

# Innovation among SMEs in the DACH region: Assessment of the status quo and the Development of an Innovation Framework.

A Master's Thesis submitted for the degree of  
"Master of Business Administration"

supervised by  
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Vienna, 07/07/2017

## Affidavit

I, **Raul Cristian Kristo**, hereby declare

1. that I am the sole author of the pages 3-5, 24-32 to 48-61 of the present Master's Thesis, "Innovation among SMEs in the DACH region: Assessment of the status quo and the Development of an Innovation Framework", 70 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
2. that I have not prior to this date submitted this Master's Thesis as an examination paper in any form in Austria or abroad.

Vienna, 07.07.2017

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Signature

I, **Eduardo Cruz Medina**, hereby declare

1. that I am the sole author of the pages 5-24 to 61-66 of the present Master's Thesis, "Innovation among SMEs in the DACH region: Assessment of the status quo and the Development of an Innovation Framework", 70 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
2. that I have not prior to this date submitted this Master's Thesis as an examination paper in any form in Austria or abroad.

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Signature

## **Preface**

This master thesis is original, unpublished and joint work by the authors, Raul Cristian Kristo and Eduardo Cruz Medina. International literature review performed within this thesis was a joint effort of the authors. Both authors contributed to the formulation of the master thesis problem in equal proportion along with the objectives, code of conduct, interpretation of research results, discussions, recommendation and further prospects. The empirical research in relation to innovation within small and medium size enterprises in the DACH region has been performed in equal matter by both of the authors.

The framework proposed within our master thesis might have utilitarian value for small and medium size companies in the DACH region and further afield. We wrote this master thesis to better understand the innovation ecosystem within this region and to try to formulate a framework that would be suitable for “small and medium enterprises” (SMEs), but at the same time keeping complexity low so that it is easily understood by every employee within a company, with the integration and implementation kept straight forward.

We thank the management of the WU Executive Academy and Vienna University of Technology for organizing events with distinguished guest speakers throughout PMBA Entrepreneurship and Innovation 2015 – 2017 and for providing access to academic papers from around the world including distinguished institutions like Harvard Business School. These elements of our study helped us understand the complexity of the subject matter and the various aspects of our master thesis in particular.

## Abstract

Small and Medium Enterprises (SMEs) are very eager to innovate and can often be more agile when adopting new processes. The problem we see is that in many cases the implementation of new process that aim to drive innovation are not systematically structured. Innovation has become a very important and broad topic and there is a lot of information on the subject matter, which makes it difficult to choose the correct literature and methodology to make an efficient adoption of an innovative culture. SMEs have usually limited budgets for such activities and big consulting firms (Price Waterhouse Coopers or Deloitte) are often too robust and costly, not only because of the infrastructure they have, but also because their projects are complex and require many resources.

Our proposal to solve this problem is to build a framework that will offer a stage-based methodology assisting the development of an open innovation driven culture within an enterprise. This framework, which we called “Cadence of Innovation System” (CIS), recommends an assessment that identifies the current innovation efforts of the enterprise at an early integration stage (stage 0). The first stage is the implementation of an “innovation system” (systematic and repeatable approach to control a company’s allocation of time and resources) on a project basis. The second stage uses the innovation system adopted in the first stage on a strategic basis and with significant effort placed on communication. The third stage continues the systematic approach in line with the first and second stage by emphasising communication and allows for an enterprise to start acting with an innovation culture. This framework, on top of all these stages, encourages the enterprise to systematically and continuously revisit all the levels of the system, including the assessment stage. CIS aims to bring up the discussion of the needed leadership style to manage an organization that has the capability to exploit and explore ideas (ambidexterity), to promote an inclusive organization that empowers employees (contextual environment) and that has a customer-oriented vision.

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# 1. Introduction (Raul Cristian Kristo, Eduardo Cruz Medina)

## 1.1 Problem assessment (Raul Cristian Kristo, Eduardo Cruz Medina)

Our starting point when assessing what the potential problems are began with the idea of implementing innovation<sup>1</sup> efforts within an enterprise, in a systematic<sup>2</sup> manner, which from our perspective would lead to implementing efficient processes that are repeatable.

We are approaching our research based on the following problem statements:

- **Problem 1:** Whether, and to what extent the definition of “innovation” is correctly understood and whether it is confused with other concepts like “creativity” and “invention”.
- **Problem 2:** Whether SMEs in the DACH region see innovation as an integral part of their strategy or as project based activity.
- **Problem 3:** Whether the open innovation concept is known to SMEs in the DACH region.

Problem 1 has been formulated based on our interest in educating enterprises in what is the correct, literature based, definition of innovation; therefore, hence the concept of innovation is correctly used. We believe that the word innovation has become a “filling word” which demerits the correct value and reach of a systematic approach to innovation initiatives within enterprises. We often also hear people talking about how they “improved” this process or how they “changed” technology in order to make things more efficient, but rarely do we hear someone talking about the fact that they took the time to look at their

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<sup>1</sup> Roger Smith, The evolution of innovation, Research Technology Management, May 2008, Vol.51(3), pp.59-62 [Peer Reviewed Journal], definition of innovation: “Innovation is an activity or action that creates value from materials, processes or ideas that are available to many people, but which have not been recognized or explored by others”

<sup>2</sup> <https://en.oxforddictionaries.com/definition/systematic>, accessed on January 20th, 2017

organization and how they innovated a process or perhaps even how they may have crowdsourced a design or how they amended a process until it reached an ideal point. We believe, since the formal study of innovation is relatively new, as Roger Smith refers to Burns and Stalker (1961)<sup>3</sup>, enterprises have not yet learned to use it. Instead they stick to old school concepts where they improved a process because “there was a need for it”. Usually with such an approach there is not a systematic way of dealing with open or closed innovation concepts and methodologies within SMEs.

Problem 2 has been formulated to understand if SMEs grasp innovation as an integral part of the company’s overall strategy. If communication is not part of the company’s strategy and innovation is not passed down the chain of command, teams can be left out and may not be properly informed about their strategic goals. These teams could be the ones that would point out that there is a lack of an innovation system within the organization even though it is part of the company’s strategy.

Problem 3 has been formulated to identify if there is an opportunity to drive a bigger interest from SMEs into an open innovation model. The answer to this problem would confirm that a business opportunity does exist to help enterprises implement a systematic approach into the open innovation field, therefore allowing enterprises to not only have to solely rely on consulting services.

## **1.2 Objective of the thesis (Raul Cristian Kristo, Eduardo Cruz Medina)**

Our aim with this thesis is to propose a solution to address the above-mentioned problems. Below we describe our objectives:

- **Objective 1:** To analyse the results coming from the survey in order to identify opportunity areas within SMEs throughout the DACH region, where an innovation system could promptly solve the problems within an enterprise during their journey towards innovation.

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<sup>3</sup> Roger Smith, The evolution of innovation, Research Technology Management, May 2008, Vol.51(3), pp.59

- **Objective 2:** To educate people and companies about the value of innovation and the importance of using innovation systems in order to have a professional approach to the adoption of an innovative culture.
- **Objective 3:** To identify if SMEs are interested in a framework that aims to help them with a systematic implementation initiative in regard of innovation.

The problems and the objectives presented above are the basis of this thesis. This thesis is in turn the basis for a bigger project, which, based on the results from the survey and the overall outcome of this paper, we are prepared to take from a conceptual proposal and bring to the market either as a mentoring workshop or as a more formal consulting business. The framework that we are presenting within this work will provide a methodical guidance system to SMEs, considering the limitations of these companies regarding budgets, timelines and resources.

We also want to propose a way to delivery our framework. If we manage to address the challenge that consultants have about limitations for scalability, we will be in a interesting path towards a meaningful option for SMEs.

### **1.3 Method overview (Raul Cristian Kristo)**

Our research, or better said our problem formulation, started when we identified that several companies that we used worked for, or that are still working for, either do not have a clear understanding of the innovation concept or they have very limited knowledge of it. We immediately discussed the topic within peer groups and concluded that this could be a very interesting topic for a research paper. Our mission was to identify whether or not our theory that "companies in the DACH region have limited understanding of the innovation concept and practices" is true or not.

We initiated the research of the subject matter with a review of the business field in the DACH region and began trying to find any evidence that would support our hypothesis. We did this by reviewing available documentation, analysing research papers on the topic and utilising the Internet for appropriate sources of information.

As there are many companies that fall into the category of small and medium enterprises, it would have been close to impossible to conduct face-to-face interviews with all of them, therefore we decided to design an electronic survey to be filled out online by the participating companies and we only conducted face-to-face interviews with selected peers that work in companies matching the profile. We used one of the most reputable survey tools (surveymonkey.com) to conduct and analyse the results of the survey.

On the research sample size, we decided to research 300 companies from the DACH region, with the majority being from Germany (N=240), followed by Austria (N=40) and Switzerland (N=20). The nature of the sample was in relation to the country size and to the amount of companies that would fit the "small and medium enterprise" definition. We used some of the biggest company databases in Europe to identify the companies that would fit the description and requirements (CMD complete<sup>4</sup>, Hoppenstedt<sup>5</sup>, Zoominfo<sup>6</sup>, Kompass<sup>7</sup>)

The companies in our sample were selected randomly, in order to preserve the objectivity and to address as many business fields as possible. The list of domains that these companies were active in varied from the automotive industry to pharmaceuticals and banking. After identifying the target company list for the survey, we proceeded by gathering as many contacts as possible from those companies through electronic audit of each of their websites. For many of the companies we managed to collect direct contact persons and for the others, the general contact email addresses.

As mentioned above we also conducted face-to-face interviews with selected people, such as colleagues, friends and family members that worked or are working in companies that matched the profile of small and medium enterprises.

In order to merge both inputs, we entered the off-line results manually into the survey tool and in this way we reached a unified view.

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<sup>4</sup> <http://www.cmd-complete.at>, accessed April 24, 2017

<sup>5</sup> <https://www.hoppenstedt-firmendatenbank.de>, accessed April 24, 2017

<sup>6</sup> <https://www.zoominfo.com>, accessed April 24, 2017

<sup>7</sup> <https://at.kompass.com/en>, accessed April 24, 2017

## **1.4 Structure of the thesis (Eduardo Cruz Medina)**

This thesis is presented in five chapters. The first chapter is the introduction where we formulated the problems encountered, defined our objectives, described the method utilised as well as the sources used.

The second chapter provides the theoretical background needed so that the reader of the thesis can understand what the proposal and the objectives of this thesis are and also to set a foundation layer for the next chapters. This chapter also describes the current environment in the DACH region and our ideas in regard to innovation, innovation systems and organisational innovation. We also present our solution in the form of a framework that SMEs could use in order to better integrate their innovation efforts.

In the third chapter we present the details of the methodology used to be able to reach our objectives and our proposed solution.

In chapter four we present the results of the empirical study performed in the DACH region and analyse the results.

Chapter five includes our recommendations regarding achieving the objectives that we initially set in the introduction, it describes our proposed framework, we challenge our framework versus other scientific work and share our future ideas for the framework and ideas for its commercial deployment.

## **2. SME's in DACH region – theoretical background and status-quo (Eduardo Cruz Medina)**

Within this study we are aiming to gather enough empirical information to determine if the SMEs within the DACH region have a clear understanding of what innovation is. We will study the definition, differentiation and typology of SMEs, the DACH region itself, innovation, innovation strategy, innovation culture and innovation systems.

In addition to the above-mentioned study, we will analyse the information and, within “Chapter 5 Recommendation”, we will develop a framework that we think fits better to today's highly competitive environment of SME's.

## 2.1 SME's in the DACH Region and its Relation to Innovation Studies (Eduardo Cruz Medina)

For this thesis, to be as clear as possible, we decided to start by defining what SMEs are and therefore we decided to use the definition by THE COMMISSION OF THE EUROPEAN COMMUNITIES that is described in the Official Journal of the European Union, where the SME definition reads as follows: *“The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million.”*<sup>8</sup> The journal goes on to describe small enterprises as the following: *“Within the SME category, a small enterprise is defined as an enterprise which employs fewer than 50 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 10 million.*

The World Bank highlights the importance of SMEs within countries' economies by saying, *“SMEs play a major role in most of the economies particularly in developing countries. Formal SMEs contribute up to 45 percent of total employment and up to 33 percent of national income (GDP) in emerging economies”*<sup>9</sup>. This statement applies to most countries in the world. In this research, we are focusing on the European economy. The European Union states that *“SMEs are the backbone of Europe's economy. They represent 99% of all businesses in the EU. In the past five years, they have created around 85% of new jobs and provided two-thirds of the total private sector employment in the EU.”*<sup>10</sup>

Within the SME landscape we strongly believe that the understanding of innovation is not necessary clear or its definition is misused when expressing creative activities that are not systematically exploited and also with the definition of invention. Due to the lack of understanding there is confusion regarding what innovation is and what the difference is to

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<sup>8</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003H0361&from=EN>, page 4, accessed March 4th 2017

<sup>9</sup> <http://www.worldbank.org/en/topic/financialsector/brief/smes-finance>, accessed June 5<sup>th</sup> 2017

<sup>10</sup> [https://ec.europa.eu/growth/smes\\_en](https://ec.europa.eu/growth/smes_en), accessed May 1<sup>st</sup>, 2017.

simply just “changing” processes or improving services. We strongly believe that there should be a mind shift within company’s cultures where organisations go from “reacting” to the market (e.g. we improved this product because the customer complained) to a pro-active mind set where innovation is understood and companies proactively seek to change things (e.g. in this case, we did a crowdsourcing campaign where we asked the customers what they want from product x). Therefore, one of our aims is to identify if our assumptions are correct based on our empirical research.

Our second aim is to develop a framework that would be focused on helping SMEs in their journey to adopt an innovative culture. Within this framework, we propose a three-stage systematic approach. Each of these steps has an innovation system structure that is an integral part of the cadence in the model. Additionally, this framework also includes a Stage 0 (zero) which we call “the assessment stage”. The aim of Stage 0 is to pinpoint a simple overview of the company strategy. Ideally the company that is assessed should have a clear understanding where the best fit of the innovation strategy would be.

These three stages represent three systematic innovation cycles. The length of the cycle will be determined by the business model of the company that is aiming to implement our proposed framework; for example, a retail store has a different sales cycle compared to an airplane manufacturer.

Our proposed systematic approach aims for a cadence that will ensure the adoption is as friendly as possible and also that there is a recurrence of innovation within the company. Innovation should not be something that you implement once and then it runs by itself. The concept needs to be revisited periodically allowing for the company to stay in touch with their innovation efforts.

The following is a short description of the three stages:

Stage 1: It proposes an innovation system on project basis. This stage fits to any SME company that has not had any systematic approach for innovation activities. The idea is to start small by integrating the concept of innovation within one project and then progress until the ultimate goal is achieved i.e. a culture of innovation. This way the financial investment impact is not so big on a small or medium organization but on the other hand the financial benefits can be seen right away.

Stage 2: It proposes a strategic approach to innovation based on an innovation system and as part of the overall company's strategy. This stage is where most companies feel comfortable when talking about innovation. This would be also a natural "next step" for such companies, where they go from a small, project based approach, to a more elaborate, strategic approach where innovation is part of more than just one project.

Stage 3: It proposes the bigger step of adopting innovation as a culture. In this stage innovation becomes as important as customer satisfaction or the social responsibility of a company. This would be the ultimate achievement, where the organization lives and breathes innovation and ultimately sees the benefits.

The Cadence Innovation System (CIS) should be suitable for any SME that understands the importance of innovation, innovation systems, and innovation strategy and has a strategy with a clear focus on competitive advantages<sup>11</sup>.

Innovation is not a new topic, but never the less, it has evolved. For example, this is seen in how it is defined<sup>12</sup>, how it is studied, how it has been positioned and its importance within companies as well as the world economy<sup>13</sup>.

The changes in the way that innovation has been studied can be easily seen if we compare research and development (R&D) practices in the past to the recent way of looking into trends of innovation management. This is mentioned in the research paper "The evolution of innovation management towards contextual innovation"<sup>14</sup>. An important finding from this research is the following: *"The idea that there is a single mainstream innovation approach does not match with the (successful) approaches companies have adopted"*. This is

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<sup>11</sup> Jones, G. & Hill, C. Theory of Strategic Management, 10<sup>th</sup> edition, page 97.

<sup>12</sup> <http://journals.sagepub.com/doi/abs/10.1177/002248717502600114?journalCode=jtea>, accessed on June 6<sup>th</sup> 2017

<sup>13</sup> <http://www.worldbank.org/en/topic/financialsector/brief/smes-finance>, accessed on June 4<sup>th</sup> 2017

<sup>14</sup> J. Roland Ortt, Patrick A. van der Duin, (2008) "The evolution of innovation management towards contextual innovation", European Journal of Innovation Management, Vol. 11 Issue: 4, pp.522-538, doi: 10.1108/14601060810911147

one of the reasons why we believe that a framework developed for SMEs, which is flexible by definition, is needed by many companies around the world.

## **2.2 Business environment in the DACH region (Eduardo Cruz Medina)**

To narrow down our research, we will focus on the region called DACH, which is a sub region within the European Union<sup>15</sup>. The DACH region comes from the initials of the countries it represents: Germany<sup>16</sup> (D), Austria<sup>17</sup> (A) and Switzerland<sup>18</sup> (CH). These countries are situated in the Western part of Europe and one of main shared characteristics of these countries is that German<sup>19</sup> is recognized as an official language. Also, they are part of the Schengen Area<sup>20</sup> cooperation which is critical for free movement of Europeans, non European, businessmen, tourist or persons legally present in the area. Due to the above-mentioned facts, the three countries are very important economical partners. They also have very efficient education systems and government programs to incentivize the creation of SMEs, for example, via the German Center for Research and Innovation<sup>21</sup>, The Austrian Research Promotion Agency<sup>22</sup> and State Secretariat for Economic Affairs<sup>23</sup>.

The three countries that belong to DACH region enjoy a strong economy and their current forecast for 2017 and 2018 is optimistic.

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<sup>15</sup> [https://europa.eu/european-union/about-eu/eu-in-brief\\_en](https://europa.eu/european-union/about-eu/eu-in-brief_en), accessed on April 15<sup>th</sup>, 2017

<sup>16</sup> [https://europa.eu/european-union/about-eu/countries/member-countries/germany\\_en](https://europa.eu/european-union/about-eu/countries/member-countries/germany_en), accessed on April 15<sup>th</sup>, 2017

<sup>17</sup> [https://europa.eu/european-union/about-eu/countries/member-countries/austria\\_en](https://europa.eu/european-union/about-eu/countries/member-countries/austria_en), accessed on April 15<sup>th</sup>, 2017

<sup>18</sup> <https://www.admin.ch/gov/en/start.html>, accessed on April 15<sup>th</sup>, 2017

<sup>19</sup> <https://www.ethnologue.com/language/deu>, accessed on April 15<sup>th</sup>, 2017

<sup>20</sup> [https://ec.europa.eu/home-affairs/what-we-do/policies/borders-and-visas/schengen\\_en](https://ec.europa.eu/home-affairs/what-we-do/policies/borders-and-visas/schengen_en), accessed on April 15<sup>th</sup>, 2017

<sup>21</sup> <http://www.germaninnovation.org/resources/entrepreneurship-funding/federal-resources>, accessed on April 15<sup>th</sup>, 2017

<sup>22</sup> <https://www.ffg.at/en>, accessed on April 15<sup>th</sup>, 2017

<sup>23</sup> [https://www.seco.admin.ch/seco/en/home/Standortfoerderung/KMU-Politik/Finanzierung\\_der\\_KMU.html](https://www.seco.admin.ch/seco/en/home/Standortfoerderung/KMU-Politik/Finanzierung_der_KMU.html), accessed on April 15<sup>th</sup>, 2017

Table 1. Economic data and 2017 & 2018 forecast.<sup>24</sup>

| GDP at market prices | 2014 | 2015 | 2016 | 2017 | 2018 |
|----------------------|------|------|------|------|------|
| D - Germany          | NA   | NA   | 1.7  | 1.9  | 1.7  |
| A - Austria          | 0.8  | 0.8  | 1.5  | 1.5  | 1.3  |
| CH - Switzerland     | 2    | 0.8  | 1.6  | 1.7  | 1.9  |
| Consumer price index | 2014 | 2015 | 2016 | 2017 | 2018 |
| D - Germany          | 0.8  | 0.1  | 0.3  | 1.4  | 1.7  |
| A - Austria          | 1.5  | 0.8  | 0.9  | 1.7  | 1.8  |
| CH - Switzerland     | 0    | -1.1 | -0.4 | 0.3  | 0.5  |
| Unemployment rate    | 2014 | 2015 | 2016 | 2017 | 2018 |
| D - Germany          | 5    | 4.6  | 4.2  | 4.2  | 4.1  |
| A - Austria          | 5.7  | 5.8  | 6.3  | 6.6  | 6.6  |
| CH - Switzerland     | 4.5  | 4.5  | 4.6  | 4.6  | 4.5  |

Source: Own elaboration

## 2.3 Innovation definition and framework (Eduardo Cruz Medina)

There is not a single definition of innovation, hence we have decided to use the one mention by Roger Smith in his paper “The Evolution of Innovation”<sup>25</sup> which reads as follows: “*Innovation is an activity or action that creates value from materials, processes or*

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<sup>24</sup> <http://www.oecd.org/eco/outlook/economic-forecast-summary-switzerland-oecd-economic-outlook-november-2016.pdf> & <http://www.oecd.org/eco/outlook/economic-forecast-summary-austria-oecd-economic-outlook-november-2016.pdf> & <http://www.oecd.org/eco/outlook/economic-forecast-summary-germany-oecd-economic-outlook-november-2016.pdf>, accessed on April 15<sup>th</sup>, 2017

<sup>25</sup> Roger Smith, The evolution of innovation, Research Technology Management, May 2008, Vol.51(3), pp.59-62 [Peer Reviewed Journal]

*ideas that are available to many people, but which have not been recognized or explored by others*”<sup>25</sup>. In this definition, it is clearly stated that innovation needs to create some sort of value and for most of companies translates into growing their revenues which in fact is the corner stone of our thesis and it is what differentiates innovation from concepts like “invention” and “creativity”.

