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HOW TO IMPLEMENT A NEW CULTURE OF INNOVATIVE THINKING TO A LARGE CORPORATE

- A THEORETICAL REVIEW APPLIED TO A GLOBAL SCIENCE AND
TECHNOLOGY COMPANY IN GERMANY –

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The MERCK logo is displayed in a bold, purple, sans-serif font.

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1. INTRODUCTION

“Belief in your creative capacity lies at the heart of innovation”

– David Kelly, Founder and CEO of IDEO¹

Innovation management is essential to corporate success. This is far from being a new finding, but the current drift towards a sharing economy and digitalization pushes the executives of large corporates re-think their business strategies. Fast adaption to existing business models can have success in the short term but creating disruptive innovations has the potential to transform a whole industry in the long term.

The aim of this work project is to investigate major characteristics and influences on the organizational culture of a large corporate. More specifically, the approach of establishing one centralized department to host cross-divisional innovation projects will be examined in more detail. This approach has been taken by the German pharmaceutical and chemical company Merck which nowadays employs 50,000 people worldwide. The motivation to focus on this research in conjunction with the case study is twofold: (i) the need for information of internal employees to understand the purpose of such cost-intensive initiative and (ii) the need of long-term management recommendations to keep the innovation culture vital. This paper shall point out the importance of collaboration and knowledge exchange internally as well as with the external environment.

In the first section, terms related to culture and innovation are defined as well as current research is introduced. Afterwards, the theoretical findings are applied to the corporate environment of Merck including a survey analysis which provides an extensive snapshot of the current view of employees on innovation. The last chapter discusses the findings and offers recommendations to successfully transform the organizational culture towards an innovative corporate environment.

¹ David Kelley is the founder and chairman of the global design and innovation company IDEO. Kelley's most enduring contributions are in human-centered design methodology and design thinking (IDEO, 2016)

2. THEORETICAL BACKGROUND

2.1. INNOVATION, CULTURE AND CLIMATE

2.1.1. Innovation

"Strategic innovation is the creation of growth strategies, new product categories, services or business models that change the game and generate significant new value for consumers, customers and the corporation" (Palmer & Kaplan, 2016). Today, innovation in a corporate context is often used in an inflationary way and comes along with the impression of a whole new approach to think about corporate structures. In reality, the definition of innovation – originating from the Latin word “innovatio” which means renewal or alteration – has its economic roots in the first half of the last century. Josef A. Schumpeter has provided a fundamental theoretic framework in the early 1930’s. “The Theory of Economic Development” already sets a context of innovation, entrepreneurial activities as well as business cycles (Schumpeter, 1934). The **commercialization** of innovation has become one of the most important factors amongst the products, processes or services which evolve from this process (Dodgson, Gann, & Salter, 2008).

In day-by-day business decisions and whitepapers, the term innovation is used in several dimensions where the definitions tend to be blurry. Most readings are positively related to company success, however, recently some skeptical views could be observed: “Innovation has become the new buzzword, but its overuse and generalization has caused more instances of eye rolling than actual innovation” (O'Bryan, 2016).

Innovation activities within an economy over time can be attributed to the long waves of technological change shown by the Russian economist Nicholai Kondratiev (1892-1938) which implies that innovation activities appear in periodic clusters which are results of mutually

supporting technological innovations (Dodgson, Gann, & Salter, 2008; Smith, 2010). However, those waves (please see Appendix 1 for an illustration) are taking into account the total economic activities. Individual companies need to stimulate innovation or at least differentiate from existing innovations in order to gain advantage of those waves and to stay profitable.

Supporting the importance of innovation for corporations, the Boston Consulting Group (BCG) found in its 2015 survey that 79% of respondents ranked innovation as top or at least top-three priority at their company. Based on a long term investigation of the consulting firm (see Appendix 2), an increasing importance of innovation can be observed over the last decade (BCG, 2016).

The purpose of the web application *Google Trends* is to identify trending search entries within the search engine. Cross-checking the search entry “innovation” does not result in an increasing search statistics over the past 12 years. However, the same search for related search entries such as “design thinking” and “business model canvas” (both are applied methods to boost innovation) show clear positive trends with search intensity multiplying around ten times within the last seven years. Interestingly, R&D, the corporate department which was originally related the most to innovation, fell in the *Google Trends* statistics by 50% over the past 12 years (Google, 2016).

2.1.2. Culture

In order to implement a strategic innovation department it is critical to understand and distinguish between the terms of corporate culture, organizational climate as well as innovation culture. A recent study of Arikan & Enginoglu (2016) has shown that elements of **corporate culture** (such as HR practices, corporate citizenship etc.) have significant impact on firm performance and that a strong corporate culture can provide a competitive advantage. For these authors “corporate culture is how an organization perceives, evaluates, and reacts to the internal and external factors shaping the environment”.

