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**SPURRING INNOVATION THROUGH IDEA CONTESTS: DATA ANALYSIS AND
PROCESS IMPROVEMENTS**

Examiners: Associate Professor Ville Ojanen
Associate Professor Kalle Elfvengren
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ABSTRACT

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Spurring Innovation through Idea Contests: Data Analysis and Process Improvements

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This research concerns the Urban Living Idea Contest conducted by Creator Space™ of BASF SE during its 150th anniversary in 2015. The main objectives of the thesis are to provide a comprehensive analysis of the Urban Living Idea Contest (ULIC) and propose a number of improvement suggestions for future years. More than 4,000 data points were collected and analyzed to investigate the functionality of different elements of the contest. Furthermore, a set of improvement suggestions were proposed to BASF SE. Novelty of this thesis lies in the data collection and the original analysis of the contest, which identified its critical elements, as well as the areas that could be improved. The author of this research was a member of the organizing team and involved in the decision making process from the beginning until the end of the ULIC.

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LIST OF ABBREVIATIONS

AP	Asia Pacific
BU	Business unit
EU	Europe
FAQ	Frequently asked questions
ICT	Information and communication technology
IP	Intellectual property
KPI	Key performance indicator
LU	Ludwigshafen
NA	North America
OI	Open Innovation
OR	Online reporter
R&D	Research and Development
SA	South America
ULIC	Urban Living Idea Contest

1 INTRODUCTION

This chapter starts with a description of the background and overall topic of this thesis project. Then the objectives and research methodology of the study are presented. At last, the scope and structure of the thesis are described.

1.1 Background and topicality

This year, 2015 marked the 150th anniversary of BASF and the company is taking this opportunity to look into the future and plan for its next successful 150 years. Innovation has been a key aspect of BASF's leading position in the industry and to ensure a sustainable growth in a highly competitive market, the innovation culture within the company must be changed and adapted to market environment. Therefore, BASF is using its 150th anniversary to involve and connect all the BASF employees across the globe, promoting and encouraging an active and collaborative participation in co-creating the future success of the company.

In order to achieve this goal, the company has introduced a new program as a co-creation pillar of its anniversary, which is known as Creator Space™. This program aims to co-create chemistry for a sustainable future by involving and connecting employees, customers and partners, scientists, and other relevant stakeholders in an open, creative, responsible and entrepreneurial way. One important Open Innovation and co-creation stakeholder for BASF is its 113,000 employees. To leverage the power of its massive pool of knowledge and encourage intrapreneurship, BASF conducted a global online employee idea contest for the first time in the history of the company: the Urban Living Idea Contest (ULIC). This contest was designed to enable a global platform for ideas to be heard, challenged and evaluated. A platform that provides an equal chance for all the employees, and not only the scientists and researcher to develop innovative business solutions to solve the challenges of humanity in future megacities. The support from the top management of BASF has been enormous since the beginning of this contest. Two members of the board of executive directors have sponsored ULIC and this extent of commitment confirms the high importance of this project to BASF SE. Moreover, in order to thrive in today's competitive environment, the company needs change its mindset towards other sources of internal innovation besides R&D units.

BASF 150th anniversary is a laboratory to try fresh innovation approaches such as ULIC, capture lessons learned, and build a culture around them to institutionalize them in the company.

Since the author of the present study has been involved in the planning and administration of this OI and co-creation activity, BASF requested the author to analyze the core elements of ULIC and suggest possible directions for future improvements of this approach.

The analysis of the ULIC and results of this thesis project will support BASF to improve the internal idea contest as an approach for future applications. Furthermore, the comprehensive case study of ULIC analyzes the different aspects of an internal innovation contest, which can be the basis for further research of the methodology by academia.

1.3 Thesis objectives

The main objective of this thesis is to provide answers to the following research questions:

1. How ULIC functioned?
2. What are the key elements of an internal idea contest?
3. What are the improvements to the current concept?

Author's intention is that this thesis project helps BASF to stimulate creativity and to encourage entrepreneurial mindset within the company. Thus, contributing to the company's innovation vision and goals.

To achieve the desired final goal, the following intermediate objectives must be attained:

1. Developing an academic base through a comprehensive literature review on OI, co-creation, crowdsourcing, innovation contests, and intrapreneurship.
2. Providing a detailed case study of the ULIC in order to comprehend its objectives and processes.
3. Collection of relevant data on the progression and functionality of the ULIC.
4. Comprehensive analysis of the collected data in order to recognize its strengths and weaknesses.
5. Proposing the key elements of a fruitful internal idea contest for BASF SE.

6. Definition of possible directions for improvement

Ultimately, by the end of this thesis project, the objectives stated above must be achieved and practical solutions must be presented. The results of this study were also presented to the ULIC organizing team, Creator Space™ team, ECSI Consulting who supported the BASF Creator Space™ program, and a number of innovation practitioners in BASF SE.

1.4 Research methodology

The research method implemented in this thesis project is case study research. A case study is an empirical investigation that explores a phenomenon in its real life environment (Yin, 1994, p. 13). An investigation that focuses on explaining, comprehending, predicting, and/or monitoring the phenomenon (Woodside et al. 2003). It is necessary to state that in such environments boundaries between the phenomenon and its context are not apparent. On the other hand, one of the advantages of the case study method is that it provides freedom for the researcher to implement and test theories in a real-life situation. Moreover, this allows the author to gain a deep insight into how the theory operates and evolves in practice.

Furthermore, the research method of this study is also influenced due to author's involvement in planning, administrating, and redesigning the ULIC in BASF in 2015. Prior to start the thesis, the author was hired by the company for a three months internship. The ULIC project started in July 2014 and officially ends in November 2015. However, to validate the generated ideas, develop a proof of concept, and to reach a potential market-ready solution, the co-creation team, the respective research platforms and business units will undertake the further steps.

1.5 Scope of the thesis

The main subject of this study is ULIC, which was held during BASF 150th anniversary. Nevertheless, this internal crowdsourcing activity is analyzed regardless of the anniversary context. The anniversary program influenced a certain set of goals that were established for this contest, and as the company looks to continue with this methodology in the following years, it is necessary to focus on the initial goals contributing to the innovation process of BASF.

To assign a success tag on an idea, several major development stages have to be undertaken, which can potentially last for years especially in the chemical industry. Since, the validation of the generated ideas from ULIC takes longer than the duration of this thesis project, this element of the framework is out of scope.

1.6 Structure of the thesis

This thesis is divided into six chapters and can be split in two main parts. The first three chapters cover the theoretical and case study research on ULIC, thus providing the basis for the following three chapters. In the last three chapters, the thesis discusses the analysis of the collected data and hence presents the results.

The first chapter provides a briefing to BASF, the company where the thesis project was completed. This chapter also discusses the objectives of the thesis and the selected methodology to achieve the objectives. In addition, the scope and structure of the research is presented.

Furthermore, prior to exploring the concept of an employee idea contest, one needs to understand the concepts of OI, co-creation, crowdsourcing, innovation contests, and intrapreneurship. The second chapter of this study presents the reviews of existing literature regarding the five mentioned concepts.

The third chapter introduces the reader to the co-creation program at BASF SE, Creator Space™ and its objectives. Moreover, the ULIC is investigated comprehensively through a case study research. Thus, providing a detailed overview of the different aspects of this OI and co-creation activity.

The fourth chapter is dedicated to collection and analysis of ULIC's data. In this chapter, qualitative and quantitative data from different sources within BASF are harmonized to provide the basis for a thorough analysis of the contest. The main objective of this chapter is to deliver the required resources for the future refinement of the current model.

The fifth chapter is the main produce of this thesis project and it is divided into two themes. The first theme presents a set of key elements for a successful employee idea contest is provided. Furthermore, the second theme proposes improvements for the refinement of the key elements.

The sixth chapter concludes the obtained results, and discusses the future steps for continuation of this OI and co-creation activity.

2 LITERATURE REVIEW

This chapter is separated into five sections. Each of the sections present the existing definition of the topic and review the relevant literature in order to provide the basis of the case study research.

The selected five topics are as follows:

1. Open Innovation
2. Co-creation
3. Crowdsourcing
4. Innovation contests
5. Intrapreneurship

The author of the thesis believes that the combination of the literature of the above topics is essential in enabling a full comprehension of ULIC.

2.1 Open Innovation

Companies and organizations in different sectors are experiencing a radical change in their innovation process and new product/service development. Not long ago, companies only accepted ideas that were developed in internal research and development departments. The 20th century until the mid-80s was likely the most 'closed' period in the whole history of innovation (Arora and Gambardella, 2010). This conventional innovation funnel did not allow ideas to become accessible to outside and rarely accepted external ideas due to "not invented here" syndrome. The internal research and development was viewed as a strategic resource that could prevent new companies to enter the competition (Chesbrough, 2004). However, the innovation landscape in the world has changed and for big corporation the conventional model no longer promised high levels of top-line growth (Huston et al. 2006). A paradigm shift in how we perceive the sources of innovation was demanding.

Since Henry Chesbrough (2003) coined the term Open Innovation, many companies are paying more attention to this new paradigm. OI suggests that firms can and must utilize

external sources of innovation as well as internal ideas (Chesbrough, 2006, pp. xx-xxii). Moreover, Open Innovation challenges the conventional mindset, which suggests that in order to win in the market, one needs to create the best ideas and deliver them to market. Therefore, a company can profit from licensing out its IP, or acquire IP from outside to gain competitive advantage (Chesbrough, 2003). P&G estimated for every researcher working inside the company there were 200 other scientists or engineers outside the company just as good—a projected number of 1.5 million individuals (Huston et al. 2006). In today's highly competitive market, companies such as P&G should scout the outside environment for new sources of innovation. Mortara and her team conducted a series of interviews in 2009 with leaders of pioneering companies in Open Innovation. These managers claimed that the main benefits of adopting Open Innovation are shorter time to market, find new technologies, access to additional competence, and cost reduction and cost efficiency and many other reasons, which the majority surprisingly focused on inbound view of OI (Mortara et al. 2009).

On the other hand, some companies decide on externalizing their knowledge and innovation via an outbound process to gain competitive advantages in the market (Gassmann and Enkel, 2004). This approach, also known as *inside-out process*, suggests that companies can offer their knowledge to market, and sell IP in order to realize ideas quicker than internal development could (Enkel et al. 2009). Thus, allowing companies to serve markets beyond their conventional reach through joint ventures or spinoffs. Thanks to these new income sources, companies can benefit from an increase in overall revenue from innovation (Lichtenthaler and Ernst, 2007).

Enkel et al. (2009) describe the *coupled process* as the third core process in open innovation. Coupled process discusses the co-creation aspect of open innovation, which combines the two previously mentioned approaches to jointly develop and commercialize innovation with complementary partners (Enkel et al. 2009). Inspired by open source project development (Von Hippel and von Krogh, 2006), co-creation discusses joint production of innovation by leveraging the knowledge of the crowd. This joint production can be done with collaboration with communities (Lakhani et al. 2008), consumers (Hienerth, 2006), lead users (Frank et al. 2006), universities or research organizations (Perkmann and Walsh, 2007), and industry

partners (Enkel and Gassmann, 2010). The topic of co-creation is discussed separately in the next section 2.2.

Today, we are living in a global village where it is no longer possible to do things alone. To thrive companies need to cooperate with the best talent all over the world and not necessarily the closest ones (Ridderstrale et al. 2000). With the advancement of information technology and communication, finding and connecting to the best talent sources have never been easier. Besides its benefits, Open Innovation raises pure organizational challenges that we can cluster into two categories. To begin with, the engagement of other agents into the innovation process creates coordination challenges. These challenges are mainly caused due to difficulties associated with the search of valuable innovation among the massive database. Moreover, cooperation arrangement and diverging objectives on the technological trajectory of the product by the firms result in more coordination problems. The second category discusses the incentive problems derived from creation and value adoption of ideas from the innovator. Firstly, the innovations can lead to spin outs that are capable of competing with the mother organization. Then to transmit ideas and knowledge across the boundaries of the firm may reduce their economic value. At last, the typical team production problem of free riders is not favorable to the major contributor. (Rodríguez et al. 2011)

As the degree of uncertainty in early-stage technological advances is high, one faces a complex evaluation process. A successful innovative company must follow a flexible innovation process rather than sticking to a handful of Open Innovation approaches. Approaches that offer a set of tools to enable stakeholders of a company to contribute to the innovation cycle. For instance, tools that enables customers to create their own product or integrate internal and external idea creators (Gassmann et al. 2010). InnoCentive is a great example of leveraging crowd knowledge to find novel solutions for problems offered by companies. Today, OI has faced a variety of trends and is being applied by increasing number of companies who previously refused to cooperate with the outside world. From penetrating to mainstream industries to a shift from a stage gate process to a probe-and-learn approach, open innovation principles are facing a paradigm shift (Gassmann et al. 2010).