In our research, we have come across a subtle variation of the definition that we find interesting. In the definition of “successful innovation” by Antony Warren and Gerald Susman in their paper named “Review of Innovation Practices in Small Manufacturing Companies”<sup>26</sup> the following is stated: *“Successful innovation is the use of new technological knowledge, market knowledge, and business models that can deliver a new product or service, or product/service combinations, to customers who will purchase at prices that will provide profits”*. This definition emphasizes that the price will generate profits and not only create economical value. We interpret this as the correct way of pricing products or services, to not only accomplish the act of selling, but also emphasizing the importance of generating enough profit to continue the endeavour.

Innovation generates controversy due to the lack of a naming convention for the word and any subtle change can generate a lot of information. This can be seen in a paper written by Joao P. C. Marques called “Closed versus Open Innovation: Evolution or Combination?”<sup>27</sup> where he states, *“We question whether this concept is really a new model, or if it is nothing more than a recent combination, sponsored by academics”*.

In our survey, we are using the concepts of innovation, invention<sup>28</sup> and creativity<sup>29</sup> to understand what people perceive when talking about innovation. We want to understand if

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<sup>26</sup> <https://www.smeal.psu.edu/fcfe/research/white/innovation.pdf>, accessed on April 30<sup>th</sup>, 2017

<sup>27</sup> <http://dx.doi.org/10.5539/ijbm.v9n3p196>, accessed on April 30<sup>th</sup>, 2017

<sup>28</sup> Kevin J. Bowmana and Sarinda Taengnoib, Invention, Innovation, and Wage Inequality in Developed Countries Eastern Economic Journal, 2013, 39, (511 – 529)

<sup>29</sup> [http://web.mit.edu/curhan/www/docs/Articles/15341\\_Readings/Group\\_Performance/Amabile\\_A\\_Model\\_of\\_CreativityOrg\\_Beh\\_v10\\_pp123-167.pdf](http://web.mit.edu/curhan/www/docs/Articles/15341_Readings/Group_Performance/Amabile_A_Model_of_CreativityOrg_Beh_v10_pp123-167.pdf), accessed on April 30<sup>th</sup>, 2017

organizations have the same problems when defining their innovation efforts. We also want to understand to what extent these companies are truly innovative or simply just creative.

The framework that we will propose, which is shown in detail within chapter 5, stands on some basic concepts that we consider important in order to achieve the adoption of an innovative culture. The following lists these to keep a clear overview of them throughout the remainder of this paper:

- Open and close innovation
- Analogue and distant markets
- Customer oriented design
- Ambidexterity
- Innovation system
  - People
  - Control system
  - Technology
  - Structure
  - Culture
  - Communication
  - Strategy

Our proposed framework should be clear to every employee within a company regardless of their role. How can we achieve a model that balances effectiveness and simplicity? To achieve this, we believe we need to have a model that is measurable, systematic, repeatable and considers today's activities allowing us to know what we need to do in the future.

When we say measurable, we mean that it needs to have a strong “control system”. This control system will be based on the most relevant key indicators for the company's business model. We will propose as starting the key indicators the ones described by

Hertenstein, Julie H;Platt, Marjorie B 2000, for “Financial and Non-Financial Measurement of design performance in Questionnaire”<sup>30</sup> table.

Our idea of a “systemic” use of an Innovation System is based on defining what are the most important factors for a company to consider when implementing innovation initiatives, for example: communication is important to quickly achieve conceptual adoption.

By repeatable, we want to emphasize that the innovation system selected will have a cycle that upon reaching its end, will automatically go back to the starting point. During the first three stages of the cycle there will be adjustments based on the characteristics of the project, strategy and culture. However, once a company has accomplished its third stage, it will continue repeating the process every time the business cycle of the company is reached.

We want to drive a mind-set that looks at both today and future efforts, utilizing the concept of ambidexterity, yet the message is always the same; the framework shall provide the basis to approach the future in a systematic way.

## **2.4 SMEs and its relation to innovation (Eduardo Cruz Medina)**

SMEs experience innovation in a different way that large enterprises do. SMEs have a less complex structure than larger enterprises, hence their capability to adapt and modify their efforts more effectively. This is also true when it comes to innovation.

What motivates SMEs to innovate? SMEs have different drivers compared to large enterprises when looking for innovation and one of these reasons is the lack of resources. Large companies have the resources, market and their leading position which forces them to continuously look for better ways of creating or acquiring modern technologies, products or methodologies to satisfy their customers.

Meeting customer expectations, in our opinion, is the most genuine driver for innovation in SMEs and the main goal of each company. By this we mean it is important to

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<sup>30</sup> Hertenstein, Julie H;Platt, Marjorie B, *Accounting Horizons*; Sep 2000; 14, 3; ABI/INFORM Collection, page 310

consider what would be useful to customers. This way innovation can be financed in a less risky way and revenues would not necessarily stop. Also, this is the most convenient way to develop innovation. Nevertheless it does not guarantee that something might change in the meantime, for example; a new product or service, that can substitute the current one or simply be cheaper with comparable performance, is a situation where revenues might be interrupted and the financing of the development gets compromised.

Listening to customers will naturally prompt companies into an open innovation model known as the Lead User method. Lead user innovations are effective from the cost and demand perspective as cost can be driven to the minimum by focusing only in the changes that add value to the user. On the market side it is very important that demand in the market for that specific improvement exists and this is important when we think about what marketing efforts are needed.

The importance of user innovation is also mentioned in the research paper ‘open innovation in SMEs: Trends, motives and management challenges’<sup>31</sup>, where the findings confirmed the importance of user innovation.

Another reason why we identify the Lead User method as being so relevant for SMEs is that with this approach, the enterprises will develop a customer-oriented culture. A proactive market orientation is important to create an innovative culture within a company, which is important for companies to have a better chance of developing radical innovations<sup>32</sup>. In order to aim for radical innovation, it’s necessary for companies to be engaged in all types of open innovation sourcing or external knowledge acquisition.

There are more reasons for companies to engage in innovation. As mentioned above, customers are important and other reasons will depend on the company’s strategy and market orientation. Companies also are sensitive to their environment, meaning competition might put pressure in their willingness to engage in innovation activities.

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<sup>31</sup> van de Vrande, Vareska ; de Jong, Jeroen P.J. ; Vanhaverbeke, Wim ; de Rochemont, Maurice Technovation, 2009, Open innovation in SMEs: Trends, motives and management challenges. Vol.29(6), pp.423-437

<sup>32</sup> Christian Lüthjer, Hamburg University of Technology, presentation November 2016, Vienna, Austria

The leadership and culture of the company are a crucial factor when engaging in innovation initiatives. These factors can act as positive catalyst for knowledge acquisition and assimilation, hence influence innovation. This is deeply studied in the research done by Rodney McAdam, Renee Reid, Mark Shevlin, (2014)<sup>33</sup>, where they also explain that the distance to resource can motivate SMEs to innovate. Some industries might be more sensitive than others. For example, a less sensitive industry could be information technology (IT) and in particular, software companies.

What is the real impact of innovation for SMEs? For any company, regardless of their size, implementing innovation initiatives requires a deep commitment due to the variety of practices that are involved. Gassmann et al. 2010<sup>34</sup> described the process of innovation as inbound, outbound and coupled, which in more recent times we refer as close innovation, open innovation and alliances.

Open innovation is highly relevant to SMEs as these companies need to overcome their smaller size, which mainly limits their reach due to the lack of resources in not only people, but also financing. These limitations prevent them being scalable and therefore, very often, SMEs that have innovative ideas need to search for complementary assets to be more effective and efficient reaching their target market.

Andre Spithoven, Wim Vanhaverbeke and Nadine Roijakkers conclude in their paper, “Open innovation practices in SMEs and large enterprises”<sup>35</sup> *“In general, we can conclude that OI is more important for SMEs than for large firms and that SMEs are prone to use different sets of OI practices to realize OI benefits than large enterprises.”*<sup>35</sup> This conclusion contradicts Schumpeter’s idea that *“large enterprises are endowed with monopoly power, which enables them to benefit more from innovations than small firms”*<sup>35</sup>. Nevertheless, we

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33 Rodney McAdam, Renee Reid, Mark Shevlin, (2014) "Determinants for innovation implementation at SME and inter SME levels within peripheral regions", International Journal of Entrepreneurial Behavior & Research, Vol. 20 Issue: 1, pp.66-90, doi: 10.1108/IJEBR-02-2012-0025 Permanent link to this document: <http://dx.doi.org/10.1108/IJEBR-02-2012-0025>

34 Gassmann, O., Enkel, E., & Chesbrough, H. (2010). The future of open innovation. R&D Management, 40(3), 213–221.

35 Spithoven, A., Vanhaverbeke, W. & Roijakkers, N. Small Bus Econ (2013) 41: 537. doi:10.1007/s11187-012-9453-9

tend to agree with the conclusion that SMEs can benefit more from innovation. This conclusion supports our enthusiasm for the need of SMEs to have a systematic approach, using the correct terminology and adopting innovation as a culture, rather than a trend.

What makes SMEs more effective? SMEs have size as their main advantage, which makes them more agile and better at managing multiple innovation activities. Nevertheless, this same characteristic makes them more vulnerable and dependent on external innovation, which brings the risk of losing their competitive advantages.

SMEs that implement innovation also aim to increment their revenue and increase their profitability. For many companies, this can be the main driver and we agree that to consider an innovation successful, the profitability aspect needs to be substantial, as we mentioned before in this paper, in the definition used by Professor Warren. As we have already mentioned, we are aiming to have a customer-oriented approach, which we believe gives a company a better chance in aiming for long-term results.

When it comes to resources, it is important to have a clear view of what might be needed, what is available and what is easily accessible. This basic knowledge is not that obvious. Resource availability might be internal and external, for example: a possible external “available resource” may be simply unknown now, due to the fact that it might belong to an analogue market. Analogue Markets refer to those industries that have little to do with a company’s core practice, but that might have knowledge from their experience or their daily practice that could be a good solution fit for the company’s challenge in a different industry at that point in time.

We have heard that people are companies’ biggest asset and we definitely see employees as an important part of any innovation model. When we refer to people we mean every employee and their creativity needs to be explored and nurtured for the benefit of the company. It is important to keep in mind that people in many cases hesitate to share their ideas thinking that it could be something “not smart”, so in this case, providing anonymity could address this situation. On the other hand, for many people, recognition is very important and for this situation it is necessary to provide the correct channel of communication for their ideas. Another situation might be people that want recognition but not the responsibility of leading their idea into creation. Again a scenario for these cases needs to be considered. Teresa M. Amabile in her paper “A Model of Creativity and

Innovation in Organization”<sup>36</sup> talks about four criteria for models of organizational innovation. Two of them in particular sustain our argument for the importance of employees in an innovation system. These two criteria are stated as follows:

*a) The entire process of individual creativity should be considered as a crucial element in the process of individual innovation.*

*d) The model should describe the influence of organizational factors on individual creativity.*

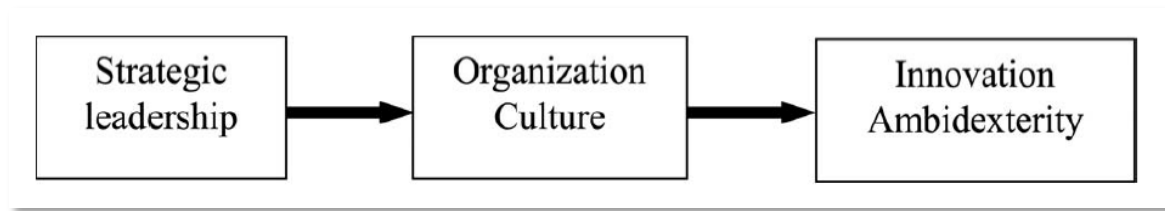
Another important aspect of the value of people in an innovative organization is that they are the ones that will stand for the values of the company. SMEs have a fantastic opportunity to build a homogeneous culture through innovation. Leaders are responsible of leading the culture in their companies. They need to have a consistent message between their innovation initiatives and the management style, which needs to be adapted to the new way of thinking. People will always recognize inconsistencies. Therefore, strategic leaders play a critical role in balancing the exploitation and exploration. For each of these activities a deferent management style might be needed and Hsing-Er Lin and Edward F. McDonough III, 2011, suggest the following: “*Strategic leaders need to gather intelligence about changes in the environment, competitive conditions, and the organization’s competitive position relative to their environment and bring it inside the organization.*”<sup>37</sup>.

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<sup>36</sup> Amabile, T. M. "A Model of Creativity and Innovation in Organizations." In Research in Organizational Behavior. Vol. 22, edited by B. Staw and R. Sutton. Elsevier Science, 2000.

<sup>37</sup> Hsing-Er Lin and Edward F. McDonough III, Investigating the Role of Leadership and Organizational Culture in Fostering Innovation Ambidexterity, IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT, VOL. 58, NO. 3, AUGUST 2011

Figure 1: *Proposed relationships among strategic leadership, organization culture and innovation ambidexterity*



Source: Investigating the Role of Leadership and Organizational Culture in Fostering Innovation Ambidexterity<sup>37</sup>

In the above figure, they explain that an innovative ambidextrous organization requires a culture and leadership that fits each other. We interpreted that high commitment of leaders will create the adequate management style, creating a positive environment to promote a culture, and consequently an ambidextrous organization is likely to happen.

We deeply believe in the benefits of ambidexterity in organizations and as an integral part of innovation. Mladenka Popadić<sup>1</sup>, Matej Černe<sup>2</sup>, Ines Milohnić<sup>1</sup>, 2015, have reached a similar opinion in their study where they state: *“The results indicate that exploration and exploitation are positively related to firm’s innovation performances which supports our assumption that both are complementary”*<sup>38</sup>. Nevertheless, this study was done for companies and industries of all sizes and we are interested to understand how ambidexterity can be achieved in SMEs. Yi-Ying Chang and Mathew Hughes, 2012, have already done some research tackling the topic of, *“How innovation ambidexterity can be achieved, particularly so in small-to-medium-sized firms (SMEs)”*. Their study explains what SMEs need to do to achieve ambidexterity. They emphasize the dimensional balance needed between structural, contextual and leadership characteristics<sup>39</sup>.

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<sup>38</sup> Mladenka Popadić<sup>1</sup>, Matej Černe<sup>2</sup>, Ines Milohnić<sup>1</sup>, Organizational Ambidexterity, Exploration, Exploitation and Firms Innovation Performance, DOI: 10.1515/orga-2015-0006

<sup>39</sup> Yi-Ying Chang, Mathew Hughes, Drivers of innovation ambidexterity in small- to medium-sized firms, European Management Journal (2012) 30, 1– 17

Structural characteristics refer to the understanding that *“The firm’s structure may then influence the firm’s ability to pursue each type of innovation.”*<sup>39</sup>

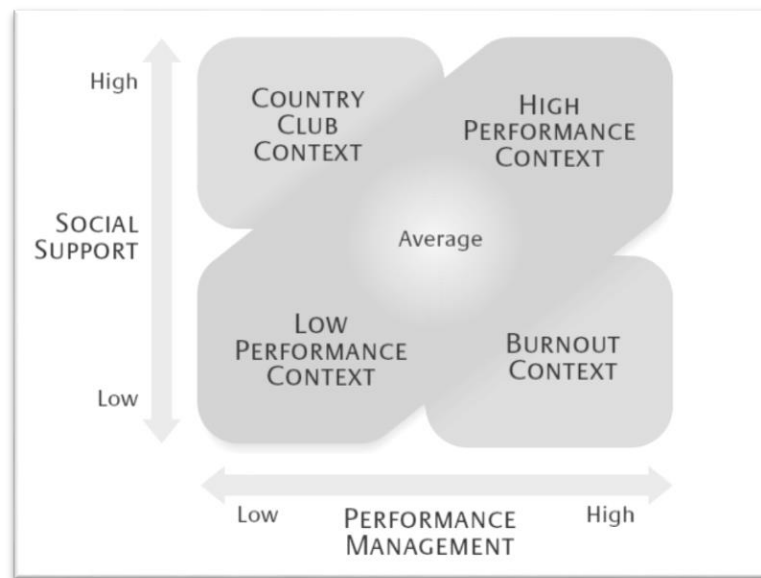
Contextual characteristics are very complex and are described in this study by making reference to the work of Gibson, C. B., & Birkinshaw, J. It can be explained as *“when the managers of a business develop a supportive firm context that enables individuals to make their own judgments on how best to manage conflicting task demands”* and *“By shaping a set of systems and processes that define a context that allows exploration and exploitation to take place, individuals can be directed to innovate ambidextrously”*.<sup>40</sup> We would like to bring some attention to a study done by Julian Birkinshaw and Cristina Gibson, 2004<sup>41</sup> that suggests visually how high performance context can be achieved. In the below figure we can see the importance of the balance between performance management and social support.

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<sup>40</sup> Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47(2), 209–226.

<sup>41</sup> Julian Birkinshaw and Cristina Gibson, Building Ambidexterity Into an Organization, MIT SLOAN MANAGEMENT REVIEW, SUMMER 2004 VOL.45 NO.4

Figure 2: Organizational Context



Source: Gibson and Birkinshaw, 2004

Leadership characteristic is described as the following: “*the SMEs require top managers to secure slack resources such as human capital and financial capital to pursue a balance of explorative and exploitative innovations*”.<sup>42</sup> What they mean by human capital is that managers are responsible when providing the company with the required talent to move forward. In regard to financial capital they explain it as a responsibility of the manager to secure enough financing to execute the planned exploration and exploitation activities. We think that this is the most common failure for enterprises. Not only is there a lack of capabilities when a manager tries to balance exploration and exploitation activities, but when small enterprises transition into medium size enterprises, managers often struggle and do not necessarily have the required skill set to successfully transfer and take on the added responsibility. There are managers that have the know-how and the capability to run a small

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<sup>42</sup> Yi-Ying Chang, Mathew Hughes, Drivers of innovation ambidexterity in small- to medium-sized firms, European Management Journal (2012) 30, Page 6

business but not a medium size enterprise, for example managing 50 employees is completely different to managing 250 employees.

In our efforts to create a simplified innovation system, we are keeping in mind that SMEs are a size grouping definition and not a homogeneous industry grouping. The question therefore is what the right way to support SMEs in their search for innovation strategy is. Brunswicker and Vanhaverbeke 2015<sup>43</sup> have already conducted research on how to cluster SMEs based on how they typically engage knowledge sourcing and how they access external ideas. They breakdown these clusters into five types as follow:

1. Minimal searcher
2. Supply-chain searcher
3. Technology-oriented searcher
4. Searcher application oriented
5. Full-scope searcher

In order to understand these five clusters, we used their text to summarize and interpret the grouping.

Minimal searchers are described as enterprises that “*are reluctant to open up their innovation activities to outside influences.*”<sup>41</sup> They do not trust any input, hence they are not actively combining potential internal with external innovations. This type has a very closed approach towards innovation and a model that is not cost-efficient.

Supply-chain searcher: “*SMEs rely heavily on “traditional” supply chain linkages. Their innovation activities do not rely on input from sources.*”<sup>41</sup> They do not give relevant importance to their network of partners as a potential source of innovation.

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<sup>43</sup> Sabine Brunswicker and Wim Vanhaverbeke, Open Innovation in Small and Medium-Sized Enterprises (SMEs): External Knowledge Sourcing Strategies and Internal Organizational Facilitators, Journal of Small Business Management 2015 53(4), pp. 1241–1263

Technology-oriented searchers are companies that “*are characterized by a relatively high degree of interaction with universities, research organizations, and IPR experts.*”<sup>41</sup> They rely on their well-established networks to innovate, engage and to complement their resources in order to pursue an idea.

Searcher application oriented: “*SMEs of type 4 are application-oriented and demand driven innovation searchers. Such SMEs regularly interact with value chain actors (for instance customers and suppliers) to get access to new ideas.*”<sup>41</sup> They have a customer-oriented mentality, they constantly look for ideas having their customers in mind and they also focus on the usability of the improvements. They are averse to trends.

Full-scope searchers are companies that “*are heavily involved in knowledge sourcing, show a strong interest in external ideas from various innovation sources and have built an innovation ecosystem for new ideas.*”<sup>41</sup> These companies are open to all sources of external innovation and the most important characteristic is that they have an “ecosystem” which we claim it is the goal of innovative enterprises.

This grouping provides a strong basis for our framework that is presented in detail during Chapter five. Nevertheless, our vision is the mix of searcher application oriented, which will provide the customer orientation and the usability of the improvement and Full-scope searcher, which should provide the basis for exploration.

## **2.5 Previous frameworks and models (Eduardo Cruz Medina)**

We have already mentioned that an enormous quantity of information exists and it is part of the challenge that companies and managers find when trying to search on their own for a suitable tool for management of innovation. One of the added values of our Cadence of Innovation System (CIS) is the consolidation of information translated into a system. We consider it very important to compare our proposed framework versus frameworks previously created. Figure 3 shows a quick overview.

