence of the influential factors on Business Process Management

H4 = the primary influencing factors on Business Process Management are the six provided (strategy, organizational evolution, generational workforce, leadership & management, innovation & digitization and Supply Chain Management & circular economy)

The following sections will now verify or falsify the given hypotheses.

5.1 KIBS and Influencing Factors

Knowledge Intensive Business Services emerged back in the late 1980s and early 1990s in the United States and Europe and are labelled as enablers of the innovation process in the new economy. *"Knowledge intensive business services (KIBS) can be described as firms performing, mainly for other firms, services encompassing a high intellectual value-added"* (Muller & Zenker, 2001). KIBS can be separated in two categories, one representing traditional professional services heavily using new technologies and new technology-based KIBS trading with software or computer-related activities. Three main features of KIBS are the knowledge-intensity of provided services for clients, the function of (problem-solving) consulting and the services provided that are strongly interactive and often client-related (Muller & Zenker, 2001).

Knowledge-intensive service firms are seen to be heavily engaged in innovation activities and thus are drivers for service innovation for new products and technologies, new processes as well as new organizational types or marketing procedures. Innovation in KIBS compared to technologically oriented processes in the manufacturing sector has the following shaping factors: no innovation without the human factor, production and consumption are not separated processes, innovative services are intangible and are strongly characterized by interaction between consultant and customer (Schricke et al., 2012).

Knowledge-intensive business services added 74,08% to the GDP within the European Union in 2016 (World Bank. (n.d.) Europäische Union, 2018).

19,8% of the survey respondents are working in knowledge-intensive services (post and telecommunications, computer and related activities and research and development), followed by other knowledge-intensive services (education, health and social work, recreational, cultural and sporting activities) with 17,1%. These two categories summarize to KIS (knowledge-

intensive services). 15,5% of the participants are working in knowledge-intensive business services such as computer and related activities, research and development and legal, technical and advertising.

For 17 of respondents who indicated to work in a knowledge-intensive business service, the most influential factor on Business Process Management is "Innovation & Digitization". Knowledge-intensive business services highly contribute to the innovation process. This fact is thus also reflected in the survey results. "Strategy" is the second important influencing factor (19,4%) followed by "Supply Chain Management & Circular Economy" with 11,9%, see Figure 77.

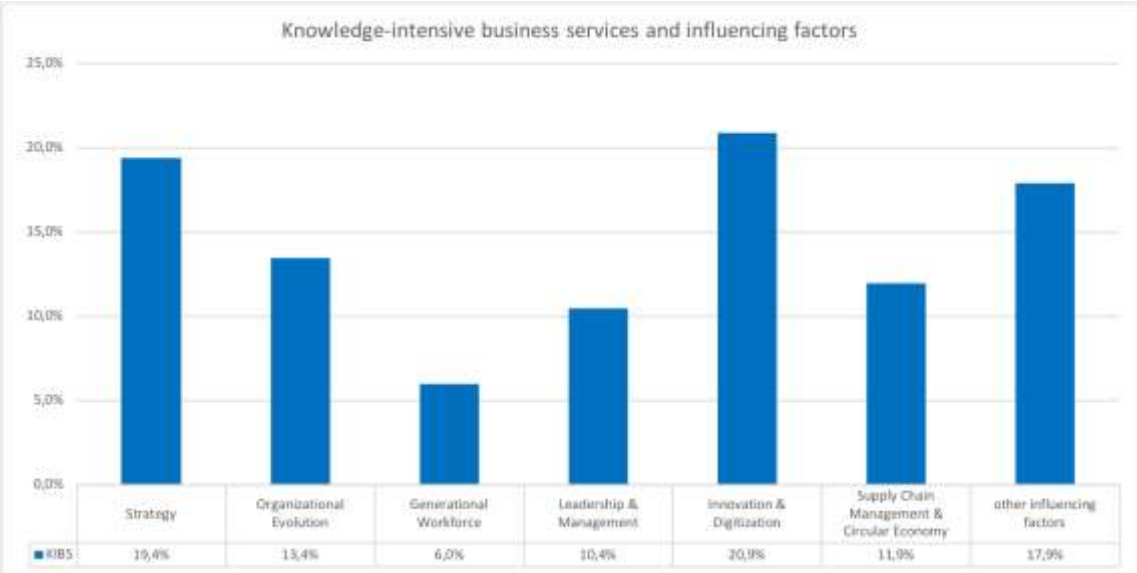

Figure 77 KIBS and influencing factors

Other factors that potentially have an influence on Business Process Management are listed by respondents working in knowledge-intensive business services are as follows:

- "*Awareness of potential of BPM skill set*" – this additional factor could be seen as part of Organizational Evolution in combination with Generational Workforce and Leadership & Management
- "*Cost reduction*" – this factor is a strategical decision when starting a Business Process Management initiative
- "*Devolving decision-making authority*" – this factor is part of the influencing factor for Organizational Evolution as decision making is changing with evolving organizational forms such as networks
- "*Industry 4.0*" – the author of this thesis counts this additional factor to Innovation & Digitization
- "*Infrastructure of company*" – this factor provides a new insight of influencing factors
- "*Resources*" – this factor is redundant with the factor "*Infrastructure of company*"

- "*Service and quality orientation resp. customer orientation*" – this additional factor is an important issue of an organization`s strategy and thus is part of the influencing factor Strategy
- "*Courage*" – without context it is not quite clear what the participant of the survey meant with this factor, but as there is room for assumptions, courage could be seen in the context of being brave to face the challenges of the market and force an organizational evolution
- "*Internet of Things*" - the author of this thesis counts this additional factor to Innovation & Digitization
- "*Measuring outcomes instead of process compliance*" – Business Process Management implicitly measures outcomes and not only process compliance
- "*Artificial Intelligence*" - the author of this thesis counts this additional factor to Innovation & Digitization
- "*Collaboration through communication and outcome deliveries*" – this factor can be found within the factor Organizational Evolution as well as Generational Workforce with evolving communication needs and Leadership & Management as guidance of collaboration and working processes

Hypothesis 1 (H1 = the levels of influence on Business Process Management of influential factors are the same across knowledge-intensive business services in Europe) is refuted as the influencing factor "Innovation & Digitization" has a higher level of influence on future developments of Business Process Management according to the respondents of the questionnaire.

5.2 Size of Business and Influences on Business Process Management

Small and medium sized enterprises (SMEs) are the core elements within European industries. 99,2% of all organizations within EU-28 in the non-financial sector are run as SMEs, employing more than 93 million people who generate 57% of value added. In comparison to SMEs in the United States, employment and value added grew less rapidly in the EU-28. Japanese SMEs performed even worse in the same time period in 2014 and 2015. (European Union, 2017).

The Annual Report on European SMEs 2016/2017 (2017) states that only 10% of the total number of enterprises are newly created ones in the EU-28 from 2010 to 2014. But even more surprising is the very low percentage rate of 7,9% of start-up organizations within the ICT sector (information communication and technology) of newly created enterprises in the EU-28. 69,9% of these new enterprises have zero employees.

The results from the survey state that 48,1% of the participants are working in organizations with less than 500 employees. This is far less than the percentage rate of SMEs in Europe. The rest of the participants (51,9%) are working in larger organizations. This fact reflects findings that small organizations do not invest in costly Business Process Management initiatives.

Business Process Management frameworks are typically tailored to medium sized and large organizations. Due to the lack of application benefits and case studies, the sector of SMEs is

not fully aware of the strategic importance of managing processes (Dallas & Wynn, 2014). Findings within the survey have shown that professions related to Business Process Management such as Process Practitioner, Lean / Six Sigma Practitioner, Business / Process Architect, BPM Instructor or BPM Consultant are rare among the participants. Three respondents stated to have the role of a Business / Process Architect, five Process Practitioners participated in the survey and only one BPM Instructor responded to the survey, see Figure 78.

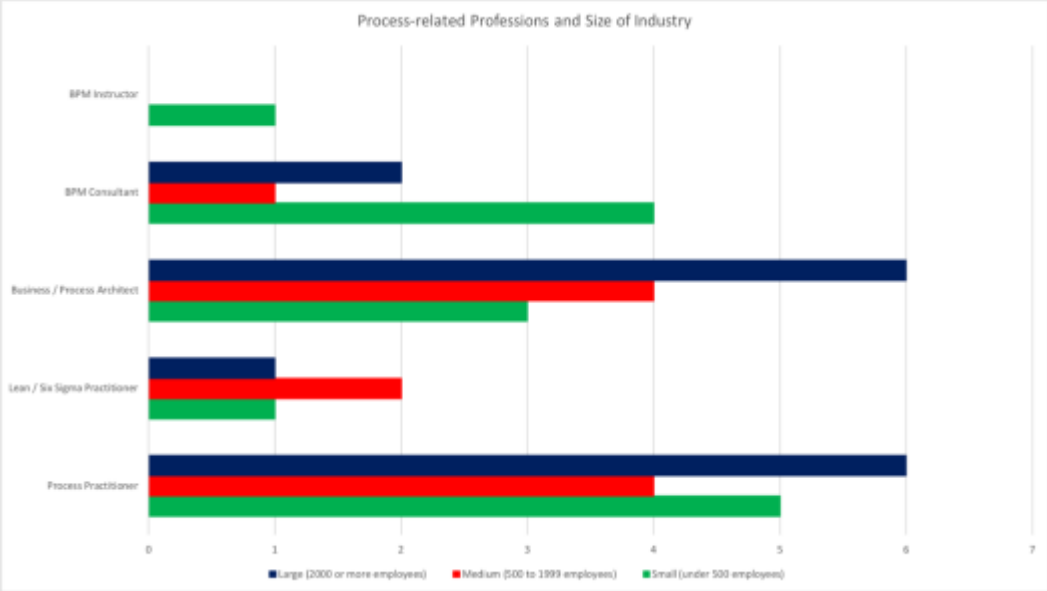

Figure 78 Size of Industry and process-related Professions

Hypothesis 2 (H2 = the size of the business does not influence the level of influence on Business Process Management of the influential factors) is partly validated as the level of influence is nearly the same for the following factors:

- "Leadership & Management" (between 13,7% for large businesses and 16,4% for medium-sized businesses)
- "Generational Workforce" (between 6,9% for large businesses and 9,8% for medium-sized businesses)
- "Supply Chain Management & Circular Economy" (between 7% for small businesses and 9,8% for medium-sized businesses)

The levels of influences are diverging for three other influencing factors as well as within the open question for other listed influencing factors:

- "Strategy" (between 16,2% for small businesses and 23% for medium-sized businesses)
- "Organizational Evolution" (between 7,8% for large businesses and 16,9% for small businesses)
- "Innovation & Digitization" (between 18% for medium-sized businesses and 23,2% for small businesses)

- Other influencing factors (between 9,8% for medium-sized businesses and 22,5% for large businesses)

5.3 Generations and Influencing Factors

The age distribution among inhabitants of the European Union in 2016 shows that 65,11% were aged between 15 and 64 years (World Bank (n.d.) European Union, 2018). In this survey the range of age was defined by the generations given in Figure 35, chapter 3.4, but it can be stated that about 84,8% of the participants are within this age range (summing up the results for Generation X and Y).

More important in this context is the view on the influencing factors and the different generations. As already mentioned, Innovation & Digitization is a highly ranked factor for Generation X and Y. For Baby Boomers, ranging from 54 to 72 years, other influencing factors were of higher importance. These additionally stated factors are listed below:

- "*Awareness of potential of BPM skill set*" – this additional factor could be seen as part of Organizational Evolution in combination with Generational Workforce and Leadership & Management; knowledge improvement and trainings of skilled employees as an asset and influences the implementation and the success of Business Process Management
- "*complexity of business*" – this factor counts to the factor Strategy; in the author´s opinion the higher the business complexity the higher the need for Business Process Management
- "*devolving decision-making authority*" - this factor is part of the influencing factor for Organizational Evolution as decision making is changing with evolving organizational forms such as networks
- "*Infrastructure of company*" - this factor provides a new insight of influencing factors
- "*Management commitment incl. funding and staffing*" – this factor can be counted to the influencing factor of Leadership & Management
- "*Multiple revenue streams from a common Fixed Asset*" – multiple business models deriving from fixed assets could be part of the influencing factor Strategy
- "*Readiness to think and work in defined processes*" – this additional factor perfectly fits the influencing factor of Generational Workforce as different generations need different processes
- "*Trust of management in capability of BPM and respective staff together with the willingness to abandon some levels of power*" – with this statement two influencing factors can be addressed: Organizational Evolution and Leadership & Management
- "*Accepting the factor that IT is (just) a tool and won´t solve business problems without aligned processes*" – this statement is on the contrary to the influencing factor of Innovation & Digitization
- "*Education of staff*" - this additional factor could be seen as part of Organizational Evolution in combination with Generational Workforce and Leadership &

Management; knowledge improvement and trainings of skilled employees as an asset and influences the implementation and the success of Business Process Management

- "*Measuring outcomes instead of process compliance*" – Business Process Management implicitly measures outcomes and not only process compliance
- "*Omni channel (event of sale, retail, web) sales and distribution*" – this additional factor is part of the influencing factor of Strategy
- "*Real focus on customer requirements*" - this additional factor is part of the influencing factor of Strategy
- "*Self-dependence of staff*" – this statement is a mixture of the influencing factors of Generational Workforce and Leadership & Management
- "*Collaboration through communication and outcome deliveries*" - this factor can be found within the factor Organizational Evolution as well as Generational Workforce with evolving communication needs and Leadership & Management as guidance of collaboration and working processes
- "*Individual sensitivities can be road blocks for successfully running BPM*" – this statement is part of Leadership & Management
- "*Type and number of interfaces*" – there are human as well as IT interfaces, so the author would assign this statement to Leadership & Management as well as Innovation & Digitization
- "*Willingness to share knowledge*" – this additional factor fits to the influencing factor of Leadership & Management

These results provide the important information that information technology, innovation or digitization are less important factors for representatives of the Baby Boomer generation. This influencing factor "Innovation & Digitization" only ranges at a level of 13,6% (see also Figure 64). In comparison to Generation Y, where the influencing factor "Innovation & Digitization" ranges at 23,3% and other provided factors are for example Artificial Intelligence, Internet of Things, Industry 4.0 or automation of Business Process Management tasks.