Indeed, it requires courage and vision to experiment new ideas in times of financial difficulties. However, if neglected companies could easily face decreases in revenue growth and losses in market share. Open Innovation certainly provides multiple possibilities, which, if diligently pursued can lead to greater innovation and increased growth (Chesbrough, 2007). Moreover, it is necessary to mention that a standard OI strategy may not be fitting to every company. The success factor here lies within a careful attention to what the company needs to open, how this should be done, and prepare to face the new problems which openness brings (King et al. 2013).

2.2 Co-creation

In the last 20 years, economic environment has changed dramatically posing new challenges to businesses around the world. The rising cost of technology development and shortening life cycles of new products dare companies to justify investment for innovation (Chesbrough, 2007). Moreover, studies have shown that each year 80-90 percent of new products fail (Di Fiore, 2014). Conventional market research tools and methods fail to inspire innovation to produce successful products. Therefore, businesses are constantly exploring new ways to innovate cheaper, quicker and more successfully.

One of these principles is co-creation, also known as co-production. This concept refers to the active collaboration of end-users in different stages of new product development process (Prahalad and Ramaswamy, 2000; Vargo and Lusch, 2004). For companies two trends created the basis for co-creation activities. First, they need to produce more efficiently. Thus, end-user can take a new role as possible co-producers in the production chain (Von Hippel, 2007). Second, end-users bring unique experiences that can add value to products or services of a company. Therefore, enabling them as an interesting element in the innovation process of products and services.

Multiple studies have shown that the result of co-creation is not limited to only improved customer satisfaction and loyalty, but also create competitive advantage in the market (Grissmann et al. 2012). Moreover, it has received an enormous attention by both academics and practitioners in public and private sector. This concept is widely studied in the open innovation literature, and inspired from open development studies (Zahedi

Anbardan and Raeyat, 2014). According to Enkel and Gassmann (2008) research with 144 companies, clients were mentioned as the top source of knowledge with an astounding rate of 78%. In addition, suppliers, competitors, as well as public sector and research institutions were stated as other major sources of information for companies (Enkel and Gassmann, 2008). Considering these results, one can acknowledge the importance degree of leveraging the massive knowledge pool derived from stated sources.

Over the years, the definition of co-creation has changed and it continues to evolve. Aarikka-Stenroos and Jaakkola (2012) describe value co-creation as a joint problem-solving in which both supplier and customer combine their resources in a collaborative interactive process. In this process supplier offer professional expertise, techniques and judgment, while customer contributes knowledge such user cases and point of view (Aarikka-Stenroos and Jaakkola). Furthermore, these definitions in existing literature share a number of key insights, such as joint problem solving, joint process and inseparability of the customer from the co-creation process.

Although the majority of the published books and articles in the area of co-creation describes itself as a method to explore, ideate and validate new ideas with the customer, this does not mean that this method cannot be applied to other cases. For instance, ECSI Consulting, a global innovation and strategy consulting firm, defines co-creation as a dynamic and creative process of collaborative innovation with external stakeholders, value chain actors, customers, suppliers, partners, and employees (Di Fiore et al. 2015).

Various companies such as General Electric, P&G, BASF, and Starbucks have embraced co-creation mentality in their innovation DNA. In 2001, P&G set a unique strategy, named “connect and develop” throughout the company. It had a goal to increase the involvement of external innovation partnerships in the new initiatives to 50% and pull P&G’s experts to co-creation new products. They perceived the 50,000 R&D staff of their top 15 suppliers as valuable sources of innovation and established a network of 70 technology entrepreneurs around the world (Huston et al. 2006). For these mega companies it is crucial to not only tap into the knowledge outside of the company, but also encourage the culture of “connect and develop” internally. For example, when P&G decided to enter to the new market of home

car-care business, the R&D began from looking for related expertise inside the company. The water filter researchers from PuR unit were able to deionize water to remove minerals, and Cascade unit had developed a compound in its dishwasher detergent to reduce water spots (Hof, 2004). P&G case provides a great example of leveraging both internal and external sources to stimulate innovation.

Innovation often occurs as insights from different perspectives create a novel combination. Co-creation encourages the participating companies to share insights, knowledge and expertise to select the most promising new combination. By its nature, co-creation brings diversity; however, this has both its advantages and disadvantages. A multidisciplinary collaboration decreases the average value of the output, but increases the probability of both failure as well as breakthrough innovation (Fleming, 2007). Moreover, a major challenge in a co-creation process is to establish focus and cohesiveness. To overcome this challenge, participants of this methodology need to compromise on their desired outcome to reach a consensus for further development of a solution.

As mentioned earlier in this section, one can co-create with various groups depending on the defined goals, needs and resources. The topic of co-creation covers a wide landscape, therefore, in this thesis; author studied co-creation as an approach to involve employees into the innovation process.

2.3 Crowdsourcing

For a long period, teams were responsible to solve problems; focus groups investigated customer needs, and companies relied on consumer surveys to study the market, but these tasks have changed (Bonabeau, 2009). With the rise of open innovation methodology, both academia and practitioners experimented new processes with various approaches.

One of these approaches is crowdsourcing, which is mostly conducted on internet platforms, and engages a global audience to share ideas (Sloane, 2011, p. 19). The term crowdsourcing originated from the combination of the terms “outsourcing” and “crowd” and it means to outsource to the crowd (Schenk and Guittard, 2009). Jeff Howe and his colleague Mark Robinson coined the term “crowdsourcing” in 2006. Later that year, Jeff Howe published

the first definition of the term in blog post just after a day his article, “The Rise of Crowdsourcing” was published on Wired magazine. He defined the term as “the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call” (Howe, 2006b).

Arolàs and de Guevara (2012) analyzed over 200 documents and found 40 original definitions for the term crowdsourcing. After examining the existing definitions, they formed a new integrated and broad definition around three factors of crowd, initiator, and crowdsourcing process. The new definition provided a complete description of the term and its key ingredients (Brabham, 2013, pp. 2-3).

“Crowdsourcing is a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity and number, via a flexible open call, the voluntary undertaking of a task. The undertaking of the task, or variable complexity and modularity, and in which the crowd should participate bringing in their work, money, knowledge, and/or experience, always entails mutual benefit. The user will receive the satisfaction of a given type of need, be it economic, social recognition, self-esteem, or the development of individual skills, while the crowdsourcer will obtain and utilize to their advantage what the user has brought to the venture, whose form will depend on the type of activity undertaken” (Estellés-Arolas and González-Ladrón-de-Guevara, 2012, p. 197).

Although the above definition is regarded as a complete definition of crowdsourcing, many applications of the term do not fit into its boundaries. For instance, open source platforms such as Wikipedia and YouTube are excluded since there is no common sponsor in the process. Furthermore, there are also different opinions about the types of crowdsourcing.

In this thesis the author refers to Jeff Howe’s views. Howe (2009) categorized the term into four types; crowd creation, crowd voting, crowdfunding, and crowd wisdom. Local Motors, an automotive design, manufacturing, and technology firm based in Arizona, leverages the power of the crowd in both crowd creation and crowd voting. The company’s online platform

enables car designers, customers, car enthusiasts to submit, discuss, and evaluate new ideas (King and Lakhani, 2013). Kickstarter and Indiegogo are two great examples of crowdfunding platforms that provide a unique opportunity for projects to raise the money they need. With the addition of novel tools in ICT, innovation intermediaries such as InnoCentive, NineSigma, or yet2.com have enabled companies to reach out to massive intellectual resources for innovation (Lakhani, 2008; Piller, 2009). Moreover, multiple companies consider crowdsourcing as a fresh method for customer integration, mass customization, and customer community integration (Enkel et al. 2009). Lego, the Danish toy company benefits from its fan base to generate new designs for its products. Adidas, the German multinational corporation that designs and manufactures sport shoes, clothing and accessories allows its customers to select from a variety of colors to have their own customized product. Through receiving a massive amount of data on consumer behavior, Adidas can understand the market trends much easier and improve its new product development.

In detail, crowdsourcing possibilities may seem endless, but Boudreau and Lakhani (2013) categorized the different formats into four distinct approaches; contest, collaborative community, complementors, and labor market. Table 1 summarizes the four approaches conceptualized by Boudreau and Lakhani (2013).

Table 1. When and how to crowdsource (Boudreau and Lakhani, 2013).

Approach	Purpose	Challenges	Best use
<i>Contests</i>	To Generate high value solutions for complex/novel problems via large scale activities	To generalize and purify the problem from company's specific details	Highly challenging technical, analytical, and scientific problems; creative projects
<i>Collaborative communities</i>	To integrate a large number of diverse contributions into value creation	Lack of shared culture and cohesiveness, harder to control, protection of IP	Wikis, customer support communities, open source projects
<i>Complementors</i>	To solve users' problems by encouraging innovative solutions to your core product	Provide access to function and information of core products while protecting assets	Open product or marketing data initiatives, content mashups, apps
<i>Labor Markets</i>	To match talent to tasks efficiently and flexibly	Identify the problem to address, fit to organizational structure	Human computation, repeated tasks, work that can be clearly described and evaluated

As illustrated in Table 1 companies that undertake crowdsourcing must consider many challenges along the process. In addition, Bonabeau (2009) defined five major important issues regarding the implementation of collective intelligence. The table below is a summary of his findings.

Table 2. Challenges related to implementation of collective intelligence (Bonabeau, 2009).

Challenge	Description
<i>Control</i>	Unwanted and undesirable outcomes, success unpredictability, unassigned liability and risks related to outsiders involvement.
<i>Diversity versus expertise</i>	Solving certain problems requires either a diverse group of participants or an expert group and each carry their own challenges. The key here is to strike the right balance between these two factors.
<i>Engagement</i>	Motivations vary widely among participants and setting the correct incentives is crucial to maintain a high level of engagement.
<i>Policing</i>	The likelihood of misbehaving increases with group size.
<i>Intellectual property</i>	Disclosing a problem and managing the transparency can be difficult for many companies. The ownership of the resulting intellectual property.

Selecting the right crowdsourcing approach demands a number of steps. At first, one needs to consider whether to reach to the crowd only for idea generation or also for idea selection. Then, ask a series of questions to see if the crowd can provide better solutions for the desired challenge, have the required knowledge to select the best ideas, and most importantly if the intellectual property is protected (King and Lakhani, 2013).

To conclude, theory and practice have shown crowdsourcing can be highly efficient in problem solving. In addition, the advancements in internet-based tools have made it very convenient for companies to experiment a variety of tools to tap into wisdom of the crowd. The key to success is to develop the right tool, balance between diversity and expertise, and distinguish between a decentralized and distributed decision-making (Bonabeau, 2009).

2.4 Innovation contests

The concept of crowdsourcing, its benefits and challenges were briefly described in the previous section. Furthermore, innovative companies are constantly experimenting new crowdsourcing tools to generate, and evaluate ideas at the fuzzy front end of innovation. Innovation contests, which utilizes the power of the crowd through crowdsourcing, is one of

these tools. In the most straightforward format, the company offers a prize and invites the crowd to submit solutions to a specific problem.

Contests have a long history in solving the world's most challenging problems. From the British longitude established by Britain's parliament to the French food preservation prize during Napoleon's era, contests have proven to be highly effective. This method is explicitly effective when a company wants to solve a complex or novel problem or there is no best-practice approach to a solution (Boudreau and Lakhani, 2013). Back in 2006, Netflix, the on-demand video company, set a prize of \$1 million to anyone who could improve its recommendation capability by 10%. In 2009, after assessing more than 44,000 entries, the company noticed that one of entries outperformed its own algorithm by more than 10% (MacCormack et al. 2013).

The potential benefits of conducting an innovation contest are considerable and with the growing trend toward outsourcing and off-shoring innovation activities (Anderson et al. 2006), many companies are reaching to web-based innovation contest platforms to solve R&D problems. Platforms such as InnoCentive, NineSigma, Inno360, TopCoder, Kaggle, and HYVE are just a few examples of companies, which act as intermediaries and conduct hundreds of innovation contests every year. Scientists, engineers, students, and in general, public are able to browse through the challenges offered by organizations and submit their solutions to win a specific prize. There are several benefits associated with executing an innovation contest: (a) it encourages competition among participants; (b) companies only pay for successful innovations and not the failures; (c) access to a wide audience; (d) reducing R&D costs; (e) enhanced idea generation and evaluation capacity (Terwiesch and Xu, 2008).

To deliver these benefits, nevertheless, these contests must be able to screen the proposed ideas effectively to select the best ones. Due to the large number of ideas, submission, and opportunities, the screening process must be cheap, quick, and accurate despite having limited information. Whereas an innovation contest may be effective in idea generation, its performance on idea screening and selection is rather poor. Yucesan (2013) analyzed the screening performance of eight different contest formats in evaluating and selecting the best

ideas through simulation study. The results of this study supported the earlier statement on the weakness of this tool in ranking and selection of contesting opportunities. Further research to improve the efficiency of screening, ranking, and selecting the ideas is encouraged.