Figure 3. Selected Frameworks to compare our Cadence of Innovation System

| Framework Name           | The Holistic Innovation Framework (HIF) <sup>44</sup>                                                                                                                                                                                                                                                                                                                                                                    | Framework for reverse innovation SMEs <sup>45</sup>                                                                                                                                                                                                                                              | The Organizational Innovation System <sup>46</sup>                                                                                                                                                                                                                                                                                                                              | A Model of Creativity and Innovation in Organizations <sup>47</sup>                                                   |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Authors                  | A. L. Wait, R. H. A. Seidel, M. Seidel.                                                                                                                                                                                                                                                                                                                                                                                  | Dominik Dellermann                                                                                                                                                                                                                                                                               | Jonas Van Lancker, Koen Mondelaers, ErwinWauters, Guido Van Huylenbroeck.                                                                                                                                                                                                                                                                                                       | Amabile, Teresa M.                                                                                                    |
| Highlights / Description | “The Holistic Innovation Framework (HIF) and Value Generation Model (VGM) support and extend the unique processes of New Product Development (NPD) in SMEs. The approach then externalizes the tacit process of the owner/manager, so that a wider management team can apply it. It diverges from existing large organizational NPD theory by taking a capability perspective rather than a project process perspective. | This approach signals a marked change or shift in view on the direction of the global movement or flow of innovations from the traditional approach of a top-down flow of innovations, i.e. from rich to poor countries, reverse, which is to say from developing to developed nations' markets. | It provides a holistic, hands-on concept currently lacking in the open innovation approach. From the conceptualization, a framework for analysis is put forward which provides structure to the study of ongoing and finished innovation processes. OIS is a first step in the development of a currently underdeveloped micro-level within the innovation systems perspective. | IT is a model of individual creativity is described and integrated in preliminary model of organizational innovation. |

Source: Own elaboration

We consider it very important to compare our proposed framework versus frameworks previously created. There are a lot of ideas that highlight important topics that are important to consider and we believe that each of them has the capability to achieve its described objectives.

In this search of self-challenge, we have found four frameworks/models that we believe have similar starting points to our CIS Some of them have more focus in the organizational part, or in the ideas generation and we have prepared the below table to visually map the characteristics of our framework against the selected works.

<sup>44</sup> A. L. Wait, R. H. A. Seidel, M. Seidel. 2008, A New Approach to Innovation Management in SMEs

<sup>45</sup> Dominik Dellermann, (2017) "Going East: a framework for reverse innovation in SMEs", Journal of Business Strategy, Vol. 38Issue: 3, pp.30-39, <https://doi.org/10.1108/JBS-02-2016-0014>

<sup>46</sup> Jonas Van Lancker, Koen Mondelaers, ErwinWauters, Guido Van Huylenbroeck 2015, The Organizational Innovation System: A systemic framework for radical innovation at the organizational level

<sup>47</sup> Amabile, Teresa M.1988, A Model of Creativity and Innovation in Organizations

We would like to emphasise that we recognize the valuable contribution of the selected frameworks and it is the reason why we decided to mention them within our document. The detailed comparison is described within chapter five, where we list all the components that best represent our CIS.

### **3. Method (Raul Cristian Kristo)**

This chapter is dedicated to presenting the approach we took when gathering evidence to sustain our thesis that we formulated in chapter one. In the course of this chapter, we will cover the thought process for the survey and the selection criteria for the companies that we interviewed. We sent electronic surveys and we also had direct interviews with selected companies that we had access to.

#### **Empirical investigation approach and evidence of the gathered data (Raul Cristian Kristo)**

Our research population consists of 300 unique small and medium companies from the DACH region. The definition of small and medium enterprises gave us the selection criteria. The definition says, "*Small and medium-sized enterprises (SMEs) are non-subsidary, independent firms which employ less than a given number of employees. The most frequent upper limit designating an SME is 250 employees, as in the European Union.*

*Small firms are generally those with fewer than 50 employees, while micro-enterprises have at most ten, or in some cases just five workers.*

*The new definition provides for an increase in the financial ceilings: the turnover of medium-sized enterprises (50-249 employees) should not exceed EUR 50 million; that of small enterprises (10-49 employees) should not exceed EUR 10 million, while that of micro firms (less than 10 employees) should not exceed EUR 2 million.* <sup>48</sup>

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<sup>48</sup> OECD, 2005, OECD SME and Entrepreneurship Outlook: 2005, OECD Paris, page 17.

With the help of friends and family we had access to four databases that helped us generate a list of companies based on the above-mentioned selection criteria:

- CMD complete<sup>49</sup>
- Hoppenstedt<sup>50</sup>
- Zoominfo<sup>51</sup>
- Kompass<sup>52</sup>

Due to the large number of companies within the DACH region that would fit the selection criteria, we had to narrow the sample size as it would have been impossible within this time frame to contact and interview all of them.

First, we defined what our relevant sample size (number of companies) would be for each country based on the country size and population. We defined that for Germany a number of 240 companies would be sufficient, for Austria, 30 and for Switzerland also 30 companies. Therefore a total of 300 companies would receive our survey. Once we had the list we began analysing the websites of all these companies to find an email address. For some of the websites we managed to find direct contact persons (e.g. CEO, COO or a high management position) which was very useful as a direct contact will tend to react better to a personalized survey and for all others we gathered the contact email addresses from the website.

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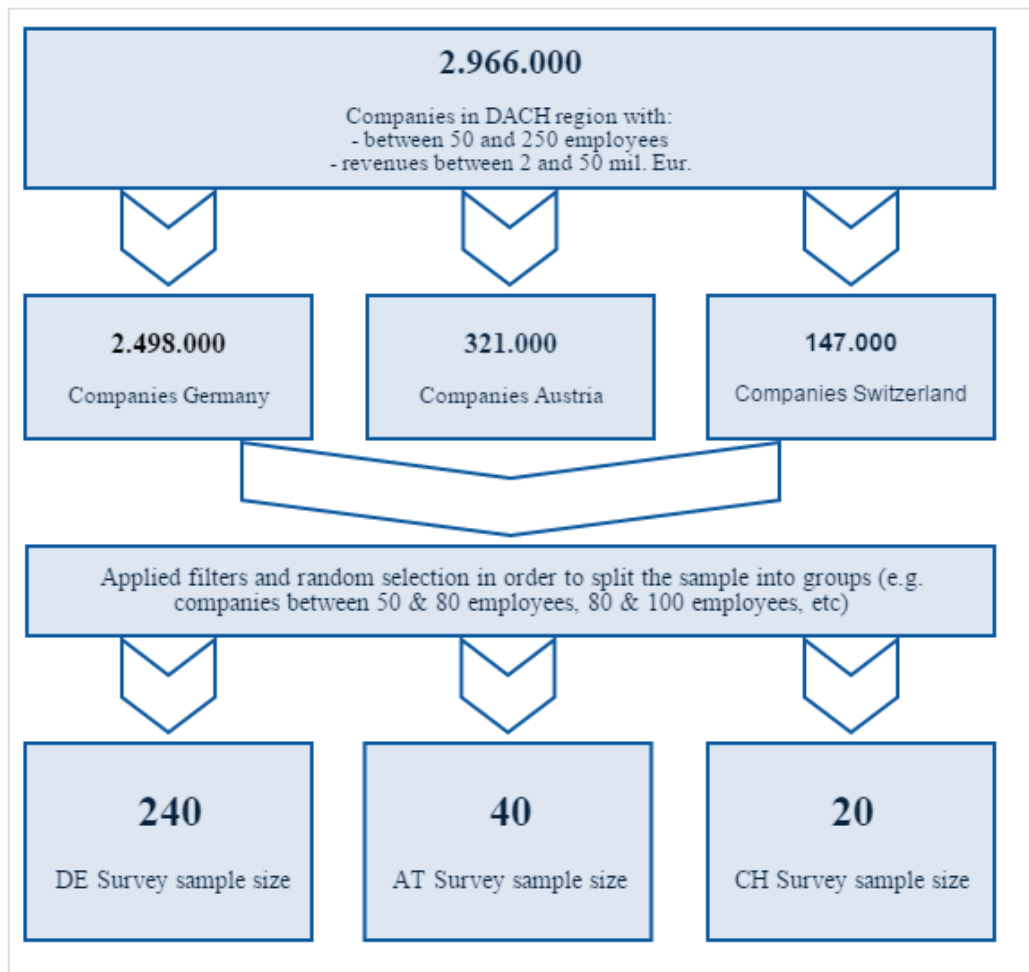
<sup>49</sup> <http://www.cmd-complete.at>, accessed on April 24<sup>th</sup>, 2017

<sup>50</sup> <https://www.hoppenstedt-firmendatenbank.de>, accessed on April 24<sup>th</sup>, 2017

<sup>51</sup> <https://www.zoominfo.com>, accessed on April 24<sup>th</sup>, 2017

<sup>52</sup> <https://at.kompass.com/en>, accessed on April 24<sup>th</sup>, 2017

Figure 4: Survey population vs. survey sample (revenues €)



Source: Own elaboration

The company list was then split into groups based on the number of employees and company revenue. Through this split we made sure that we have representatives from all company sizes and revenue. From these groups, we made our selection of companies that we would interview. The selection was random in order to assure the objectiveness of the survey.

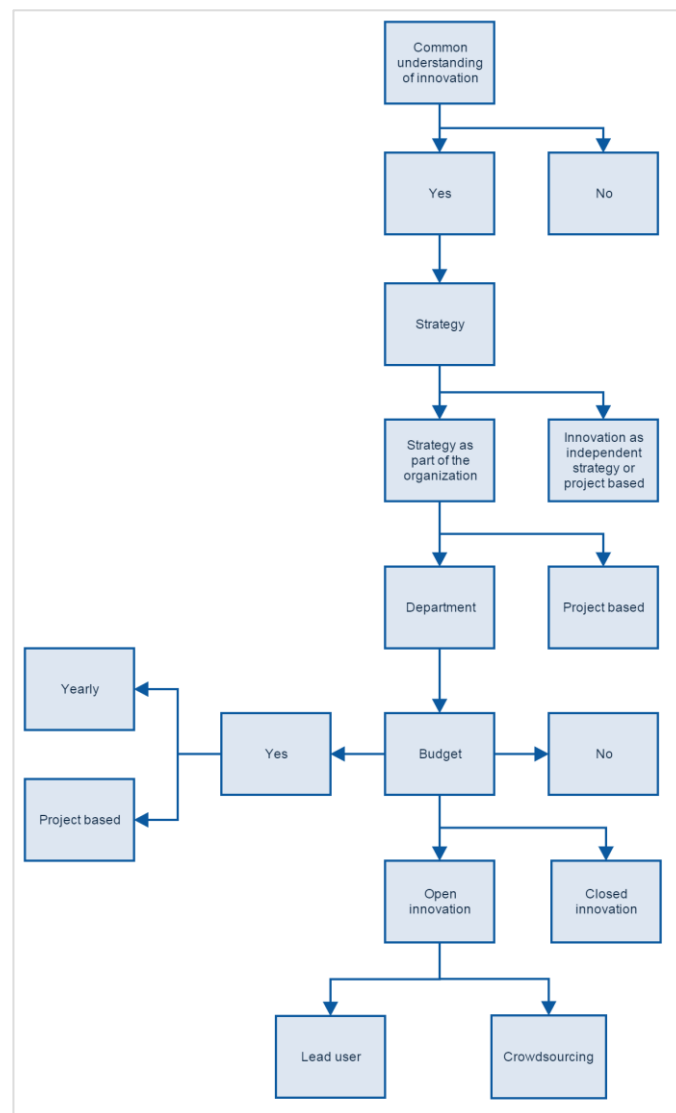
To send out the survey we used an online tool called Survey Monkey<sup>53</sup>. This survey web-tool enabled us to compare the results from all the respondents based on descriptive and

<sup>53</sup> [www.surveymonkey.com](http://www.surveymonkey.com) - the world leading provider of web-based survey solutions

analytical statistics. With this online tool we managed to send personalized emails to those contacts where we had their personal email addresses and knew their position and name.

In order to come up with a survey that made sense and was easily readable, we defined a logical concept for the questions based on the assumptions that we made in previous chapters. We started by thinking of obvious questions like "is there a common understanding of what innovation represents?" or "is there a dedicated innovation department?" In the figure below you will be able to see the entire thought process, which would guide the respondent through the survey.

*Figure 5: Survey concept*



Source: Own elaboration

Based on this concept, we started formulating the questions. The goal was to keep the number of questions to a minimum, but at the same time gather the data that we were interested in. Even though the topic of innovation in companies is such a complex topic, we decided to keep the number of questions to 14.

In order to make sure that our questions were adequate and served the purpose, we used the Harvard University questionnaire design tip sheet<sup>54</sup> which is part of a program on survey research. We used this tool to aid question audit in order to guide us through the question formulation and to get the best results. This also made sure that the survey respondents understood what the meaning was. The final survey questions and the survey design tool can be found in appendix 1 and appendix 2.

At the same time and using the same questions, we interviewed friends, colleagues and family that were either own or are working at a company that would fit the criteria described above. We did both face-to-face interviews and also sent out the survey in electronic format.

The survey was totally anonymous and we did not divulge the name of the companies that we interviewed due to requests from some of these companies not to do so.

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<sup>54</sup> [https://psr.iq.harvard.edu/files/psr/files/PSRQuestionnaireTipSheet\\_0.pdf](https://psr.iq.harvard.edu/files/psr/files/PSRQuestionnaireTipSheet_0.pdf), accessed on May 15<sup>th</sup>, 2017

## **4. Results (Raul Cristian Kristo, Eduardo Cruz Medina)**

Within this chapter we present the results of the empirical research conducted on the small and medium enterprises in the DACH region (Germany, Austria and Switzerland) done with the help of an electronic survey tool and face-to-face interviews. We conclude this chapter with a general overview and comment on the status quo.

### **4.1 Analysis of the gathered data (Raul Cristian Kristo)**

#### **4.1.1 Survey (Raul Cristian Kristo)**

As mentioned in the previous chapter, the survey was designed with the intention of finding out what small and medium enterprises in the DACH region perceive when it comes to the concept of innovation. The survey was created initially in English but then translated into German in order to accommodate the companies in this area, given that it is a German-speaking region. The questionnaire was sent out both in German and in English in order to make sure that we covered all grounds. One of the first things we observed was that most of the completed surveys were undertaken in English. We know that the DACH region has a high multicultural population as in total it hosts almost 15 million foreigners, with 8.4 million being non EU-Citizens<sup>55</sup>. This could explain why the majority of surveys were completed in English.

The questionnaire was sent to more than 300 companies from the DACH region as described in chapter 3. The questionnaire was also made available to friends and acquaintances that work in small and medium companies in the region. We managed to collect 76 respondents out of which 39 were complete responses. The remaining 27 respondents did not complete the full set of questions and therefore we did not take these

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<sup>55</sup> [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Foreign-born\\_population\\_by\\_country\\_of\\_birth,\\_1\\_January\\_2016\\_\(%C2%B9\).png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Foreign-born_population_by_country_of_birth,_1_January_2016_(%C2%B9).png), accessed June 20<sup>th</sup>, 2017

responses into consideration. Nevertheless, our 12,6 % response rate is significant to make this survey useable for our study.

Due to limitations of time and resources, we could not perform this analysis on more companies but we believe that this survey can be the foundation for a bigger research project in the future, where innovation among SMEs can be studied on a larger scale. Our research gives us sufficient information to be able to assess the bigger picture and to draw some conclusions that could be used to perform deeper analysis.

#### **4.1.2 Interpretation of results and findings (Raul Cristian Kristo**

Through our research we found out that there are companies that are very good when it comes to innovation, the so-called outliers. As a matter of fact, in Germany, there is a classification of the top 100 most innovative SME's in the country<sup>56</sup>. We also found here the so-called outliers or “spearheads”, the ones that are the leaders in that specific domain and the ones that give direction. The organizations that are listed within this classification are the best of the best when it comes to innovation, but we believe this is not representative of the entire field and therefore we were curious to understand what the situation was with the remaining SMEs.

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<sup>56</sup> <https://www.top100.de/die-top-innovatoren.html>, accessed on May 30<sup>th</sup>, 2017

Figure 6: Top 100 most innovative SME's sign-up site



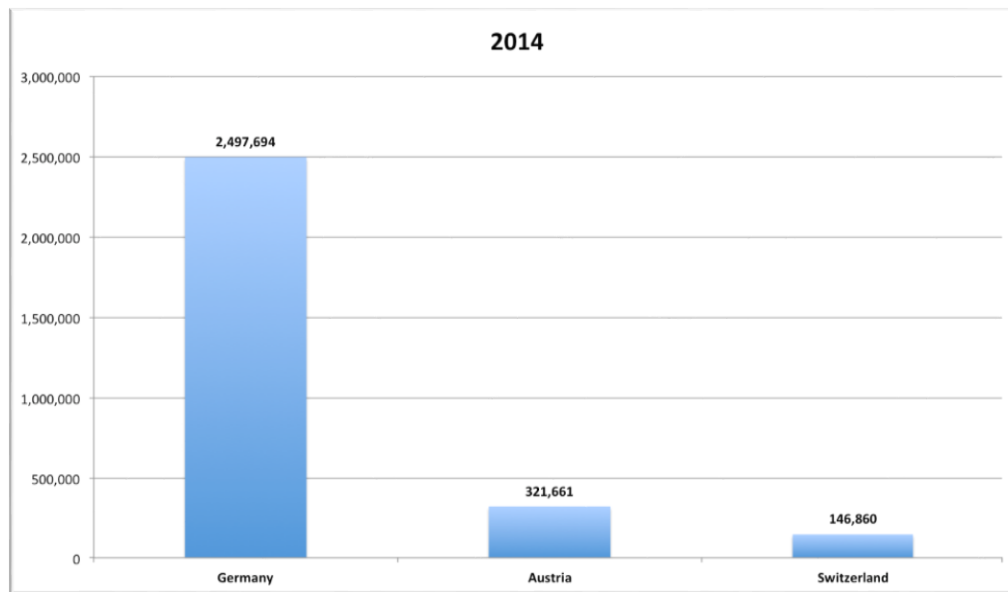
Source: official website screenshot

According to Eurostat in 2014, the DACH region contained almost three million<sup>57</sup> small and medium enterprises and the number was predicted to grow at an average rate of 1,2%<sup>58</sup> per year till year 2017 Europe wide. Out of the almost three million SMEs, 2,5 million are based in Germany, around 320 thousand are in Austria and 147 thousand are in Switzerland. By analysing only the top 100 of the most innovative companies, at least in Germany, it would not paint the entire picture of the market and country. We would like to find out what the entire population of SME's feels about innovation. We believe that in terms of innovation, only analysing the top 100 is not representative of the entire population. With this approach, we would be only looking at the best performing companies and we would not take into consideration the others.

57 Annual enterprise statistics by size class for special aggregates of activities, Eurostat, <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>, accessed on May 30<sup>th</sup>, 2017

58 Annual report on European SME's 2015/1016, page 47, figure 56 [https://ec.europa.eu/jrc/sites/jrcsh/files/annual\\_report\\_-\\_eu\\_smes\\_2015-16.pdf](https://ec.europa.eu/jrc/sites/jrcsh/files/annual_report_-_eu_smes_2015-16.pdf), accessed on May 30<sup>th</sup>, 2017

*Figure 7: Number of SME's per country in the DACH region.*



Source: Annual enterprise statistics by size class for special aggregates of activities, Eurostat.

Therefore, our analysis takes into consideration any small and medium enterprises from this region in order to diagnose the status quo of innovation. Our analysis could be also the base for a bigger research that would include more, if not all, small and medium enterprises that due to lack of time and resources where not take into consideration in this paper.

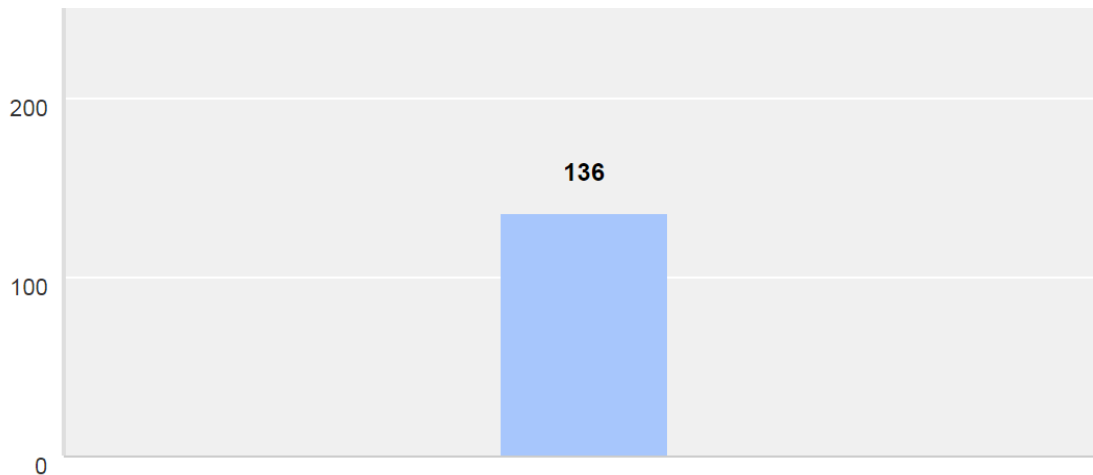
## **4.2 Analysis of survey questions results (Raul Cristian Kristo, Eduardo Cruz Medina)**

Question 1. What was the size of your company in 2016, based on the number of employees?

When segmenting the population we took into consideration companies that had from 50 to 250 employees. Also when looking at domains and industries, the companies that we surveyed are from various fields of business, from manufacturing, to banking, to auto repair shops and on average they employed 136 people. We did not split the population between different domains, as we wanted to gather information regardless of the type of business.

Figure 8: Survey question on the size of the organization.