Hypothesis 3 (H3 = the age provide by the participant is significant for the level of influence of the influential factors on Business Process Management) is verified.

5.4 Other Influential Factors

Based on expert workshops and a deep literature review, six shaping forces that potentially have an influence on future developments of Business Process Management, were offered as given in the online survey for this thesis.

To give room for other opinions and to share world-wide experience of Process Practitioners, the survey respondents were asked to state other influencing factors related to Business Process Management. The complete list of provided influencing factors is provided in ANNEX G – Other Influencing Factor.

When examining these 44 influential topics, as already stated earlier, 14 of these answers are directly related to the six influential factors provided by the author. To give an example, the term “technology” can be related to the factor “Innovation & Digitization”.

One interesting finding can be seen in Figure 79. Putting all given answers into a so-called word cloud, where the more often one term is entered, the bigger the font size of this word, the terms Management and BPM are used several times by the survey participants.

Figure 79 Word cloud of other influential factors, source: www.worditout.com

After in-depth examination, Figure 63 Influencing Factors plus others has to be recalculated by reducing 44 provided responses to 32 new statements. These are not directly related to the six given influential factors. Thus, the percentage rate of the item “other influencing factors” is reduced to 9,5%, from initial 15,1%.

Hypothesis 4 (H4 = the primary influencing factors on Business Process Management are the six provided (strategy, organizational evolution, generational workforce, leadership & management, innovation & digitization and Supply Chain Management & circular economy)) is verified as no other influential factor has a higher level of influence on Business Process Management than the provided influencing factors.

5.5 Results on Factor Analysis

Statistically the factor analysis was executed in chapter 4.4. The prose interpretation on the statistical results allows a deeper insight on the findings in this thesis. The factor analysis

provides findings on six different components. These components were labelled according to the findings in the rotated component matrix and the content of the variables.

The first component “Strategy” combines the following statements with each other:

- Core processes influence strategic goals and vice versa.
- A competitive strategy is the perfect fit of business process activities to succeed on the market.
- Organizations with focus on the value chain and the surrounding system are able to sustain competition.
- Agile in the customer context means adjusting everything in the organization – strategy, principles, values, processes, systems, data structures - to generate continuous new value.
- Processes in circular economies have to be derived from sequential supply chains to be able to understand possible improvements.
- The better all participants within the supply chain know the processes the more successful the supply chain.
- Supply Chain Management is defined by a very structured and detailed business processes framework.

In contrary to these variables, the following statements are negatively related:

- Employees who follow rigid process descriptions become unmotivated and reluctant.
- The generational workforce within an organization has different communication needs on process information.

This negative correlation means that these two variables are seen to be false statements in the context of the component “Strategy”.

Thus, the component “Strategy” comprises interrelations between the influencing factors “Strategy”, “Organizational Evolution”, “Supply Chain & Circular Economy” and “Generational Workforce”.

The second component is called “Agile” which sums up the following statements on agility:

- Managing an agile organization means having an agile mindset and implementing agile methodologies.
- Business processes in agile organizations do exist but are designed differently (eg continuous improvement process).
- Supply chain networks are a sustainable alternative to sequential supply chains.
- Agile in the customer context means adjusting everything in the organization – strategy, principles, values, processes, systems, data structures - to generate continuous new value.
- Processes in circular economies have to be derived from sequential supply chains to be able to understand possible improvements.
- A standardized process model notation is an adequate means of visualization for the younger workforce (Millennials) to communicate processes.

- A perfect mix and match of leadership styles helps managing a diverse workforce.
- Flat organizational structures with adequate leaders are the key for the generation gap.

The component “Agile” consists of elements of the influencing factors “Leadership & Management”, “Supply Chain & Circular Economy” and “Generational Workforce”.

The third component “Innovation” comprises the following statements:

- Process innovations as transformative ideas can be explored in any function of an organization, not only in product development.
- Circular economy has the potential to become the defacto standard for economies.
- The better all participants within the supply chain know the processes the more successful the supply chain.
- The generational workforce within an organization has different communication needs on process information.
- Supply Chain Management is defined by a very structured and detailed business processes framework.
- Innovations due to technology evolution will generate new working opportunities.

Two variables are negatively related:

- A standardized process model notation is an adequate means of visualization for the younger workforce (Millennials) to communicate processes.
- Every employee can become a good leader by obtaining leadership skills.

The component “Innovation” consists of elements from the influencing factors “Innovation & Digitization”, “Supply Chain & Circular Economy”, “Generational Workforce” and “Leadership & Management”.

Component number four was labelled “People” and comprises the following variables:

- Digital natives (Millennials and Generation Z) are forcing the development of technology and digitization within organizations.
- Innovations due to technology evolution will generate new working opportunities.
- A well-defined and communicated strategy as well as skilled, enthusiastic people are not able to compensate unstructured or badly automated business processes.
- Having a digital strategy is essential for staying competitive.
- The provision of appropriate team networking conditions is essential for innovation processes.
- A perfect mix and match of leadership styles helps managing a diverse workforce.

Negatively related within the component “People” is the statement that the generation gap can be closed by the workforce itself. Thus, this component comprises statements of the influencing

factors “Generational Workforce”, “Innovation & Digitization”, “Organizational Evolution”, “Strategy” and “Leadership & Management”.

Component five is labelled “Organizations” and comprises the following positively related variables:

- The provision of appropriate team networking conditions is essential for innovation processes.
- Platform businesses such as Apple´s iPhone and App Store do not optimize business processes but use other metrics to measure success.
- Team-based organizational forms have to reinvent organizational processes, with processes like playbooks with defined start and end but loose activities.
- Dedicated innovation teams should be freed from structured organizational processes.
- Every employee can become a good leader by obtaining leadership skills.
- Innovation networks need process structures to work properly.
- Organizations of the future are built without structural hierarchies and with networks of empowered teams.

This component thus consists of statements related to the influencing factors “Innovation & Digitization”, “Organizational Evolution”, “Strategy” and “Leadership & Management”.

The last component “Structure” comprises the following related variables:

- Supply chain networks are a sustainable alternative to sequential supply chains.
- A well-defined and communicated strategy as well as skilled, enthusiastic people are not able to compensate unstructured or badly automated business processes.
- Platform businesses such as Apple´s iPhone and App Store do not optimize business processes but use other metrics to measure success.
- The digital age influences strategies in many ways (networked customers, data generated in all processes or rapid experimentation in innovation).
- Organizations of the future are built without structural hierarchies and with networks of empowered teams.
- Flat organizational structures with adequate leaders are the key for the generation gap.

Two negatively correlating statement are the ones on the perfect mix and match of leadership styles helping to manage a diverse workforce and on innovation networks that need process structures to work properly.

The sixth component is thus the one combining statements of all six influencing factors that have a potential influence on future developments of Business Process Management.

5.6 Overall Result on Quantitative Research

Figure 80 describes the main output of the quantitative research underlying this thesis. This lollipop graphic represents different findings that are illustrated by bubbles, arrows, and connectors and summarizes also the prose interpretation of the factor analysis.

The first main finding is the size of the circles indicating the level of influence on future developments of Business Process Management. The biggest circle represents the factor "Innovation & Digitization" with an influence level of 25,1%. This level is also represented by the thickness of the connector from BPM to "Innovation & Digitization" and the digits itself. The factor "Supply Chain Management & Circular Economy" has the lowest level of influence with 9,7%.

The second and not fewer interesting findings are the interdependencies between the six shaping forces. As result from the factor analysis, positive and negative correlations among the 30 statements provided in the questionnaire were identified. One controversial statement relating the influencing factor "Strategy" with "Organizational Evolution" was that employees who follow rigid process descriptions become unmotivated and reluctant.

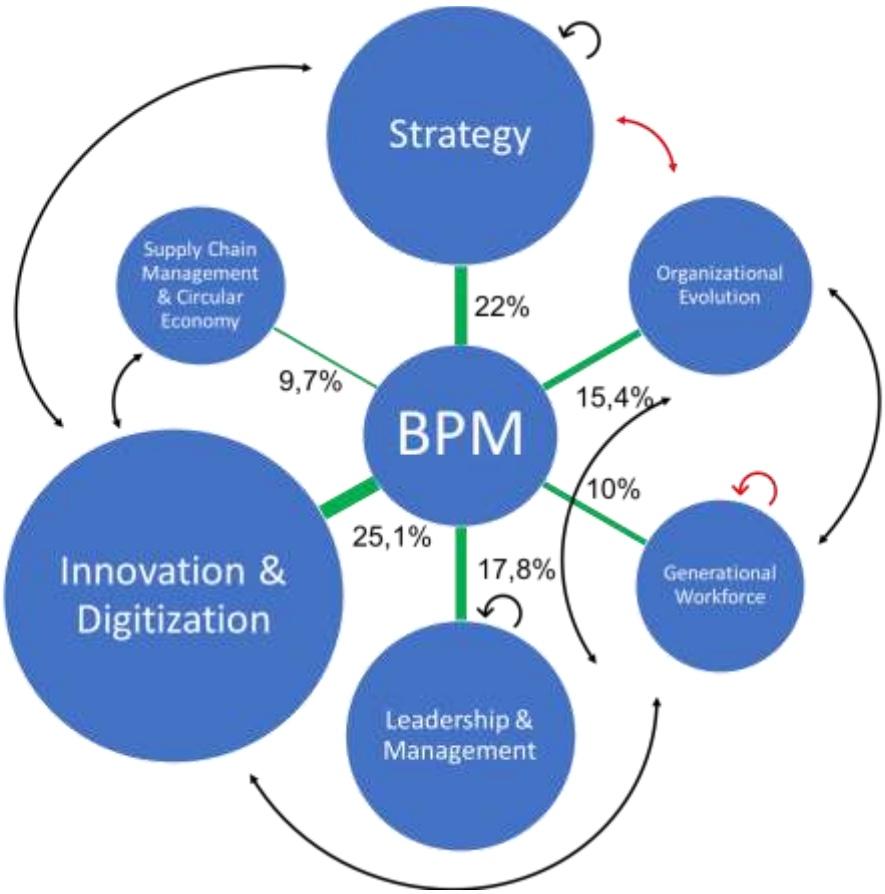

Figure 80 Overall view on influencing factors on BPM

5.7 Summary

The results and outputs described in chapter 5 Empirical Studies refute hypothesis 1 (H1 = the levels of influence on Business Process Management of influential factors are the same across knowledge-intensive business services in Europe), partly verify hypothesis 2 (H2 = the size of the business does not influence the level of influence on Business Process Management of the influential factors) and verify hypothesis 3 (H3 = the generation the participant can be counted to is significant for the level of influence on Business Process Management of the influential

factors) and 4 (H4 = no other influential factor has a higher level of influence on Business Process Management than the given influential factors).

The prose interpretation strongly stresses out that the provided influencing factors are dependent on each other and therefore not only influence future developments of Business Process Management but also each other.

6. NEW SCIENTIFIC STATEMENTS (THESES)

In the beginning of the 20th century, theories of Smith, Ford, Taylor and Fayol formed and revolutionized organizational behaviours in the way how production was structured, and resources were used. Business Process Management evolved out of the 3rd Industrial Revolution where efficiency goals, cost cutting initiatives and process automation through the use of technology changed entrepreneurship.