In addition to tapping to the knowledge of the crowd that a company does not know, for large corporations leveraging the knowledge pool of its employees is as important. Incorporating the innovation contest as an internal tool into the innovation process of a company enables companies to encourage creativity, entrepreneurship, and innovative mindset among its employees. Internal innovation contest refers to a crowdsourcing model, which only uses employees of the company as participants of the contest. This initiative is thus only open to an internal audience and excludes the external crowd. Villaroel and Reis (n.d., p. 2) use the term intra-corporate crowdsourcing and define it as a “distributed organizational model used by the firm to extend problem-solving to a large and diverse pool of self-selected contributors beyond the formal internal boundaries of a multi-business firm: across business divisions, bridging geographic locations, leveling hierarchical structures.” This definition shows the objectives sought to be achieved by the organizations. The goal is to overcome long developed knowledge silos and exceed the boundaries of personal networks in order to foster new knowledge connection.

There also various terms, which academia and practitioners use to refer to an internal crowdsourcing initiative such as idea campaign, innovation contest, and idea contest. In 2008, Baumgartner described an idea campaign as “a focused event designed to solicit ideas that solve specific business needs” (Baumgartner, 2008, p. 8) and introduced a five step process. Similar to the process defined by Baumgartner, Muhdi et al. (2011) conducted a series of case studies from 12 crowdsourcing projects and identified five major phases for its process. Considering the similarities and differences, the following process is proposed to conduct an idea contest (Koller, 2015):

1. Preparation: timeline definition, project resource alignment, establishing evaluation criteria and follow-up process. And most importantly, defining the problem statement.
2. Initiation: secure management support, communication and promotion of the contest.

3. Execution: crowd engagement, active administration and monitoring of the initiative.
4. Evaluation: evaluating the submitted ideas, selecting and awarding the winner.
5. Further processing: incorporating the ideas into the new product development process of the organization.

It is necessary to mention that there is no “one key to open all doors” process. For instance, the framework presented by Koller (2015) focuses on product innovation, and therefore excludes service and business model innovation.

There are various point of views on how a company can increase the efficiency of an innovation contest. For instance, Terwiesch and Xu (2008) discuss that designing a contest with multiple rounds, in which after each round a number of contestants advance to the next, encourages participants to invest more time and effort, resulting in a better solution at the end.

Furthermore, one needs to consider the potential management challenges associated with the implementation of an idea contest. The first is to identify a problem within the company that is easily understandable by the solvers and encourages feasible solutions that the organization can implement. Secondly, a proper treatment of intellectual property must be considered to prevent possible related issues. Finally, the company should not underestimate the administration, operation and prize costs, and be aware of the information disclosure risks while describing the problem statement. (Boudreau and Lakhani, 2013; MacCormack et al. 2013)

On the other hand, conducting an internal innovation contest carries its own specific challenges, which may not be observed while targeting the outside world. Companies must set the right support and incentives, provide the tools to develop ideas, and encourage the culture of entrepreneurship (Carini and Townsend, 2007). In the next chapter, the topic of intrapreneurship and the related literature is briefly introduced.

2.5 Intrapreneurship

Intrapreneurship, also referred to as corporate entrepreneurship, can be described as the act to encourage innovation inside an organization, through evaluating potential new

opportunities, appropriate resources orientation, and finally to exploit and commercialize the identified opportunities (McFadzean et al. 2005). For a company to truly promote creativity and innovation among its employees, it is necessary to create an entrepreneurial environment to exploit opportunities as they rise from the bottom of the organization. Otherwise, the innovative ideas remain as aspirations and would not have the chance to be nurtured to full proof solutions.

The crucial role of an entrepreneur in the innovation process cannot be denied. Schumpeter, one of the most influential economists of the 20th century, argues that innovation comes from the entrepreneur (Schumpeter, 1947). Schumpeter placed the entrepreneur's role in the core of his theory as he claimed that the actions of an influential individual initiates the triggers of change in economy, which later spreads to the rest of the economy (Schumpeter, 2003, pp. 131-143).

In addition, the intrapreneurs and their role to develop novel ideas within their daily task operations are important in a company's innovation process. These individuals have a unique ability to analyze methods critically, question conventional procedures, services and products, which are valuable sources of innovation (Zhang et al. 2010). With their alertness and intuition, they can recognize an opportunity that has been underestimated previously (Shaw et al. 2005). There are many characteristics that could be attributed to who an intrapreneur is. Characteristics such as visionary, understanding of markets and consumer problems, and having a wide social network (Shaw et al. 2005). The search to find the personalities of intrapreneurs provides us with an understanding of how they react and what are their motives.

However, a more important challenge for companies is to create an environment where the intrapreneur arises. Kuratko et al. (1990) analyzed the literature since late-1980s and introduced five internal enablers of intrapreneurship: management support, organizational structure, risk taking, rewards, and resources. Based on this framework, Christensen (2005) conducted a case study on Danfoss Drives, an international engineering company. Her findings showed that the five enablers mentioned previously are not sufficient to fully unleash the intrapreneurial capacity in a knowledge-intensive company. The proposed

framework suggests adding communication, culture, and process (Christensen, 2005). The table 3 demonstrates an overview of these eight intrapreneurial enablers that are proposed by Christensen (2005). The basic factors refer to those that are crucial and necessary for the occurrence of entrepreneurship. On the other hand, intrapreneurial factors represent those that can stimulate and enhance intrapreneurial activities. In addition to the previous model, the structural model testing by Park et al. (2014) revealed that communication symmetry, strategies for empowerment of employees, and managerial openness result in an increase in employee's intrapreneurship, and in internal and external scouting capabilities.

Table 3. Influential factors for intrapreneurship (Christensen, 2005).

Factor	Basic factor	Intrapreneurial factor
<i>Communication</i>	Language	Direct and open communication, formal and informal knowledge sharing
<i>Culture</i>	Creativity and innovation	Idea generation across the whole company, consensus-seeking in decision making, decentralized decision, flexible working conditions
<i>Process</i>	Constant improvement	Using different models for different projects, flexibility
<i>Rewards</i>	Regular pay, job security	Promotion, expanded job responsibility, autonomy, recognition, free time to work on pet projects, bonuses
<i>Management support</i>	Sponsors	Commitment
<i>Organizational structure</i>	Hierarchy	Corporate venturing, cross-functional teams, internationalization, external networks
<i>Resources</i>	Finance and materials	Knowledge resources
<i>Risk</i>	Tolerance of lower risks	No penalization

It is clear that corporate entrepreneurship and internal innovation models are not two topics that are independent from each other. Nevertheless, the lack of explanation about the dynamics and relationship between corporate entrepreneur and the innovation process identifies a gap to be explored (McFadzean et al. 2005). A company cannot expect innovative ideas to rise from its employees through only asking them to be innovative. Referring to previously mentioned gap between intrapreneurship and the innovation process, development of a new model is necessary. Shaw et al. (2005) developed and presented both a macro-model and a micro-model of corporate entrepreneurship and innovation. In abstract, these models demonstrate that an intrapreneurial culture, which encourages change and provides a supportive environment, is most likely to stimulate innovation (Shaw et al. 2005).

There are multiple success stories of companies who embraced entrepreneurship in their corporate culture. Companies such as Google, LinkedIn, Lockheed Martin, 3M and many others capitalized on their employees' ideas to fuel business growth and gain competitive advantage in the market (Schawbel, 2013). Intrapreneurs are key actors in innovative companies and their role is seen crucial to the company's success. Nevertheless, in today's highly dynamic business environment, large organizations that neglect the benefits of incorporating an entrepreneurial mentality within their massive global systems can put themselves in the risk of disruption (Armano, 2012).

3 BASF CASE STUDY

The beginning of this chapter introduces BASF SE, the company that the thesis project was occurred and the Creator Space™, the co-creation program of BASF for its 150th anniversary. Furthermore, it provides a detailed description of the Urban Living Idea Contest that BASF conducted in the framework of the Creator Space™ in 2015. The last section of this chapter raises a few questions that are the starting point for the fourth chapter.

3.1 BASF SE

BASF SE is the world's largest and leading chemical corporation in the world and its headquarters is located in Ludwigshafen, Germany. Today, BASF SE has more than 113,000 employees contributing to the success of its customers in nearly all industries and almost every country in the world. In 2014, BASF recorded sales of more than €74 billion and €7.6 million in EBIT. The company summarized its contribution into its corporate purpose: We create chemistry for a sustainable future. The core values of BASF are to be creative, open, responsible, and entrepreneurial. Furthermore, BASF has set innovation targets to achieve by 2020: circa €30 billion sales and €7 billion EBITDA from innovations. (BASF, 2015a)

3.2 Creator Space™

In the 150th year of its existence, BASF is celebrating by connecting people and ideas around the globe to address the key challenges of our time. Together with celebration, co-creation is the key pillar of the anniversary year and Creator Space™ is its co-creation program. It is a movement to deliver BASF's purpose to co-create chemistry for a sustainable future by involving and connecting employees, customers/partners, scientists, and the relevant public in an open, creative, responsible and entrepreneurial way. Moreover, the three main themes of urban living, food, and smart energy summarize the key challenges that we as humans need to address to ensure a sustainable future on planet earth.

Creator Space™ is consisted of four key elements: Creator Space™ Online, Creator Space™ Tours, Science Symposia, and Co-creation activities portfolio. Creator Space™ Online is an online platform that connects individuals to share and debate solutions for a specific challenge. The Tours are a series of global events hosted by BASF to connect individuals,

firms, policy makers to generate solutions and discover the role of chemistry in addressing the local challenges in each tour stop. During this program BASF collaborated with various stakeholders on challenges such as water accessibility in Mumbai, resource efficient farming in North and South America, smart consumption in Shanghai, energy storage in Ludwigshafen, and low-income housing in Sao Paulo. Under Science Symposia, BASF enabled a platform for topic experts around the globe to come together, exchange ideas and debate solutions. The three symposiums were on urban living, food, and smart energy held respectively in Shanghai, Chicago and Ludwigshafen.

Furthermore, the co-creation portfolio is consisted of 50 co-creation activities with different stakeholders and focusing on various themes. With Creator Space™, BASF extended its external network of people in science, business and civil society and leveraged these connections to enable a deeper understanding of the challenges fronting humanity around the globe. With better insights, the company identified potential solutions, which can be developed together with BASF's co-creation partners both internally and externally. Creator Space™ is considered as the largest OI and co-creation program conducted by a corporation combining both online and offline channels. Due to the scope of this thesis, the study briefly introduces the OI and co-creation activity portfolio of Creator Space™ and later focuses on ULIC.

Creator Space™ presents eight co-creation methodologies where BASF can involve different stakeholders in different phases of the innovation process to explore, ideate, or validate a solution. Figure 1 provides an overview of these co-creation formats. In this Figure, the Y-axis represents the different co-creation stakeholder groups, which are suitable for each co-creation methodology. On the contrary, the X-axis differentiates between the various levels of stakeholders' engagement. From highly virtual environment (e.g. online platforms) to highly physical presence (e.g. workshop).

In addition to these new methodologies, Creator Space™ offered a scalable learning and knowledge diffusion model to foster this cultural change. This approach started with the creation of new approaches, and then followed by a global training across multiple BASF business units. A series of educational webinars with the methodology experts were

conducted throughout the year to provide an opportunity for all BASF employees to get familiar with these topics. A set of easy to read and small handbooks were designed and distributed freely to innovation departments in the company. Moreover, by applying these methodologies in approximately 50 pilot projects during its anniversary year, the company put itself in the cycle of experimentation and learning. These learned lessons are captured, and then analyzed in order to further improve the processes.

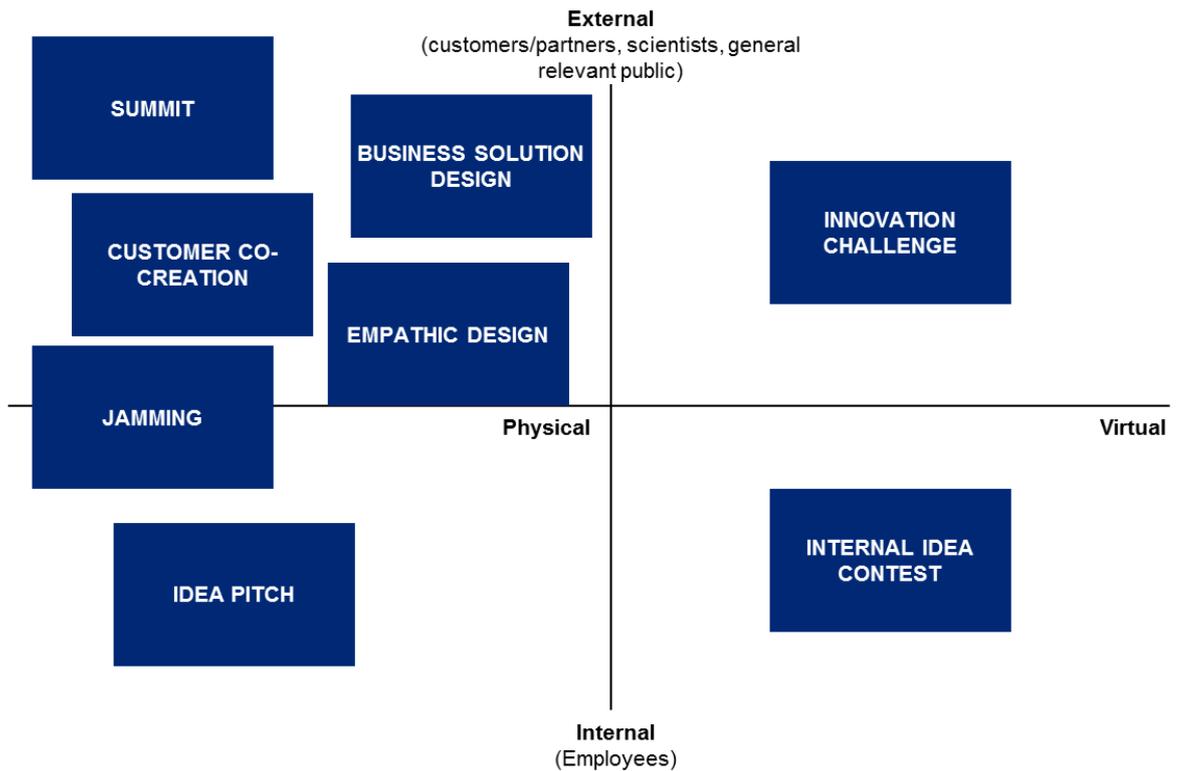


Figure 1. Creator Space™ co-creation formats.