**What was the size of your company in 2016,  
based on the number of employees?**



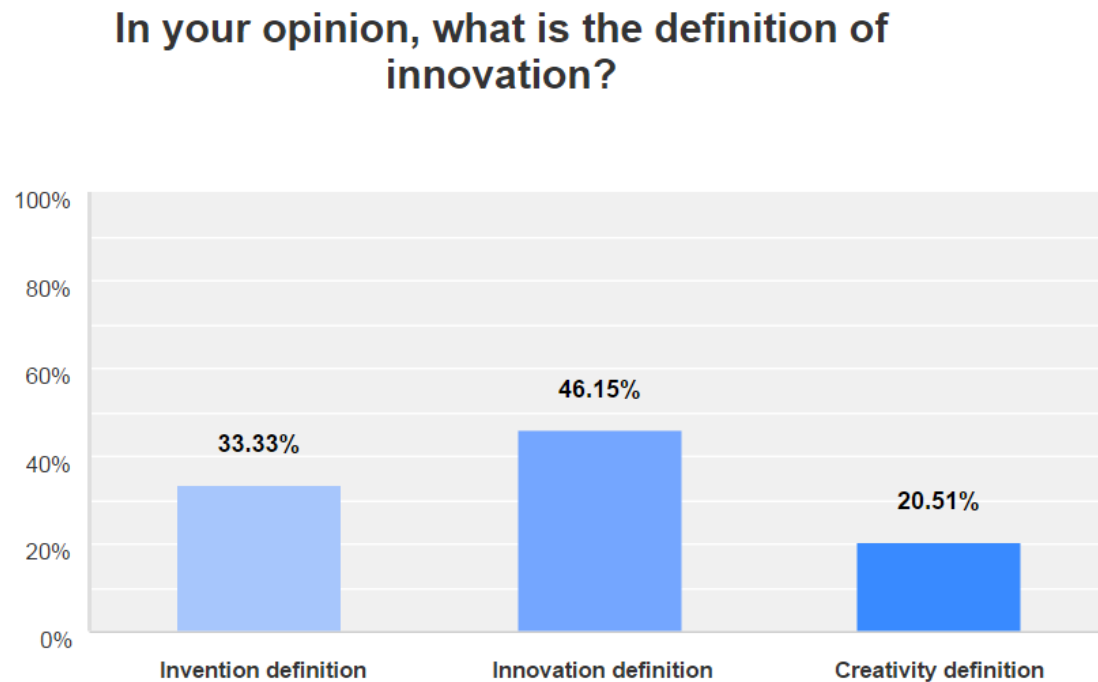
Source: Survey monkey analytics tool

Question 2. In your opinion what is the source of innovation?

One of the first questions that we asked was attempting to define what their understanding was when it comes to what is meant with innovation. When asked the above question, the respondents had to choose between creativity, innovation and invention. They were not provided though with an explanation for the terms mentioned above. Surprisingly, almost 47% of the respondents answered the question correctly. The results also show us that the majority of the respondents (more than 53%) did not have a clear understanding of the concept of innovation. Even though the three concepts of invention, innovation and creativity are very similar, we believe that there is a clear difference between them when it comes to operating a business. Even so, more than 30%, as it can be seen in figure 9, of the respondents confuse innovation with invention. This suggests, as we stated in our problem formulation during chapter 1, that many companies and their employees do not have a full understanding of what differentiates innovation from invention. We are aiming to contribute to our society by educating people in this differentiation, with our simplified message being

that innovation is the systematic approach to generate value from invention, product enhancements and service improvements.

*Figure 9: Survey question on the definition of innovation.*



Source: Survey monkey analytics tool

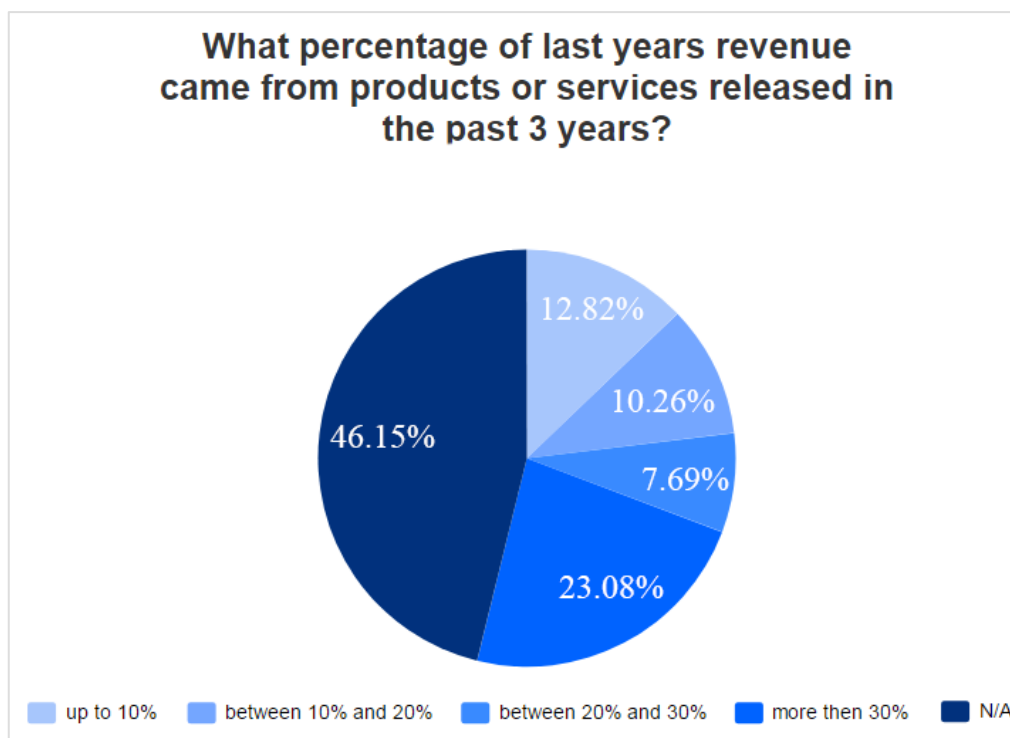
Question 3. What percentage of last year's revenues came from products or services released in the past 3 years?

The fact that companies do not have a clear understanding of what innovation represents is also reinforced by the answers to the next question. Only 23% of the respondents said that they have generated more than 30% with services or products release in the past 3 years. The graph also shows us that that 44% of the companies in the region benefit from innovation and their innovation initiatives by generating revenues from new products released in the past 3 years.

In the graph from figure 10, one can see that 46% of the interviewed companies have not generated any revenues from products or services released last year. There are a number of reasons why this might be with the three more likely reasons being as follows; first, either the company is very traditional and has not released anything new on the market since its

inception or that the products have not generated any revenues yet. Secondly, this might also mean that these companies are currently developing existing products or services and are not focusing on new products or services. Finally, that the information is not available or that it is not recognized as an important Key Performance Indicator (KPI), which we could also be interpreted as an opportunity area to challenge the current control system and in such cases we would be able to identify a potential user of our proposed framework.

*Figure 10: Survey question on last year's revenues coming from products or services released in the past 3 years.*



Source: Survey monkey analytics tool

In any case we believe that companies that do not release new products or services on the market continuously are going to be in trouble in the near future. We believe that the service industry is evolving at a very rapid pace, compared to manufacture industry. If companies do not stay on top and bring new products or services on the market that satisfy the needs of customers, the chances that those companies will not exist in the near future are high. This can be easily achieved by incorporating more innovation initiatives within the organization, meaning a formal innovation system would be needed.

It is worrying to see that more than 46% of the companies are not releasing new products or services, but on the other hand most of the companies have at least 10% of their revenues coming from new products or services.

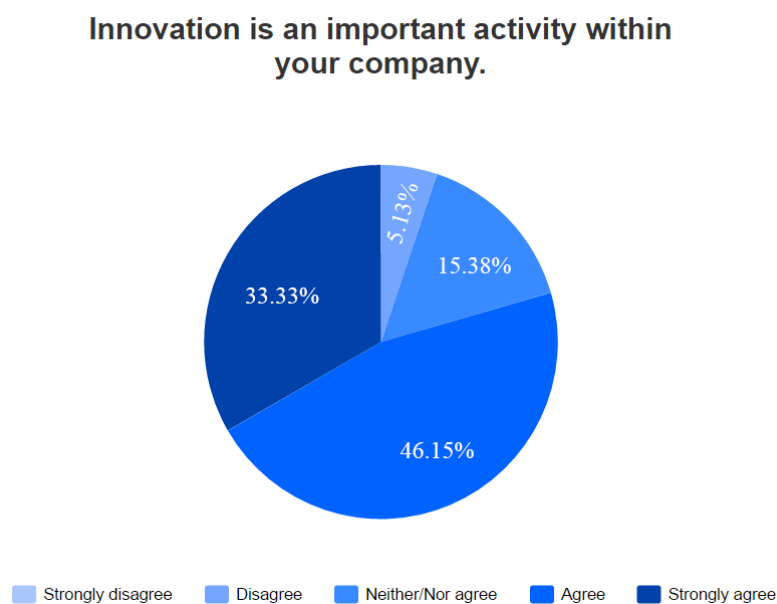
Question 4. Is innovation an important activity within your company?

Here we addressed another important topic. We wanted to understand how important innovation is or should be within these organizations. Almost 80%, as seen in figure 11, of the respondents agreed or strongly agreed that innovation is something that needs to be treated very seriously and it should be a very important activity within the organization.

When relating this question to the previous one, we could interpret that organizations do not really understand what the concept of innovation is, but they would like to find out and therefore the importance of a framework that is comprehensible and that aims to help integrating such a concept within their businesses is vital.

Due to the fact that more than 20% (see figure 11) of the respondents either do not have an opinion or disagree with the importance of innovation, that this resembles a lack of understanding of the concept.

*Figure 11: Survey question on the importance of innovation within the company.*

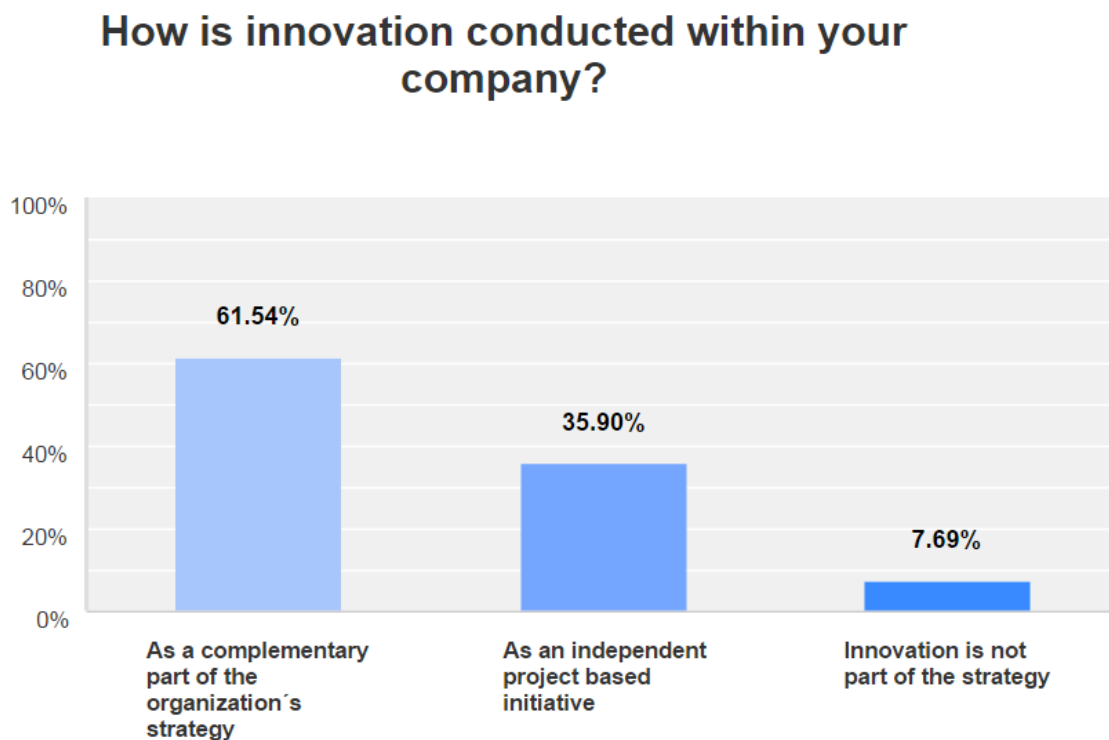


Source: Survey monkey analytics tool

### Question 5. How is innovation conducted within your company?

The next question clearly emphasizes the fact that there is a misconception when it comes to innovation. If the previous survey results are taken into consideration when analysing the results of question 5 (see figure 12), the results are clearly misleading. Organizations do not fully grasp the concept of innovation, they do not generate revenues from innovating, but on the other hand, more than 61% of the respondents say that innovation is a complementary part of the organizations strategy. How can innovation be part of an organizations strategy when the concept is misunderstood or when more than 20% of the respondents say that innovation is not an important activity within their organization? This is a big question mark. Have these companies have fallen into the trap of thinking that they are in fact practicing innovation when they are being just creative or inventive and that the concept is deeply rooted within the organization strategy, when actually it is not. Or do they really pursue innovation and it is an important aspect of their organization, but they would need help with understanding the roots of the concept and what it stands for.

*Figure 12: Survey question on how innovation is conducted with the company.*



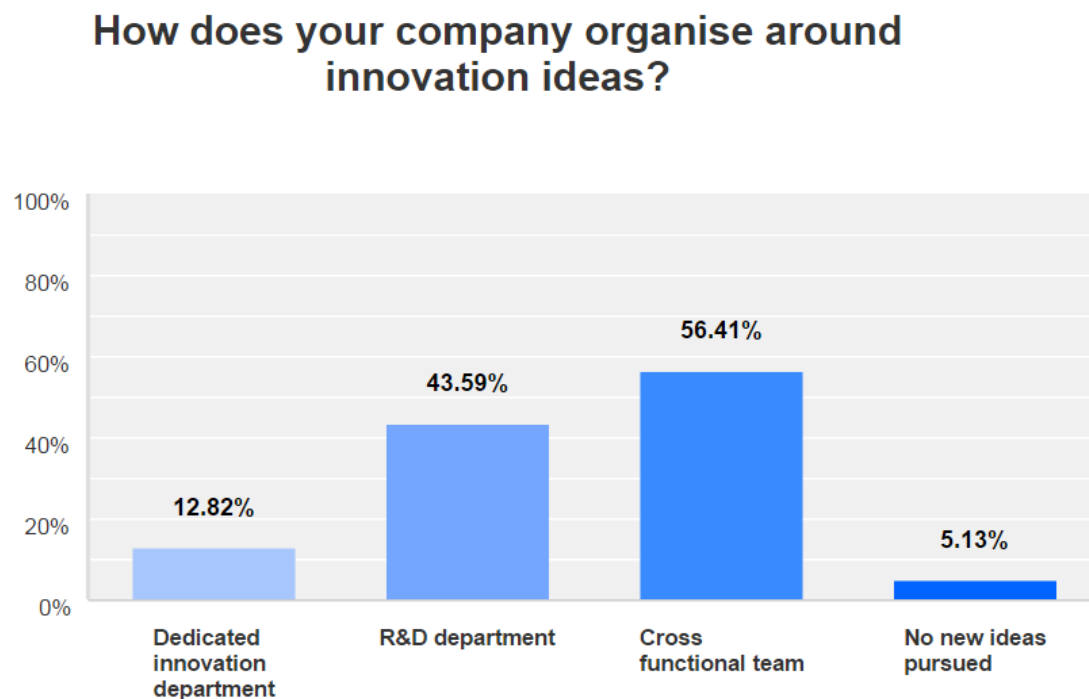
Source: Survey monkey analytics tool

## Question 6. How does your company organize around innovation ideas?

Following the concept logic that we defined in the previous chapter, the next survey questions tackled how these organizations come up with innovative ideas and how they take the innovation ideas and transform them into actual products or services. The results of the question can be seen in figure 13, where most of the respondents were either form a cross-functional team that handles these topics or have a dedicated R&D department. The question was formulated so that the respondents could have more than one answer. This was done on purpose as we wanted to find out if there was more than one form of organization structure that companies practice around new ideas.

After the face-to-face interviews we found out that some companies have a dedicated innovation department (more than 12%) and some of them form separate teams. These teams in many cases take the ideas from a discovery state, which is done within an innovation department, to at least a prototyping state where then the company can decide if this idea is worth pursuing or not.

*Figure 13: Survey question on how companies organize around innovation ideas.*



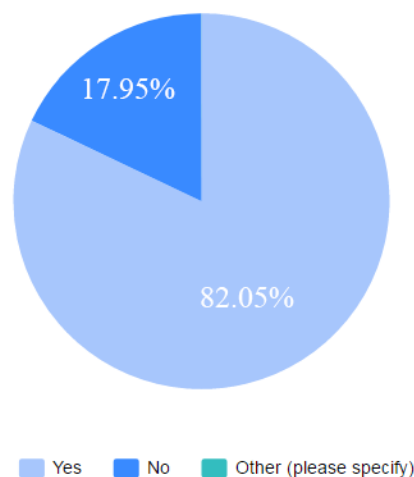
Source: Survey monkey analytics tool

Question 7. Do you evaluate the progress of the innovation projects?

We principally wanted to find out if these companies have a way of measuring and evaluating the progress of the ideas that they are pursuing. It turns out that more than 82% (figure 14) of the respondents use some kind of tool or method to track the progress of their new project ideas. This also strengthens the answers from the previous question where some companies have set up cross functional teams separated from their innovation department or R&D departments in order to be able to track the progress of the projects easier, but and at the same time to be more transparent.

*Figure 14: Survey question on evaluating the innovation projects*

**Do you evaluate the progress of the innovation projects?**



Source: Survey monkey analytics tool

Within the next couple of questions, we wanted to dig deeper and to try and understand if some of these companies are practicing innovation and how they are performing it. Financing innovation is done mostly at the idea level with more than 53% of the respondents financing ideas as they come.

Question 8. How is the financing of innovation budgeted within your organization?

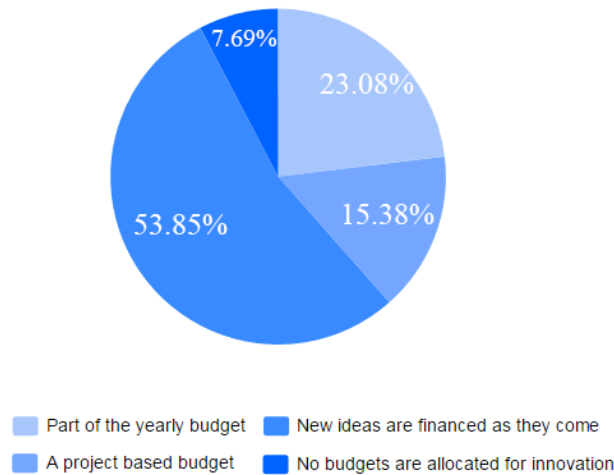
The results of this question contradict the results from question number 5, where more than 61% of the respondents said that innovation is part of their strategy. If this would be the case then the answers to this question should tend to have a higher percentage in the “as part of the yearly budget” response.

This again indicates that there is confusion among SMEs about what the concept of innovation is and what it means to have innovation initiatives within the company. Financing ideas as they come is not the way to go if you want sustainable innovation projects or when it comes to the culture of innovation. What if a project comes along that has immense potential but there is not enough money in the budget to finance it? Therefore, we believe that having an innovation budget, as a key aspect of your yearly budget, is vital. When companies have yearly budgets planned for innovation, it usually means that they also have a control mechanism to differentiate what projects they finance and which ones get left behind.

By having a control mechanism, you can usually diminish the risk when investing in radical innovation as the ideas are assessed and measured before they receive financing. Having the correct control and the correct KPI will help to make the decision as to when a project needs to stop for example and there will always be great ideas that will not generate any profit at a particular point in time, but it could be an idea should be paused and revisited when the appropriate time comes.

Figure 15: Survey question on how innovation is financed.

**How is the financing of innovation budgeted within your company?**



Source: Survey monkey analytics tool

**Question 9. How is innovation performed within your organization?**

Here we addressed the ambidexterity<sup>59</sup> of companies. We wanted to understand in what manner these companies perform innovation. We wanted to understand if these companies are open to innovation organizations or if they are ambidextrous for example. We identified that 33% of the respondents are ambidextrous when it comes to innovation, therefore telling us that they on one side these companies are innovating within the company by iterating on their processes, products and services and at the same time they are trying to reach out externally to either find innovative ideas that they can implement within their

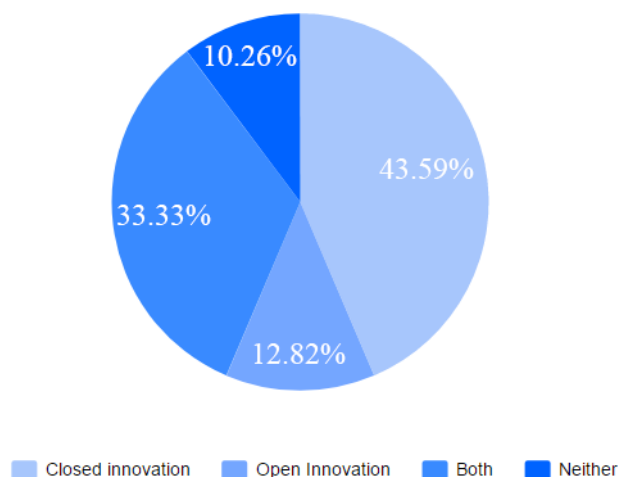
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<sup>59</sup> Retno Kusumastuti, Nuru Nurul Safitri and Nidaan Khafian, “The word “ambidexterity” can be interpreted as the capability of an organization that simultaneously implement innovation activities both in exploratory and exploitative manner.” - Developing Innovation Capability of SME through Contextual Ambidexterity - International Journal of Administrative Science & Organization, January 2015, volume 22, number 1,

company or use external sources to find solutions to the problems of developing products or services internally.