Benefits of Business Process Management to different stakeholders - such as improved processes with a positive impact on customer satisfaction or a precise definition of the appropriate set of tools for process actors - are made clear to process practitioners and the top management in order to justify investment costs for implementing Business Process Management on an organization-wide level.

A process-centric organization defines its process architecture with three types of processes (management, core and support processes) along their organizational structure, typically hierarchically managed. Top management and staff organizations are responsible for management processes, production or service divisions are managing core processes and departments like Human Resources or Information Technology are responsible for support processes.

The question introduced in the first chapter of this theses on the impact influencing factors do have on processes within organizations and whether management has to rethink process activities due to such influences will be answered in the following paragraphs.

Respondents of the online questionnaire stated that the level of influence of the factor "Strategy" is 22% and thus will have an influence on future developments on Business Process Management, but how will these changes look like? Let us remember the definition of Strategic Management provided by Gluck et al. (1982):

"Strategic Management should refer to some special kind of management process or system, one that links strategic planning and decision making with the day-to-day business of operational management."

This 'management process or system' changes with evolutions within other influencing factors. Platform businesses have different approaches towards gaining competitive advantage than classical pipeline businesses. Agile and network organizations do not separate strategic planning and decision making from day-to-day business. Technology allows customers to become members of the management process or system and thus the decision-making process within organizations. Innovation is most powerful when separated from traditional management processes and day-to-day business of operational management. Strategy cannot be analysed stand-alone. Almost all discussed influencing factors interact with strategy and Strategic Management.

When an organization decides to implement Business Process Management it is not enough to study standard literature on the management approach itself anymore.

The way how business processes are managed with respect to the organizational structure is different. Hierarchical pyramids define their processes along management levels and staff functions like human resources, information technology, purchasing, finance, controlling, marketing and many more. Self-organizing teams in team-based or networking organizations perform most of the functions by the teams themselves. Usually few staff members remain but only have an advisory role. The coordination in such networking organizations is done within the team or in ad-hoc meetings when the need arises. Hierarchical structures coordinate via rigid meeting structures with a knowledge cascade from top management downwards. Even project-oriented organizations have huge amounts of strict processes to conduct day-to-day business via projects. Teams work with organic prioritization and self-staffed projects.

As processes are designed along hierarchical organizational structures, decision making is also usually high up in the pyramid and overrules all inferior hierarchical decisions. These process structures also imply a process-oriented information flow, where information is only extracted where needed in the process. New organizational structures implement the so-called advice process, see chapter 3.3.2 of this thesis, which is fully decentralized. Due to networked structures and usually a vast usage of technology, information is available anywhere at any time to everyone.

With new evolving organizational forms management has to change and become agile. Agile in this context means operating with common mind-sets as a network of high performance teams within the whole organization. This also changes leadership in a way that leaders are not created or inherited, but act as servants to help develop specialized skills of employees.

Innovation & Digitization as most influential factor for future developments with a level of 25,7% is influencing not only Business Process Management but all other influencing factors. The use of technology allows changing business models from pipeline to platform businesses, information flows without barriers within supply chain networks, shared business processes with the help of cloud computing, permanent connectivity of employees and customers and gaining competitive advantage through the use of Artificial Intelligence or Robotic Process Automation.

Figure 19 in chapter 3.2 depicts the three levels of the Business process pyramid representing the corporate level with strategic decisions such as vision, goals, the overall process architecture or the performance measurement techniques, the business level with the definition of how Business Process Management is implemented and the functional level with the representation of the organizational structure and the available resources for the execution of the processes.

Decisions on new organizational forms, the use of information technology, the knowledge about generational workforce and changes in leadership and management are changing this business process pyramid as depicted in Figure 81. There are no level separations as there is no defined overall strategy and no rigid process architecture defined over organizational structures. The processes themselves are existing but are more fluid and agile and even scalable according to the current situation the organization is facing.

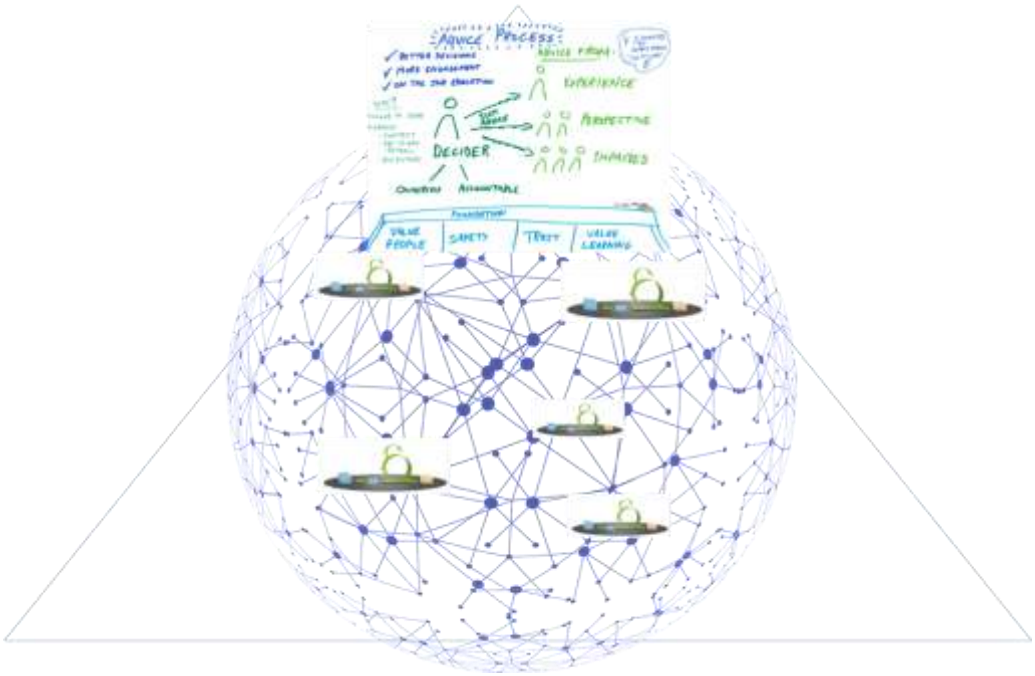

Figure 81 New Business Process Pyramid, own illustration

The following paragraphs provide a structured guideline according to the main findings of this thesis. The implementation strategy of Business Process Management including the definition of goals is dependent on six influencing factors: Strategy, Organizational Evolution, Generational Workforce, Leadership & Management, Innovation & Digitization and Supply Chain Management & Circular Economy.

6.1 Decisions on Implementation of Business Process Management

As already stated, a lot of factors are changing organizational environments and organizations themselves. Many reasons are provided why a company should focus on its processes. Only an organization that knows how to manage its processes will remain in the market.

The first decision an organization will have to make is on how Business Process Management is implemented. The goals of this initiative are helping to decide which focus is the most appropriate one, see Figure 82.

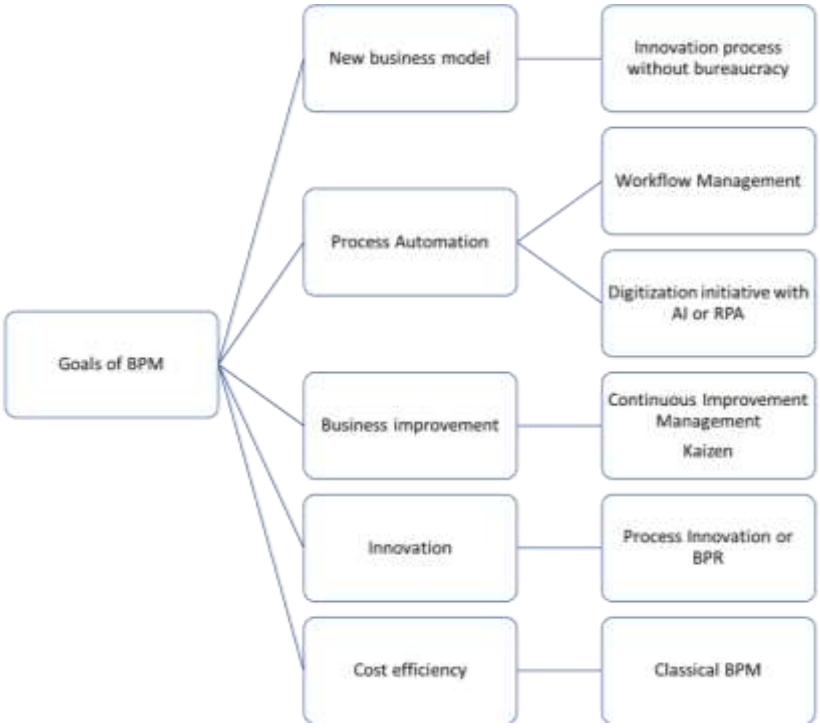

Figure 82 Decision on Goals of Business Process Management, own illustration

According to Armistead (1996) Business Process Management should focus on people, processes and systems. This forms the basis and the foundation of the structure of the proposed Business Process Management approach of this thesis, graphically depicted in Figure 83.

One of the three interconnected pillars is the used technology for Business Process Management. The more advanced an organization is in technology use, the more advanced its BPM efforts will be. Simple process automation is no longer applicable as Artificial Intelligence, Robotic Process Automation, cloud-based Business Processes as a Service (BPaaS) or machine learning algorithms can boost one`s business.

The conduits of communication are important in respect to how business processes are communicated to which audience. Not only generational differences are important, but also the degree of information, the level of detail, the kind of resources involved in the process and the technology how the information is submitted have to be determined.

Agility and scalability refer to the degree of process definition and the level of detail. Not every business process is worth documenting and defining as it is rapidly changing or not value adding. It is recommended to design business processes in iterations with the help of sprints to dynamically evolve usable output.

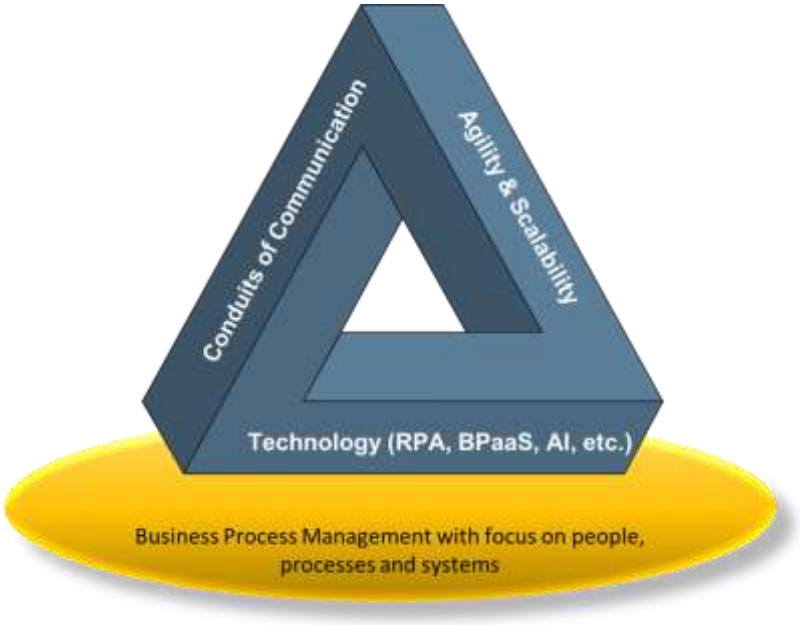

Figure 83 Pillars of Business Process Management, own illustration

The main outcome of this thesis is that the six shaping forces introduced to the respondents of the survey are the ones with the highest impact on future developments of Business Process Management. Based on this result organizations have to focus on these six concepts in combination with Business Process Management and follow the structured guideline, provided in Table 20.