However, defining the term of corporate or organizational culture has been focused by many researchers in the early 1980's. For instance Hofstede (1980) defines culture as the “collective programming of the human mind that distinguishes the members of one human group from those of another” and summarizes culture as “a system of collectively held values”.

Due to the influence of many factors affecting the corporate culture such as norms, beliefs, values and (contemporary) lifestyles of social society, a single definition of culture is not applicable. The life within the society is embedded in long historic development and contains the interdependencies of individuals and groups (Bloor & Dawson, 1994). Moreover, since each individual which is new to the organization brings a new and complementary set of cultural aspects to an organization, the corporate culture remains vital: “Culture is to a human collectivity what personality is to an individual” (Hofstede, 1980).

A comparison of the terms corporate **culture** and organizational **climate** is often not clearly elaborated and studies tend to mix the two concepts. A well-grounded overview is provided by Denison (1996) who describes the corporate climate as a relatively temporary way to express the organizational value system. “**Climate** refers to a situation and its link to thoughts, feelings, and behaviors of organizational members. Thus, it is temporal, subjective, and often subject to direct manipulation by people with power and influence. **Culture**, in contrast, refers to an evolved context [...]. It is rooted in history, collectively held, and sufficiently complex to resist many attempts at direct manipulation” (Denison, 1996). Combining this to the definition of a long-term based organizational **culture** which comes along with stabilizing contributions to the firm, some research suggests climate to be defined in relation with current expressions of organizational (job) satisfaction (Johannesson, 1973). The term of organizational climate is “reality-based” and thus the state of climate is “capable of being shared” (Woodman & King, 1978) and is therefore often being

used as the visible part of the corporate culture which can be measured (for instance in employee engagement or satisfaction surveys).

This work project will primarily focus on the investigation of organizational culture in combination with innovation due to the much clearer definition and better understanding in a corporate context. Moreover, sustainable management requires to implement strategic changes based on a long-term perspective which can only be achieved by influencing the overall organizational culture. Climate indicators are used as supporting indicators to measure organizational and individual characteristics in a snapshot manner. The case study will therefore investigate both dimensions – the cultural change through external attraction of new stimuli as well as climate figures in terms of currently perceived job satisfaction amongst the internal employees.

2.1.3. Innovation Culture

Having defined the concepts of innovation and culture independently, this section will elaborate on the combined usage of both terms. Researchers of the technical university (TU) Berlin are concluding the *innovation culture* as a “subset of corporate culture” as defined above since this area is responsible for new and disruptive concepts regarding ideas, risk and failure. Within the innovation culture they distinguish between (i) a more **process-oriented analytical function** which is a relevant prerequisite for (outward) strategic orientation as well as (ii) a **people-related practical function** which relates (internal) incentives and rewards to innovative thinking within a corporation (Unger, Rank, & Gemünden, 2014, O'Reilly, 1997).

According to Kaplan (2013) the failure of organizational changes is primarily driven by insufficient consideration of corporate culture. To create a culture of innovation he refers to several main principles including for instance an open formulation of the innovation intent with a customer focus, a structured (but not over-engineered) schedule to give employees time to innovate and both,

a proper rewarding system for innovation and an acceptance for failure. Nonetheless, a culture of innovation is always unique to each company and cannot be replicated from others.

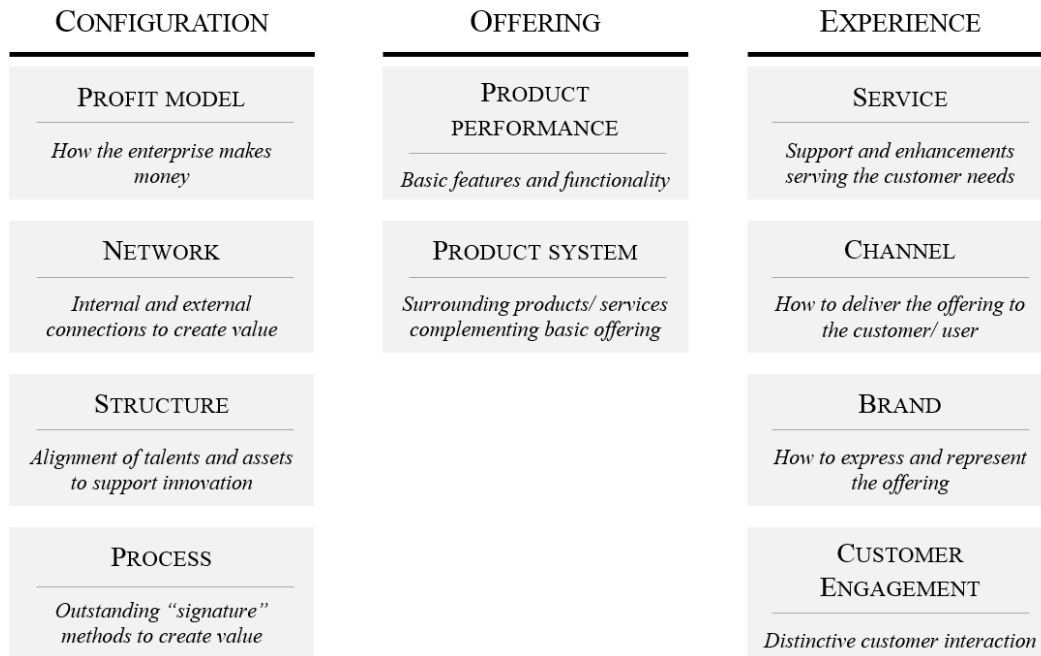
Whereas fostering an innovation culture is rather gradual and requires a long-term process to generate positive change, innovation management can be seen in a more practical way to observe several innovation models and implement the company-adjusted best practices. The innovation itself should then be reflected in all dimensions of the organization including organizational culture, its processes, its structures as well as the external network where the organization is embedded in.