*Figure 16: Survey question on how innovation is financed*

**How is innovation performed within your organisation?**



Source: Survey monkey analytics tool

Most of the companies interviewed practice closed innovation, which leads us to believe that these companies might not understand the benefits of open innovation or are a traditional company that does not want to share their “secrets” with the world. For example, gambling companies are very careful when it comes to sharing information regarding the company. In most cases due to the strict policies and regulations companies are subject to, they are not even allowed to make certain aspects of their business public. On the other hand, practicing open innovation means a lot of transparency.

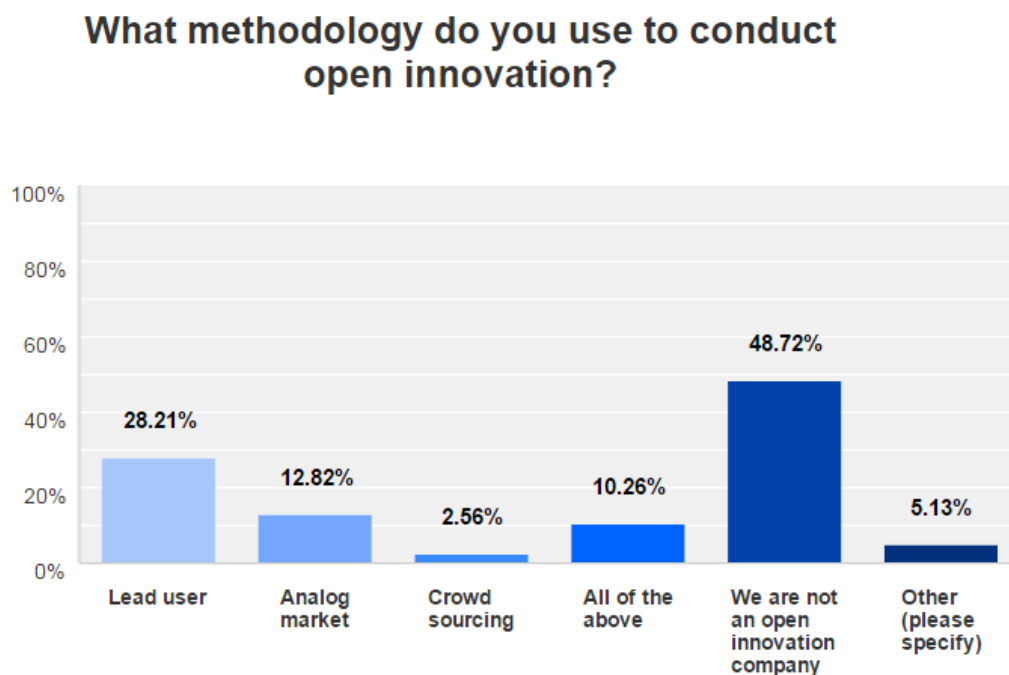
Question 10. What methodology do you use to conduct open innovation?

In relation to the previous question we wanted to understand how companies conducted open innovation. This was regardless of whether the companies were performing either open innovation or a mixture of both open and closed. Given the more technical nature of these questions about innovation and about terms that you do not hear very often, we were

surprised to see that the companies that we interviewed understood these terms and that a lot of them perform the lead user methodology.

This might have to do with the fact that Germany is a very industrialized country and the knowledge sources are spread around the country. This would mean that these companies benefit from their networks in order to address key specialists (lead users) in order to find solutions to their innovation challenges. Also, more than 12,8% of the respondents look outside their market to find solutions using the “analogue market” methodology. As expected, the organizations in the DACH region are not very fond of “crowd sourcing”, probably due to the fact that there are still a lot of traditional companies in this region.

*Figure 17: Survey question on open innovation.*



Source: Survey monkey analytics tool

It would be interesting to understand if the rest of SMEs in Europe have or have ever undertaken crowd-sourcing initiatives. In general, we see that crowd sourcing, as a methodology, is more popular with younger, smaller companies who see crowd sourcing as a more cost efficient methodology to attract new ideas and to solve product or service problems.

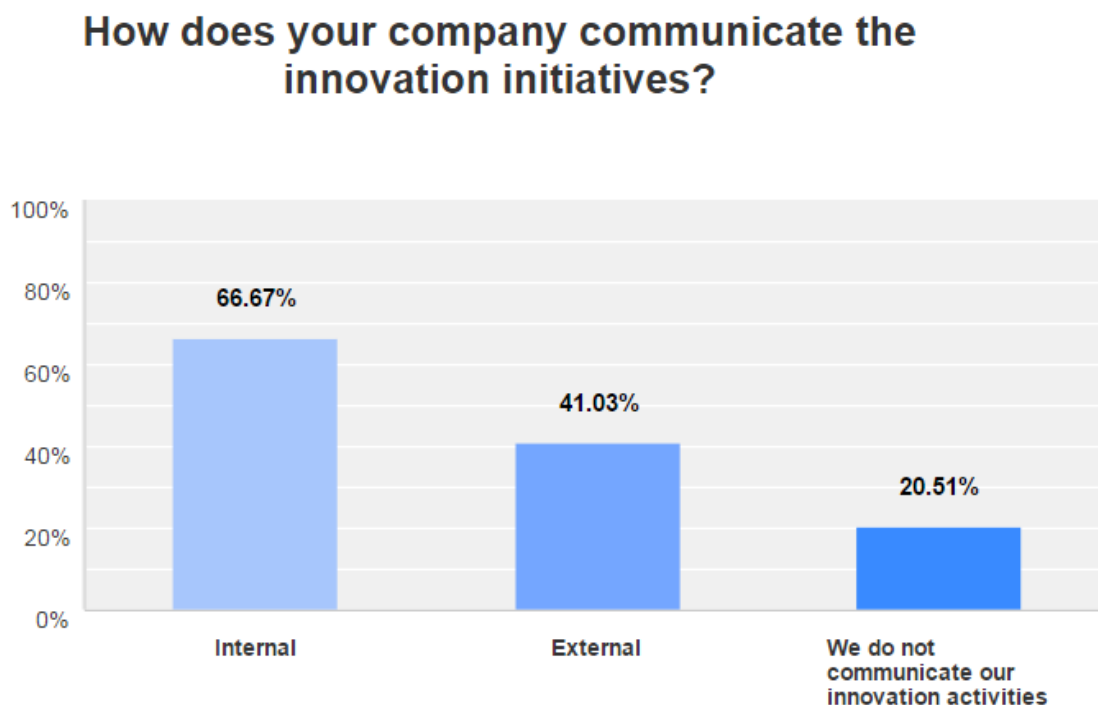
As expected, more than 48% of the respondents (see figure 17) have said that they are not an open innovation company, which again questions their knowledge of the concept. This in line with the previous answers in the survey

Question 11. How does your company communicate the innovation initiatives?

Communication is one of the aspects that a company cannot live without. Communication becomes even more important when we talk about innovation. A company should be able to communicate their innovation ideas and their innovation successes both within the company as well as outside of the organization. The correct communication and the correct leadership are essential to foster an innovation culture.

Communication is earning a place within an advanced innovative company. They recognize the importance and they are willing to invest in senior positions to keep the innovation vision of the company consistent. The role requires a high degree of persuasion and the capability to develop and execute effective communication campaigns.

Figure 18: Survey question on communication of innovation activities



Source: Survey monkey analytics tool

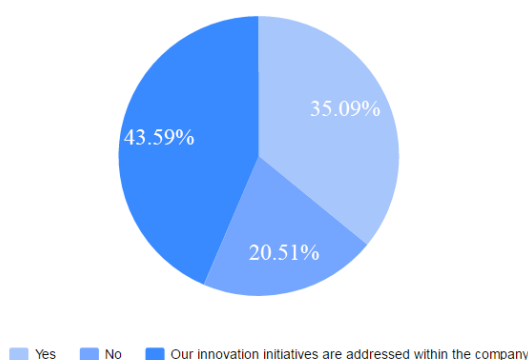
Questions 12. Do you think you will use third party services (i.e. consulting companies) to better understand and implement innovation within your company?

Question 13. Have you ever used third party services to address innovation issues within your company (i.e. strategy, communication, etc.)?

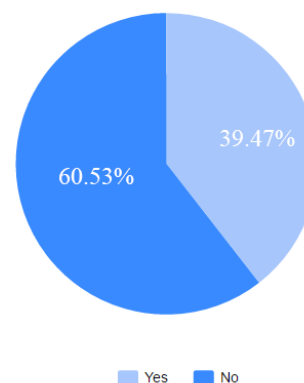
Nowadays companies are relying more on third party services when it comes to fields where their knowledge is limited and therefore we wanted to find out if the companies that we interview are in the same position. We wanted to find out if they were in collaboration with any third party companies that provides them with consultation services on innovation. More than 60% (figure 3) of the respondents told us that have not used such services in the past and most probably they will not use in the future.

*Figures 19 & 20: Survey question on 3<sup>rd</sup> party innovation services*

**Do you think you will use 3rd party services (consulting company) to better understand and implement innovation within the company?**



**Have you ever used 3rd party services to address innovation issues within the company (strategy, communication, etc.)**



Source: Survey monkey analytics tool

This tells us that either they underestimate how simple it is to integrate innovation within a company by thinking that they have already started this procedure internally or they are willing to take it step by step within the company to achieve this innovation culture by themselves. In both cases we believe that this procedure will take much longer and in the end they will have to rely to such services to be able to properly integrate innovation. Based on the results shown in this survey that most organizations have a misinterpretation of the

innovation concepts, most probably the companies that already think that they have started initiatives to integrate innovation will ultimately fail and have to start all over again.

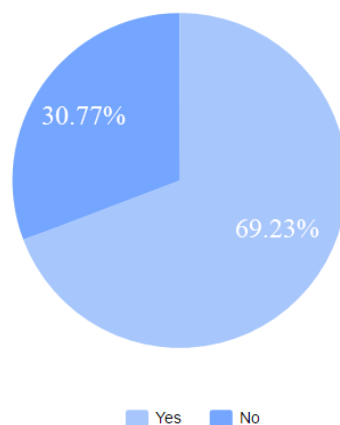
Question 14. Do you think that a special tailored innovation framework would be useful when pursuing innovation in your company?

Finally, when asked if they think about a tailor made framework for SMEs that would help them successfully implement and integrate innovation within their organization, 69% of the respondents were interested to find out more as you can see in figure 21.

This gives us a clear understanding that there is a gap on the market for such a framework and for tailor made services for SMEs. This provides us with enough insight to be able to lay the foundation for a possible consulting company that would focus on the small and medium enterprise niche when we talk about frameworks for innovation.

*Figure 21: Survey question on innovation framework for SME's*

**Do you think that a special tailored innovation framework would be useful when pursuing innovation in your company?**



Source: Survey monkey analytics tool

The outcome of this survey was that there is a lot of misunderstanding regarding innovation and that most of the companies, even though they believe that they have understood the concept and even use it within their companies, they actually do not.

We believe that due to the fact that the concept is relatively new, there is a confusion between the concepts of “we are doing things differently” and “improving a process” and innovation itself. Most of the companies that we have interviewed are practicing innovation in some form, but not in a controlled, systematic and transparent matter.

Most importantly the results showed us that these companies are willing to learn and start the education process as they identify clear benefits through innovation. We believe that the education process is key before pursuing any efforts of implementing any kind of system or framework that would help these companies further integrate innovation within their projects, strategies and culture.

This survey respectively this research can also be the grounds for a more in depth study of these companies, but we consider this research as substantial proof that the concept is misunderstood and misinterpreted.

## **5. Strategies of innovation for SME's (Raul Cristian Kristo, Eduardo Cruz Medina)**

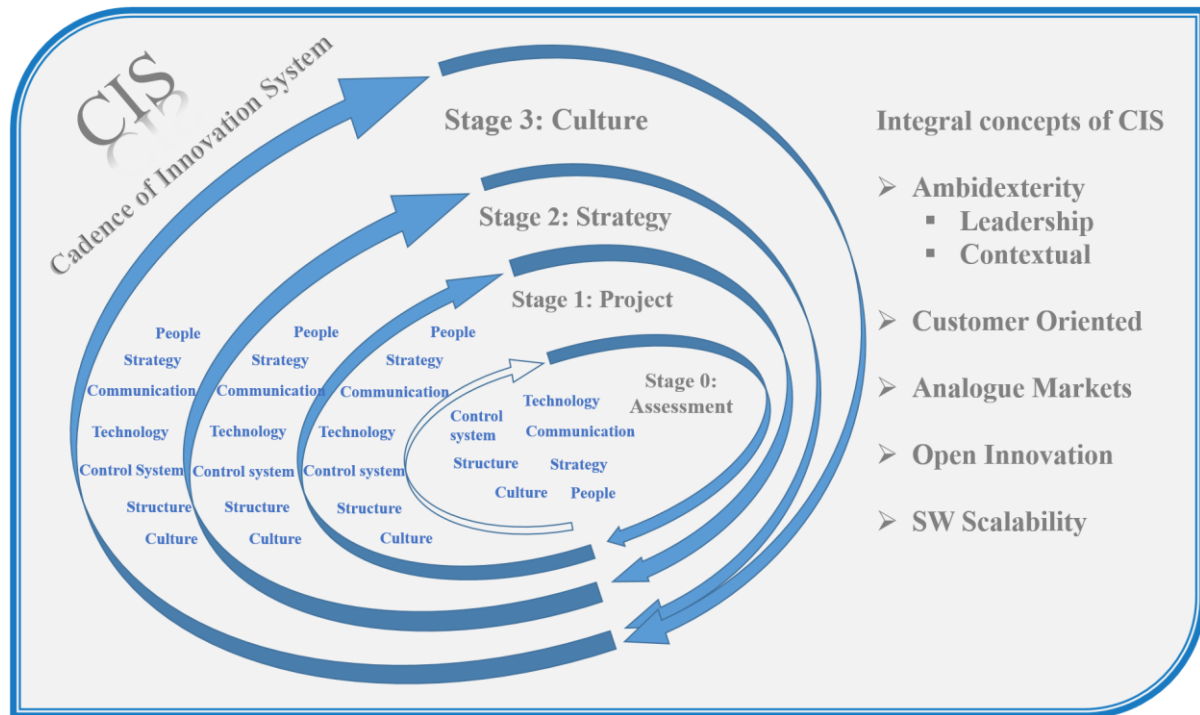
### **5.1 Cadence innovation system (CIS) (Raul Cristian Kristo)**

During this chapter we will focus on describing the innovation framework that we have developed with small and medium businesses in mind. We will go through the stages and explain in detail how this framework is flexible and suitable for any industry. This means that we see a potential customer as any company with less than 250 employees and who seeks for a systematic way to control its innovation efforts.

As described in the previous chapters, we identified that most companies have a limited understanding of innovation and most of them practice innovation but not in a controlled and organized manner. This is also what our results in the previous chapter have shown.

We believe that organizations are not familiar with innovation systems and do not quite grasp the concept. Therefore, they do not practice such concepts within their companies, although, they should consider integrating innovation step by step. CIS offers a systematic approach and companies will be able to understand the concepts such as innovation, innovation culture, ambidexterity, leadership style as well as being aware of the benefits that it could bring.

Figure 23: Cadence innovation system (CIS)



Source: Own elaboration

### Stage 0 – Assessment

The assessment stage proposes a scan of the entire company, from leadership to communication, methods, employees and through to its systems. We propose to look at all the components that integrate a company in relation to innovation. This stage is critical to determine how the company fits together and in what way innovation can influence the organization.

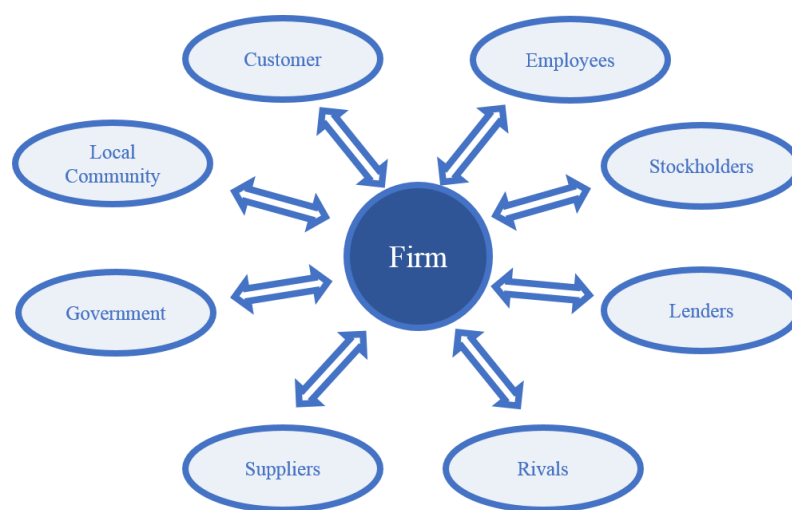
There is not a right or wrong order to how topics should be tackled during the examination stage, but we strongly believe that these types of assessments should happen regularly (at least annually) in every company. Consistency is key to achieving this stage, as companies tend to implement projects and then completely forget about them later down the line. It is even worse, we believe, when companies implement an innovation project and they fail to take it to the next stage, running individual innovation projects is a waste of time and resources. For example, a company could implement an innovation framework on a project, they then recognize the direct benefits, but they never do an assessment to understand how

the lessons learned from this particular project can be implemented company wide and therefore be part of the company's overall strategy.

Before we start our assessment, we need to understand what the company's current position is towards CIS and if there is a favourable or sceptical feeling. This will allow us to isolate any bias and also it is important to identify who are going to be the main stakeholders doing the assessment. Therefore, we will perform a stakeholder analysis, and as described in Schilling, Melissa A. 2017, strategic management of technological innovation<sup>60</sup> book, we would assess the following:

- a) "Who are the stakeholders?
- b) What does a stakeholder want?
- c) What resources do they contribute to the organization?
- d) What claims are likely to make on the organization?"

*Figure 24. Stakeholder Analysis*



Source: Schilling, Mc Graw Hill 2017 p. 115

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<sup>60</sup> Schilling M. A. 2017, Strategic Management of Technological Innovation, Mc Graw Hill 5<sup>th</sup> edition.

Through this analysis we will have a clear picture of who the influencers are, the decision makers and the executives in the company.

During the assessment we propose to look at the following topics or key elements that make up an organization<sup>61</sup>:

**Communication** – how does the company communicate both internally and externally? How does the company communicate with its customers, with its suppliers, with its representatives, with its distributors, etc.? More important would be to understand how internal communication happens. How does the company communicate with their employees?

After this first step of the communication assessment is made, we then propose to look at how innovation could be made part of the communication process. What parts of the communication methods need to be changed in order to factor in and talk about innovation? Maybe the company will have to be more creative with its communication. This assessment should give us a clear picture of where the company stands in terms of communication and how innovation can be made a part of it.

**Structure** –similar to communication, we would like to understand the structure of the company at that particular point in time. This assessment will have to be done both with the help of the management and with the help of employees. We would have a close look at the organizational chart of the company. This would give us the basis of how innovation could be implemented most effectively and how many levels of the company would be affected. At the same time, through this assessment, we will be able to understand who the key people are and who we would need to collaborate with to implement a successful framework. A key element that we would see as red flag is a high hierarchical structure and in this case our aim would be to move a high operative company into a more innovative organization, meaning as flat as possible in its structure.

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<sup>61</sup> Organization: a group of people who work together in an organized way for a shared purpose according to Cambridge dictionary (<http://dictionary.cambridge.org/dictionary/english/organization>)

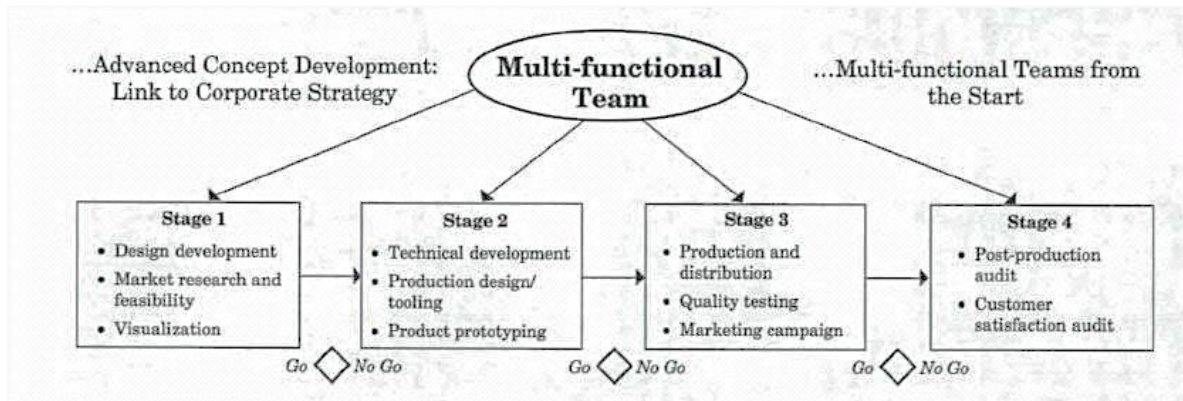
**People** – As we all know, a key element in each company is its people. Employees are the ones that are doing the day to day job and at the end of the day that make or break a company. Through our assessment, we would like to learn how people are treated within the respective company. What benefits do they have and what is their work life balance? Employees are not always motivated by higher salaries therefore we have to not only meet the industry standards but also strive to bring into the organization a culture of awards and recognition. CIS aims to create a contextual environment where people are empowered to make decisions that would require their knowledge and creativity. On top it would highlight who are the creative and innovative people and thus enabling the creation of an award and recognitions system.

**Technology** – By assessing the technology we would understand how tech savvy or not the company is. What kinds of systems are available within the company? Once this is defined and understood, we would then establish what technological changes or adaptations the company would need in order to integrate innovation.