Table 20 Structured Guideline for six shaping forces, own illustration

Strategy	Question	YES/NO	Answer
	Are my strategic goals still valid?	YES	Align processes to these strategic goals.
		NO	Take existing process metrics as input for new goals.
	Did I consider all necessary strategies for my organization?	YES	Align all strategies (digital, marketing, financial, etc.).
		NO	Start to work on necessary strategies.
	Are my processes fitting to strategic goals?	YES	Competitive advantage is given.
		NO	Reconsider both, strategy and processes.
	Is my strategy customer-centric?	YES	Align processes to optimally satisfy customers.
		NO	Examine customers, create customer journey and align strategy.
	Will my strategy hold against disruptive forces?	YES	Be aware of disruption anyway!
		NO	Examine possible disruptors and align strategy.
Organizational Form	**Question**	**YES/NO**	**Answer**
	Are my processes aligned with the organizational structure?	YES	Measure process efficiency with KPIs.
		NO	Rethink and redesign processes and structure.
	Is my organizational structure most suitable for my business?	YES	Optimize for further advantage.
		NO	Change organizational structure in an orderly manner.
	Should dedicated teams be employed?	YES	Free them from bureaucracy.
		NO	Integrate teams into organizational structure.
	Is my organization a learning organization?	YES	Optimize knowledge sharing.
		NO	Emphasize on changes to ensure learning organization.
	Do my processes bridge interfaces between teams?	YES	Optimize for avoiding any gaps.
		NO	Redesign processes and structure, think of technology.
Generational Workforce	**Question**	**YES/NO**	**Answer**
	Does my organization employ different age groups?	YES	Know your generational workforce.
		NO	Think of appropriate conduits of communication.
	Is process information communication adjusted?	YES	Handle all conduits in the same way.
		NO	Rethink communication methods and adjust.
	Are generational differences known?	YES	Take care of these differences and close the gap.
		NO	Ask employees and find out.
	Is the management flexible to handle generational gap?	YES	Make them leaders.
		NO	Employ leaders instead of managers.
	Is a mentoring system employed?	YES	Share knowledge about the results.
		NO	Develop bidirectional mentoring system.
Leadership / Management	**Question**	**YES/NO**	**Answer**
	Is my management thinking agile?	YES	Align processes and make them nimble.
		NO	Align processes to organiztion to avoid gaps.
	Do I employ leaders?	YES	Explore and profit from their skils.
		NO	Employ leaders, get rid of managers.
	Do leaders encourage innovation?	YES	Free them from rigid processes.
		NO	Employ dedicated teams who manage themselves.
	Is only top management making decisions?	YES	Change decision-making process.
		NO	Communicate decision-making process.
	Are my processes aligned with my leaders´mindset?	YES	Communicate these processes.
		NO	Align processes to leaders´mindest.
Innovation / Digitization	**Question**	**YES/NO**	**Answer**
	Does my organization practice innovation?	YES	Free the teams from structured organizational processes.
		NO	Encourage employees to innovate.
	Is the right technology employed for innovation?	YES	Use available technology.
		NO	Make right decisions on technology.
	Is my organizational structure allowing innovation?	YES	Free the teams from structured organizational processes.
		NO	Rethink organizational structure.
	Do I take advantage of collected data?	YES	Use data for predictions.
		NO	Learn how to take advantage of collected data.
	Do I concider new business models due to innovations?	YES	Develop new business models and employ them.
		NO	Learn how to develop new business models.
SCM / Circular Economy	**Question**	**YES/NO**	**Answer**
	Do I manage the supply chain with technology?	YES	Know your partners within the supply chain.
		NO	Take advantage of integrated processes and systems.
	Is my supply chain a network?	YES	Interact with this network.
		NO	Learn how to move to a networked supply chain.
	Do I concider new processes out of the existing supply chain?	YES	Develop closed loops.
		NO	Learn how circular economy works.
	Is sustainability important to me?	YES	Redesign your processes within the supply chain.
		NO	Start to think sustainable.
	Are my supply chain processes agile?	YES	Share knowledge within supply chain partners.
		NO	Employ lean practices and become agile.

By understanding and answering the questions provided in Table 20, organizations will be able to choose a best fit of the six shaping forces and bring their Business Process Management initiative to success. A graphical representation of the holistic approach is depicted in Figure 84.

Figure 84 Organizational Decisions based on Business Process Management, own illustration

6.2 Process Framework Template

In accordance with the output of this thesis the author proposes a generic process framework for organizations. This framework is developed with the following assumptions:

- The organizational form of the company is fluid and is described with a mix of top management and team levels.
- The interface between management and team processes is agile and scalable in terms of defined processes, for example decision making process or problem resolution process.
- Management processes are to some extent only advisory processes and final decisions on process design are made in circle meetings.

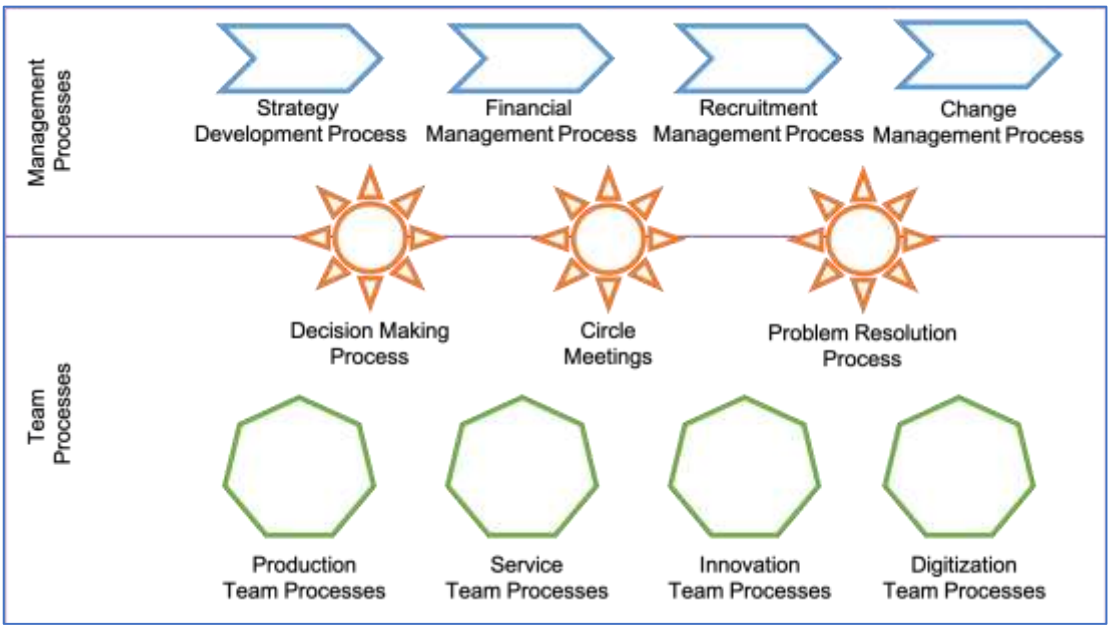

Figure 85 Process framework template, own illustration

Figure 85 illustrates the proposed process framework template. This framework breaks with the threefold approach proposed by Hammer, Davenport or Porter. Processes on the management layer are designed by managers with staff functions. These processes are developed in an agile manner realised in sprints. Sprint development helps to design processes in iterations while enriching the processes with new or changing information on a step by step basis. Core elements of the processes are set as given, activities, tasks and roles are more fluid. Key performance indicators are defined in accordance with implemented technology and datafication incentives as data should be collected where data incurs to allow prediction and an appropriate redesign of processes in time.

The decision-making process and the problem resolution process are well defined and structured. These processes are communicated to all employees via defined conduits of communication according to the generational workforce structure. In case these processes are needed, decisions or defined escalations are made in a timely manner.

Circle meetings are conducted on a regular basis to discuss team and management processes and to keep all involved parties informed on decisions, changes or business successes. In such circle meetings decisions on innovation investments and strategic alignments are also discussed.

Team processes are designed within the team and according to the assignment of the team. The innovation team processes are freed from other organizational processes, while service team processes are closely aligned with management processes and other team processes. Digitization team processes support other team processes in terms of recommendations on digital implementations or usages.

This proposed process framework template allows an implementation of Business Process Management for all industry sizes and branches. The organization has to answer the questions in the previous chapter and then start to integrate the proposed process framework into its organizational structures. This procedure implies strong leaders with agile personalities to guide their employees through these organizational challenges.

7. CONCLUSIONS

A 360-degree view, starting with the early years of the 20th century to date highlighted different aspects of concepts such as Business Process Management, strategy, organizational forms, generational workforce, leadership and management and Supply Chain Management. This research surfaced strong interdependencies between these approaches and raised additional interconnected aspects.

The current research gap on the extent to which these concepts influence the way how business processes will be managed in the future was central for this thesis. As one main result, six shaping forces were researched and defined: Strategy, Organizational Evolution, Generational Workforce, Leadership & Management, Innovation & Digitization and Supply Chain Management & Circular Economy. Innovation & Digitization emerged as influencing factor with the highest influential level closely followed by the factors Strategy and Leadership & Management.

Organizations that do not sufficiently manage their business processes, their customers and other stakeholders as well as their environmental developments will not be able to sustain in the market as other companies will overtake their position by just performing better.

The results of the online questionnaire responses provided by Business Process Professionals underscore the importance of combining concepts such as digitization with strategic management, generational workforce structure with communication of process information, agile management concepts with diverse process definitions or innovation processes with less hierarchical organization forms (Palkovits-Rauter, 2018).

Chapter 6 of this thesis provides a systematic guideline for organizations how to position themselves in order to successfully start a Business Process Management initiative that is holistic and persistent. Business Process Management has to be defined in the context of the organizational setting first, and other determining factors are analysed in a second step. Connecting the shaping forces with each other as depicted in chapter 5 and focussing on Business Process Management will indeed change the way how business processes are managed. The four-step approach starting with the decision on the goals of Business Process Management, the definition of the main pillars of BPM to the questionnaire related to the six shaping forces and ending up with the process framework template provided and explained by the author of this thesis a managerial approach is described. This approach shall be tested with a Proof of Concept in the field and adjusted by the feedback and result.

Research beyond this thesis should be conducted towards conduits of communication of process information as literature, academics and professionals are very vague in this aspect. Another interesting research field could lead towards scalable Business Process Management approaches, enhancing the ones already in place. Small and medium sized organizations usually do not manage their processes in a structured manner as the available frameworks bear too much effort as resources are usually not available for implementation projects.

Business Process Management is about 40 years old and still very stable compared to other management approaches that were hyped and then sunk into oblivion. It is a vehicle to support organizational decisions and a possibility to effectively and efficiently manage the business. Business Process Management should partly reinvent itself in alliance with the six shaping forces in order to catch up with the agile and scalable approaches and ways of thinking of today´s macroeconomics.

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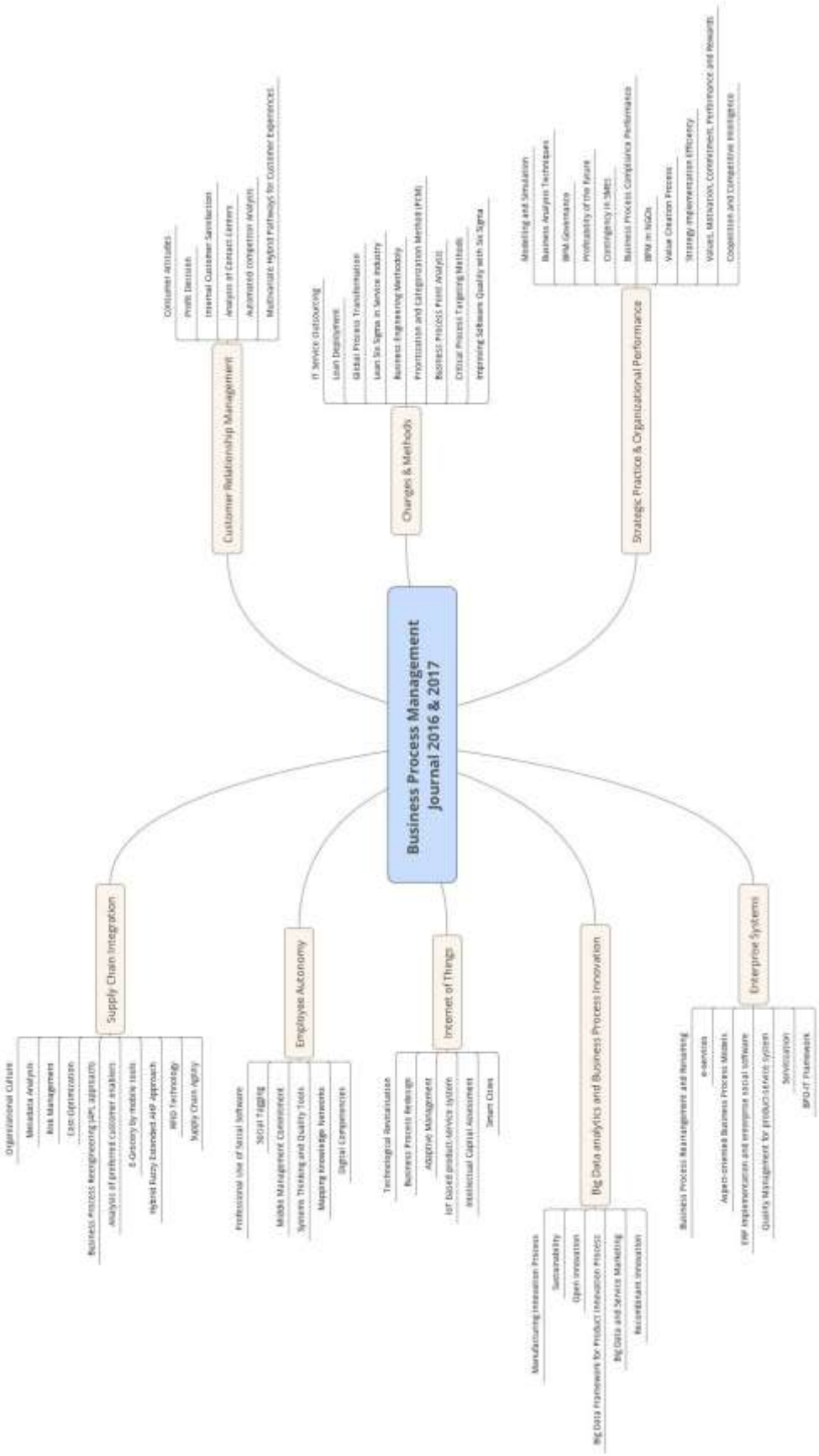
9. ANNEX A – ENTERPRISE PROCESSES