The 113,000 employees of BASF are a major source of innovation and the company conducted a series of co-creation activities with its employees in order to leverage the full potential of its internal knowledge and encourage creativity and entrepreneurship. Among these activities, the series of jamming sessions for the employees in order to generate new solution to a specific problem are worth mentioning. Jamming is a high-energy, tight-deadline physical event where diverse groups of people gather to generate innovative ideas in the form of tangible, rough prototypes around a specific challenge (BASF, 2014e). In addition to the jamming session, the company conducted two global idea contest to encourage creativity and entrepreneurship among the employees. An internal idea contest within BASF is defined as an online contest in which teams of employees submit idea

proposals to a certain challenge and after the submission deadline, proposals are evaluated and one or more winners selected (BASF, 2014b). The first contest, known as “Connected to Care” invited employees to propose projects in corporation with a NGO in order to solve an environmental or social problem. This contest generated more than 500 projects, which eventually BASF funded 150th projects and enabled the winners to take one complete day off in order to realize their projects. The second contest had a more business-oriented design. The ULIC provided a platform for all BASF employees to share their innovative ideas, give feedback to each other, shape new cross business unit teams, and vote for the submitted ideas. This crowdsourcing initiative gathered numerous ideas from all over the globe and gave the employees a highly visible platform to be seen and heard. This thesis focuses on the ULIC as an approach. The following section of the chapter presents a case study of this particular OI and co-creation activity.

3.2 Urban Living Idea Contest

Cities are hubs of innovation and creativity, but they tend to struggle with air pollution, a lack of drinking water supply as well as traffic congestion. Consequently, creative ideas and adventurous entrepreneurs are in demand in order to overcome these major challenges. Over the past 150 years, innovation has been a decisive success factor for BASF and will continue to be so in the future. With 10,700 employees in research and development, more than €1.8 billion in R&D expenditure, and 3,000 R&D projects the company ensures a long-term business success with chemistry-based solutions in almost every industry (BASF, 2015b). Moreover, one of the main objective of the 150th anniversary is to involve and connect all the BASF employees across the globe, promoting and encouraging an active and collaborative participation in both celebration and co-creation.

For the first time in the history of the company, BASF conducted a global internal contest in 2015 to encourage its employees to generate innovative ideas. Ideas that are beneficial for society, environment and can, generate new businesses for the company. The overall theme of the contest was Urban Living, which was one of the three themes for the 150th anniversary of BASF. In addition, the company selected three challenge areas as the main topics of the idea contest: air, transportation and water. The aim of the ULIC was to support and promote entrepreneurship for the anniversary year. BASF, the leader in the chemical industry has a

great opportunity to provide meaningful contributions to environment and society. With its enormous knowledge pool, BASF addresses the challenges of our time with sustainable solutions in alignment with “creating chemistry for a sustainable future” strategy.

The ULIC is a part of the Creator Space™ co-creation program, established by BASF for its 150th anniversary year. The program was created alongside “Connected to Care”, the global team contest for employee involvement, and is the second largest OI and co-creation activity in which all employees worldwide could participate. The management of the company, at its highest level, gave direct recognition to the best ideas generated by the BASF global community of employees; that is also important to bridge the typical distance that exists between most of the population of employee and the top managers who steer the company.

ULIC was consisted of two main elements: the online idea contest, and the idea pitch. First in the online part, every employee had the opportunity to post his or her idea on the internal platform, give feedback to each other, and ask questions. After the submission phase, employees voted for their favorite ideas to select the top 30. In the next step, an expert team evaluated the refined top 30, to select the best 10 ideas. In the final phase, these top 10 teams were invited to BASF headquarters in Ludwigshafen to perform a pitch presentation in front of a jury of the company’s highest management. Each team had only 5 minutes to pitch their ideas to the jury and only one winner acquired full financial support. A more comprehensive analysis of the contest’s process is provided as a separate section later in the chapter.

3.2.1 Objectives

At the beginning of this project, four main objectives were defined.

1. To leverage the power of 113,000 BASF employees.
2. To connect diverse minds across organizational boundaries - cross-unit and cross-region to create sustainable business opportunities for BASF.
3. To include homeless ideas from many individuals by engaging leadership in setting the right environment for innovation and collaborative behaviors. These ideas must address environmental and social problems while ensuring business sustainability.
4. To appreciate many individual employees by giving them visibility and recognition in the organization.

With defining these four objectives, a few challenges rose. Connecting people and initial ideas for better business value across a gigantic company like BASF is a difficult task. Moreover, the engagement of the leadership, especially the middle management is a key into achieving the objectives. Lastly, for such a crowdsourcing innovation approach, a maximum number of employees need to be motivated.

3.2.2 Challenge statement

This contest called for ideas concerning solutions for the challenge posed by modern urbanization in three areas: air, transport, and water. The challenge for the employees should be easy to communicate and formulated in broad terms to give everybody the chance to participate. Therefore, not only the specialists of an issue or a specific business unit, but to engage the whole population to leverage the power of the crowd. Based on a predefined context, three challenge themes were selected to address the crucial issues of the urbanization in future:

- 1- **Air:** in what ways might BASF help reduce emissions and make the air we breathe cleaner and healthier?
- 2- **Transport:** in what ways might BASF make transportation in cities faster, safer, more affordable, comfortable and enjoyable, but less damaging to the environment?
- 3- **Water:** in what ways might BASF help use water more efficiently, make it clean and accessible to everyone?

Each of the above challenge statements were used to define the key question of each theme. To facilitate the submission, discussion and voting process of the contest, each of the three challenge themes of air, transport, and water, were put into a separate sub-community.

3.2.4 Target groups

The ULIC was open to all BASF employees. However, since the company's internal business network, connect.BASF, was the main platform of the contest, participants had to be a registered member of this platform. In 2015, the number of the connect.BASF user base accounted for 35% of all BASF employees.

Employees could participate in this contest in various ways. If an individual or a team had an idea to improve a process, design a new product, or even create a new market, this was a great opportunity to highlight the idea and acquire the needed resources for its development. In addition, the experts in topics related to air, transportation and water were encouraged to improve the quality of the submitted ideas by giving feedback, asking critical questions and helping the communities by sharing their knowledge and experience. Finally yet importantly, the employees handled the first screening and selection of submitted ideas.

In order to design a fruitful and all around accepted idea contest for employees, four target groups were defined. These groups were the focus in planning, communication and awarding aspects of the contest.

3.2.5 Resources and tools

The design, launch, and administration of the ULIC, required an enormous amount of resources to function at high standards. The following resources played a crucial role to ensure a well-functioning internal idea contest in a global company such as BASF with more than 113,000 employees.

1. **Project team:** the organizing team of ULIC consisted of individuals with different backgrounds and expertise. At the core, the team had two senior innovation managers, the responsible expert of the connect.BASF online tool, an external project management consultant, and the author of this thesis.
2. **Communication tools:** the main announcements concerning the contest were broadcasted by online reporter and emails. The following displays a comprehensive overview of the applied communication channels:
 - Connect.BASF: BASF's global internal virtual platform and the main platform to hold the online ULIC.
 - Online Reporter: a feature on the company's intranet website, which publishes articles and announcements on daily basis.
 - Euroscope: BASF's employee magazine, which is published four times a year and in 15 different versions.
 - BASF information: BASF SE's monthly magazine, which is available mainly in the Ludwigshafen site.

- BASF today: the large BASF screen displays located in numerous sites. BASF today is also available in a news sticker format for desktop PCs and mobile devices.
 - Promotional postcards: Over six thousands postcards, which described the purpose of ULIC were printed, and distributed in Ludwigshafen.
- 3. Methodology:** dozens of co-creation activities took place at global and regional level in BASF's 150th anniversary. To ensure success in these activities, eight co-creation formats were developed and each was introduced in a separate handbook. The planning and preparation of the ULIC were stirred by the principles explained in the handbooks of Idea Contest and Idea Pitch.
 - 4. Connect.BASF:** is an online business network, which aims at boosting efficiency through open communication across the organization, promote knowledge sharing, facilitate online collaboration of teams and communities, and help employees to find experts faster. A common platform for dialogue, connect.BASF integrates various tools and options, such as blogs, wikis, forums, etc. In an effort to promote the discovery and scoping phase of idea generation, the recent introduction of a new tool – the Ideation Blog – allows members to post ideas, vote and comment, and finally graduate an idea to the Phase Gate process. A main community to host the ULIC was created. Under this community, three sub-communities provided the needed platform to share and discuss ideas, and vote for the most promising ones in each of the three challenge areas. There are different reasons why connect.BASF was selected as the platform for this internal ideation contest. First, in order to run global campaigns, it was necessary to utilize a global tool where it is possible to have one community spread worldwide. In addition to the geographical feature, it was necessary to adopt a tool, which allow participation and collaboration among participants. Connect.BASF has the features that enable the cooperation among different contributors (e.g. possibility to post comments and vote using a “vote” button). Finally yet importantly, Connect.BASF is a tool already in place and widely spread across the company with over 40.000 registered users as of October 2015 -of which 20,000 individual login per month.

3.2.6 Contributors

Apart from the organizing team, the involvement of three major groups was essential to enable a well-functioning and fruitful internal idea contest.

1. **Employees:** this OI and co-creation activity targets the internal stakeholder group of BASF employees. The activity was held on a global level, targeting all regions and countries. All employees globally were entitled to propose, discuss and vote on ideas. The engagement of all employee groups, such as intrapreneurs, topic experts, advocates and voters was a key performance indicator.
2. **Evaluation experts:** a team of evaluation experts with different backgrounds evaluated the 30 ideas selected by the crowd (i.e. the most voted ideas). This team then selected the top 10 that received the chance to pitch in front of the “Final Jury”. The evaluations experts were consisted of managing director of the BASF New Business GmbH, senior vice president of innovation management, and the head of the innovation strategy development.
3. **Final Jury:** A panel of five jury members saw the top 10 teams pitch their ideas, asked questions to the teams, and selected the winner based on the pre-defined criteria. The jury members included two members of the BASF’s board of executive directors, managing director of the BASF New Business GmbH, president of advanced materials and systems research division, and the president of nutrition and health division.

3.2.5 Process overview

ULIC was a combination of two of the Creator Space™ co-creation methodologies, the Idea Contest and the Idea Pitch. The crowdsourcing and the crowd voting took place on the online platform, connect.BASF. Furthermore, at the final stage of the contest, the top 10 teams of contest pitched their ideas to high management of BASF in order to secure funding and support to develop their ideas.

The contest included six main phases:

1. Preparation and launch: the contest was launched on June 1, 2015 with an online reporter article. During the pre-engagement phase, employees were encouraged to join the online community of the contest on connect.BASF to get acquainted with

the platform. A comprehensive list of frequently asked questions and answers was provided to shed light on every aspect of the contest.

2. Idea submission: the idea submission window was open between June 15 and July 31. During this period, employees were able to submit their ideas, comment, and edit their submissions under three challenge themes of air, transport, and water. During the contest the organizing team of the contest decided to extend the deadline of the idea submission to August 15. The idea submission template that was used for this contest is provided in the appendices.
3. Crowd voting: to utilize the power of the crowd wisdom, all BASF employees were encouraged to join the contest community, read the submitted ideas, and vote for the best proposals. In this period, the submission of a new ideas was not allowed. However, employees who had submitted an idea, could improve the while discussing it with topic experts. The voting period started from August 17 and ended on September 15. The top 10 most voted ideas of each challenge theme (i.e. air, transport, and water) advanced to the next round of the contest.
4. Idea refinement: the top 30 teams (i.e. top 10 from the three challenge themes) had two weeks of time in order to improve their ideas for the next evaluation round. The organizing team of the contest delivered individual feedback to each team as improvement suggestions.
5. Top 30 evaluation: the evaluation experts analyzed the top 30 ideas during a period of one week. Based on the criteria of environmental, social, and business impact, each of the three evaluator rated the 30 ideas individually. After the consolidation of the ratings, the evaluation experts selected the best 10 ideas during a physical workshop facilitated by the ULIC organizing team. Table 4 demonstrates the evaluation criteria that the expert team applied to rate the ideas.
6. Final Pitch: Each of the ten finalist teams received an individual coach to assist them in the preparation of the final presentations. In addition, a comprehensive set of preparation materials such a guide on “how to pitch”, Creator Space™ Idea Pitch Handbook, and video examples was provided to the top 10 teams. On November 30, the top 10 teams of the contest arrived in BASF headquarters in Ludwigshafen to deliver their final pitch to a jury of board members and top-tier management. After rating each idea based on the criteria of environmental, social, and business impact,

the jury selected the best idea. The winning idea is entitled to receive the funding and support for development of its proof of concept.