The technology should be seen as a tool for implementing innovation and therefore it needs to be as efficient and as convenient as possible. CIS will help the company on one hand to gather all the ideas and on the other it could be very helpful for filtering the ideas. CIS would make it easy for the management or the innovation department to understand which ideas are worth investing in and which not. We would have to understand what tools are there in place that could ease the integration of innovation. Also, we would have to analyse what type of changes would have taken place in order to integrate such a tool and what are the direct implications to other tool within the company.

**Control system** – during this module we want to evaluate what type of control mechanism, if any, is in place with these companies. We believe that innovation is complex enough to integrate and therefore we believe that the process defined by Hertstein and Platt would fit best in the beginning. The stage-gate process proposes to have decision steps and that each step is measured according to a number of predefined indicators. According to these stage gates, the company will be able to evaluate if the idea they are pursuing is worth investing in more or if they should turn the switch off. This is also called a go/no-go decision-making process for innovation projects.

Figure 25: Innovation as process of go/no-go decisions (Stage-gate)



Source: Hertenstein & Platt (2000)

Here we want to also understand what tools the company needs or has to manage projects. We would like to understand how transparent the company is both externally and internally.. As mentioned in the previous assessment stage, a tool is very important for gathering ideas and putting them into context, but also very important is to define clear key performance indicators (KPI's) in order to be able to evaluate the ideas.

Figure 26: Key performance indicators

| Financial and Nonfinancial Measures of Design Performance in Questionnaire                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Financial Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Nonfinancial Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>• Revenue/Sales</li> <li>• Product cost</li> <li>• Development process cost—total</li> <li>• Development process cost—phase</li> <li>• Gross Profit—total</li> <li>• Gross Profit—new products</li> <li>• Cash flow</li> <li>• Net income/Profit</li> <li>• Economic value added (EVA®)</li> <li>• Stock Price</li> <li>• Market share—product</li> <li>• Percent sales—new products</li> <li>• Percent sales—new customers</li> <li>• Percent sales—repeat customers</li> <li>• Percent sales—proprietary products</li> <li>• Sales to break even</li> </ul> | <p><b>Timing Measures</b></p> <ul style="list-style-type: none"> <li>• Time to market</li> <li>• Cycle time, by phase</li> <li>• Time to revision</li> <li>• Time to break even</li> </ul> <p><b>Design Effectiveness Measures</b></p> <ul style="list-style-type: none"> <li>• Percent first designs meet needs</li> <li>• Team assessment of design effectiveness</li> <li>• Percent projects that reach production</li> <li>• Assessment of CAD use</li> </ul> <p><b>Design Efficiency Measures</b></p> <ul style="list-style-type: none"> <li>• Number of design modifications</li> <li>• Frequency of specification changes</li> </ul> | <p><b>Customer Satisfaction Measures</b></p> <ul style="list-style-type: none"> <li>• Satisfaction—product</li> <li>• Satisfaction—style/appearance</li> <li>• Satisfaction—ease of use</li> </ul> <p><b>Employee-Rated Measures</b></p> <ul style="list-style-type: none"> <li>• Employee morale</li> <li>• Team assessment of individual contribution</li> <li>• Ratio: # designers/# employees</li> </ul> <p><b>Strategic Measures</b></p> <ul style="list-style-type: none"> <li>• Alignment: design with company strategy</li> <li>• Achievement of specific strategic goals</li> </ul> | <p><b>Innovation Measures</b></p> <ul style="list-style-type: none"> <li>• Number of patents</li> <li>• Number of new products developed</li> <li>• Number of new products introduced</li> <li>• Number of design awards</li> <li>• Peer evaluation of design work</li> <li>• Percent new features</li> </ul> <p><b>Volume Measures</b></p> <ul style="list-style-type: none"> <li>• Number of products in pipeline</li> <li>• Number of products started</li> <li>• Number of products completed</li> </ul> |

Source: Hertenstein & Platt 2000

**Strategy** – the strategy of the company is what actually gives direction to the entire organization. The organizations strategy needs to be understood and communicated

throughout the entire company, from the corporate level management and owner all the way to the janitor. The entire company needs to understand that only through joint effort and pulling together in the same direction, and then success can be achieved. This is what we need to understand during this assessment phase.

We believe one of the most important aspects of this assessment, if not the most important, is strategy and at the same time the leadership, who is actually defining the strategy of the company. During this assessment, we would look at things like the vision mission of the company. How is the company structured in terms of top management? What are the communication channels that the management is using to communicate the strategy to the entire organization? Is innovation already a part of their strategy? What are the goals of the company? What are they trying to achieve long, medium, and short term and how is innovation part of those goals?

**Culture** – There are many definitions of culture in today’s literature but perhaps the most straightforward is “the way we do things around here” (Lundy and Cowling, 1996). Organisational culture as described by E. C. Martins and F. Terblanche is “*manifested in the typical characteristics of the organisation. It therefore refers to a set of basic assumptions that worked so well in the past that they are accepted as valid assumptions within the organisation. These assumptions are maintained in the continuous process of human interaction (which manifests itself in attitudes and behaviour), in other words as the right way in which things are done or problems should be understood in the organisation*”<sup>62</sup>.

Culture is probably the most challenging part of the assessment as the explanation of an organizations culture is not something that you will find in an excel spread sheet or in an organizational chart or a power point presentation. Therefore to achieve this we would have to conduct a lot of face-to-face interviews, sit down with the different departments, talk to management and investigate the vision and mission of the organization.

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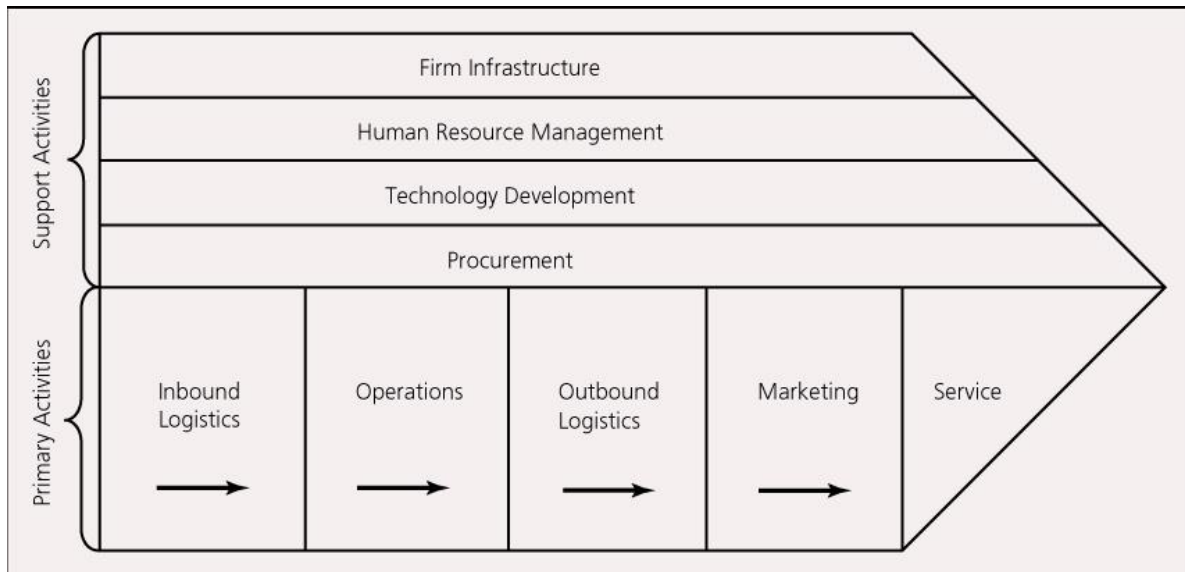
<sup>62</sup> E. C. Martins & F. Terblanche, Building organisational culture that stimulates creativity and innovation- page 65.

During this stage we would like to understand what the employees think and how they feel about the company. Also it would be interesting to comprehend what their understanding and point of view is in regards to innovation; how they think the company is handling innovation; what their work life balance is like; what their incentive scheme is and so on. All these elements will provide us with a deep understanding of how the company ticks, not just from an innovation standpoint, but also in general.

As part of stage 0 we will also use a more detailed questionnaire compared to the one used to evaluate the current status of the companies in the DACH region (as presented in the previous chapters). This questionnaire, alongside face to face discussions, with not only key members of the company but also randomly selected employees from the entire organization, will give us a more complete picture of the company. By also assessing the company structure, management style, strategy, vision and mission, we would have a complete overview of the company. This is dependent however on the company being fully cooperative and giving the assessment team full access and disclosure.

The assessment stage is part of a so-called internal analysis where we are trying to identify the strengths and weaknesses of the company in order to be able to propose a simple tailor made strategy. We have to understand which activities are primary within an organization and which are support activities. In other words, what aspects is the company mastering and are considered main activities and are the aspects of the company that support like procurement, controlling, call centre, etc.

Figure 27: Internal organization analysis



Source: Schilling, Mc Graw Hill 2017 p. 116

### Stage 1 - Project based

During this stage we propose to take part of the learning from stage zero and apply that within a project. Implementing a project would help the company understand what the impact of innovation would be on a small scale. At this stage a company would possibly learn from its mistakes but at low cost as the first innovation initiative would be done at a project base and not implementing an entire strategy. This stage is also a good chance for the company to learn to work together, to try and think of ways they could improve their processes and their entire organization.

What we also recommend is that companies look at this stage just as they looked at the previous stage and assess all the elements described during that previous stage. They would have to look at how communication needs to change or is impacted through this project, understand the structural changes needed if any to implement such a project, grasp what the strategical and cultural impacts are by doing a project whilst thinking of innovation or actually implementing an innovation project. Will there be any technological needs? How will the people handle such a project? The company might identify that not all the aspects will have to be dealt with during this stage as they might be focused on implementing a technological innovation project that would not affect the entire company, but, nevertheless,

we consider that by assessing all the aspects at the time, it would be a good exercise for the company to stay on top of the situation.

What companies need to take from this is the way they would implement innovation on a small scale in order to see the benefits, both financial and non-financial, that innovation would bring to a company.

### Stage 2 – Strategy

Some companies might already understand and have implemented innovation projects but are not sure how to take innovation to the next level. Implementing an innovation-based project does not mean that they should stop and that was it as far as innovation is concerned. Companies need to understand that innovation is more and more beneficial if it scales.

Repetition is key when it comes to being proficient in something, so what we propose during this stage is that companies continue implementing innovation projects with a strategic goal in mind and in order to better understand and constantly learn what innovation means for their company. At the same time companies need to experience how strategic innovation changes affect all these innovation projects. Does the company need to undergo significant changes in order to head to its innovative culture or do the strategies at hand promote innovation, hence there is no need for structural change?

During this stage, we also recommend to look again at assessing the same elements as in stage one. This is a very good exercise to understand the strengths and weaknesses of the company when it comes to innovation.

### Stage 3 – Culture

The last part of our innovation system is to integrate and assimilate innovation in the company's culture. Integrating innovation within a company's culture is not something that you can do overnight or that can be implemented according to a timetable and project milestones. Even words like implementation or integration of innovation do not convey what should be happening within an organization in order for innovation to be part of it. As described earlier, the culture of the company is something very complex and it is what defines the company at the end of the day. Therefore, making sure that innovation is live and

thought of at every decision level in the company is something that needs a lot of consideration.

This stage is the most challenging to integrate and at the same time the most rewarding. Consulting companies that we have spoken to and also other frameworks will tackle culture at the very beginning. Their justification being that the company can reap the benefits quickly. We strongly disagree with this approach. Incorporating innovation as a very first step in a company that has never understood the concept can be very damaging.

We would strongly suggest doing it at the very end, when the company has gone through some iteration on a smaller level and where the organization has experienced what it means to look at strategy with innovation in mind. This way, we hope, that by the time the company reaches the maturity to look at innovation from a cultural perspective, innovation is already there, in the mind of all the employees, during the strategy meetings and when undertaking small and maybe insignificant projects. In order for a new concept to be lived and used by a company it needs to happen over a longer period of time. The goal for the organization is to subconsciously think of innovation, it does not need to be a bourdon.

The most crucial factor of our framework is cadence. The word is used more in the theatre of music and means “*the modulated and rhythmic recurrence of a sound especially in nature*”<sup>63</sup>. We believe that the word cadence fits very good in the business environment and it refers to how often regularly scheduled things happen<sup>64</sup>. In this paper, this word takes another meaning. It is the occurrence of events repeatedly in a systematic matter.

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<sup>63</sup> <https://www.merriam-webster.com/dictionary/cadence>

<sup>64</sup> <https://www.merriam-webster.com/words-at-play/words-we%27re-watching-cadence>, accessed April 27<sup>th</sup> 2017

## Review stage

We recommend that after the completion of each stage, especially the very first ones (project based integration and innovation as part of the company strategy) the company should go through a revision stage. For the 3<sup>rd</sup> stage in particular, the revision part should be integrated within the culture, where the company constantly assesses whether the direction or the strategy that they are pursuing is the right one.

In the revision stage the company will have a look at the targets and objectives set in the assessment stage and establish what went well and what went not so successfully. Since this is an iterative process, the company will constantly learn and also find out its limitations.

We would like to keep our framework as straight forward as possible compared to other frameworks on the market. We could use complex tools for determining various aspects of the company's environment like *Porter's five forces model*<sup>60</sup>, but this is what the consulting firms do and they overwhelm the company to the point that they do not understand or might not even benefit from the introduction of such tool. In so many cases, companies go for a pilot project, with the help of the consulting firm, and once the project is finished and evaluated the company usually forgets about the entire scope and never looks back. We propose something simple and very transparent that will help them not only short term but more importantly, long term.

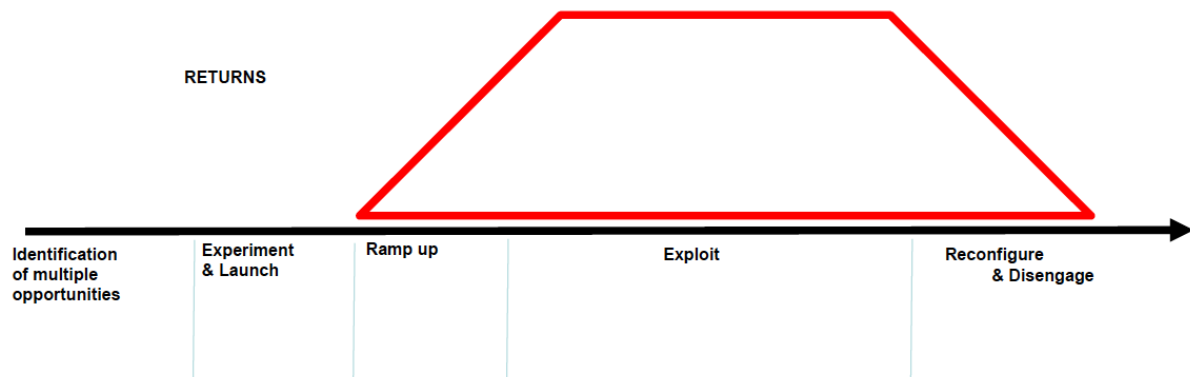
We see a lot of value on a combination of Gruber and McGrath's proposal to "*think in short-lived opportunity lifecycles*" (figure 24) and the manifesto for agile software development where one of the very first principles "*Our highest priority is to satisfy the customer through early and continuous delivery of valuable software*"<sup>65</sup>. We propose to identify these so called "opportunity lifecycles" when it comes to innovation and iterate them

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<sup>65</sup> Kent Beck, Mike Beedle, Arie van Bennekum, Alistair Cockburn, Ward Cunningham, Martin Fowler, James Grenning, Jim Highsmith, Andrew Hunt, Ron Jeffries, Jon Kern, Brian Marick, Robert C. Martin, Steve Mellor, Ken Schwaber, Jeff Sutherland, Dave Thomas. 2001. Manifesto for Agile Software Development, twelve principles of agile software.

until they become part of the common standard for the company or better said, they become part of the company's strategy and part of the organization's culture. This way we can assure a sustainable integration of the framework and ensure that it is not something done today and forgotten tomorrow.

*Figure 28: Opportunities lifecycle*



Source: Gruber et al., 2013; McGrath, 2013

The beauty of our framework is that it is not necessarily tailored to a specific company and it does not recommend implementing innovation as a process, but rather it is a more of a one glove fits all type of framework for SMEs. Companies that have not done anything in terms of innovation can implement our framework and they would have to start from the beginning and go through every stage. But at the same time our framework can be used by companies that have already implemented project based innovation successfully, but are not sure how to get to the next level. In this case we recommend going through stage zero to understand the strengths and weaknesses but then jump straight to stage two where we look together at how innovation is part of the strategy within the company. In another scenario, where companies have innovation as part of their strategy, but the company does not live and breath innovation, we would apply the same principle, assess (stage zero) and then implement (stage three). Stage zero needs to be considered at constantly as it gives the company the chance to learn about itself and it helps understand where change needs to happen.

By using the same control system as described in the assessment stage, companies can review their performance on innovation ideas and can judge if the investment made was a

successful one. In the long term, companies will learn to recognize which ideas are worth pursuing and which are not, by iterating on the above-mentioned concepts of assessing, implementing, reviewing and repeating.

As it can be seen, our framework is very versatile and it can be applied to any small or medium company. It is easy to implement as it adjusts depending on which stage the company is at that particular moment in time. This also makes it interesting for companies as they would have to go through the entire framework in order to achieve what they are looking for. Also from a cost perspective the framework would adapt based on the needs of the company.

## **5.2 Comparison of different frameworks (Eduardo Cruz Medina)**

In the following table, we compare four of the most representative frameworks that we think would challenge our Cadence of Innovation System. When comparing the CIS with other frameworks described throughout the literature, a clear differentiator is the fact that most of the other frameworks do not focus on SMEs. This is a quite significant niche that no many frameworks have looked at specifically.

As it can be seen from our research results, some of the companies that we have interviewed have some innovation concepts in place or are in the first stages of integrating innovation. At the same time there are other companies that do not grasp the innovation concept at all. The added value of the CIS is that it is tailored for these companies, SME'S. The system can be applied to both organizations that have dealt with innovation concepts at some level but it also works for companies that would start from the very beginning.

Table 2: Framework comparison

| Framework Name                                                                                       | Cadence of Innovation System (CIS)                                                                                                                                                                                                                                                                 | The Holistic Innovation Framework (HIF) <sup>66</sup>                                                                                                                                                                                                                                                                                                                 | Framework for reverse innovation SMEs <sup>67</sup>                                                                                                                                                                                                                                              | The Organizational Innovation System <sup>68</sup>                                                                                                                                                                                                                                                                                                                               | A Model of Creativity and Innovation in Organizations <sup>69</sup>                                                   |
|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Authors                                                                                              | Kristo, R & Cruz Medina, E                                                                                                                                                                                                                                                                         | A. L. Wait, R. H. A. Seidel, M. Seidel.                                                                                                                                                                                                                                                                                                                               | Dominik Dellermann                                                                                                                                                                                                                                                                               | Jonas Van Lancker, Koen Mondelaers, ErwinWauters, Guido Van Huylenbroeck.                                                                                                                                                                                                                                                                                                        | Amabile, Teresa M.                                                                                                    |
| Highlights / Description                                                                             | CIS considers the importance of leadership as a key success factor, the need of different management styles to lead a contextual and an ambidextrous organisation. CIS proposes the benefit of open innovation and potential of analogue markets, also calls for a customer oriented organisation. | The Holistic Innovation Framework (HIF) and Value Generation Model (VGM) support and extend the unique processes of New Product Development (NPD) in SMEs. These processes were found to be primarily dependent on the owner/manager of the SME. The approach then externalizes the tacit process of the owner/manager, so that a wider management team can apply it. | This approach signals a marked change or shift in view on the direction of the global movement or flow of innovations from the traditional approach of a top-down flow of innovations, i.e. from rich to poor countries, reverse, which is to say from developing to developed nations' markets. | It provides a holistic, hands-on concept currently lacking in the open innovation approach. From the conceptualization, a framework for analysis is put forward which provides structure to the study of on-going and finished innovation processes. OIS is a first step in the development of a currently underdeveloped micro-level within the innovation systems perspective. | IT is a model of individual creativity is described and integrated in preliminary model of organizational innovation. |
| Does the framework explicitly aim to drive open innovation?                                          | Yes                                                                                                                                                                                                                                                                                                | No                                                                                                                                                                                                                                                                                                                                                                    | Yes                                                                                                                                                                                                                                                                                              | Yes                                                                                                                                                                                                                                                                                                                                                                              | No                                                                                                                    |
| Does the framework propose analogues and distant markets as additional practice for open innovation? | Yes                                                                                                                                                                                                                                                                                                | No                                                                                                                                                                                                                                                                                                                                                                    | Yes                                                                                                                                                                                                                                                                                              | No                                                                                                                                                                                                                                                                                                                                                                               | No                                                                                                                    |

66 A. L. Wait, R. H. A. Seidel, M. Seidel. 2008, A New Approach to Innovation Management in SMEs

67 Dominik Dellermann, (2017) "Going East: a framework for reverse innovation in SMEs", Journal of Business Strategy, Vol. 38Issue: 3, pp.30-39, <https://doi.org/10.1108/JBS-02-2016-0014>

68 Jonas Van Lancker, Koen Mondelaers, ErwinWauters, Guido Van Huylenbroeck 2015, The Organizational Innovation System: A systemic framework for radical innovation at the organizational level

69 Amabile, Teresa M.1988, A Model of Creativity and Innovation in Organizations

| (Cont)<br>Framework Name                                                    | Cadence of<br>Innovation System<br>(CIS) | The Holistic<br>Innovation<br>Framework (HIF) | Framework for<br>reverse innovation<br>SMEs | The<br>Organizational<br>Innovation System | A Model of<br>Creativity and<br>Innovation in<br>Organizations |
|-----------------------------------------------------------------------------|------------------------------------------|-----------------------------------------------|---------------------------------------------|--------------------------------------------|----------------------------------------------------------------|
| Does the framework propose a customer-oriented organization?                | Yes                                      | No                                            | No                                          | No                                         | No                                                             |
| Does the framework propose ambidexterity as an integral part of its system? | Yes                                      | No                                            | No                                          | No                                         | No                                                             |
| Does the framework propose a cyclical cadence as an integral part?          | Yes                                      | No                                            | No                                          | No                                         | Yes                                                            |
| Does the framework consider the below lever of the organization?            | Yes                                      | Partially                                     | Partially                                   | Partially                                  | Yes                                                            |
| People                                                                      | Yes                                      | Yes                                           | Yes                                         | No                                         | Yes                                                            |
| Control system                                                              | Yes                                      | No                                            | No                                          | No                                         | Yes                                                            |
| Technology                                                                  | Yes                                      | No                                            | No                                          | Yes                                        | Yes                                                            |
| Structure                                                                   | Yes                                      | Yes                                           | Yes                                         | No                                         | Yes                                                            |
| Organizational culture                                                      | Yes                                      | Yes                                           | Yes                                         | Yes                                        | Yes                                                            |
| Communication                                                               | Yes                                      | Yes                                           | No                                          | No                                         | Yes                                                            |
| Strategy                                                                    | Yes                                      | Yes                                           | Yes                                         | Yes                                        | Yes                                                            |

Source: Own elaboration

In the **holistic innovation framework** (HIF), we find strong correlations to CIS. They both identify people, organizational culture, communication, structure and strategy as an integral part of the organization. HIF sees the importance of certain characteristics from the leadership perspective that is needed to implement this framework. Nevertheless, HIF does not make recommendations on the suitable technological supportive tools that might be necessary to control the implemented initiatives, whereas CIS uses software as an important part of its deployment.