Enterprise Processes – A Subset	
Account Management	Organizational Learning
Advance Planning & Scheduling	Payroll Processing
Advertising	Performance Management
Assembly	Performance Monitoring
Asset Management	Performance Review
Benefits Administration	Physical Inventory
Branch Operations	Planning and Resource Allocation
Budget Control	Post-Sales Service
Build to Order	Problem / Resolution Management
Call Centre Service	Process Design
Capacity Reservation	Procurement
Capital Expenditures	Product Data Management
Check Request Processing	Product Design, Development
Collateral Fulfilment	Product / Brand Marketing
Collections	Production Scheduling
Commissions Processing	Program Management
Compensation	Promotions
Component Fabrication	Property Tracking / Accounting
Corporate Communications	Proposal Preparation
Credit Request / Authorization	Publicity Management
Customer Acquisition	Real Estate Management
Customer Inquiry	Recruitment
Customer Requirements Identification	Returns & Depot Repairs
Customer Self Service	Returns Management
Customer / Product Profitability	Sales Channel Management
Demand Planning	Sales Commission Planning
Distribution / VAR Management	Sales Cycle Management
Financial Planning	Sales Planning
Financial Close / Consolidation	Service Agreement Management
Hiring / Orientation	Service Fulfilment
Installation Management	Service Provisioning
Integrated Logistics	Shipping
Internal Audit	Site Survey & Solution Design
Inventory Management	Six Sigma
Investor Relations	Sourcing
Invoicing	Strategy Development
IT Service Management	Succession Planning
Knowledge Management	Supply Chain Planning
Manufacturing	Supply Planning
Manufacturing Capability Development	Test
Market Research & Analysis	Time & Expense Processing
Market Test	Timekeeping / Reporting
Materials Procurement	Training
Materials Storage	Treasury / Cash Management
Order Dispatch & Fulfilment	Warehousing
Order Fulfilment	Warranty Management
Order Management	Zero-Based Budgeting

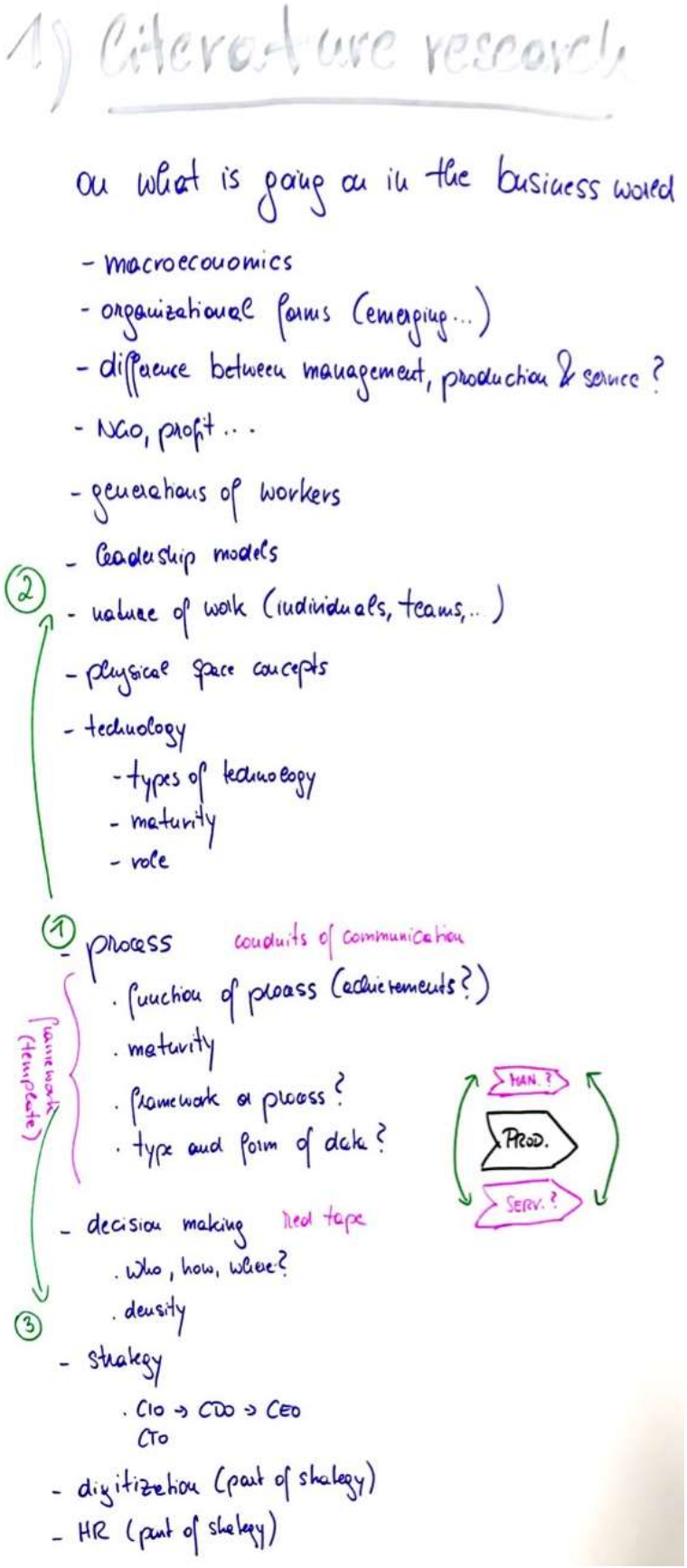
10. ANNEX B - LITERATURE REVIEW ON BPM JOURNAL 2016 & 2017

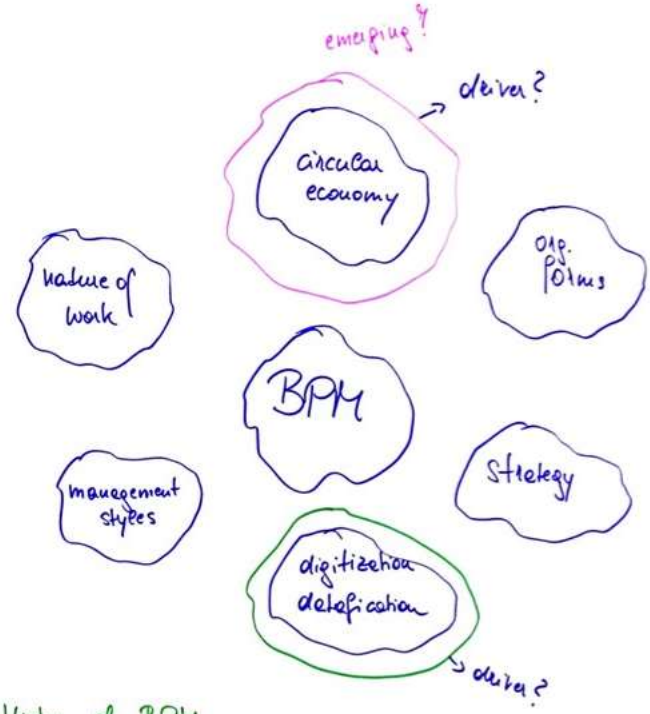


11. ANNEX B – INFOGRAPHIC ON GEN Z AND GEN ALPHA

Source: http://generationz.com.au

12. ANNEX C – FLIPCHART TRANSCRIPT





History of BPM

Increasing Role of BPM

-> process information
-> control - efficiency - BPO
-> historical - time issues
-> digitization + record + others
anytime, anywhere
-> datafication

13. ANNEX D – QUESTIONNAIRE

Thank you for being interested in my research topic.

Business Process Management as supportive management approach is influenced by many different factors. The aim of this questionnaire is to identify the level of influence for six selected factors on Business Process Management as well as to which extend they influence each other.

My research will identify

who the influencers of Business Process Management are
the effect and impact of these influencers on the definition of processes within organizations
and the extent to which their influences will require businesses to rethink their Business Process Management activities.

Please be part of a global survey on the identification of the future development of Business Process Management!

Are you working in a knowledge-intensive service (KIS) or knowledge-intensive business service (KIBS) industry according to NACE (Nomenclature statistique des activités économiques dans la Communauté européenne)?

- ○ Knowledge-intensive services (post and telecommunications, computer and related activities, research and development)
- ○ Knowledge-intensive market services (water/air transport, real estate activities, renting of machinery and equipment without operator, and of personal and household goods, other business activities)
- ○ Knowledge-intensive financial services (financial intermediation, except insurance and pension funding, insurance and pension funding, except compulsory social security, activities auxiliary to financial intermediation)
- ○ Knowledge-intensive business services (computer and related activities, research and development, legal, technical and advertising)
- ○ Other knowledge-intensive services (education, health and social work, recreational, cultural and sporting activities)
- ○ none of the above

Please indicate the size of your company.

- ○ Large (2000 or more employees)
- ○ Medium (500 to 1999 employees)
- ○ Small (under 500 employees)

In which region are you mainly operating your business?

- ○ Europe
- ○ North America
- ○ Central & South America
- ○ India and South East Asia
- ○ North East Asia (China, Japan, Korea)
- ○ Australia / New Zealand
- ○ Africa / Middle East

Which role(s) do you have within your business?

- ☐ Executive (CEO, COO, CFO, CTO, etc.)
- ☐ Business or Line of Business Manager
- ☐ Vendor Representative
- ☐ Process Practitioner
- ☐ Lean / Six Sigma Practitioner
- ☐ Business Analyst
- ☐ Business / Process Architect
- ☐ IT Manager
- ☐ IT Developer
- ☐ HR Manager
- ☐ HR Human Performance Practitioner
- ☐ BPM Instructor
- ☐ BPM Consultant
- ☐ Other

Please select your range of age.

- ○ Age 73 and up (Traditionalist)
- ○ Age 54 - 72 (Baby Boomer)
- ○ Age 39 - 53 (Generation X)
- ○ Age 23 - 38 (Generation Y)
- ○ Age 9 - 22 (Generation Z)
- ○ No answer

The following six shaping forces have been identified:

Strategy
An organization's strategy is directly linked to Business Process Management as processes should meet strategic goals in an operative manner.

Organizational Forms
The defined organizational structure determines the implementation of Business Process Management, the less hierarchy, the less processes.

Workforce (generational perspective)
Different generations in the workplace need aligned conduits of communication related to process information.

Leadership & Management
Agility in both leadership styles and management determines the structure of Business Process Management within an organization.

Innovation & Digitization
Information technology and innovation are both boosting organizations, but still processes have to be defined to sustain in the market.

Supply Chain Management & Circular Economy
Both are very process-oriented as new opportunities and sustainability can be derived from processes.

Please select the influencing factors you agree on shaping the future of Business Process Management.

- ☐ Strategy
- ☐ Organizational Evolution
- ☐ Generational Workforce
- ☐ Leadership & Management
- ☐ Innovation & Digitization
- ☐ Supply Chain Management & Circular Economy

Please indiciate your agreement or disagreement on the following statements on strategy and BPM.

	Disagree strongly	Disagree	Neither agree nor disagree	Agree	Agree strongly
A competitive strategy is the perfect fit of business process activities to succeed on the market.	○	○	○	○	○
Core processes influence strategic goals and vice versa.	○	○	○	○	○
The digital age influences strategies in many ways (networked customers, data generated in all processes or rapid experimentation in innovation).	○	○	○	○	○
Platform businesses such as Apple´s iPhone and App Store do not optimize business processes but use other metrics to measure success.	○	○	○	○	○
Having a digital strategy is essential for staying competitive.	○	○	○	○	○

Please indiciate your agreement or disagreement on the following statements on organizational forms and BPM.

	Disagree strongly	Disagree	Neither agree nor disagree	Agree	Agree strongly
Team-based organizational forms have to reinvent organizational processes, with processes like playbooks with defined start and end but loose activities.	○	○	○	○	○
Organizations with focus on the value chain and the surrounding system are able to sustain competition.	○	○	○	○	○
Organizations of the future are built without structural hierarchies and with networks of empowered teams.	○	○	○	○	○
Employees who follow rigid process descriptions become unmotivated and reluctant.	○	○	○	○	○
A well-defined and communicated strategy as well as skilled, enthusiastic people are not able to compensate unstructured or badly automated business processes.	○	○	○	○	○

Please indiciate your agreement or disagreement on the following statements on generational workforce and BPM.