Urban Living Idea Contest

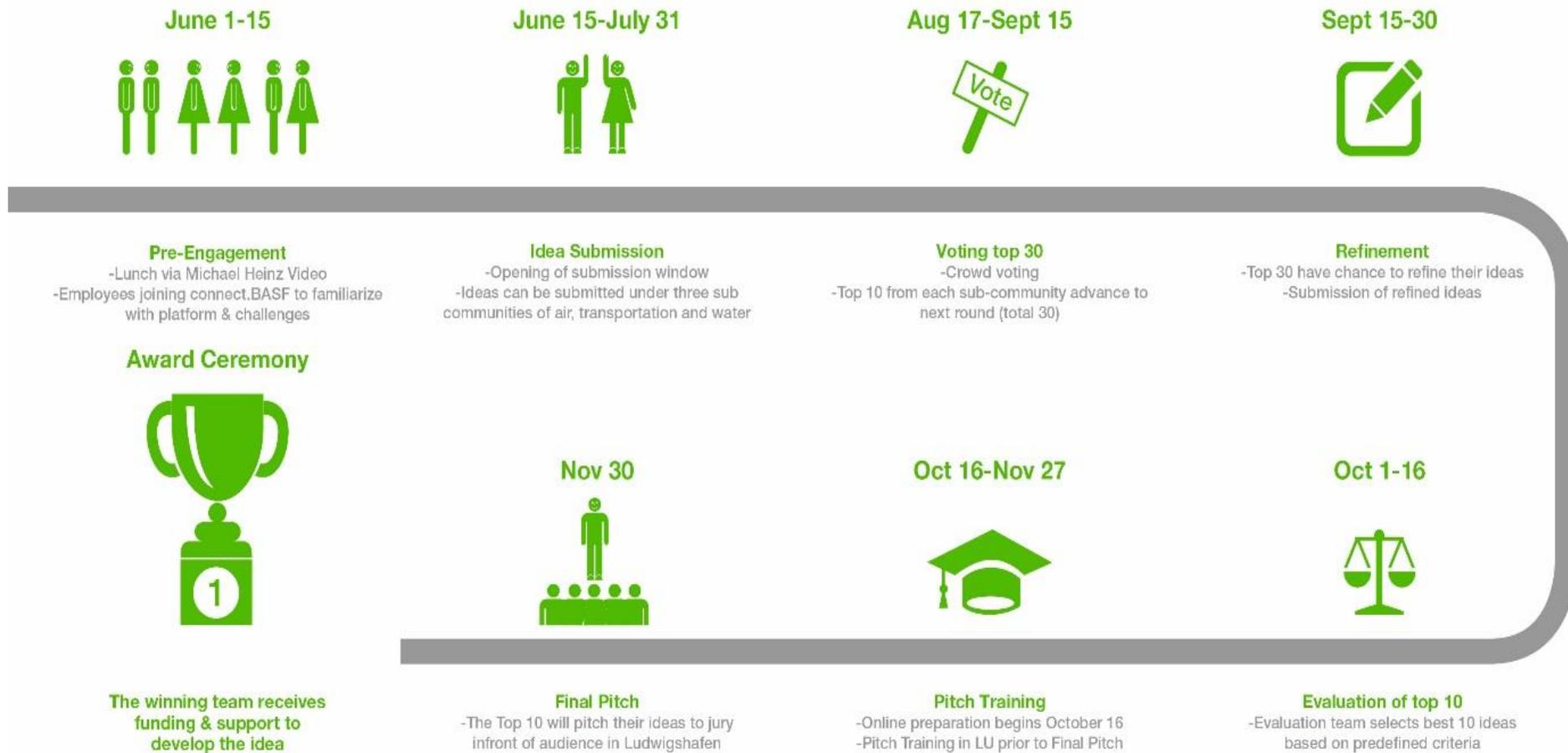


Figure 2. Overview of the different phases of the Urban Living Idea Contest.

Table 4. The evaluation criteria.

Main criteria	Sub-criteria	Guiding questions
Business impact	Innovation potential	How radical is the novelty of the proposed solution?
	Market attractiveness	How big market might be in the future? Is the value proposition unique? Do the size of the opportunity and the potential investment appear to be in balance?
	Fit to BASF	Can BASF play a role as for capabilities and competences?
Environmental impact	Emissions and pollution	Does the project contribute to a significant reduction of relevant emissions?
	Resource consumption	Does the project contribute to a significant reduction of a relevant resource consumption? Does it allow to create more with less and to deliver greater value with less input?
Social impact	Health & Safety	How big is the impact on public health in the long term? Does it improve people safety and protection?
	Basic requirements	Are different aspects of basic living requirements addressed by the project proposal?

3.2.6 Structure of connect. BASF

In order to provide a clearer image of the ULIC and its structure, Figure 3 is prepared and presented. As mentioned earlier, the ULIC was hosted on a specific community on BASF's internal business and social network. The term "community" stands for a feature that allows the user to build a separate environment to discuss different topics, post ideas, and cast votes. The main community was also the information and communication hub during ULIC. The contest process, FAQ, the idea submission template, and multiple announcements were broadcasted through the main community of the contest. It is necessary to mention that an important factor in engagement of the employees was the multiple blogs posted by innovation managers, contest sponsors, and the organizing team. These blogs enabled the employees to have an inside view over the organization of the contest, the desired objectives and ultimately how this approach can be improved in next years.

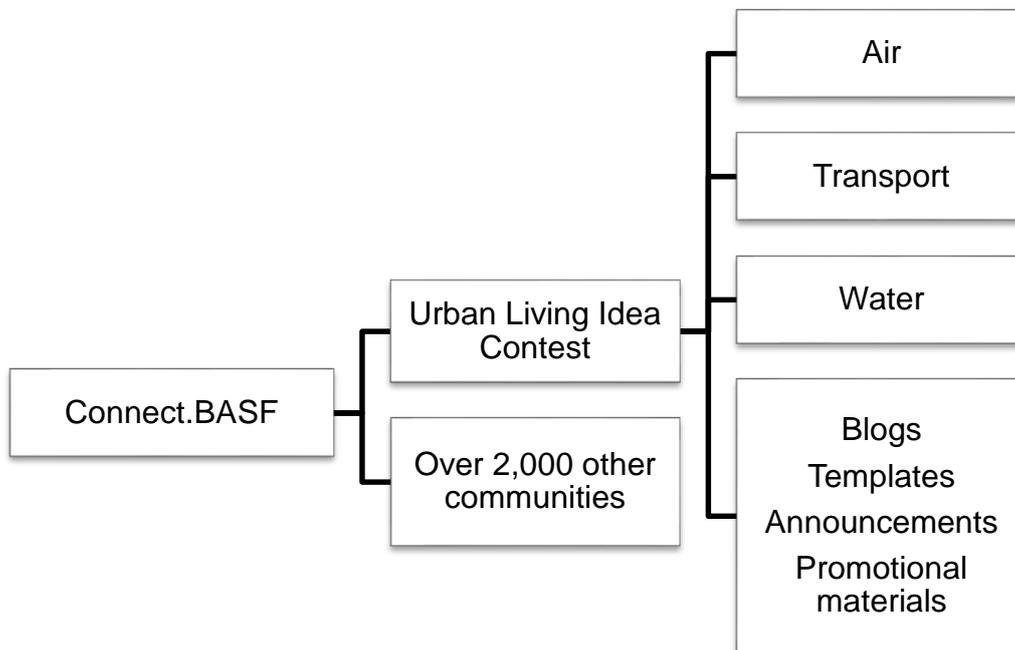


Figure 3. Macro view of ULIC community on connect.BASF.

3.2.7 Rules of the contest

From a contestant point of view, rules of the contest is a crucial factor in their behavior during the contest. Therefore, a list of frequently asked questions and answers was prepared and posted on the online community of ULIC on connect.BASF. This list contained all the

necessary information about the definition of the contest, its objectives, the main steps, the evaluation process, and the regulations.

Since the majority of the elements mentioned above has been defined earlier, this sub-section focuses on the established regulations for the ULIC. Thus, a list of questions and answers is presented.

- ***Who can submit an idea?***

Either an individual or a team can submit an idea. Team submissions are highly encouraged. Each team must nominate a spokesperson to explain the idea.

- ***Is there a limit to number of members in a team?***

No, there are no limitations.

- ***Can I submit more than one idea?***

You can join several teams but you can only be the spokesperson of one idea.

- ***What are the ways to submit an idea?***

Employees must submit their ideas on ULIC community on connect.BASF. We kindly ask you to use only the form we have provided so that we will have a standardized format.

- ***Can I submit my idea in any language?***

No, employees must submit their ideas in English.

- ***Does my idea have to be a completely new and original idea?***

No, your idea can also be an improvement of an existing product, service or process in any of the three challenge areas.

- ***Is there a certain limit for the required budget of a project proposal?***

No there is no limit for budget of an idea. However, the idea owner must clearly specify the needed financial resources for the first development phase of the idea.

- ***Can proposals include external partners?***

Yes, it is possible to include external partners. Moreover an explanation on why this partner is chosen and how they will contribute to further development of the idea, is required

- ***Once an idea is submitted, can it be modified, changed or improved?***

Yes. It is possible to modify, change, or improve a submitted idea.

- ***What confidentiality regulations should I be aware of before submitting an idea?***

Do not submit any confidential information to the idea contest.

- ***What do I need to know regarding intellectual property rights?***

All BASF internal and labor law provisions apply, in particular obligations spelled out in your employment contract. Your contributions or results are not deemed an invention report or a (technical) improvement proposal, in particular according to the German law for employee inventions.

- ***Can I vote for my own project?***

Yes, it is possible to vote for your own project.

- ***Is it possible to give a project more than one vote?***

No, you have only one vote per project.

- ***What if two ideas receive the same number of votes and both rank number 10? Which one will advance to the next round?***

In this case, both ideas will advance to next round of the idea contest.

It is necessary to mention that as the contestants asked more questions during the contest, the FAQ list was updated. The above list is the final version of the FAQ list published in the community of the ULIC.

3.2.8 Results of the ULIC

As mentioned earlier in this chapter, the ULIC was launched on June 1, and idea submission window was initially open from June 15 to July 31. This period was later extended to August 17, due to multiple requests from a large number of employees. During this period (June 15-

August 17), 141 (44 in air, 49 in transport, and 48 in water) project proposals were submitted on the online community of the contest. More than 520 employees from all over the world registered their innovative proposals either as individuals or as teams. Most of the proposals came from the research platforms with approximately 40% of the total amount. Moreover, the BASF headquarters in Ludwigshafen also generated the highest volume of employees' engagement and contributions, accounting for 37% of the submitted ideas.

Subsequent to the end of the submission phase, the voting phase started. In this period, employees could see all the submitted ideas, read them, provide feedback, and vote for their favorite project proposals. Between August 17 and September 15 more than 6,300 votes were casted by the participants of this online OI and co-creation activity. In addition, nearly 180 constructive feedbacks were shared as comments to the submitted ideas. On September 15th, the top 10 most voted ideas of each challenge theme advanced to the next round of the contest. Each of the top 30 teams received a comprehensive individual feedback in order to provide them with directions for the improvement. In the second round of screening and evaluation, the expert team selected the best 10 ideas with the most positive impact on environment and society highest potential to create new businesses for BASF. Half of the finalists were teams from Ludwigshafen, two from Europe, and the rest was divided equally between Asia Pacific, North America, and South America regions. The research platforms had a dominant presence in the top 10, with eight finalist teams. After each of the finalist teams performed their pitch presentation, and answered the questions by the jury, the team from Asia Pacific was announced as the winner of the ULIC. In addition, due to the reason that one of the ideas demonstrated the highest positive impact on environment and society, the jury made the decision to also announce a second winner. In the next steps, the winning teams will present concrete project plans including the needed resources in details in order to acquire the financial and non-monetary resources to develop the proof of concepts, and eventually take the products into the market. The general feedback by both participants of the contest and the management of BASF was highly positive. It is necessary to mention that although only two proposals out of the initial 141 won the contest, the Creator Space™ team delivered all the ideas to respected business units for further research.