2.2. INNOVATION MANAGEMENT

Managing innovation can be seen in several parts of a corporation. Classic approaches to innovations can be found in process, service or strategic innovations. Despite these classic forms of innovation, this work projects aims to emphasize on innovation practices within a firm's management practices – both internally as well as externally (Birkinshaw, Hamel, & Mol, 2008).

2.2.1. INNOVATIVE MANAGEMENT PRINCIPLES

Based on the management practices provided by Keeley (2016), innovation can be managed and build up systematically. Their framework emphasizes ten different types of innovation which can be further clustered into the main categories (i) configuration, (ii) offering and (iii) experience (see Graphic 1). Distinct factors can be modified independently, however, the more factors are adapted, the more likely it is to implement innovative products or services successfully. For instance, Apple re-thought 8 of the shown 10 innovation types with the launch of their Apple Music segment (iPod + iTunes) starting with the profit model of single song purchases rather than complete LP's and ending with a whole new customer engagement process which has built a specific Apple community, sharing the Apple lifestyle (Keeley, 2016).



Graphic 1: Ten types of innovation (Own representation based on Keeley, 2016)

2.2.2. TYPES AND EXTEND OF INNOVATION

An approach to categorize innovation management provide Birkinshaw et al (2008), who summarize two distinct ways to innovate: first, innovation that is a new “state of the art” (Abrahamson, 1996; Kimberley, 1981) also known as disruptive innovations and second, innovation which is characterized as “new to the organization”, which herewith will be named as adapted innovations (McCabe, 2002, Zbaracki, 1998).

Besides the intensity of innovations it is also crucial to identify the origin. Klein and Sorra (1996) summarize the two most common models to describe the source of an innovation. First, the **source-based approach**, where the innovation is entirely developed from scratch, i.e. from an idea through the prototypes up to the final product. This innovation is then “created for market”. Second, the **user-based approach** is primarily driven by intra-organizational innovation processes. The user, i.e. employee of an organization, is aware of need for internal process renovation (Klein & Sorra,

1996). Hence, within this work project it needs to be distinguished between **external** and **internal** innovation processes as well as **disruptive** and **adapted** ways to innovate. Other dimensions include for instance (i) **modular versus architectural components** of innovations, i.e. addressing only parts of or the entire system, (ii) the **strategic use of product life cycles**, which distinguishes management for early stage versus mature products, or (iii) the **open versus closed** innovation strategies, i.e. the extent to which the process is open to external networks (Dodgson, Gann, & Salter, 2008). Again, in order to achieve the best outcome, all forms and models of innovation are to be considered and reflected while implementing a new management approach.

2.2.3. PLACE OF INNOVATION

Innovation management can take place in a centralized way as well as in a decentralized way. Innovation, or general R&D activities, may also be organized in a hybrid way, i.e. with a strong central hub as well as regional sub-divisions. A study of 71 large corporates has shown that central research centers are more likely to produce innovations with greater impact and a larger cross-industrial impact (Argyres & Silverman, 2004). Pursuing the centralized approach comes along with financial benefits, as for instance specialized lab equipment can be used more often and economies of scale are generated. However, a centralized approach comes along with the bundling of risk to a single department. Thus, a decentralized approach can be seen as good diversification tool which is more likely to react to instant market needs as well as to involve all employees in a cultural change towards open innovation (Wentz, 2016).