	Disagree strongly	Disagree	Neither agree nor disagree	Agree	Agree strongly
The generational workforce within an organization has different communication needs on process information.	○	○	○	○	○
A standardized process model notation is an adequate means of visualization for the younger workforce (Millennials) to communicate processes.	○	○	○	○	○
Flat organizational structures with adequate leaders are the key for the generation gap.	○	○	○	○	○
Digital natives (Millennials and Generation Z) are forcing the development of technology and digitization within organizations.	○	○	○	○	○
The generation gap can be closed by the workforce itself.	○	○	○	○	○

Please indiciate your agreement or disagreement on the following statements on leadership & management and BPM.

	Disagree strongly	Disagree	Neither agree nor disagree	Agree	Agree strongly
Every employee can become a good leader by obtaining leadership skills.	○	○	○	○	○
A perfect mix and match of leadership styles helps managing a diverse workforce.	○	○	○	○	○
Agile in the customer context means adjusting everything in the organization — strategy, principles, values, processes, systems, data structures - to generate continuous new value.	○	○	○	○	○
Business processes in agile organizations do exist but are designed differently (eg continuous improvement process).	○	○	○	○	○
Managing an agile organization means having an agile mindset and implementing agile methodologies.	○	○	○	○	○

Please indiciate your agreement or disagreement on the following statements on innovation & digitization and BPM.

	Disagree strongly	Disagree	Neither agree nor disagree	Agree	Agree strongly
The provision of appropriate team networking conditions is essential for innovation processes.	○	○	○	○	○
Process innovations as transformative ideas can be explored in any function of an organization, not only in product development.	○	○	○	○	○
Dedicated innovation teams should be freed from structured organizational processes.	○	○	○	○	○
Innovation networks need process structures to work properly.	○	○	○	○	○
Innovations due to technology evolution will generate new working opportunities.	○	○	○	○	○

Please indiciate your agreement or disagreement on the following statements on Supply Chain Management & circular economy and BPM.

	Disagree strongly	Disagree	Neither agree nor disagree	Agree	Agree strongly
Supply Chain Management is defined by a very structured and detailed business processes framework.	○	○	○	○	○
The better all participants within the supply chain know the processes the more successful the supply chain.	○	○	○	○	○
Supply chain networks are a sustainable alternative to sequential supply chains.	○	○	○	○	○
Circular economy has the potential to become the defacto standard for economies.	○	○	○	○	○
Processes in circular economies have to be derived from sequential supply chains to be able to understand possible improvements.	○	○	○	○	○

Thank you for your interest.

If you would like to get a copy of my PhD-Thesis, please send message to:

www.linkedin.com/in/silke-palkovits-rauter-12844913

14. ANNEX E – CODEBOOK

v_1			
	Wert	Anzahl	Prozent
Standardattribute Label	Are you working in a knowledge-intensive service industry according to NACE?		
Gültige Werte 1	Knowledge-intensive services (post and telecommunications, computer and related activities, research and development)	22	19,8%
2	Knowledge-intensive market services (water/air transport, real estate activities, renting of machinery and equipment without operator, and of personal and household goods, other business activities)	11	9,9%
3	Knowledge-intensive financial services (financial intermediation, except insurance and pension funding, insurance and pension funding, except compulsory social security, activities auxiliary to financial intermediation)	10	9,0%
4	Knowledge-intensive business services (computer and related activities, research and development, legal, technical and advertising)	17	15,3%
5	Other knowledge-intensive services (education, health and social work, recreational, cultural and sporting activities)	19	17,1%
6	none of the above	32	28,8%

v_5				
		Wert	Anzahl	Prozent
Standardattribute	Label	Size of Industry		
Gültige Werte	1	Large (2000 or more employees)	25	22,5%
	2	Medium (500 to 1999 employees)	16	14,4%
	3	Small (under 500 employees)	38	34,2%
Fehlende Werte	-77		32	28,8%

v_71				
		Wert	Anzahl	Prozent
Standardattribute	Label	Region of Industry		
Gültige Werte	1	Europe	68	61,3%
	2	North America	7	6,3%
	3	Central & South America	3	2,7%
	4	India and South East Asia	0	0,0%
	5	North East Asia (China, Japan, Korea)	1	0,9%
	6	Australia / New Zealand	0	0,0%
	7	Africa / Middle East	0	0,0%
Fehlende Werte	-77		32	28,8%

v_23				
		Wert	Anzahl	Prozent
Standardattribute	Label	Range of Age		
Gültige Werte	1	Age 73 and up (Traditionalist)	0	0,0%
	2	Age 54 - 72 (Baby Boomer)	12	10,8%
	3	Age 39 - 53 (Generation X)	36	32,4%
	4	Age 23 - 38 (Generation Y)	31	27,9%
	5	Age 9 - 22 (Generation Z)	0	0,0%
	6	No answer	0	0,0%
Fehlende Werte	-77		32	28,8%

v_59				
		Wert	Anzahl	Prozent
Standardattribute	Label	Strategy		
Gültige Werte	0	not quoted	22	19,8%
	1	quoted	57	51,4%
Fehlende Werte	-77		32	28,8%

v_60				
		Wert	Anzahl	Prozent
Standardattribute	Label	Organizational Evolution		
Gültige Werte	0	not quoted	39	35,1%
	1	quoted	40	36,0%
Fehlende Werte	-77		32	28,8%

v_61				
		Wert	Anzahl	Prozent
Standardattribute	Label	Generational Workforce		
Gültige Werte	0	not quoted	53	47,7%
	1	quoted	26	23,4%
Fehlende Werte	-77		32	28,8%

v_62				
		Wert	Anzahl	Prozent
Standardattribute	Label	Leadership & Management		
Gültige Werte	0	not quoted	33	29,7%
	1	quoted	46	41,4%
Fehlende Werte	-77		32	28,8%

v_64				
		Wert	Anzahl	Prozent
Standardattribute	Label	Supply Chain Management & Circular Economy		
Gültige Werte	0	not quoted	54	48,6%
	1	quoted	25	22,5%
Fehlende Werte	-77		32	28,8%

v_85				
		Wert	Anzahl	Prozent
Standardattribute	Label	influencing factor		
Gültige Werte	0	not quoted	51	45,9%
	1	quoted	28	25,2%
Fehlende Werte	-77		32	28,8%

v_87				
		Wert	Anzahl	Prozent
Standardattribute	Label	influencing factor		
Gültige Werte	0	not quoted	67	60,4%
	1	quoted	12	10,8%
Fehlende Werte	-77		32	28,8%

v_86				
		Wert	Anzahl	Prozent
Standardattribute	Label	influencing factor		
Gültige Werte	-66		32	28,8%
	-99		51	45,9%
	automization of BPM-tasks		1	0,9%
	Awareness of potential of BPM skill set.		1	0,9%
	Common ideas, common understanding		1	0,9%
	complexity of business		1	0,9%
	Cooperation		1	0,9%
	cost reduction		1	0,9%
	devolving decision-making authority		1	0,9%
	discipline in daily operations		1	0,9%
	External organizations which influence customer expectations		1	0,9%
	Gender and Diversity		1	0,9%
	HR		1	0,9%
	Industry 4.0		1	0,9%
	Infrastructure of company		1	0,9%
	Knowledge of the workforce		1	0,9%
	Laws		1	0,9%
	management committment incl. funding and staffing		1	0,9%
	Mitarbeiter		1	0,9%
	Multiple revenue streams from a common Fixed Asset		1	0,9%
	Organizational maturity		1	0,9%
	Politics		1	0,9%
	readyness to think and work in defined processes		1	0,9%
	Regulatory compliance e.g. MiFid II, SOX, PSD2		1	0,9%
	requirement of customers		1	0,9%
	Ressource		1	0,9%
	service and quality orientation resp. customer orientstion		1	0,9%
	Technology		1	0,9%
	The middle Management		1	0,9%
	trust of management in capability of BPM and respective staff together with the willingness to abondon some levels of power		1	0,9%

15. ANNEX F – STATISTICAL VARIABLES AND TABLES

A competitive strategy is the perfect fit of business process activities to succeed on the market.

		Häufigkeit	Prozent	Gültige Prozent	umulierte Prozente
Gültig	Disagree	1	0,9	1,3	1,3
	Neither agree n	15	13,5	19,0	20,3
	Agree	40	36,0	50,6	70,9
	Agree strongly	23	20,7	29,1	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Core processes influence strategic goals and vice versa.

		Häufigkeit	Prozent	Gültige Prozent	umulierte Prozente
Gültig	Disagree strong	1	0,9	1,3	1,3
	Disagree	8	7,2	10,1	11,4
	Neither agree n	9	8,1	11,4	22,8
	Agree	31	27,9	39,2	62,0
	Agree strongly	30	27,0	38,0	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

The digital age influences strategies in many ways (networked customers, data generated in all processes or rapid experimentation in innovation).

		Häufigkeit	Prozent	Gültige Prozent	umulierte Prozente
Gültig	Disagree strong	2	1,8	2,5	2,5
	Neither agree n	2	1,8	2,5	5,1
	Agree	31	27,9	39,2	44,3
	Agree strongly	44	39,6	55,7	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Platform businesses such as Apple´s iPhone and App Store do not optimize business processes but use other metrics to measure success.

		Häufigkeit	Prozent	Gültige Prozent	umulierte Prozente
Gültig	Disagree strong	4	3,6	5,1	5,1
	Disagree	16	14,4	20,3	25,3
	Neither agree n	34	30,6	43,0	68,4
	Agree	17	15,3	21,5	89,9
	Agree strongly	8	7,2	10,1	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Having a digital strategy is essential for staying competitive.

		Häufigkeit	Prozent	Gültige Prozent	umulierte Prozente
Gültig	Disagree	1	0,9	1,3	1,3
	Neither agree n	3	2,7	3,8	5,1
	Agree	35	31,5	44,3	49,4
	Agree strongly	40	36,0	50,6	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Team-based organizational forms have to reinvent organizational processes, with processes like playbooks with defined start and end but

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree	9	8,1	11,4	11,4
	Neither agree nor disagree	25	22,5	31,6	43,0
	Agree	35	31,5	44,3	87,3
	Agree strongly	10	9,0	12,7	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Organizations with focus on the value chain and the surrounding

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	1	0,9	1,3	1,3
	Disagree	5	4,5	6,3	7,6
	Neither agree nor disagree	11	9,9	13,9	21,5
	Agree	43	38,7	54,4	75,9
	Agree strongly	19	17,1	24,1	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Organizations of the future are built without structural hierarchies and

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	5	4,5	6,3	6,3
	Disagree	20	18,0	25,3	31,6
	Neither agree nor disagree	20	18,0	25,3	57,0
	Agree	21	18,9	26,6	83,5
	Agree strongly	13	11,7	16,5	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Employees who follow rigid process descriptions become unmotivated

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	3	2,7	3,8	3,8
	Disagree	17	15,3	21,5	25,3
	Neither agree nor disagree	17	15,3	21,5	46,8
	Agree	25	22,5	31,6	78,5
	Agree strongly	17	15,3	21,5	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

A well-defined and communicated strategy as well as skilled,

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	4	3,6	5,1	5,1
	Disagree	11	9,9	13,9	19,0
	Neither agree nor disagree	15	13,5	19,0	38,0
	Agree	28	25,2	35,4	73,4
	Agree strongly	21	18,9	26,6	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

The generational workforce within an organization has different communication needs on process information.

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	1	0,9	1,3	1,3
	Disagree	5	4,5	6,3	7,6
	Neither agree nor disagree	14	12,6	17,7	25,3
	Agree	32	28,8	40,5	65,8
	Agree strongly	27	24,3	34,2	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

A standardized process model notation is an adequate means of

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	9	8,1	11,4	11,4
	Disagree	14	12,6	17,7	29,1
	Neither agree nor disagree	14	12,6	17,7	46,8
	Agree	35	31,5	44,3	91,1
	Agree strongly	7	6,3	8,9	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Flat organizational structures with adequate leaders are the key for the

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	2	1,8	2,5	2,5
	Disagree	13	11,7	16,5	19,0
	Neither agree nor disagree	31	27,9	39,2	58,2
	Agree	27	24,3	34,2	92,4
	Agree strongly	6	5,4	7,6	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Digital natives (Millennials and Generation Z) are forcing the

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	1	0,9	1,3	1,3
	Disagree	7	6,3	8,9	10,1
	Neither agree nor disagree	14	12,6	17,7	27,8
	Agree	38	34,2	48,1	75,9
	Agree strongly	19	17,1	24,1	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

The generation gap can be closed by the workforce itself.

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	4	3,6	5,1	5,1
	Disagree	14	12,6	17,7	22,8
	Neither agree nor disagree	32	28,8	40,5	63,3
	Agree	26	23,4	32,9	96,2
	Agree strongly	3	2,7	3,8	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Every employee can become a good leader by obtaining leadership skills.