Furthermore, in order to ensure the appropriate business units have access to all the potential ideas generated during ULIC, the organizing team clustered all the ideas and sent them to related organizational divisions.

To better understand how the ULIC functioned and what could be improved for the next years, a large set of data has been collected and analyzed in the next chapter.

4 DATA COLLECTION AND ANALYSIS

In the beginning of this chapter, the objectives of data collection and data analysis are discussed. Then the portfolio of the respective information, and how have they been collected are explained. Furthermore, a comprehensive analysis of the presented data sets is presented to answer a number of questions. Finally, at the end of the chapter, a summary of the examined information is offered. This summary provides the basis for the definition of improvements for the next generation of internal innovation contests at BASF.

4.1 Objectives and research questions

The main objective of this chapter is to analyze the database of the ULIC in order to understand how it functioned and how it can be improved. Moreover, because an initiative such as ULIC is happening for the first time in BASF, the importance of data collection and analysis is significant. Through searching for unique data about contest participants, and how they react to the defined processes creates real advantage for a contest's organizing team. Furthermore, the analysis of data allows a company to test the defined hypotheses to learn its intuition is whether correct or not (Davenport, 2013), benefit from data based decision-making (Davenport, 2012), solve problems, and identify opportunities (Barton et al. 2012).

Prior to the start of ULIC, a set of expectations was defined:

- High participation of employees in idea submission, voting and discussions
- Balanced engagement of all regions and all organizational units
- Generating high quality solutions and select the best ones through crowd voting
- Contributing to the cultural shift of BASF during the anniversary

In order to verify these expectations, this chapter aims to answer the following questions:

1. Which organizational unit had a higher participation rate?
2. What are the ratios for individual and team submissions?
3. Which regions were more active?

4. How did the activity level of contestants changed throughout different phases?
5. Which communication tool had a stronger influence?
6. How was the quality of the submitted ideas?
7. What type of ideas did the employees submit?
8. How did the crowd voting function?
9. What were the intrapreneurs' main motivation and challenges?

Furthermore, it is necessary to mention that the gathering and inquiry of the data by the author of this study played a crucial role in the project management of the ULIC. As in many cases, it improved the organizing team's decision-making process.

4.2 Information portfolio

This section of the chapter explains the collected datasets, their sources, and possible applications. The author of the study exploited two sources of primary data: ULIC community on connect.BASF, and an email-questionnaire.

As stated in the previous chapter, the ULIC occurred on a built community on the BASF's internal business and social network, connect.BASF. At the time of the project, the platform was only able to provide the following information: total number of community members, metadata on a member, total number of submissions, total number of votes for a specific idea, and the aggregated number of page views at a certain time. In order to be able to access to the above information on a daily, weekly and monthly basis, the total numbers were recorded on an Excel spreadsheet every day. This number was then reduced from the next day's data to provide the needed information for a specific day. In addition, to have an understanding of which employee groups are contributing, the individual metadata was collected, and categorized to provide the macro perspective of employees' participation. It is necessary to mention that the names of the employees is excluded from the metadata collection and analysis. Furthermore, each of the submitted project proposals was screened to extract the data on region, division, team size, business potential, and resources. In total more than 4,000 pieces of data from the ULIC were compiled over a 4-month period. The assembly of these datasets at micro level (e.g. profile of each contestant) enabled an understanding over macro level data (e.g. participation rate of a certain division).

Furthermore, two types of applications can be attributed to assortment and inquiry of data generated from the contest. First, it enables a databased decision-making approach while the contest is being conducted. It also allows the organizing team to monitor the different aspects of a contest such as communication efficiency and employee engagement. The second application is examine the extracted macro data to test the defined hypotheses, update processes and develop the contest's capabilities.

The author of the thesis designed and sent an email questionnaire to only the employees who had submitted an idea in ULIC. This email was sent after the end of the crowd-voting phase and to 141 spokespersons of the submitted project proposals. In total 47 replies were received and the answers were documented on an Excel spreadsheet. This questionnaire contained three multiple-choice questions with defined answers.

The three questions and the defined answers are as follows:

1. Why did you participate in the Urban Living Idea Contest?
 - a. To get budget and resources for novel ideas
 - b. To share knowledge and receive feedback
 - c. To learn about other innovative ideas
 - d. To connect with new colleagues
 - e. To support other innovative ideas
2. What was your biggest challenge during the online phase of the contest?
 - a. The quality of the provided information about the contest was insufficient
 - b. The information about the contest was not communicated in time
 - c. Difficulty in using the online platform (connect.BASF)
 - d. Idea submission process was not easy
 - e. Not knowing what kind of ideas are suitable for this contest
 - f. Acquire votes for my idea
3. What was your biggest challenge during the online phase of the contest?
 - a. Address environmental/social concerns
 - b. Enhance my reputation
 - c. Gain publicity for my idea
 - d. Career improvement

For the questions one and two, the respondents were allowed to select more than one answer. In question three, it was asked to select only one answer. However, a few number of respondents chose more than one answer. The results of the questionnaire is presented in the next section of this chapter.

4.3 Analysis

This section of the chapter presents the analysis of the collected data to answer the eight defined research questions. The following sub-sections focus on answering one or more research questions.

4.3.1 Contestants

This sub-section answers the following three questions:

1. Which organizational unit had a higher participation rate?
2. What were the ratios for individual and team submissions?
3. Which regions were more active?

To answer the above questions, the profile of each idea submitter was analyzed, and the information about their organizational unit and region was documented. Furthermore, the number of people involved in a submitted project proposal was obtained to determine the team size factor.

The collected data illustrates that the employees from the research and development divisions generated the most amount of project proposals. Table 5 illustrates the number of ideas submitted by the employees working in a certain organizational unit.

Table 5. Number and percentage of submitted ideas by each organizational unit.

Theme	R&D		Operating units		Functional units		Sum	
	#	%	#	%	#	%	#	%
Air	27	61	13	30	4	9	44	100
Transport	16	33	12	24	21	43	49	100
Water	25	52	17	35	6	13	48	100
Total	68	48	42	30	31	22	141	100

Employees working in research and development divisions submitted 48% of the total 141 project proposals. This is a significant amount considering that this group of employees only account to 9% of the total employee population¹. Moreover, the consistent dominance of R&D employees throughout the ULIC was a proof of high quality of their ideas. Table 6 summarizes the number of ideas registered from each organizational unit in total, top 30, and top 10. The two winners of the contest were also from R&D units.

Table 6. Number of submitted ideas by each organizational unit throughout the contest.

Organizational unit	From 141	Top 30	Top 10
R&D	68	21	9
Operating units	42	6	1
Functional units	31	3	0

Moreover, the high engagement of the employees in R&D was not a surprise. Creativity and invention are the core elements of their daily jobs; therefore, the possibility of identifying new opportunities is higher. In a knowledge-intensive chemical company such as BASF, the majority of the innovative ideas arise from the research and development units. Remarkably,

¹ Referring to BASF annual report in 2014, 10,700 people are employed in R&D. Total number of BASF employees is 113,292.

another major reason for R&D employees' success in the ULIC was the strong sponsorship from the president of a research division. With this commitment and support, a one-day workshop was held in the headquarters in Ludwigshafen, to generate ideas, form teams, and develop the ideas to project proposals. Referring to the influential factors for intrapreneurship that were presented in section 2.5, management support can have a significant impact on behavior of employees (Christensen, 2005). This management support can also be connected to the success of project proposals from R&D units in the crowd-voting phase, as it created a sense of unity to develop a winning culture. Consequently, they benefited from a larger crowd who could eventually vote for their ideas.

Secondly, the compiled datasets demonstrate that although teamwork was highly encouraged, nearly a third of the project proposals were submitted by individuals. From which only two of them received enough votes to advance to the next round of the ULIC. Table 7 compares the ratio of individual, small team, and large team submissions. The highest number of employees in a single team was 12.

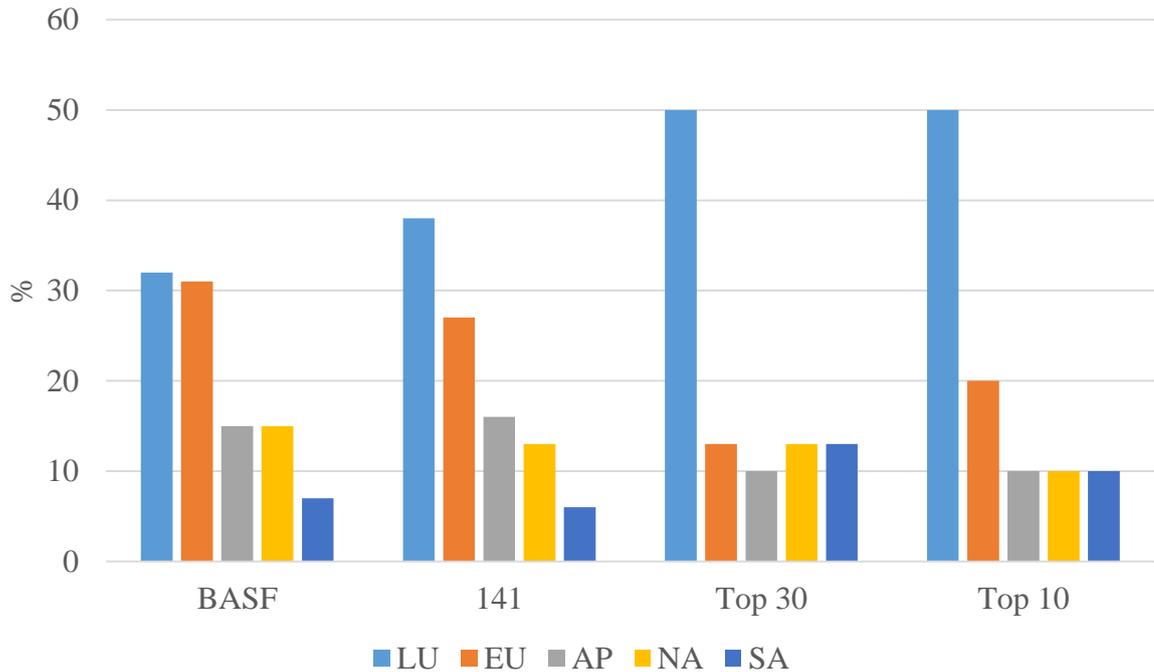
Table 7. Comparison of individual, small team, and large team submissions.

Team size	From 141		Top 30		Top 10
	#	%	#	%	#
Individual	51	36	2	7	2
<5	44	31	10	33	1
>=5	46	33	18	60	7

The significant elimination of individual submissions, from 51 to only two after the crowd-voting phase can be justified by two assumptions. First, one can claim that the quality of the project proposals submitted by individuals were much lower than the proposals submitted by teams of employees, therefore they received less votes. The second assumption refers to the size of the social network associated with the team members of a submitted idea. To some extent, the increase in the number of members of a team enlarges the social network

linked with that team. This eventually results in a higher chance of receiving more votes through benefiting from a larger social network.

To answer the third question, the information on the working location of all the 141 idea submitters was compiled, and then categorized under five organizational regions:



Ludwigshafen, Europe (Ludwigshafen excluded), Asia Pacific, North America, and South America. Table 8 shows the share of each region in different phases of the ULIC.

Table 8. Comparison of submitted ideas based on the location of the submitter.

Region	From 141		Top 30		Top 10
	#	%	#	%	#
LU	53	38	15	50	5
EU	38	27	4	13,3	2
AP	23	16	3	10	1
NA	18	13	4	13,3	1
SA	9	6	4	13,3	1

Table 8 clearly shows a high participation rate of the employees located in the region Ludwigshafen compared to the other regions. This difference became considerably larger as

the contest proceeded to the next rounds. The Figure below compares the total population of BASF employees in different regions to their performance in different phases of the contest.

Figure 4. Comparison of regions' performance to their number of employees.

Referring to the Figure 4 regions Ludwigshafen and South America both had a greater overall performance compared to their number of employees. The breakdown of different employee groups in each region could not be found. Supplementary research to compare the performance of each region relative to the size of its employee groups is encouraged.