Focusing more on innovation management rather than R&D, several forms of integrating innovative structures can be found. The concept of **ambidextrous organizations** describes the ability of sustainable innovative structures within mature companies. "Ambidextrous organization designs create distinct units that have their own unique processes, structures and cultures that are

specifically intended to support early-stage innovation". The concept aims to set up a corporate structure where the core business continues while the innovative venture activities can be developed at the same time. The ambidextrous organization is one of several approaches of to promote innovation in a company. Companies may pick a combination of several or just one single approach. Other principles such as for instance **venture boards** (a specific board that pulls external innovation into the corporate), **innovation councils** (cross-functional governance body that aims to align corporate innovation activities across business units) or **open innovation networks** (relationships with external partners such as universities, institutes or other corporates) are likely to complement the ambidextrous organizations (Kaplan, Organizational Models for Innovation: Organizational Designs that Support Strategic Innovation & Growth, 2016).

2.3. SOURCES OF INNOVATION

Searching new combinations of knowledge and sourcing external knowledge comes along with challenges of integrations and require managerial relationship building and the right networks. Innovation can arise from internal sources such as the classic R&D department or creative and ambitious individuals with entrepreneurial spirit, close business partners such as suppliers or customers, or further external sources such as start-ups, universities or other institutes (Dodgson, Gann, & Salter, 2008). This section aims to provide an overview on (i) corporate entrepreneurship, (ii) the related corporate HR management as well as (iii) start-ups as an external factor.

2.3.1. CORPORATE ENTREPRENEURSHIP / INTRAPRENEURSHIP

Both, the creation as well as the implementation of an (accepted) innovative structure require an open work culture which enables innovation to develop and grow. Adding the right market orientation (in terms of strategic fit and customer orientation) to this organizational setup leads to growing corporate entrepreneurship (CE), also named as **intrapreneurship**. Taking active

employees as a major source of innovation is under-estimated by many corporates. Individuals who are encouraged to develop their own ideas and get rewarded properly can boost internal innovation (Smith, 2010; Ahmed, 2016) showed in his study that the innovative climate (which here is defined by the work environment) has a significantly positive impact on intrapreneurship. Hence we know that the work environment in a company is vital for innovative structures. The actual support of corporate entrepreneurs differs amongst firms, ranging from dedicated working time to spend on innovations up to centralized innovation boot camps or pure financial support.

2.3.2. HR MANAGEMENT

Despite the support and development of people actively involved into innovation activities, it is highly relevant to integrate all employees in the cultural transformation towards an agile and innovative corporate. “Research strongly indicates that the most successful corporate innovation strategies are the ones that predominantly focus on people and human capital issues” (KPMG, 2013). Simply copying an already existing and successful business model is not sufficient to generate sustainable profits. Companies need to allow employees to experiment, give space for failure, reward entrepreneurial spirit and educate employees in terms of innovation skills. Since this approach is often hardly to implement during the day-by-day business and supervisors are frightened about their quarterly revenue targets, it is important to clearly explain the long-term benefits. Especially leaving the individual comfort zone is a key element of fostering innovation. Graphic 2 (below) shows several possibilities to establish innovative HR best practices. This contains several principles ranging from talent attraction, communication up to financial incentives. Companies need to develop their own framework which is adopted to the needs within the company.

INNOVATIVE HR MANAGEMENT PRACTICES

| | | | |
|-------------------------|--|------------------------|--|
| PERFORMANCE MANAGEMENT | <i>Ensure right signaling in terms of innovation expectations.</i> | ORGANIZATIONAL DESIGN | <i>Enable flexible networks through flexible organizational design.</i> |
| IDENTIFY CRITICAL ROLES | <i>Identify and develop clear roles in innovation process.</i> | REWARD & RECOGNITION | <i>Reward the innovative activities in employee development schemes.</i> |
| CHANGE MANAGEMENT | <i>Promote new working practices to boost innovation.</i> | INTERNAL COMMUNICATION | <i>Use technology to improve cross-organizational collaboration.</i> |
| TALENT MANAGEMENT | <i>For Individuals: Promote idea sharing and encourage resource sharing. For Leaders: Educate leaders to continually develop the mindset of their employees.</i> | | |

Graphic 2: Innovative Human Resource tools (own illustration based on KPMG, 2013)

2.3.3. ENTREPRENEURSHIP / START-UPS

Disruptive innovations are often found in the context of **cross-industrial collaborations** amongst different companies. According to Kotabe and Swan (1995) corporations should “constantly monitor within its own industry but even more importantly outside its industry for product technology”. More than two decades ago, the researchers already recommended large corporates to partner with smaller companies to boost innovation power. More specifically, “horizontal and cross-industry cooperative arrangements have contributed to the increase of product innovativeness” (Kotabe & Swan, 1995).

Schumpeter (1934) defines an entrepreneur as a risk-taking individual for the sake of innovation and the creation of new processes. Thus, entrepreneurs with disruptive business models should not be under-estimated within a large corporate’s strategic focus. Start-ups are seen as a major source of innovation due to their business model innovation and lean management methodologies. Especially for business-to-business (B2B) products and services, corporate networking is key for the success of start-ups as well as of large corporates. A well-developed network of alliances comes

along with competitive advantage. Particularly industries with high know-how requirements profit from networking activities, both with internal colleagues as well as external partnerships such as universities, institutes or competing corporates (Powell, Koput, & Smith-Doerr, 1996).