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	18	16,2	22,8	22,8
	Disagree	42	37,8	53,2	75,9
	Neither agree nor disagree	7	6,3	8,9	84,8
	Agree	7	6,3	8,9	93,7
	Agree strongly	5	4,5	6,3	100,0
	Gesamt	79	71,2	100,0	
Fehlend	-77	32	28,8		
Gesamt		111	100,0		

A perfect mix and match of leadership styles helps managing a diverse

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	2	1,8	2,5	2,5
	Disagree	2	1,8	2,5	5,1
	Neither agree nor disagree	7	6,3	8,9	13,9
	Agree	54	48,6	68,4	82,3
	Agree strongly	14	12,6	17,7	100,0
	Gesamt	79	71,2	100,0	
Fehlend	-77	32	28,8		
Gesamt		111	100,0		

Agile in the customer context means adjusting everything in the

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	4	3,6	5,1	5,1
	Disagree	18	16,2	22,8	27,8
	Neither agree nor disagree	19	17,1	24,1	51,9
	Agree	25	22,5	31,6	83,5
	Agree strongly	13	11,7	16,5	100,0
	Gesamt	79	71,2	100,0	
Fehlend	-77	32	28,8		
Gesamt		111	100,0		

Business processes in agile organizations do exist but are designed

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	1	0,9	1,3	1,3
	Disagree	4	3,6	5,1	6,3
	Neither agree nor disagree	19	17,1	24,1	30,4
	Agree	43	38,7	54,4	84,8
	Agree strongly	12	10,8	15,2	100,0
	Gesamt	79	71,2	100,0	
Fehlend	-77	32	28,8		
Gesamt		111	100,0		

Managing an agile organization means having an agile mindset and

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree	5	4,5	6,3	6,3
	Neither agree nor disagree	14	12,6	17,7	24,1
	Agree	42	37,8	53,2	77,2
	Agree strongly	18	16,2	22,8	100,0
	Gesamt	79	71,2	100,0	
Fehlend	-77	32	28,8		
Gesamt		111	100,0		

The provision of appropriate team networking conditions is essential for innovation processes.

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree	2	1,8	2,5	2,5
	Neither agree nor disagree	7	6,3	8,9	11,4
	Agree	43	38,7	54,4	65,8
	Agree strongly	27	24,3	34,2	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Process innovations as transformative ideas can be explored in any

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree	1	0,9	1,3	1,3
	Neither agree nor disagree	8	7,2	10,1	11,4
	Agree	38	34,2	48,1	59,5
	Agree strongly	32	28,8	40,5	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Dedicated innovation teams should be freed from structured

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	1	0,9	1,3	1,3
	Disagree	16	14,4	20,3	21,5
	Neither agree nor disagree	17	15,3	21,5	43,0
	Agree	22	19,8	27,8	70,9
	Agree strongly	23	20,7	29,1	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Innovation networks need process structures to work properly.

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	2	1,8	2,5	2,5
	Disagree	13	11,7	16,5	19,0
	Neither agree nor disagree	25	22,5	31,6	50,6
	Agree	29	26,1	36,7	87,3
	Agree strongly	10	9,0	12,7	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Innovations due to technology evolution will generate new working

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Neither agree nor disagree	11	9,9	13,9	13,9
	Agree	36	32,4	45,6	59,5
	Agree strongly	32	28,8	40,5	100,0
	Gesamt	79	71,2	100,0	
Fehlend	77	32	28,8		
Gesamt		111	100,0		

Supply Chain Management is defined by a very structured and detailed business processes framework.

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree	3	2,7	3,8	3,8
	Neither agree nor disagree	19	17,1	24,1	27,8
	Agree	41	36,9	51,9	79,7
	Agree strongly	16	14,4	20,3	100,0
	Gesamt	79	71,2	100,0	
Fehlend	-77	32	28,8		
Gesamt		111	100,0		

The better all participants within the supply chain know the processes

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree	3	2,7	3,8	3,8
	Neither agree nor disagree	8	7,2	10,1	13,9
	Agree	39	35,1	49,4	63,3
	Agree strongly	29	26,1	36,7	100,0
	Gesamt	79	71,2	100,0	
Fehlend	-77	32	28,8		
Gesamt		111	100,0		

Supply chain networks are a sustainable alternative to sequential supply

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Disagree strongly	1	0,9	1,3	1,3
	Disagree	6	5,4	7,6	8,9
	Neither agree nor disagree	31	27,9	39,2	48,1
	Agree	33	29,7	41,8	89,9
	Agree strongly	8	7,2	10,1	100,0
	Gesamt	79	71,2	100,0	
Fehlend	-77	32	28,8		
Gesamt		111	100,0		

Circular economy has the potential to become the defacto standard for

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	0	1	0,9	1,3	1,3
	Disagree strongly	2	1,8	2,5	3,8
	Disagree	6	5,4	7,6	11,4
	Neither agree nor disagree	51	45,9	64,6	75,9
	Agree	9	8,1	11,4	87,3
	Agree strongly	10	9,0	12,7	100,0
	Gesamt	79	71,2	100,0	
Fehlend	-77	32	28,8		
Gesamt		111	100,0		

Processes in circular economies have to be derived from sequential

		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	0	1	0,9	1,3	1,3
	Disagree strongly	2	1,8	2,5	3,8
	Disagree	8	7,2	10,1	13,9
	Neither agree nor disagree	44	39,6	55,7	69,6
	Agree	20	18,0	25,3	94,9
	Agree strongly	4	3,6	5,1	100,0
	Gesamt	79	71,2	100,0	
Fehlend	-77	32	28,8		
Gesamt		111	100,0		

Häufigkeiten von $Profession

Size of Industry			Antworten N	Antworten Prozent	Prozent der Fälle
Large (2000 or more employees)	$Profession[a]	Executive (CEO, COO, CFO, CTO, etc.)	2	4,5%	8,0%
		Business or Line of Business Manager	5	11,4%	20,0%
		Process Practitioner	3	6,8%	12,0%
		Lean / Six Sigma Practitioner	1	2,3%	4,0%
		Business Analyst	3	6,8%	12,0%
		Business / Process Architect	6	13,6%	24,0%
		IT Manager	12	27,3%	48,0%
		IT Developer	3	6,8%	12,0%
		HR Manager	2	4,5%	8,0%
		BPM Consultant	2	4,5%	8,0%
		Other	5	11,4%	20,0%
	Gesamt		44	100,0%	176,0%
Medium (500 to 1999 employees)	$Profession[a]	Executive (CEO, COO, CFO, CTO, etc.)	4	12,5%	25,0%
		Business or Line of Business Manager	2	6,3%	12,5%
		Vendor Representative	2	6,3%	12,5%
		Process Practitioner	4	12,5%	25,0%
		Lean / Six Sigma Practitioner	2	6,3%	12,5%
		Business Analyst	5	15,6%	31,3%
		Business / Process Architect	4	12,5%	25,0%
		IT Manager	3	9,4%	18,8%
		HR Manager	2	6,3%	12,5%
		BPM Instructor	1	3,1%	6,3%
		BPM Consultant	1	3,1%	6,3%
		Other	2	6,3%	12,5%
	Gesamt		32	100,0%	200,0%
Small (under 500 employees)	$Profession[a]	Executive (CEO, COO, CFO, CTO, etc.)	7	14,9%	18,4%
		Business or Line of Business Manager	5	10,6%	13,2%
		Process Practitioner	5	10,6%	13,2%
		Lean / Six Sigma Practitioner	1	2,1%	2,6%
		Business Analyst	1	2,1%	2,6%
		Business / Process Architect	3	6,4%	7,9%
		IT Manager	6	12,8%	15,8%
		IT Developer	3	6,4%	7,9%
		HR Manager	1	2,1%	2,6%
		BPM Instructor	1	2,1%	2,6%
		BPM Consultant	4	8,5%	10,5%
		Other	10	21,3%	26,3%
	Gesamt		47	100,0%	123,7%

a. Dichotomie-Gruppe tabellarisch dargestellt bei Wert 1.

Häufigkeiten von $Fakoren

Region of Industry			Antworten N	Antworten Prozent	Prozent der Fälle
Europe	$Fakoren[a]	Strategy	49	18,0%	72,1%
		Organizational Evolution	37	13,6%	54,4%
		Generational Workforce	22	8,1%	32,4%
		Leadership & Management	39	14,3%	57,4%
		Innovation & Digitization	61	22,4%	89,7%
		Supply Chain Management & Circular Economy	22	8,1%	32,4%
		influencing factor1	25	9,2%	36,8%
		influencing	11	4,0%	16,2%
		influencing factor3	6	2,2%	8,8%
	Gesamt		272	100,0%	400,0%
rest of the world	$Fakoren[a]	Strategy	8	24,2%	85,7%
		Organizational Evolution	3	9,1%	42,9%
		Generational Workforce	4	12,1%	28,6%
		Leadership &	7	21,2%	71,4%
		Innovation & Digitization	4	12,1%	42,9%
		Supply Chain Management & Circular Economy	3	9,1%	28,6%
		influencing factor1	4	12,1%	42,9%
		influencing factor2	1	4,0%	14,3%
	Gesamt		25	100,0%	357,1%
Central & South America	$Fakoren[a]	Strategy	1	25,0%	33,3%
		Generational Workforce	1	25,0%	33,3%
		Leadership & Management	1	25,0%	33,3%
		Supply Chain Management & Circular Economy	1	25,0%	33,3%
	Gesamt		4	100,0%	133,3%
North East Asia (China, Japan, Korea)	$Fakoren[a]	Strategy	1	25,0%	100,0%
		Generational Workforce	1	25,0%	100,0%
		Leadership & Management	1	25,0%	100,0%
		Innovation & Digitization	1	25,0%	100,0%
	Gesamt		4	100,0%	400,0%

a. Dichotomie-Gruppe tabellarisch dargestellt bei Wert 1.

Häufigkeiten von $Fakoren

		Antworten		Prozent der Fälle
		N	Prozent	
$Fakoren[a]	Strategy	57	18,7%	22,0%
	Organizational Evolution	40	13,1%	15,4%
	Generational Workforce	26	8,5%	10,0%
	Leadership & Management	46	15,1%	17,8%
	Innovation & Digitization	65	21,3%	25,1%
	Supply Chain Management & Circular Economy	25	8,2%	9,7%
	influencing factor1	28	9,2%	35,4%
	influencing factor2	12	3,9%	15,2%
	influencing factor3	6	2,0%	7,6%
Gesamt		305	100,0%	386,1%

a. Dichotomie-Gruppe tabellarisch dargestellt bei Wert 1.