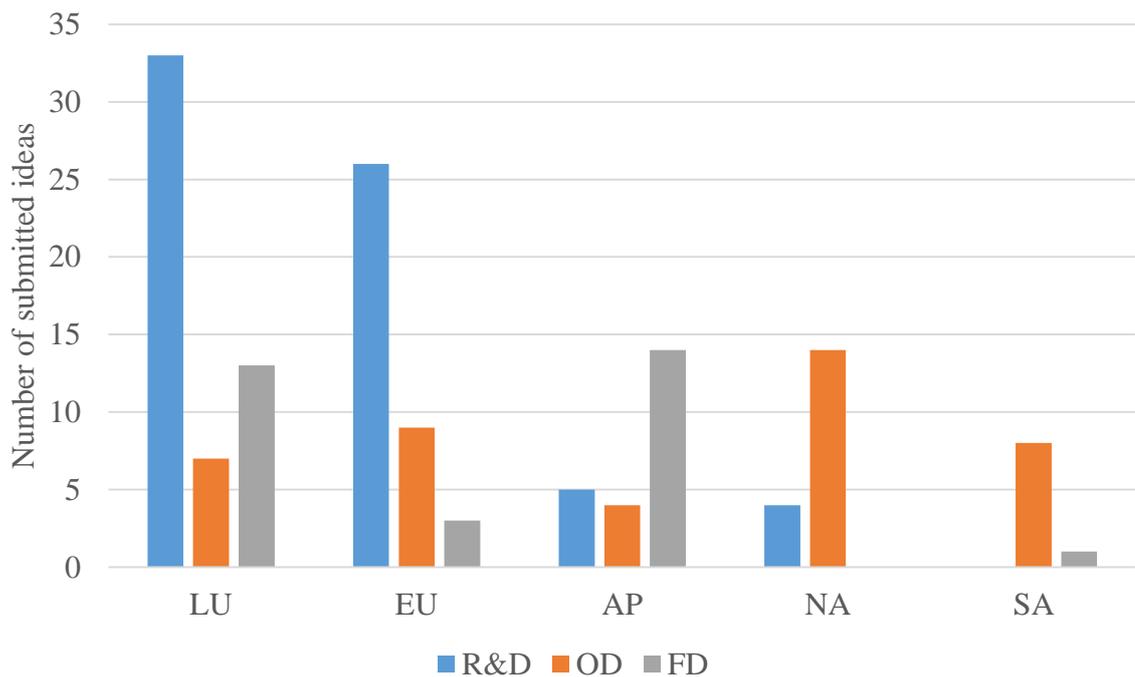
To further evaluate the submitted ideas from different organizational units in each region, the respected data was compiled and compared. The Figure 5 summarizes the outcome of this investigation.

As mentioned earlier in this section, the management support of a R&D unit and the one-day ideation workshop in the Ludwigshafen had a significant impact, which can be seen in the Figure above. Similarly, the high participation of employees from Functional Divisions in Asia Pacific was influenced heavily by another one-day workshop in Kuala Lumpur, Malaysia. During this workshop, 13 new ideas were generated, which were all submitted to the ULIC. However, only two of these ideas advanced to the Top 30 category, and neither were selected among the Top 10 finalists. Moreover, a root cause analysis for low

participation of R&D employees in North America and South America is required to investigate the influencing factors. However, this is out of the scope of this thesis project.

Figure 5. Comparison of submitted ideas by different organizational units in each region.

With the knowledge of regions' engagement and employee groups' performance in ULIC,



BASF is able to create the right incentives for creation of an intrapreneurial environment. An environment where every employee has an equal chance to participate in an innovation contest.

4.3.2 ULIC community on connect.BASF

This sub-section answers the following question:

4. How did the activity level of contestants changed throughout different phases?

In order to answer this question, the documented data of the following parameters were compiled on a weekly basis:

1. Number of ULIC community page views
2. Number of new members in the ULIC community
3. Number of new idea submissions in the ULIC community

4. Number of new casted votes in the ULIC community

Table 9 presents the weekly number of page views, new community members, new submissions, and casted votes through the three online phases of the ULIC.

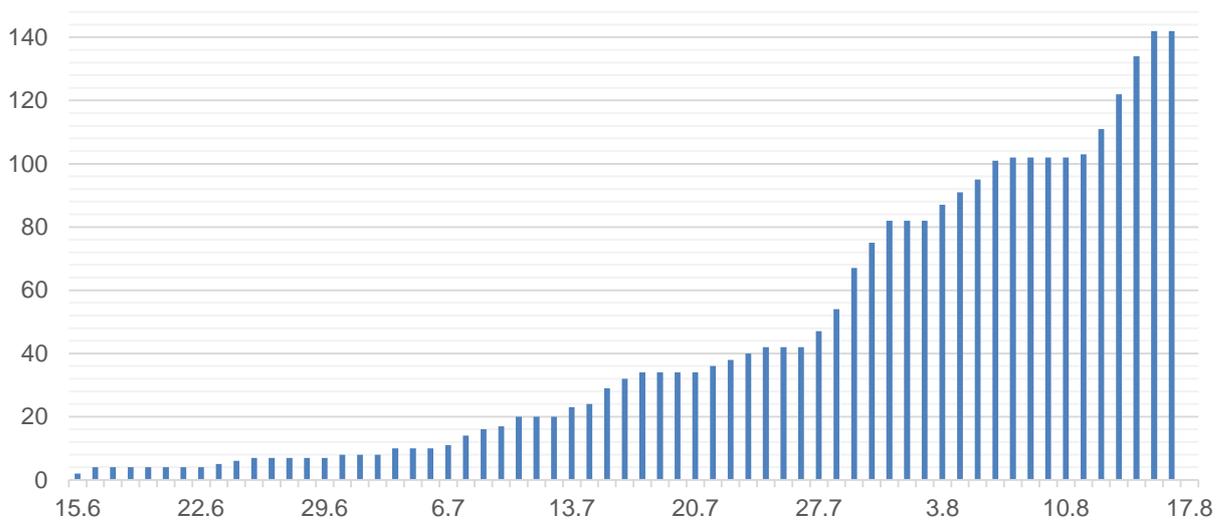
Table 9. Activity level of ULIC contestants throughout the online phases.

Week	Phase	Page views	New Members	New Submissions	Casted votes
1	Pre-engagement	735	53		
2		555	20		
3	Idea submission	545	16	4	
4		258	13	3	
5		244	13	3	
6		369	15	10	
7		686	23	14	
8		479	21	8	
9		855	44	40	
10		861	23	20	
11		664	30	39	
12	Crowd Voting	2635	14		3390
13		641	0		765
14		391	4		635
15		487	2		1182
16		620	0		344

It is important to note that week 16 of the ULIC is only consisted of three days, as the crowd-voting phase ended on September 15. Since the crowd-voting phase, the ULIC community on connect.BASF was no longer the host the contest, only the data within the first three phases in analyzed. With the selection of Top 30 project proposals, individual communication with the teams began, which was handled through email.

In order to have a better understanding of the relationships between the mentioned four parameters, two diagrams are presented.

Figure 6. Activity level of contestants during idea submission.



The information illustrated in the Figure 7 demonstrates the close relationship between the number of page views, new memberships, and the new idea submissions. A closer investigation into the relationships between the idea submission and membership trends shows that only employees with an intention to submit an idea visited the online community and became a member. Furthermore, another assumption that can be associated with the similarity of the trends in Figure 7 is that the ULIC community on connect.BASF was mostly visited by the contestants rather than employees interested in reading the submitted ideas. Since, one of the objectives of this contest was to leverage the knowledge of all BASF employees; a better communication strategy is required to engage a larger number of individuals. Thus, a larger community of scientists and experts can view, discuss, and provide constructive feedback to the contestants. This exchange of knowledge and experience can significantly improve the quality the project proposals.

Moreover, the documented data over the idea submission phase states that the majority of the project proposals were submitted within the week before a deadline. The initial deadline to post an idea was July 31, which was later extended to August 17. During the last three weeks of the submission phase, 100 project proposals were posted on the online community

of ULIC on connect.BASF. This number accounts to 70% of the total number of posted ideas. The diagram below provides an overview of the submitted ideas on a daily basis during the submission phase.

Figure 7. The number of submitted ideas between June 15 and August 17.



The fact that many employees postponed this task to the last weeks of the deadline can be linked to the procrastination caused by distractions in the workplace. This phenomenon reduces the time that an idea is visible to the crowd, thus decreasing the discussion and improvement opportunities. Supplementary research on the success rate of proposals posted adjacent to the deadline compared to the other proposals is encouraged.

4.3.3 Communication efficiency

To answer the following question, the performance of a communication tool is compared to the number of page views on a specific date.

5. Which communication tool had a stronger influence?

As stated in the chapter three of the thesis, the organizing team of the ULIC applied six communication tools to promote the contest: 1) Connect.BASF; 2) Online Reporter (OR); 3) BASF info magazine; 4) Euroscope; 5) BASF today, 6) Promotional postcards. Since

connect.BASF and BASF today were both passive communication tools, the influence of them cannot be traced in the trends page views.

The analysis of the data on number of page views, idea submissions, and votes demonstrates that OR and promotional postcards were the most effective communication tools compared to other four. Table 10 provides a summary of the most effective communication waves throughout the ULIC.

Table 10. Communication waves producing highest recorded page views.

Communication wave	Tool	Execution date	Page views	Notes
Announcement	OR	1 June	250	11,000 article views
Advertisement (LU)	Postcards	8-10 June	420	Distributing 2,400 cards
Submission opening	OR	15 June	186	40 template downloads
Deadline reminder	OR	15 July	307	5 new submissions
Deadline extension	OR	29 July	264	13 new submissions
Voting opening	OR	17 August	1,363	Highest in one day

It is necessary to mention that the average daily page view during the idea submission phase was 107. Moreover, this number increased to 150 throughout the voting phase.

4.3.4 Submitted ideas

This sub-section answers the following two questions concerning the outcome of the idea submission phase:

6. How was the quality of the submitted ideas?
7. What type of ideas did the employees submit?

During the idea submission phase of ULIC, 141 ideas in three areas of air, transport, and water were submitted to the online community of the contest on BASF's internal business network. To submit an idea, the contestants had to fill a standard template and upload it to the online platform. This template contained a number of questions regarding the business potential of an idea and its needed resources.

To answer the mentioned two questions, all the submitted ideas were screened and the extracted information was documented into three parameters:

1. Business potential: market size, potential user base, potential profitability
2. Budget: amount of money asked by the idea submitter
3. Timeline: required time to develop the idea's proof of concept

Before starting the data analysis, it is necessary to explain the two question. In the first question, the quality of the idea is measured by how many of the three parameters above was given. For instance if the idea submitter had written the information regarding the business potential, budget, and timeline, the submission is considered as high quality. Furthermore, here type of an idea indicates whether the idea is a short term or long term project. To consider a project as short or long term, the two factors of budget and timeline are measured.

The collected data demonstrates that only a minority of the employees who submitted an idea, presented a high quality proposal. Table 11 shows the number of project proposals, which contained information about the business potential, budget, and timeline.

Table 11. Number of submitted idea containing data on the quality parameters.

Parameter	Air	Transport	Water	Sum
Business potential	22	13	23	58
Budget	17	18	11	46
Timeline	13	12	9	34

This information indicates that the majority of the project proposals were either at the early stage of their innovation process, or their business aspects were not sufficiently researched.

Moreover, the collected data stated that 52 project proposals did not include any information regarding neither of the three parameters. Since these 52 proposals only presented qualitative information, increases the complexity and decreases the efficiency of the screening and evaluation process.

Secondly, to identify whether an idea is a short term or a long-term project. The budget and the required timeline of the submitted ideas were screened and categorized. Table 12 compares the submitted projects in terms of budget and timeline.

Table 12. Budget and timeline comparison of the project proposals.

Parameter		Air	Transport	Water	Sum
Budget	\geq €1 million	6	11	4	21
	$<$ €1 million	11	7	7	25
Timeline	\geq 1 year	9	10	6	25
	$<$ 1 year	4	2	3	9

The statistics from the above table show that the majority of the ideas require more than a year for the development of their proof of concept therefore can be labeled as long term. The long required timeline of these project proposals can be related to the nature of company. Since the new product development process in a chemical company is based on series of research, material development, and test, the required timeline of a new project is much longer compared to other industries. On the other hand, only 21 project proposals demanded an investment of more than €1 million to develop the proof of concept.

Furthermore, a deeper analysis of all the submitted ideas showed that from the 141 project proposals, 24 were not in the scope of the contest. This is a good indication that a group of employees did not fully understand the intentions of the contest, and the types of ideas that the BASF is looking for.

4.3.5 Crowd voting

This sub-section investigates the performance of the crowd voting in selecting screening the generated ideas and selecting the best ones. The main question of this sub-section is as follows:

8. How did the crowd voting function?

To answer the above question, three aspects of the crowd voting are examined:

- a. Distribution of votes throughout the voting phase
- b. Distribution of votes among the submitted ideas
- c. Success rate of the most voted ideas in the expert evaluation process

As mentioned earlier in 4.3.2, during the five weeks of voting phase, employees casted 6,316 votes. Figure 8 illustrates the distribution of the total votes compared to number of times the main community of ULIC was visited (page views).