The collaboration between large corporates, entrepreneurs and startups can be seen in several forms of engagements, including corporate **hackathons** (short term business innovation challenges), business and corporate **incubators** (provision of corporate working space), corporate **venturing** (financing external innovation) and **mergers and acquisitions** activities. Moreover, corporate **accelerators**, i.e. the temporary (educational, financial and organizational) support of a start-up in a corporate environment, are seen as one of the most promising approach to “nurturing innovations from entrepreneurial ventures”. Accelerators build an infrastructure for “bridging the gap between corporations and startups” and can be a fruitful symbiosis with benefits for both sides (Kohler, 2016).

3. CASE STUDY

3.1. INTRODUCTION MERCK

In order to properly understand the context and the reason behind the implementation of a new innovative strategy it is of significant importance to review the company origin and the stakeholder structure. Merck is a globally acting company focusing in high-tech products in the fields of healthcare, life sciences and performance materials. With roots back to the year 1668 where *Friedrich J. Merck* acquired a pharmacy in the city center of Darmstadt, Germany, Merck states to be the oldest pharmaceutical and chemical company of the world. Based on a long tradition and many generations of active family involvement, the company is still owned by the family with around 75 per cent of shares. However, today no family member represents an active member of

the executive board. The remaining quarter of shares are traded on the stock exchange since 1995 where the Merck KGaA is listed in the German top index DAX since 2007 (Merck KGaA, 2016).

Through the acquisition of the US-based laboratory supply company Sigma-Aldrich in 2015 (purchase price at \$17 billion) and the further leading position within the OLED production, Merck is more and more diversifying its portfolio and develops from a pure pharmaceutical company to a multi-focus corporate. The recent M&A activities Merck increased its number of employees by 10,000 people to roughly 49,600 employees and businesses in 66 countries by end of 2015. Net sales of €12.8 billion in 2015 (+13% compared to 2014) are still dominated by the healthcare sector with a share of 54% (58% in 2014), followed by the life science department with 26% (24%) and the performance materials department with 20% (18%) of the group sales (Merck KGaA, 2016). From a corporate culture perspective, the family tradition has a lasting effect on the current culture, but also the newest company acquisitions are driving the firm's environment.

Looking back at the very successful history of the company does not guarantee future performance. An always changing competitive environment with disruptive concepts that are reinventing whole industries through innovative sharing business models (see Uber or Airbnb) are just one of many threats to Merck. Launching a “blockbuster” pharmaceutical, a drug which produces annual sales of more than \$1 billion per year, is getting more and more difficult with more available drugs in the market. Moreover, the dependence of a company on few drugs is highly risky as patents are expiring sooner or later. Within the competitive environment of Merck, companies such as Pfizer or Bayer have all shown strong commitment towards more innovative strategies. For instance, Pfizer already founded its venture capital unit with an annual budget of \$50 million in 2004 focusing in investments in healthcare startups. The pharma company Bayer has launched the

cooperative institution *INVITE* with the technical university in Dortmund focusing innovative process solutions as well as agile development processes (Pfizer, 2016; Bayer, 2016).

In addition to the already existing competitors there are threats such as cross-industrial innovations. For instance, Google – usually known as a search engine provider making money by placing advertisement – has a fast growing life science department hiring top-tier biologists (WSJ, 2014). The power of big data analysis and related products are of significance importance while developing strategies for the future.

Those are just a few examples of arising competition within the industry as well as outside the industry. Taking the focus back to internal structures it is critical to understand the influence of the Merck company history and the latest development within the company. Employees usually trust in their long-term contracts which can also be attributed to the major influence of the Merck family as a stabilizing factor. Their sense of job protection provided through sustainable management of the company is one of the biggest assets of the company. However, this positive aspect of the family business on the one hand is also a risk-bearing part on the other side. The more comfortable the employees feel within their working contract, the slower the need to improve and re-think processes. Moreover, the size of the company increases the occurrence of protective behavior of individual employees and politics becomes a major factor in decision-making processes.

In 2014, Merck management decided to implement new structures, including a cultural change towards open innovation processes as well as strengthening the product and service portfolio based on permanent business model innovations. Since a new headquarter has been planned during that time, the company chose the approach to implement a **central innovation center** in order to generate a new stimulus towards future innovation. Rather than just having a purely representative office building, the company faced the challenge to set up the structures in three different

dimensions: (i) architectural, (ii) cultural and (iii) processual. The wrap-up of the period starting with the decision to construct an innovation center and ending with a recent awareness survey will be shown and discussed in the next section.