Häufigkeiten von $Fakoren

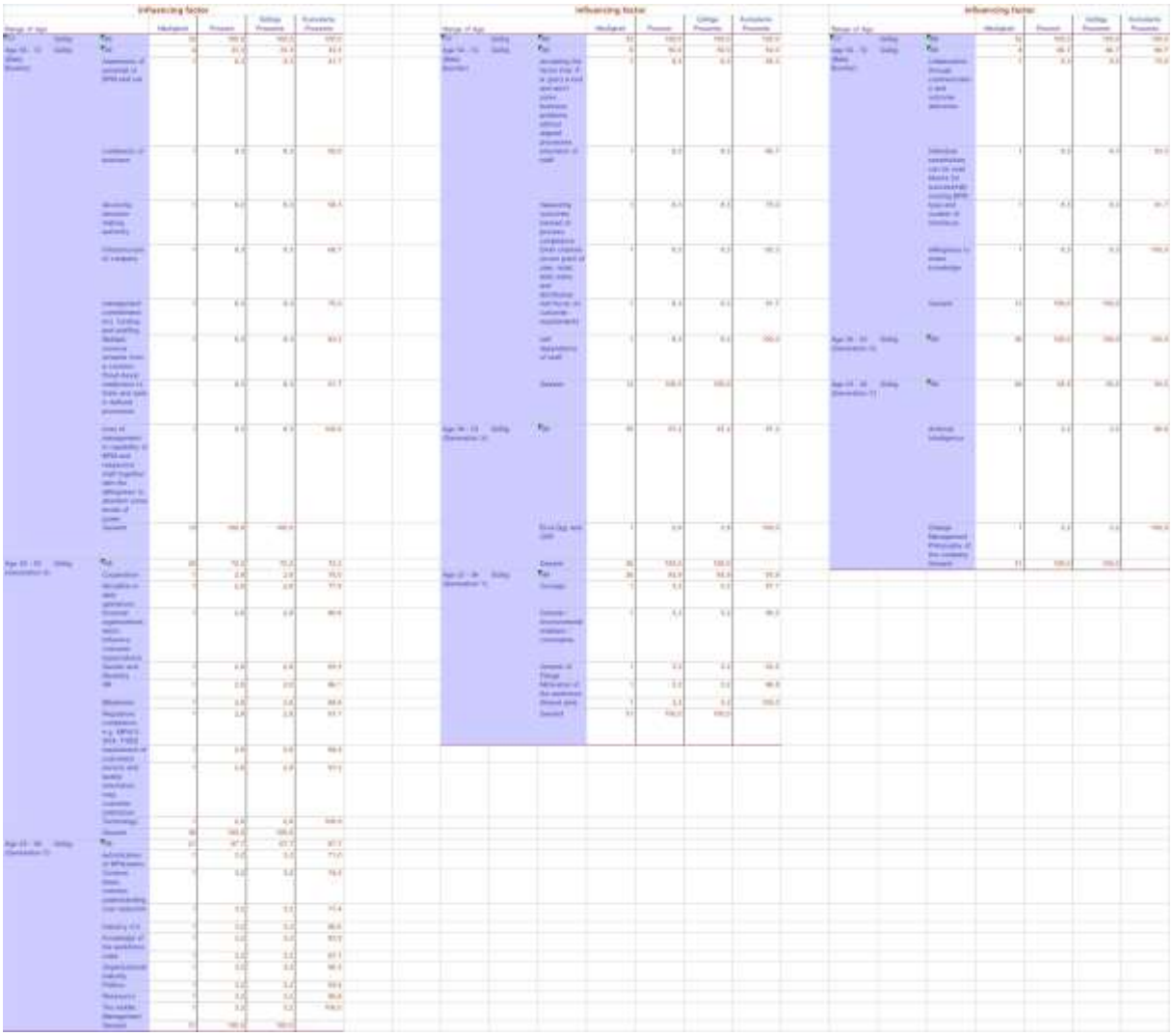
Size of Industry			Antworten N	Antworten Prozent	Prozent der Fälle
Large (2000 or more employees)	$Fakoren[a]	Strategy	20	19,6%	80,0%
		Organizational Evolution	8	7,8%	32,0%
		Generational Workforce	7	6,9%	28,0%
		Leadership & Management	14	13,7%	56,0%
		Innovation & Digitization	21	20,6%	84,0%
		Supply Chain Management & Circular Economy	9	8,8%	36,0%
		influencing factor1	12	11,8%	48,0%
		influencing factor2	7	6,9%	28,0%
		influencing factor3	4	3,9%	16,0%
	Gesamt		102	100,0%	408,0%
Medium (500 to 1999 employees)	$Fakoren[a]	Strategy	14	23,0%	87,5%
		Organizational Evolution	8	13,1%	50,0%
		Generational Workforce	6	9,8%	37,5%
		Leadership & Management	10	16,4%	62,5%
		Innovation & Digitization	11	18,0%	68,8%
		Supply Chain Management & Circular Economy	6	9,8%	37,5%
		influencing factor1	3	4,9%	18,8%
		influencing factor2	2	3,3%	12,5%
		influencing factor3	1	1,6%	6,3%
	Gesamt		61	100,0%	381,3%
Small (under 500 employees)	$Fakoren[a]	Strategy	23	16,2%	60,5%
		Organizational Evolution	24	16,9%	63,2%
		Generational Workforce	13	9,2%	34,2%
		Leadership & Management	22	15,5%	57,9%
		Innovation & Digitization	33	23,2%	86,8%
		Supply Chain Management & Circular Economy	10	7,0%	26,3%
		influencing factor1	13	9,2%	34,2%
		influencing factor2	3	2,1%	7,9%
		influencing factor3	1	0,7%	2,6%
	Gesamt		142	100,0%	373,7%

a. Dichotomie-Gruppe tabellarisch dargestellt bei Wert 1.

Häufigkeiten von $Fakoren

Range of Age			Antworten N	Antworten Prozent	Prozent der Fälle
Age 54 - 72 (Baby Boomer)	$Fakoren[a]	Strategy	11	18,6%	91,7%
		Organizational Evolution	5	8,5%	41,7%
		Generational Workforce	3	5,1%	25,0%
		Leadership & Management	7	11,9%	58,3%
		Innovation & Digitization	8	13,6%	66,7%
		Supply Chain Management & Circular Economy	7	11,9%	58,3%
		influencing factor1	8	13,6%	66,7%
		influencing factor2	6	10,2%	50,0%
		influencing factor3	4	6,8%	33,3%
	Gesamt		59	100,0%	491,7%
Age 39 - 53 (Generation X)	$Fakoren[a]	Strategy	26	20,0%	72,2%
		Organizational Evolution	20	15,4%	55,6%
		Generational Workforce	11	8,5%	30,6%
		Leadership & Management	22	16,9%	61,1%
		Innovation & Digitization	30	23,1%	83,3%
		Supply Chain Management & Circular Economy	10	7,7%	27,8%
		influencing factor1	10	7,7%	27,8%
		influencing factor2	1	0,8%	2,8%
	Gesamt		130	100,0%	361,1%
Age 23 - 38 (Generation Y)	$Fakoren[a]	Strategy	20	17,2%	64,5%
		Organizational Evolution	15	12,9%	48,4%
		Generational Workforce	12	10,3%	38,7%
		Leadership & Management	17	14,7%	54,8%
		Innovation & Digitization	27	23,3%	87,1%
		Supply Chain Management & Circular Economy	8	6,9%	25,8%
		influencing factor1	10	8,6%	32,3%
		influencing factor2	5	4,3%	16,1%
		influencing factor3	2	1,7%	6,5%
	Gesamt		116	100,0%	374,2%

a. Dichotomie-Gruppe tabellarisch dargestellt bei Wert 1.



Are you working in a knowledge-intensive service industry according to NACE?					
		Häufigkeit	Prozent	Gültige Prozente	Kumulierte Prozente
Gültig	Knowledge-intensive services (post and telecommunications, computer and related activities, research and development)	22	19,8	19,8	19,8
	Knowledge-intensive market services (water/air transport, real estate activities, renting of machinery and equipment without operator, and of personal and household goods, other business activities)	11	9,9	9,9	29,7
	Knowledge-intensive financial services (financial intermediation, except insurance and pension funding, insurance and pension funding, except compulsory social security, activities auxiliary to financial intermediation)	10	9,0	9,0	38,7
	Knowledge-intensive business services (computer and related activities, research and development, legal, technical and advertising)	17	15,3	15,3	54,1
	Other knowledge-intensive services (education, health and social work, recreational, cultural and sporting activities)	19	17,1	17,1	71,2
	none of the above	32	28,8	28,8	100,0
	Gesamt	111	100,0	100,0	

Size of Industry

		Gültige Prozente
Gültig	Large (2000 or more employees)	31,6
	Medium (500 to 1999 employees)	20,3
	Small (under 500 employees)	48,1
	Gesamt	100,0
Fehlend	77	
Gesamt		

Are you working in a knowledge-intensive service

		Gültige Prozente
Gültig	Knowledge-intensive services (post and telecommunications, computer and related activities, research and development)	19,8
	Knowledge-intensive market services (water/air transport, real estate activities, renting of machinery and equipment without operator, and of personal and household goods, other business activities)	9,9
	Knowledge-intensive financial services (financial intermediation, except insurance and pension funding, insurance and pension funding, except compulsory social security, activities auxiliary to financial intermediation)	9,0
	Knowledge-intensive business services (computer and related activities, research and development, legal, technical and advertising)	15,3
	Other knowledge-intensive services (education, health and social work, recreational, cultural and sporting activities)	17,1
	none of the above	28,8
	Gesamt	100,0

Range of Age

		Gültige Prozente	Kumulierte Prozente
Gültig	Age 54 - 72 (Baby Boomer)	15,2	15,2
	Age 39 - 53 (Generation X)	45,6	60,8
	Age 23 - 38 (Generation Y)	39,2	100,0
	Gesamt	100,0	
Fehlend	77		
Gesamt			

Region of Industry			
		Gültige Prozente	Kumulierte Prozente
Gültig	Europe	86,1	86,1
	North America	8,9	94,9
	Central & South America	3,8	98,7
	North East Asia (China, Japan, Korea)	1,3	100,0
	Gesamt	100,0	
Fehlend	77		
Gesamt			

Rotierte Komponentenmatrix[a]

	Komponente					
	1	2	3	4	5	6
Core processes influence strategic goals and vice versa.	0,718					
Employees who follow rigid process descriptions become unmotivated and reluctant.	-0,626					
Organizations with focus on the value chain and the surrounding system are able to sustain competition.	0,609	0,379				
A competitive strategy is the perfect fit of business process activities to succeed on the market.	0,533					
Managing an agile organization means having an agile mindset and implementing agile methodologies.		0,745				
Business processes in agile organizations do exist but are designed differently (eg continuous improvement process).		0,650				
Supply chain networks are a sustainable alternative to sequential supply chains.		0,487				0,332
Agile in the customer context means adjusting everything in the organization – strategy, principles, values, processes, systems, data structures - to generate continuous new value.	0,471	0,482				
Processes in circular economies have to be derived from sequential supply chains to be able to understand possible improvements.	0,338	0,451				
Process innovations as transformative ideas can be explored in any function of an organization, not only in product development.			0,697			
Circular economy has the potential to become the defacto standard for economies.			0,624			
The better all participants within the supply chain know the processes the more successful the supply chain.	0,469		0,483			
The generational workforce within an organization has different communication needs on process information.	-0,411		0,480			
Supply Chain Management is defined by a very structured and detailed business processes framework.	0,453		0,470			
A standardized process model notation is an adequate means of visualization for the younger workforce (Millennials) to communicate processes.		0,379	-0,444			
Digital natives (Millennials and Generation Z) are forcing the development of technology and digitization within organizations.				0,651		
Innovations due to technology evolution will generate new working opportunities.			0,332	0,612		
A well-defined and communicated strategy as well as skilled, enthusiastic people are not able to compensate unstructured or badly automated business processes.				0,590		0,399
Having a digital strategy is essential for staying competitive.				0,576		
The provision of appropriate team networking conditions is essential for innovation processes.				0,541	0,330	
The generation gap can be closed by the workforce itself.				-0,532		
A perfect mix and match of leadership styles helps managing a diverse workforce.		0,307		0,455		-0,315
Platform businesses such as Apple´s iPhone and App Store do not optimize business processes but use other metrics to measure success.					0,663	0,378
Team-based organizational forms have to reinvent organizational processes, with processes like playbooks with defined start and end but loose activities.					0,637	
Dedicated innovation teams should be freed from structured organizational processes.			0,307		0,569	
Every employee can become a good leader by obtaining leadership skills.			-0,381		0,536	
Innovation networks need process structures to work properly.					0,466	-0,326
The digital age influences strategies in many ways (networked customers, data generated in all processes or rapid experimentation in innovation).						0,687
Organizations of the future are built without structural hierarchies and with networks of empowered teams.					0,410	0,487
Flat organizational structures with adequate leaders are the key for the generation gap.		0,425				0,481

Extraktionsmethode: Hauptkomponentenanalyse.

a. Die Rotation ist in 8 Iterationen konvergiert.

16. ANNEX G – OTHER INFLUENCING FACTOR

Influential Topics				
External organizations which influence customer expectations	requirement of customers	real focus on customer requirements		
cost reduction				
Common ideas, common understanding				
Technology	automization of BPM-tasks	Industry 4.0	Internet of Things	Artificial Intelligence
trust of management in capability of BPM and respective staff together with the willingness to abondon some levels of power				
Laws	Regulatory compliance e.g. MiFid II, SOX, PSD2	Politics	EcoLOgy and CSR	
Ressource	Infrastructure of company			
Multiple revenue streams from a common Fixed Asset				
The middle Management				
complexity of business				
readyness to think and work in defined processes				
devolving decision-making authority				
management committment incl. funding and staffing				
Organizational maturity				
Knowledge of the workforce				
Gender and Diversity				
Mitarbeiter				
Cooperation				
Awareness of potential of BPM skill set.				
discipline in daily operations				
Shared aims				
accepting the factor that IT is (just) a tool and won't solve business problems without aligned processes				
Courage				
Omni channel (event point of sale, retail, web) sales and distribution				
self dependance of staff				
education of staff				
measuring outcomes instead of process compliance				
Cultural / environmental enablers / constraints				
Motivation of the workforce				
individual sensitivities can be road blocks for successfully running BPM				
type and number of interfaces				
collaboration through communication and outcome deliveries				
willingness to share knowledge				
Change Management Philosophy of the company				

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DECLARATION OF ACADEMIC HONESTY

I herewith declare on my word of honour, that I created the thesis at hand independently, that I did not use any material other than the cited resources and that I marked all results created by somebody else, be they overtaken into my thesis word for word or by a matter of meaning, accordingly.

I further declare, that the thesis at hand was not submitted to any other institution (university, university of applied sciences, university of education or other comparable institution) to obtain an academic degree.

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Location, Date Signature