HIF is lacking when proposing external sources as a formal source of innovation. Terms like analogue markets and ambidexterity are not used. The major difference between HIF and CIS is that HIF is focused on product development, whilst CIS is focused on innovation culture creation through a customer-oriented commitment.

**Framework for reverse innovation in SMEs**, (FRI) is chosen for comparison in the first instance due to the novelty of the term and we recognise that it sounds attractive. FRI places a significant amount of importance to people, structure, organizational culture and strategy. FRI focuses on open innovation and it uses geographical and economical distance to developed countries to identify products or services that could be innovative. This distance does not necessarily refer to analogue markets but to significant differences in economic development. We understand that in this case a multinational might create a product for a developing country that could be used to satisfy a customer/user in developed markets.

We see the value of this framework as a supportive work stream but we do not see the sustainability potential of this approach without falling into imitation practices. FRI is rather a tool to consider in more medium sized enterprises, when they have presence in more than one country and significant differences in customer consumption habits, rather than an alternative to develop systematic innovation.

We believe that FRI would be a complementary line of thought for CIS rather than an alternative.

**The organizational innovation system** (OIS) has a strong visual diagram that delivers a powerful message. OIS considers technology tools, organizational culture and its focus on open innovation is significant. OIS is in fact a supportive view for leadership.

We have found it very interesting to see that even though this system is relatively new (2015), it does not consider leadership style as a critical part for success. It does not propose a control system; it mentions culture as a part of a high-level system but not as a mind-set driven by the company's leaders. As a consequence of not integrating leadership into their system, ambidexterity can not be achieved. The efforts towards strategy are describe within the commercialization, leaving many open questions as to what OIS's role is within a company's strategy.

**A model of creativity and innovation in organizations (MCIO)** is probably the model that shares most of the aims with CIS, in relation to what would be the goal of an organization. We find the control and cyclical approach a significant added value. There is a substantial effort in creating a contextual organization. The model breaks the group and the individual efforts giving them high importance and talks about intrinsic motivations to innovate beyond revenue growth and resource maximization.

In our opinion, it is an impressive body of work despite being created in 1988. It is still relevant in many ways and it can drive thoughts that are a lot more complex than financial and strategic management. The effort to foster an environment for the generation of ideas is extraordinary.

What it is not explicitly considered is the leadership characteristic needed to drive this model. Managers that would attempt to look into these intrinsic motivations require a particular profile. We believe that leaders willing to drive an organization considering this complex term are also very likely of being capable to drive ambidexterity within an organization, to promote an innovative culture and to succeed in this journey.

CIS can still give an additional value versus MCIO based on the following traits, The assessment is done in stage zero (where to start is always important), CIS brings up the need for the correct leadership style to formally adopt ambidexterity, to diligently search for ideas and solution in analogue markets, and to deploy the contextual requirements that CIS proposes.

There is one characteristic that we did not compare which is the way that these frameworks can be delivered. We have kept this out since we do not know if any of those frameworks have been use in any real-life case. As we have mentioned, we will use the power of software as an integral value to deliver CIS capabilities.

We believe that one of the main reasons why SMEs are confused or misunderstand innovation is due to the fact that there are not any tailor made frameworks for them; at least we could not find any. On top, the big consultancy firms charge large fees for the assessments and the integration of such frameworks that these types of companies are often too afraid to even talk to them about. Not to mention that for companies of this size, it's

usually very cumbersome to stick to the rules and to the frameworks that the consultants create.

What we propose is very different. The above-mentioned framework is built with SMEs in mind and on top is flexible enough to suit companies at any stage in the innovation integration process. The flexibility of our CIS comes also from the fact that it suits more than one company and even across industries. This would give us the advantage to scale the system to more companies at the same time and also a huge benefit for the companies from a cost perspective.

## **6. Recommendation and final conclusions (Raul Cristian Kristo, Eduardo Cruz Medina)**

### **6.1 Recommendations (Raul Cristian Kristo, Eduardo Cruz Medina)**

The challenge that we are throwing out to academics and consultants is how can we make innovation consultancy scalable, affordable, meaningful, sustainable and “innovative”? While trying to answer this same question we share the following ideas.

In terms of costs incurred for and SME, our solution would be significantly cheaper to integrate and manage due to the fact that we benefit from economies of scale, whereas consultants only have the bandwidth to work with a couple of companies at any one given time and due to this charge a lot for their services.

We recommend that these companies start the education process as the initial step with our video material, where they learn and understand what innovation is. This way we would be able to have an educated conversation with them once they decide to use our CIS. Consequently, they would understand the principles and concepts of innovation and through this they would understand the benefits of implementing and managing our system.

In order to make it even simpler for these companies to integrate our system and also to address the scalability of our framework, we will use the power of a software tool. The only way we can keep our costs low is by not having an entire apparatus, like the consultancy companies have, therefore this software would take on a lot of the duties away from the support staff. If we think what makes Ikea<sup>70</sup> great, probably one of the leading sellers of furniture in the world, it is because it is simple to buy and to install at home by yourself. We would like to apply the same principle through our software. The company would get this software which is essentially a do it yourself handbook covering everything from educational materials, notification to reports (helping with the assessment and the review section of our framework). All this is usually provided by the support staff of a consultancy firm. In addition, this tool would be a step by step instruction of how to integrate innovation, through friendly interphases and dashboards, space for internal collaboration.

Another important aspect of the CIS software tool would be the engagement with the employees of the company that is going to use it. This aspect will be very useful for a company once it reaches one of the later stages of integration (strategy of innovation or culture of innovation), where employees can submit their innovation ideas. By using gamification concepts this software tool will collect the ideas submitted by the employees and create and filter, based on some predefined filters, a short list of ideas for management that would help them decide which ideas are worth pursuing and which not. The gamification aspect will help motivate employees and at the same time it would be based on a reward system that intrinsically will stimulate the employees to think outside of the box and come up with new innovation ideas.

The benefits for us, by creating such a tool, would be that we would also get reports on the progress of the companies that we are consulting and that we would not have to be there at every step that the company is taking when integrating innovation. The tool would provide us with indicators of key decisions or key milestones when our intervention is needed

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<sup>70</sup> <http://www.inter.ikea.com/en/about-us/business-in-brief/>, accessed on 5<sup>th</sup> June, 2017.

in order either to steer the company in the right direction or to give the assurance and acknowledge of the progress.

The biggest benefit for a company is that we believe they would get to do it by themselves, which makes things more challenging initially, but in the long run very rewarding. This would also indicate to us the level of devotion that the company shows towards integrating such a framework and in case that the momentum seems to be getting lost we can proactively engage to keep the effort on the right pad.

Further layers of this tool could facilitate education, communication and feedback within the company to promote and integrate innovation. These layers would have to be discussed as additions to the core CIS implementation. These layers could act like the innovation control and communication system of the company. In the case of communication CIS could manage not only internal but also external communication.

Besides the fact that there is a scarcity of innovation frameworks dedicated to small and medium enterprises, our solution goes one step beyond by innovating the way consultancy is done and the approach in which innovation frameworks are integrated.

We see CIS as a innovation intelligence unit, all these pieces together would be a potential virtual substitute of innovation managers or similar roles, this potential substitution would represent already a significant saving to a company.

How will we reach customer while being a new player? We believe that at the beginning, the most viable approach would be through alliances; we would present CIS as an alternative product to already established consulting companies. We believe this to be a win-win situation both for us and at the same time for the consultancy companies. We will not compete for the same customers and they might tap into niche markets (i.e. SMEs) where they could get new customers.

## **6.2 Conclusion** (Raul Cristian Kristo, Eduardo Cruz Medina)

**Problem 1:** the first problem questioned whether, and to what extent the definition of “innovation” is correctly understood and whether it is confused with other concepts like “creativity” and “invention”. We concluded that yes, there is a significant confusion among

these concepts. One of the reasons for this confusion, in our opinion, is that there is not a naming convention to have a homogeneous definition. We faced this problem when we needed to select the definition that fitted best to our study, this decision might contain a certain degree of bias. We could not find a consistent definition used throughout the literature, in many cases. the field of study drove significant differences. We understand the likelihood of confusion and misconception among the interviewed companies is high. Therefore, we recognized the importance of education companies in regards innovation.

We would like to present in this paper is, that the definition of innovation should include the wording “create or generate value” and, if it would be up to us, we would narrow it to economic value. This makes a clear distinction between the invention, creativity, and innovation. This clarity would make easier to set goals and evaluate the performance of the efforts done in this regard.

**Problem 2:** In the next problem formulation, we wanted to identify whether SMEs in the DACH region see innovation as an integral part of their strategy or as project based activity. We can conclude that SMEs acknowledge the importance of innovation as a complementary part of the strategy. Nevertheless, there is not a real commitment from management when it comes to financing innovation. Lack of financing is an important blockage to achieve the true potential of innovation activities. Without the acknowledgement from companies that they have to invest before they would see any benefits, any efforts will have significantly less chances to succeed.

We interpret this as the possibility that a considerable number of leaders in SMEs don not see the value of the financial investment in innovation, which might be cause by the lack of an understandable framework that would lead them to systematically implement innovation like CIS is. We believe that this means an opportunity for a services CIS, to educate and assist a considerable number of SMEs.

**Problem 3:** Our final problem assesses whether the open innovation concept is known to SMEs in the DACH region. We can conclude that the concept is known, nevertheless, we also appreciate that SMEs still rely significantly on close innovation as their primary source of knowledge. This is an important indicator for us, in our opinion, as CIS has a significant possibility to generate an impact in SMEs implementing it. The implementations of CIS will provide access to the possibilities that open innovation offers. The systematic

approach to analogue markets to find solution to problems and the education to lead ambidexterity organisations can add a significant value to these companies.

We strongly believe that the cadence of innovation system (CIS) has a solid theoretical base to drive an impact into SMEs' innovation strategies. CIS considers the importance of leadership as a key success factor and the need of different management styles to lead a contextual and an ambidextrous organisation. Its progressive approach leverages the education and adoption of an organization, in our opinion, it generates a better atmosphere to adopt new concepts at all levels of the organization. Its focus is on the parts that, to our consideration, are the most important for an innovation system to be successful. CIS proposes the benefit of open innovation and potential of analogue markets as source of knowledge. It also stands for a customer oriented organisation. CIS persuades a shift from an operational organization into an innovative organization with the sole purpose of driving innovation as a culture.

What we find more significant from the ideas we have put into the development of CIS is the way we visualize the scalability of it: using the power of software to create valuable intelligence, continuously delivering support to customers, the friendly hands on approach, the possibilities of internal and external communication, and the possibility of collection of feedback. These all are unique characteristics and we believe unique selling point for our framework. We are confident that CIS and its software capabilities can be seen as a key resource that supports outstanding leaders in their journeys to transform companies into innovation driven organizations.

# Appendices

## Appendix 1

### Strategies of innovation

1. What was the size of your company in 2016, based on the number of employees?

50100250

☐

2. In your opinion, what is the definition of innovation?

☐ It is the discovery of new knowledge or technologies that has the potential to increase total factor productivity in the production of goods and services (Invention)

☐ It is an activity or action that creates value from materials, processes or ideas that are available to many people, but which have not been recognized or explored by others (innovation)

☐ It is the production of novel and useful ideas by an individual or small group of individuals working together. (creativity)

3. Innovation is an important activity within your company.

Strongly disagree

Disagree

Neither/Nor agree

Agree

Strongly agree

☐

☐

☐

☐

☐

4. How is innovation conducted within your company?

☐ As a complementary part of the organization's strategy

☐ As an independent project based initiative

☐ Innovation is not part of the strategy

5. How does your company organise around innovation ideas?

☐ Dedicated innovation department

☐ R&D department

☐ Cross functional team that address the idea's potential

☐ There aren't any new ideas pursued within my company

6. What percentage of last years revenue came from products or services released in the past 3 years?

up to 10%

between 10% and 20%

between 20% and 30%

more then 30%

N/A

☐

☐

☐

☐

☐

### 7. How is the financing of innovation budgeted within your company?

- ☐ Part of the yearly budget
- ☐ A project based budget
- ☐ New ideas are financed as they come
- ☐ No budgets are allocated for innovation

### 8. How is innovation performed, within your organisation?

- ☐ Closed innovation (In closed innovation, a company generates, develops and commercializes its own ideas)
- ☐ Open Innovation (the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation, respectively)
- ☐ Both
- ☐ Neither

### 9. What methodology do you use to conduct open innovation?

- ☐ Lead user (*Definition: Product users who are well ahead of market trends and have a high need for innovations – and hence are the source of particularly value information with regard to innovation management.*)
- ☐ Analog market (*Drawing on distant analogous base domains (far analogies) increases the likelihood of developing creative ideas. Many creativity methods apply mechanisms of analogical reasoning to stimulate creative problem solving.*)
- ☐ Crowd sourcing (*Crowdsourcing involves obtaining work, information or opinions from a large group of people who submit their data via the Internet, social media and smartphone apps. People involved in crowdsourcing sometimes work as paid freelancers, while others perform small tasks on a voluntary basis.*)
- ☐ All of the above
- ☐ Other (please specify)
- ☐ We are not an open innovation company
- ☐ Other (please specify)

### 10. Do you evaluate the progress of the innovation projects?

- ☐ Yes
- ☐ No

### 11. How does your company communicate the innovation initiatives?

- ☐ Internal
- ☐ External
- ☐ We do not communicate our innovation activities

12. Have you ever used 3rd party services to address innovation issues within the company (strategy, communication, etc.)

- ☐ Yes  
☐ No

13. Do you think you will use 3rd party services (consulting company) to better understand and implement innovation within the company?

- ☐ Yes  
☐ No  
☐ Our innovation initiatives are addressed within the company

14. Do you think that a special tailored innovation framework would be useful when pursuing innovation in your company?

- ☐ Yes  
☐ No

## Appendix 2

[illegible]

|                                                                                                                                         |   |   |   |   |   |   |   |   |   |   |
|-----------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|
| 9. What methodology do you use to conduct open innovation?                                                                              | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 10. Do you evaluate the progress of the innovation projects?                                                                            | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 11. How does your company communicate the innovation initiatives?                                                                       | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 12. Have you ever used 3rd party services to address innovation issues within the company (strategy, communication, etc?)               | ✓ | ✓ | ✓ | ? | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 13. Do you think you will use 3rd party services (consulting company) to better understand and implement innovation within the company? | ✓ | ✓ | ✓ | ? | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 14. Do you think that a special tailored innovation framework would be useful when pursuing innovation in your company?                 | ✓ | ✓ | ✓ | ? | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

### Appendix 3 – list of companies contacted during the survey

| Email                                                        | Sent | Responded |
|--------------------------------------------------------------|------|-----------|
| (subject to confidentiality agreement)@gschwander.de         | Yes  | No        |
| (subject to confidentiality agreement)@autohaus-schuster.de  | Yes  | No        |
| (subject to confidentiality agreement)@t-online.de           | Yes  | No        |
| (subject to confidentiality agreement)@brodmann.de           | Yes  | Complete  |
| (subject to confidentiality agreement)@stadtwerke-husum.de   | Yes  | No        |
| (subject to confidentiality agreement)@bank-verlag.de        | Yes  | No        |
| (subject to confidentiality agreement)@tui-reisecenter.de    | Yes  | No        |
| (subject to confidentiality agreement)@synova.ch             | Yes  | No        |
| (subject to confidentiality agreement)@psyma.com             | Yes  | No        |
| (subject to confidentiality agreement)@elmat.de              | Yes  | No        |
| (subject to confidentiality agreement)@canoo.com             | Yes  | No        |
| (subject to confidentiality agreement)@landwehrgmbh.de       | Yes  | No        |
| (subject to confidentiality agreement)@kiwitours.com         | Yes  | No        |
| (subject to confidentiality agreement)@ricardo.ch            | Yes  | Complete  |
| (subject to confidentiality agreement)@dectris.com           | Yes  | No        |
| (subject to confidentiality agreement)@bilfinger.com         | Yes  | Complete  |
| (subject to confidentiality agreement)@votteler.com          | Yes  | No        |
| (subject to confidentiality agreement)@crl.com               | Yes  | No        |
| (subject to confidentiality agreement)@brunner-blum.de       | Yes  | No        |
| (subject to confidentiality agreement)@bkw-kuema.de          | Yes  | No        |
| (subject to confidentiality agreement)@aol.com               | Yes  | No        |
| (subject to confidentiality agreement)@lamina-tech.ch        | Yes  | No        |
| (subject to confidentiality agreement)@s.wu.ac.at            | Yes  | No        |
| (subject to confidentiality agreement)@bioswing.de           | Yes  | Partial   |
| (subject to confidentiality agreement)@timbertex.de          | Yes  | No        |
| (subject to confidentiality agreement)@eikamp-gmbh.de        | Yes  | No        |
| (subject to confidentiality agreement)@formgroup.eu          | Yes  | No        |
| (subject to confidentiality agreement)@kmsgmbh.com           | Yes  | No        |
| (subject to confidentiality agreement)@hk-hydraulik.de       | Yes  | No        |
| (subject to confidentiality agreement)@rottler.fsoc.de       | Yes  | No        |
| (subject to confidentiality agreement)@jonas-stanztechnik.de | Yes  | No        |
| (subject to confidentiality agreement)@zimmermann-gruppe.com | Yes  | No        |
| (subject to confidentiality agreement)@geiger-bdt.de         | Yes  | No        |
| (subject to confidentiality agreement)@farner.ch             | Yes  | No        |
| (subject to confidentiality agreement)@omnisens.com          | Yes  | No        |
| (subject to confidentiality agreement)@hegmann-transit.de    | Yes  | No        |
| (subject to confidentiality agreement)@mibag.at              | Yes  | Complete  |
| (subject to confidentiality agreement)@vw-ummenhofer.de      | Yes  | No        |
| (subject to confidentiality agreement)@wirz.ch               | Yes  | No        |
| (subject to confidentiality agreement)@avr-umweltservice.de  | Yes  | No        |
| (subject to confidentiality agreement)@umb.ch                | Yes  | No        |

|                                                                  |           |          |
|------------------------------------------------------------------|-----------|----------|
| (subject to confidentiality agreement)@altex.de                  | Yes       | No       |
| (subject to confidentiality agreement)@typoserv.de               | Yes       | No       |
| (subject to confidentiality agreement)@verwohlt.de               | Yes       | No       |
| (subject to confidentiality agreement)@eculine.com               | Yes       | No       |
| (subject to confidentiality agreement)@smt-wertheim.de           | Yes       | No       |
| (subject to confidentiality agreement)@schandl.de                | Yes       | No       |
| (subject to confidentiality agreement)@endosense.com             | Yes       | No       |
| (subject to confidentiality agreement)@dargel-reisen.de          | Yes       | No       |
| (subject to confidentiality agreement)@hti-handel.de             | Yes       | Complete |
| (subject to confidentiality agreement)@klaesener-jr.de           | Yes       | No       |
| (subject to confidentiality agreement)@biosafe.ch                | Yes       | No       |
| (subject to confidentiality agreement)@nielsen.com               | Yes       | No       |
| (subject to confidentiality agreement)@ah-barschat.de            | Yes       | No       |
| (subject to confidentiality agreement)@akkaelteteam.de           | Yes       | No       |
| (subject to confidentiality agreement)@akula.de                  | Yes       | No       |
| (subject to confidentiality agreement)@armbruster-gmbh.de        | Yes       | No       |
| (subject to confidentiality agreement)@astron-immobilien.com     | Yes       | No       |
| (subject to confidentiality agreement)@atzwanger.net             | Yes       | No       |
| (subject to confidentiality agreement)@autobleuel.de             | Opted out | No       |
| (subject to confidentiality agreement)@auto-krasser.de           | Yes       | No       |
| (subject to confidentiality agreement)@autowalter.de             | Yes       | No       |
| (subject to confidentiality agreement)@bauergruppe.de            | Yes       | No       |
| (subject to confidentiality agreement)@baum-gmbh.de              | Yes       | No       |
| (subject to confidentiality agreement)@bau-rahm.de               | Yes       | No       |
| (subject to confidentiality agreement)@bbv-cd.de                 | Yes       | No       |
| (subject to confidentiality agreement)@bessergesundbleiben.de    | Yes       | No       |
| (subject to confidentiality agreement)@biw-schonach.de           | Yes       | No       |
| (subject to confidentiality agreement)@blitzschutz-graff.de      | Yes       | No       |
| (subject to confidentiality agreement)@boege-hamburg.de          | Yes       | No       |
| (subject to confidentiality agreement)@bohrer-maschinenbau.de    | Yes       | No       |
| (subject to confidentiality agreement)@breco.de                  | Yes       | No       |
| (subject to confidentiality agreement)@brenner-kaefer.de         | Yes       | No       |
| (subject to confidentiality agreement)@bueddemann.de             | Yes       | Complete |
| (subject to confidentiality agreement)@bukgmbh.de                | Yes       | No       |
| (subject to confidentiality agreement)@cinestar.de               | Yes       | No       |
| (subject to confidentiality agreement)@citroen-thuemmler.de      | Yes       | No       |
| (subject to confidentiality agreement)@cws-boco.at               | Yes       | No       |
| (subject to confidentiality agreement)@demco-trading.com         | Yes       | No       |
| (subject to confidentiality agreement)@dold-holzwerke.com        | Yes       | No       |
| (subject to confidentiality agreement)@drahtwerk-bp.de           | Yes       | No       |
| (subject to confidentiality agreement)@espan-klinik.de           | Yes       | No       |
| (subject to confidentiality agreement)@europaservice-muenchen.de | Yes       | No       |
| (subject to confidentiality agreement)@fein-elast.at             | Yes       | No       |