3.2. MERCK INNOVATION CENTER

Launched in May 2015, based on intensive strategic assessment and identification of the most important needs, the Merck Innovation Center (MIC) has initiated a broad variety of changes within the Merck environment. The architectural aspect with open space offices and furniture which invites employees to interact and engage in innovative projects is only the primary visible part of the innovation center. The mission “we help ideas grow” is essential in the configuration of the team and the projects, primarily taking place in the four pillars. Additionally, a marketing and communications team is promoting the MIC activities on both ends – internally and externally – to further boost awareness as well as acceptance of the new institution. In general, the MIC acts as the intermediary institution to connect the distinct business units. The purpose to drive innovation primarily focuses on those ideas which cannot be realized within the business units. Therefore, cross-department ideas and non-business related ideas are the main focus of the MIC. This affects not only the idea generation but also enhance employee interaction and dissolves “silo thinking”.

3.2.1. FOUR PILLARS STRUCTURE

The MIC is managed by 13.5 FTE’s (as per Nov 2016) as well as a pool of ca. 10 team members who are either freelancers, external consultants or students. The current setup of the MIC consists of four main pillars, namely the (i) Accelerator, (ii) Think Tanks, (iii) Internal Innovation Projects and (iv) the Innovator’s Academy.

Being the bridge to the external start-ups, the **Accelerator** program is designed to host a number of start-ups within the Merck facilities for a period of three months. As part of the program, start-

ups gain insights into the corporate landscape, get financial support, receive workshops and professional trainings and, most importantly, connect to potential future partners within the company. The hands-on mentality is highly appreciated by the life science and healthcare start-ups which are solely selected in the early-stage phase of the business. Currently, Nairobi (Kenia) is another hub of the Accelerator program with similar structures. More global hubs are in planning.

The **Think Tanks** and the **Internal Innovation Projects** cover the internal project development side. **Think Tanks** are specific 3-month programs for internal employees to work together in a cross-divisional team on a specific (global) topic which is of interest for Merck. After the initial internal and external stakeholder mapping of the project teams and an intensive brainstorming phase, the teams pitch their final outcome (for instance a product, a service or simply a report) in front of an internal innovation committee. Depending on the quality of the proposed project, the Think Tank gets transformed into an **Internal Innovation Project** which then gets extension of several years and substantially more funding. However, those more specific internal projects can also be accessed through continuously open idea submission platforms where employees are free to propose their innovations. Hence, the short-term Think Tank programs can be used as the pre-stage for the long-term internal innovation projects, but not necessarily need to.

The **Innovator's Academy** is supposed to serve as a central platform for all forms of workshops, trainings and other events related to educational topics around innovation. The purpose is to train the temporary project teams within the MIC as well as all other employees. This is the main pillar to actively change the current understanding of the corporate culture. Through continuous communication of new approaches to innovative thinking, the academy tries to implement a growing community of people thinking “out-of-the-box”.

3.2.2. THE IMPACT OF THE MIC ON THE CORPORATE CULTURE – AN ANALYSIS

In fall 2016, a cooperative survey of company and the Technical University of Darmstadt (TU Darmstadt) has been conducted and spread within more than 6,000 employees. 1,556 responses were collected, well-distributed over several business units and departments. As shown in the table below the main group of respondents (641 respondents, 41%) is employed in a group function such as IT, Site Operations, Finance or similar (see Table 1).

| Business unit | Total | Language | | Gender | | Years at Merck; 1240 responses | | | |
|-----------------------|-------|----------|---------|--------|--------|---|----------------|-------------|-----------|
| | | German | English | Male | Female | <5 years | 5-10 years | 10-20 years | >20 years |
| Healthcare | 392 | 313 | 79 | 227 | 165 | 27% | 23% | 24% | 26% |
| Life Science | 197 | 187 | 10 | 140 | 57 | Education (highest level); 1236 responses | | | |
| Performance Materials | 326 | 303 | 23 | 235 | 91 | High School | Apprenticeship | University | PhD |
| Group Functions | 641 | 565 | 76 | 436 | 205 | 15% | 26% | 40% | 18% |
| | 1556 | 88% | 12% | 67% | 33% | | | | |

Table 1: Survey responses summary

For this work, a set of 38 questions has been further investigated to get a better understanding of the corporate innovative thinking. Based on the results in form of a 5-point Likert scale assessment, 11 constructs² were built. These constructs have been tested in terms of reliability and validity through a factor analysis (each construct as one single factor with an Eigenvalue threshold of 0.8³) as well as the Cronbach alpha (>0.7). An aggregated overview of the collected responses can be found in the radar chart below (see Graphic 3). Three main categories are plotted based on the average result per each distinct construct. The categories are clustering the following characteristics:

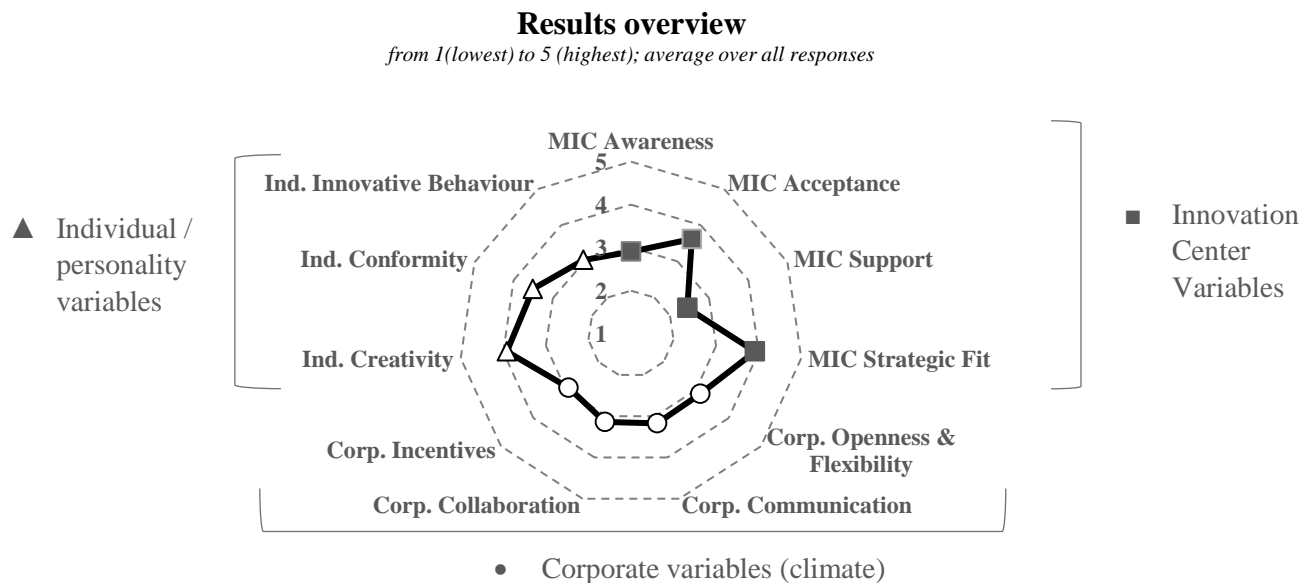
- The current attitude towards the **innovation center** (in terms of the employees' awareness and acceptance of the MIC, how employees feel supported by the MIC and how the employees think the MIC strategy fits to the overall strategy)

² Please refer to Appendix 3 for a detailed list of the selected survey questions and the built constructs

³ Please refer to Appendix 4 for the complete Factor analysis

- Overall **corporate variables** indicating the current climate within the overall firm (in form of incentives, collaboration, communication and openness & flexibility towards new approaches) and
- **Personal variables** for individual characteristics such as individual creativity, conformity with processes and individual innovative behavior (as self-perceptions)

The higher the average rating (with 5 being the upper boundary), the higher and better the overall result per construct.



Graphic 3: Survey results for selected constructs

First, within the MIC category, a good acceptance and strategic fit of the innovation with the overall Merck strategy center can be found. However, the overall awareness of the MIC and especially the perceived support of enabling innovation through the MIC seem to show potential for improvement compared to the already achieved acceptance. Second, the corporate variables regarding several climate indicators are positively correlated (see Appendix 5) and indicate a moderately open and collaborative work environment. Third, the individual variables show a relatively high personal creativity combined with a high conformity regarding processes (which is typical for

pharmaceutical companies with many regulations to follow). However, the individual innovative behavior is not catching up with the individual creativity, which could be improved through a higher support by the innovation center.

After the descriptive analyses above, an inferential statistical analysis has been performed in order to identify potential drivers of the change towards an innovative culture. As mentioned in the theoretical part of this work there is no consensus yet in measuring the organizational culture. Therefore, this analysis assumes to use climate indicators as snapshots of the current culture. Based on current research (Patterson, West, Shackleton, & Dawson, 2005) the above-mentioned **corporate variables** (openness & flexibility, communication, collaboration and incentives) have thus been aggregated to the variable "**climate**" (*Cronbach alpha = 0.89*) to get an appropriate indicator to measure the impact of the MIC. Taking this as the dependent variable in a multiple regression analysis, I have conducted following equation:

$$\begin{aligned} climate = & a_0 + b_1 * awamic + b_2 * accmic + b_3 * suppmic + b_4 * stratfit + b_5 * iib + b_6 * creat + b_7 * conf \\ & + c_1 * age + c_2 * gender + c_3 * edu + c_4 * tenure + \varepsilon \end{aligned}$$

The regression has been performed with the statistical analysis STATA 14 and results are shown in Appendix 6. Starting with the quality of this social sciences model, the adjusted R-squared (0.2316) indicates a suitable fit of the regression with 23% of explained residuals by the model. Due to several limitations of the R-squared concept and the nature of psychological variables that often imply low R-squared values, the 0.23 can be classified as a good fit for this purpose⁴.