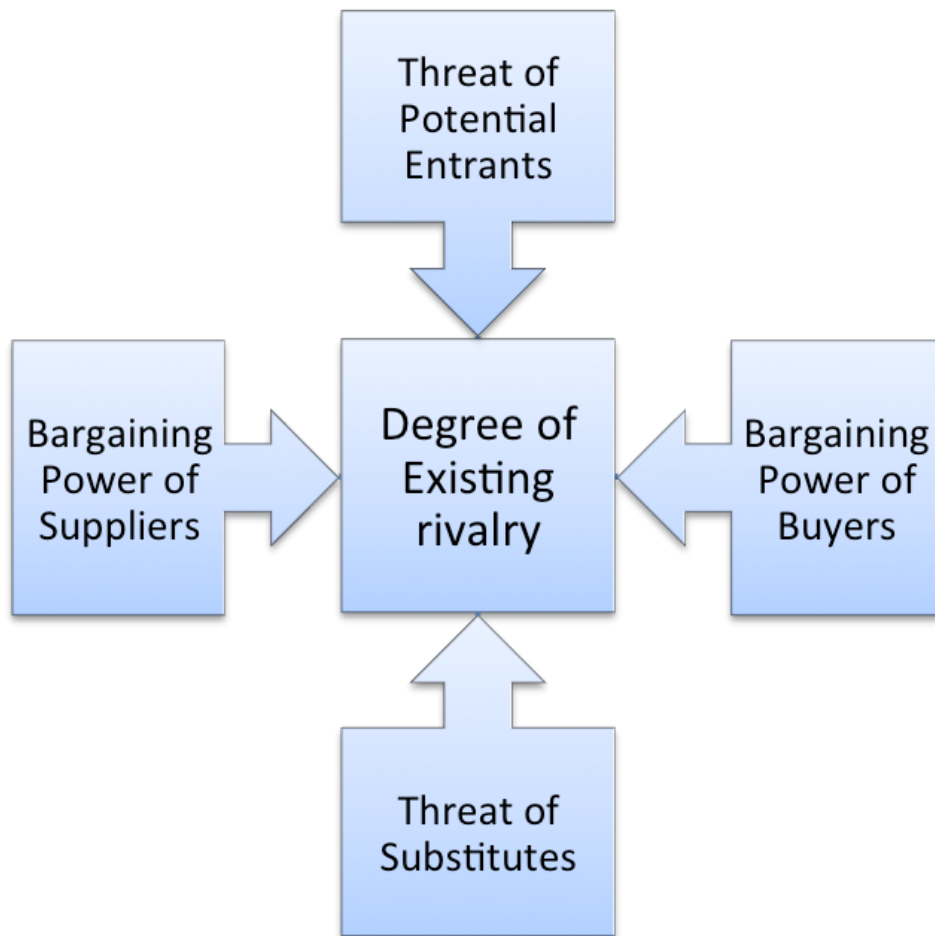
|                                                               |           |          |
|---------------------------------------------------------------|-----------|----------|
| (subject to confidentiality agreement)@feinkosthausschulz.de  | Yes       | No       |
| (subject to confidentiality agreement)@filament-technik.de    | Yes       | No       |
| (subject to confidentiality agreement)@fitnesscenter-horn.de  | Yes       | No       |
| (subject to confidentiality agreement)@fkn-gruppe.de          | Yes       | No       |
| (subject to confidentiality agreement)@getraenke-reichle.de   | Yes       | No       |
| (subject to confidentiality agreement)@gramm-technik.de       | Yes       | Complete |
| (subject to confidentiality agreement)@haberl-bau.de          | Yes       | No       |
| (subject to confidentiality agreement)@haerle.de              | Yes       | No       |
| (subject to confidentiality agreement)@hagenbaeumer.de        | Yes       | No       |
| (subject to confidentiality agreement)@halfen.de              | Yes       | No       |
| (subject to confidentiality agreement)@haug-cnc.de            | Yes       | No       |
| (subject to confidentiality agreement)@hauke-automobile.de    | Yes       | No       |
| (subject to confidentiality agreement)@hegarath.org           | Yes       | No       |
| (subject to confidentiality agreement)@hellum.de              | Yes       | No       |
| (subject to confidentiality agreement)@htm.ht-group.com       | Yes       | No       |
| (subject to confidentiality agreement)@igl-landtechnik.de     | Yes       | Complete |
| (subject to confidentiality agreement)@inotech.de             | Yes       | No       |
| (subject to confidentiality agreement)@janinhoff.de           | Opted out | No       |
| (subject to confidentiality agreement)@jens-peter-arlt.de     | Yes       | No       |
| (subject to confidentiality agreement)@kaelte-rudi.de         | Yes       | No       |
| (subject to confidentiality agreement)@kaeserei-stich.de      | Yes       | No       |
| (subject to confidentiality agreement)@karg-pfister.de        | Yes       | No       |
| (subject to confidentiality agreement)@kauselmann.com         | Yes       | No       |
| (subject to confidentiality agreement)@kerschbaum-haus.de     | Yes       | No       |
| (subject to confidentiality agreement)@kirsten-ohg.de         | Yes       | No       |
| (subject to confidentiality agreement)@klotzbach-gmbh.de      | Yes       | No       |
| (subject to confidentiality agreement)@knubel.de              | Yes       | No       |
| (subject to confidentiality agreement)@kron-solingen.de       | Yes       | No       |
| (subject to confidentiality agreement)@kussmaul-transporte.de | Yes       | Complete |
| (subject to confidentiality agreement)@kwpteamhr.com          | Yes       | No       |
| (subject to confidentiality agreement)@landtechnik-buchen.de  | Yes       | No       |
| (subject to confidentiality agreement)@lmg.de                 | Yes       | No       |
| (subject to confidentiality agreement)@lodder-gkt.de          | Yes       | No       |
| (subject to confidentiality agreement)@loermecke.de           | Yes       | No       |
| (subject to confidentiality agreement)@maleco.de              | Yes       | No       |
| (subject to confidentiality agreement)@marmara.de             | Yes       | No       |
| (subject to confidentiality agreement)@may-online.com         | Opted out | No       |
| (subject to confidentiality agreement)@mb-schneider.de        | Yes       | No       |
| (subject to confidentiality agreement)@messner-pumpen.de      | Yes       | Partial  |
| (subject to confidentiality agreement)@metzgerei-schelkopf.de | Yes       | No       |
| (subject to confidentiality agreement)@metzgerei-wieland.de   | Yes       | No       |
| (subject to confidentiality agreement)@mobau-wirtz.de         | Yes       | No       |
| (subject to confidentiality agreement)@munny.de               | Yes       | No       |
| (subject to confidentiality agreement)@neumann-metallbau.com  | Opted out | No       |

|                                                               |           |          |
|---------------------------------------------------------------|-----------|----------|
| (subject to confidentiality agreement)@nitsch-gmbh.de         | Yes       | No       |
| (subject to confidentiality agreement)@nuebel-bau.de          | Yes       | No       |
| (subject to confidentiality agreement)@oellerking.com         | Yes       | No       |
| (subject to confidentiality agreement)@offergeld.de           | Yes       | No       |
| (subject to confidentiality agreement)@opel-hueppe.de         | Yes       | Complete |
| (subject to confidentiality agreement)@pago-elektric.de       | Yes       | No       |
| (subject to confidentiality agreement)@peternhof.com          | Yes       | No       |
| (subject to confidentiality agreement)@plaengsken-gmbh.de     | Yes       | No       |
| (subject to confidentiality agreement)@pulsbau.de             | Opted out | No       |
| (subject to confidentiality agreement)@quarzglas-heinrich.de  | Yes       | No       |
| (subject to confidentiality agreement)@ratio-handel.de        | Yes       | No       |
| (subject to confidentiality agreement)@reality-bytes.com      | Opted out | No       |
| (subject to confidentiality agreement)@richter-rw.de          | Yes       | No       |
| (subject to confidentiality agreement)@roeger-sauna.de        | Yes       | No       |
| (subject to confidentiality agreement)@rotel.de               | Yes       | No       |
| (subject to confidentiality agreement)@roton.de               | Yes       | No       |
| (subject to confidentiality agreement)@rpv-gmbh.de            | Yes       | No       |
| (subject to confidentiality agreement)@rubart-spedition.de    | Yes       | No       |
| (subject to confidentiality agreement)@santex.de              | Yes       | No       |
| (subject to confidentiality agreement)@schmidt-mineraloele.de | Yes       | No       |
| (subject to confidentiality agreement)@schrauben.at           | Yes       | No       |
| (subject to confidentiality agreement)@schuegner.com          | Yes       | Complete |
| (subject to confidentiality agreement)@sielhorst-gmbh.de      | Yes       | No       |
| (subject to confidentiality agreement)@siriusmail.de          | Yes       | No       |
| (subject to confidentiality agreement)@sparkasse-hattingen.de | Yes       | No       |
| (subject to confidentiality agreement)@sparkasse-pm.de        | Yes       | No       |
| (subject to confidentiality agreement)@sped-hoecker.de        | Yes       | No       |
| (subject to confidentiality agreement)@spedition-kastner.de   | Yes       | No       |
| (subject to confidentiality agreement)@spk-don.de             | Yes       | No       |
| (subject to confidentiality agreement)@spkeo.de               | Yes       | No       |
| (subject to confidentiality agreement)@stadtwerke-erkrath.de  | Yes       | No       |
| (subject to confidentiality agreement)@sternchemie.de         | Yes       | No       |
| (subject to confidentiality agreement)@stump-p-balingen.de    | Yes       | No       |
| (subject to confidentiality agreement)@susogmbh.de            | Yes       | No       |
| (subject to confidentiality agreement)@tantris.de             | Yes       | No       |
| (subject to confidentiality agreement)@tecklenborg.de         | Yes       | No       |
| (subject to confidentiality agreement)@theo-milte.de          | Yes       | No       |
| (subject to confidentiality agreement)@topline-gmbh.de        | Yes       | No       |
| (subject to confidentiality agreement)@traco-transporte.de    | Yes       | No       |
| (subject to confidentiality agreement)@volz-bau.de            | Yes       | No       |
| (subject to confidentiality agreement)@vortec-germany.de      | Yes       | No       |
| (subject to confidentiality agreement)@vr-b.de                | Yes       | No       |
| (subject to confidentiality agreement)@vr-banknordeifel.de    | Yes       | No       |
| (subject to confidentiality agreement)@vzm.de                 | Yes       | No       |

|                                                                 |           |          |
|-----------------------------------------------------------------|-----------|----------|
| (subject to confidentiality agreement)@wachtel.de               | Yes       | No       |
| (subject to confidentiality agreement)@walter-geraetebau.de     | Yes       | No       |
| (subject to confidentiality agreement)@walter-germany.com       | Yes       | No       |
| (subject to confidentiality agreement)@weischer.de              | Yes       | No       |
| (subject to confidentiality agreement)@wenatex.com              | Yes       | No       |
| (subject to confidentiality agreement)@wera.de                  | Yes       | No       |
| (subject to confidentiality agreement)@westfalia-kunststoffe.de | Opted out | No       |
| (subject to confidentiality agreement)@wiggert.com              | Yes       | No       |
| (subject to confidentiality agreement)@winwin.at                | Yes       | No       |
| (subject to confidentiality agreement)@wisekey.com              | Yes       | No       |
| (subject to confidentiality agreement)@woehler.de               | Yes       | No       |
| (subject to confidentiality agreement)@zauggamerica.com         | Yes       | No       |
| (subject to confidentiality agreement)@avadis.ch                | Yes       | No       |
| (subject to confidentiality agreement)@autohaus-barth.de        | Yes       | No       |
| (subject to confidentiality agreement)@schmitt-aufzuege.de      | Yes       | No       |
| (subject to confidentiality agreement)@jlr-haas.de              | Yes       | Complete |
| (subject to confidentiality agreement)@stragen.ch               | Yes       | No       |
| (subject to confidentiality agreement)@autobauer.net            | Yes       | No       |
| (subject to confidentiality agreement)@rueschhoff-beckum.de     | Yes       | No       |
| (subject to confidentiality agreement)@futurecom.ch             | Yes       | No       |
| (subject to confidentiality agreement)@jungfleisch.de           | Yes       | No       |
| (subject to confidentiality agreement)@brenscheidt.com          | Yes       | No       |
| (subject to confidentiality agreement)@spedition-wuest.de       | Yes       | No       |
| (subject to confidentiality agreement)@leo-koenig.de            | Yes       | No       |
| (subject to confidentiality agreement)@baustoffe-wolf.de        | Yes       | No       |
| (subject to confidentiality agreement)@dornburger.de            | Yes       | No       |
| (subject to confidentiality agreement)@nienhaus-rhede.de        | Yes       | No       |
| (subject to confidentiality agreement)@wbg-straubing.de         | Yes       | No       |
| (subject to confidentiality agreement)@clama-int.de             | Yes       | No       |
| (subject to confidentiality agreement)@digicolor.de             | Yes       | No       |
| (subject to confidentiality agreement)@rs-schwarze.de           | Yes       | Complete |
| (subject to confidentiality agreement)@bmw-ratzel.de            | Yes       | No       |
| (subject to confidentiality agreement)@agentur-aktuell.de       | Yes       | No       |
| (subject to confidentiality agreement)@armaturenbau.com         | Yes       | No       |
| (subject to confidentiality agreement)@auto-sirries.de          | Yes       | No       |
| (subject to confidentiality agreement)@infocom-de.com           | Yes       | No       |
| (subject to confidentiality agreement)@seitenbacher.de          | Yes       | No       |
| (subject to confidentiality agreement)@sparkasse-gevelsberg.de  | Yes       | No       |
| (subject to confidentiality agreement)@fillmatic.com            | Yes       | No       |
| (subject to confidentiality agreement)@praml-bau.de             | Yes       | No       |
| (subject to confidentiality agreement)@evatecnet.com            | Yes       | No       |
| (subject to confidentiality agreement)@praller.de               | Yes       | No       |
| (subject to confidentiality agreement)@wiegel-kulmbach.de       | Yes       | No       |
| (subject to confidentiality agreement)@edhaas.at                | Yes       | No       |

|                                                                |           |          |
|----------------------------------------------------------------|-----------|----------|
| (subject to confidentiality agreement)@auto-stanglmair.de      | Yes       | No       |
| (subject to confidentiality agreement)@itsystems.ch            | Yes       | Complete |
| (subject to confidentiality agreement)@amag.at                 | Yes       | No       |
| (subject to confidentiality agreement)@rink.de                 | Yes       | No       |
| (subject to confidentiality agreement)@rehfuss.com             | Yes       | No       |
| (subject to confidentiality agreement)@bowo-bauelemente.de     | Yes       | No       |
| (subject to confidentiality agreement)@michel-fenster.de       | Yes       | No       |
| (subject to confidentiality agreement)@marcher.at              | Yes       | No       |
| (subject to confidentiality agreement)@benteler-sgl.com        | Yes       | No       |
| (subject to confidentiality agreement)@columbus-reisen.at      | Yes       | No       |
| (subject to confidentiality agreement)@cpb-software.com        | Yes       | No       |
| (subject to confidentiality agreement)@dmce.at                 | Yes       | No       |
| (subject to confidentiality agreement)@geg.co.at               | Yes       | No       |
| (subject to confidentiality agreement)@landsteiner.at          | Yes       | No       |
| (subject to confidentiality agreement)@mehler.at               | Opted out | No       |
| (subject to confidentiality agreement)@steyr-mannlicher.com    | Yes       | No       |
| (subject to confidentiality agreement)@tilo.com                | Yes       | Complete |
| (subject to confidentiality agreement)@winkelbauer.com         | Yes       | No       |
| (subject to confidentiality agreement)@abbag.com               | Opted out | No       |
| (subject to confidentiality agreement)@stadtwerke-engen.de     | Yes       | No       |
| (subject to confidentiality agreement)@grampp.net              | Yes       | No       |
| (subject to confidentiality agreement)@firstframe.net          | Yes       | No       |
| (subject to confidentiality agreement)@prelios.com             | Yes       | No       |
| (subject to confidentiality agreement)@stadtwerke-kulmbach.de  | Yes       | No       |
| (subject to confidentiality agreement)@up-great.ch             | Yes       | No       |
| (subject to confidentiality agreement)@vku-online.de           | Yes       | No       |
| (subject to confidentiality agreement)@open.ch                 | Yes       | No       |
| (subject to confidentiality agreement)@greentube.com           | Yes       | No       |
| (subject to confidentiality agreement)@hoehn.de                | Yes       | No       |
| (subject to confidentiality agreement)@hasenauer-anlagenbau.at | Yes       | Complete |
| (subject to confidentiality agreement)@dewetron.com            | Yes       | No       |
| (subject to confidentiality agreement)@rauter.de               | Yes       | No       |
| (subject to confidentiality agreement)@vollrathwasmuth.de      | Yes       | No       |
| (subject to confidentiality agreement)@scala-design.de         | Yes       | No       |
| (subject to confidentiality agreement)@lignumonline.de         | Yes       | No       |
| (subject to confidentiality agreement)@psm-service.com         | Yes       | No       |
| (subject to confidentiality agreement)@bi-log.de               | Yes       | No       |
| (subject to confidentiality agreement)@sig-gmbh.de             | Yes       | No       |
| (subject to confidentiality agreement)@s-web.de                | Yes       | No       |
| (subject to confidentiality agreement)@pfnuer-gmbh.de          | Yes       | No       |
| (subject to confidentiality agreement)@evolva.com              | Yes       | No       |
| (subject to confidentiality agreement)@autohaus-angerer.com    | Yes       | No       |
| (subject to confidentiality agreement)@eickmeyer24.com         | Yes       | No       |
| (subject to confidentiality agreement)@greubelforsey.com       | Yes       | No       |

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|------------------------------------------------------------------|-----|----------|
| (subject to confidentiality agreement)@heinz-zimmermann.de       | Yes | No       |
| (subject to confidentiality agreement)@xaver-lipp.de             | Yes | Complete |
| (subject to confidentiality agreement)@herford.creditreform.de   | Yes | No       |
| (subject to confidentiality agreement)@bnc.ch                    | Yes | No       |
| (subject to confidentiality agreement)@watermann-objekt.de       | Yes | No       |
| (subject to confidentiality agreement)@trodat.net                | Yes | No       |
| (subject to confidentiality agreement)@gwbs.de                   | Yes | No       |
| (subject to confidentiality agreement)@hsg-baunach.de            | Yes | No       |
| (subject to confidentiality agreement)@iba-ag.com                | Yes | No       |
| (subject to confidentiality agreement)@wansor.de                 | Yes | No       |
| (subject to confidentiality agreement)@schiessl-kaelte.de        | Yes | No       |
| (subject to confidentiality agreement)@wallenreiter.de           | Yes | No       |
| (subject to confidentiality agreement)@jedi-kunststofftechnik.de | Yes | No       |
| (subject to confidentiality agreement)@ford-renner.fsoc.de       | Yes | No       |
| (subject to confidentiality agreement)@img-schwanhof.de          | Yes | No       |
| (subject to confidentiality agreement)@hsl-lindlar.de            | Yes | No       |
| (subject to confidentiality agreement)@rb-bad-goegging.de        | Yes | Complete |
| (subject to confidentiality agreement)@ocb.de                    | Yes | No       |
| (subject to confidentiality agreement)@stoebener.de              | Yes | No       |
| (subject to confidentiality agreement)@wewira.de                 | Yes | No       |
| (subject to confidentiality agreement)@tpa-group.at              | Yes | Complete |
| (subject to confidentiality agreement)@web.de                    | Yes | No       |
| (subject to confidentiality agreement)@boese-fahrzeugbau.de      | Yes | No       |
| (subject to confidentiality agreement)@wsg-moeglingen.de         | Yes | Complete |
| (subject to confidentiality agreement)@reineke-kg.de             | Yes | No       |
| (subject to confidentiality agreement)@geagroup.com              | Yes | No       |
| (subject to confidentiality agreement)@werkstatt-ac.de           | Yes | No       |



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