Taking into account the provided t-statistics, significantly positive variables (at a 95% confidence level) include the **acceptance** (coefficient 0.17) and the **strategic fit** (coefficient 0.13) of the MIC

⁴ Due to the limited extend of this statistical research I refer to several sources such as Kohler and Kreuter (2008) or Frost (2013)

as well as the **individual innovative behavior** (coefficient 0.17) and the individual **process conformity** (coefficient 0.12). Variables such as age, tenure, education and gender are implemented as control variables.

Keeping in mind the shown assumptions and limitations of the model, a long-term cultural change can be achieved by focusing on the further acceptance boost of the MIC amongst the employees, a well-connected strategic alignment of the MIC with the overall corporate strategy and the improvement of the individual innovative behavior while taking into account the required process conformity. The MIC seems to have positive impact on that process of cultural change given the analysis of this sample. Specific management recommendations for the MIC are elaborated in the following discussion.

Please note that this survey is constructed based on the intention to perform the same survey again in a few years. Participants have entered a personal identifier at the end of the survey to enable the future research to match the individual development. This comparison will allow to collect central findings in the empirical research regarding the success of the MIC implementation.

4. FUTURE OUTLOOK / DISCUSSION

Setting up an environment for innovation and to influence the overall organizational culture requires time and is a long term process. Within the past months the basis for this has been built by the developing the 4 pillars system and the respective awareness of the program. However, the survey has shown that employees are open for more support of the MIC in terms of innovative projects and creative thinking. The acceptance of such initiative like the MIC, which is not able to generate (visible) cash inflows in the short term, needs therefore be further pushed forward in the future. The multiple regression has shown the importance of the strategic fit of the innovation strategy with the overall corporate strategy as a main factor improving the corporate environment.

Probably the most important signal of the Merck stakeholders is the current construction of the new headquarter, which will not only be a representative office building, but also the new home of the innovation center activities. This shows commitment of the top management in terms of providing facilities and budget, but also to further align the strategies on corporate and innovation side. The implementation of the innovation culture will thus be further boosted by scaling up the activities of the innovation center as well as further bundling with the overall strategy.

Within this development over the next years, the innovation center has to constantly re-think its processes to keep interest in innovation vital and to help Merck continuously having a competitive advantage. Based on the theoretical research as well as the case study findings, I propose to consider following strategic options to achieve an open and engaged culture of innovation:

- Extend the existing project pipeline and implement an alumni community of employees engaged with the innovation center (including reward systems to incentivize).
- Engage start-ups from other industries to increase cross-industry ideation process; create lean processes to implement start-ups in regular business units; moreover, set up more strategic partnerships with other large corporates to gain advantage through exchanging ideas.
- Further boost the acceptance of failure within the employees through good reintegration into regular business units and communication to supervisors.
- Increase the academy activities to further increase employee engagement for innovation.
- Keep the MIC structures lean within the scale-up process, for instance the creation of a separate legal entity of the MIC allows more flexibility (Capgemini, 2016).
- By extending the team of the innovation center, hire people that are radically different to the regular Merck employee such as artists, architects or carpenters.

- Establish more international innovation center hubs with similar projects to the main innovation center but to a smaller extend.

Since the MIC has been established in 2015, it is challenging to measure the success of the initiatives so far. The supported start-ups are still in early stage status, internal projects are not yet at a stage to sell products. Therefore it is important to define a roadmap which allows a clear valuation (not necessarily from a financial perspective) of the initiatives of the MIC from a certain project age onwards. For instance, an internal project needs follow-up decisions after a certain period of time which might be followed by (i) the integration into the business unit, by (ii) the new construction of an additional business unit, (iii) the spin-off to the market or (iv) the cancellation of the project. However, since innovation needs a certain degree of freedom and time, these steps should be initiated after a certain growth of the ideas and projects.

This work project has shown the importance of innovation to company success and the role of the organizational culture within this process. Merck has chosen the approach of the ambidextrous organization form through the implementation of the MIC. The analytical part of this paper has illustrated the significant impact of the MIC to the corporate climate which is the observable and measurable part of the culture. Based on this several strategic management options have been proposed to achieve long-term success of Merck's innovation strategy.

Future research may complement this paper by analyzing more granularly the acceptance and awareness on a project level rather than on general MIC level. This can lead to fruitful insights for the scale-up process and the evaluation of the several innovation channels. Moreover, the current research focuses on the cross-divisional aspects of innovation. The strategic innovation strategy should also influence the distinct business units for instance via learning synergies of other business unit innovations.

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