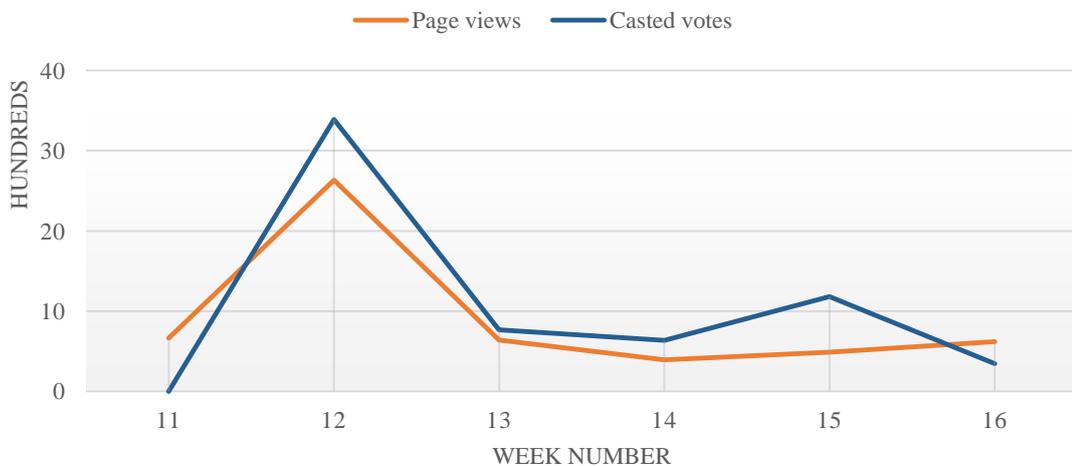


Figure 8. Activity level of contestants during crowd voting.

The data indicates that approximately 53% of the total votes were casted during the first week of the voting. After the first week of voting, the voting activity significantly decreased, and at the end of the voting phase, slightly increased.

Secondly, to analyze the voting distribution among all the submitted ideas, the total amount of casted votes for the final top 10 of each challenge theme (i.e. air, transport, water) is compared to the ideas ranked between 11th and 15th, and the rest of the ideas. Table 13

compares the number of votes acquired by the Top 30 ideas, to two categories of ideas that did not advance to the second round of the contest.

Table 13. Comparison of casted votes among the most voted and least voted.

Category	Casted votes	% of total	Average
Top 30	4133	65	137
15 ideas, ranked 11 th - 15 th	793	13	52
Least voted 96 ideas	1389	22	14

As demonstrated in the table above, 65% of the total votes were casted for the Top 30 ideas which advance to the next round of the contest. The author of this idea believes that the low number of average votes for the bottom 96 ideas, does not indicate the bad quality of an idea, but rather the inefficiency of the crowd voting process to screen and evaluate all the ideas. Moreover, the data on the received individual votes during the voting phase, indicates the majority of the ideas who received the most amount of votes during the first week, remained at the top for the whole period. Table 14 illustrates the top 10 most voted ideas of each challenge theme and their rank after the first voting week. The data from this table clearly shows the high importance of the first week of voting. Here, one can conclude that if an idea that has received more votes from the employees during the first week, is more likely to receive more votes from others during the rest of the voting period.

Table 14. Top 10 most voted ideas of each theme compared to ranking (#) after first week.

Air			Transport			Water		
#1W	#Final	Votes	#1W	#Final	Votes	#1W	#Final	Votes
1	1	344	2	1	254	1	1	220
8	2	172	14	2	213	8	2	199
2	3	150	8	3	171	2	3	188
3	4	136	3	4	148	11	4	187
28	5	113	1	5	141	3	5	137
4	6	104	9	6	117	7	6	135
5	7	65	11	7	113	4	7	116
9	8	54	10	8	101	10	8	92
6	9	53	5	9	97	9	9	84
15	10	53	4	10	92	6	10	82

Comparing the rankings after the first week, and the final ranking shows that only 5 project proposals in the top 30 were not among the top 30 after the first week of voting. Furthermore, these 30 ideas advanced to the next round of the ULIC to be evaluated by an expert team. The expert team carefully assessed the ideas and selected the best 10 ideas with most environmental, social, and business impact. The expert team selected three ideas from air, two from transport and 5 from water to compete in the final round of the contest. These top 10 ideas are as follows.

- Air: 1st, 5th, and 9th
- Transport: 5th and 10th
- Water: 4th, 5th, 6th, 7th, and 8th

Surprisingly, the ideas that the employees voted the most were not selected by the expert team. This questions the performance of the crowd in screening and selection of the best ideas. To conclude, the author of this study believes that the existing crowd voting process of the ULIC did not perform effectively, therefore it needs to be improved.

4.3.6 Questionnaire

An email questionnaire was designed and sent to the 141 idea submitters of the ULIC. The detail of the questions and answers were provided in section 4.2. The results of this questionnaire show that the main motivation of the majority of the idea submitters was to address the environmental and societal challenges of our time. In addition, acquiring the needed funds and resources for development of the ideas was mentioned as the main reasons why the contestants entered ULIC. Moreover, the voting process was regarded as the most challenging aspect of the contest.

Figures 9, 10 and 11 demonstrate the answers given by the idea submitters of ULIC to the following three questions respectively:

1. Why the idea submitter chose ULIC?
2. What was their biggest challenge?
3. What was their main motivation?

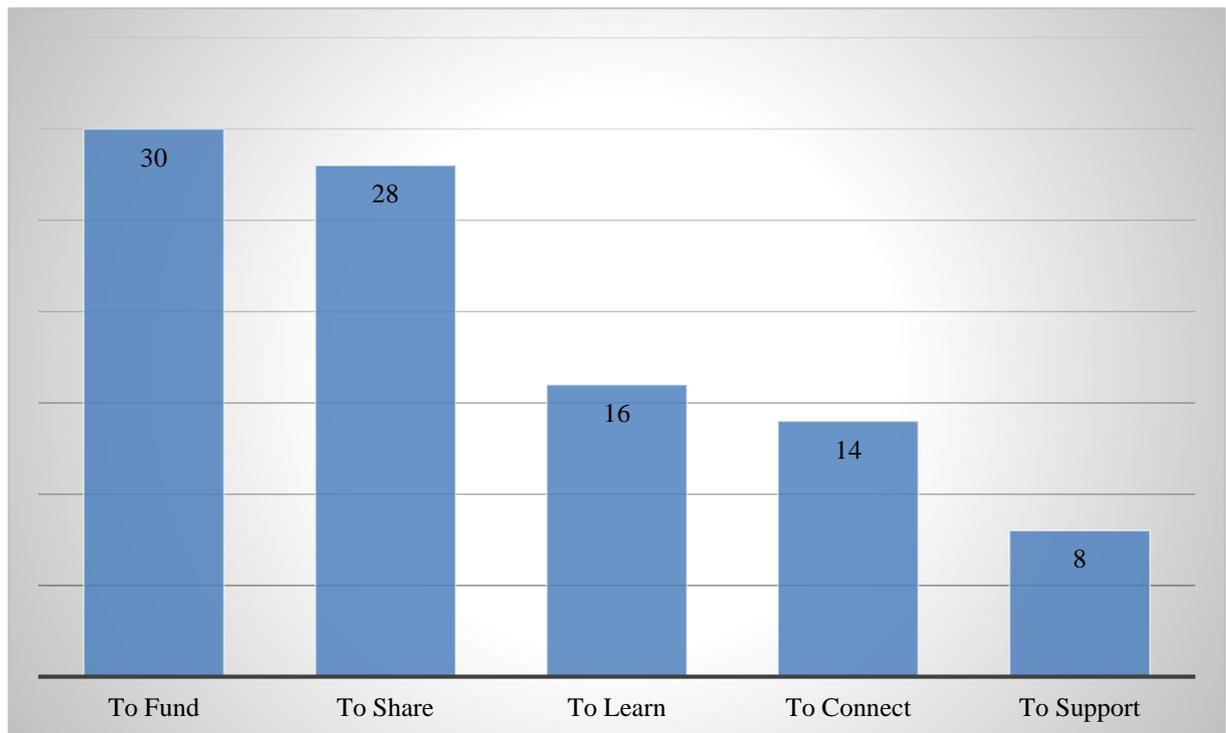


Figure 9. Idea submitters' main reason to enter ULIC.

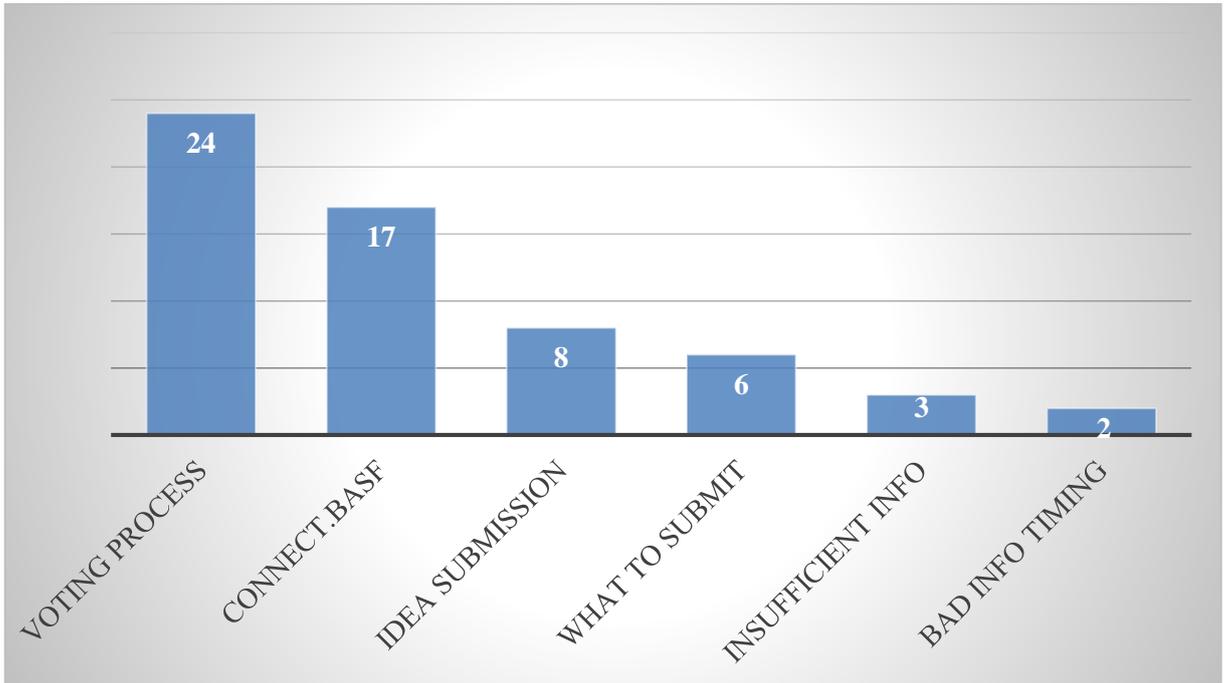


Figure 10. The most challenging aspects of ULIC from idea submitters' perspective.

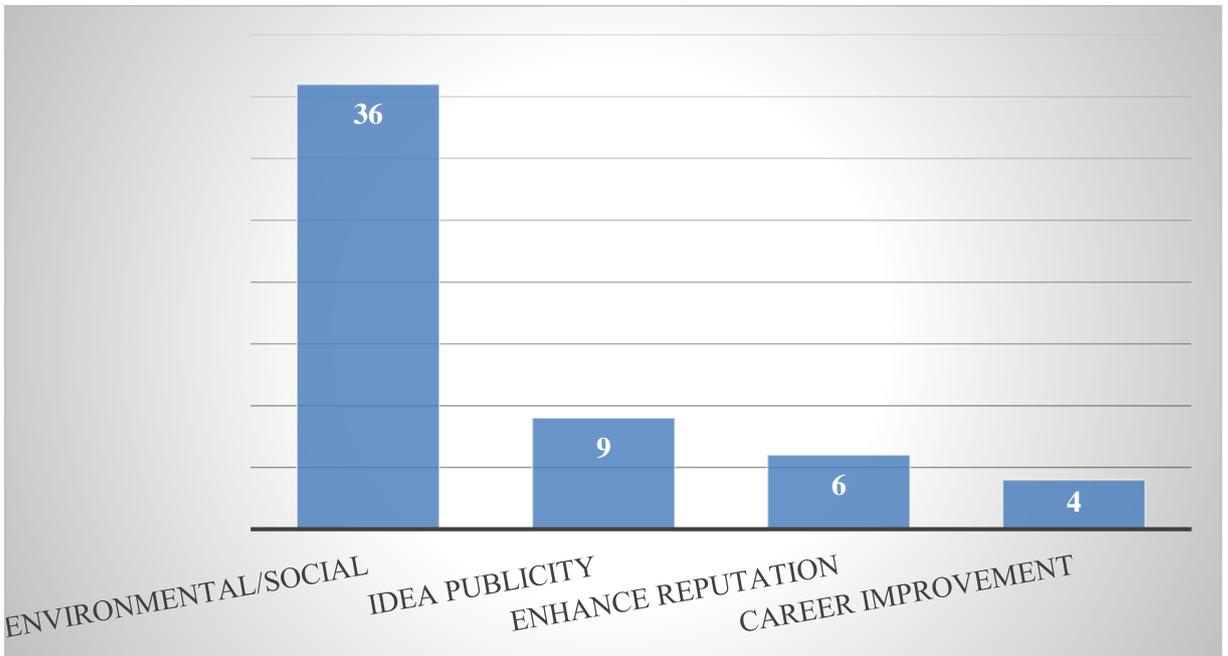


Figure 11. Idea submitters' main motivation to participate and compete in ULIC.

A few number of the employees also provide qualitative feedback about what the liked the most about ULIC, and how it can be improved for next years. The following sentences are quoted from the answers received from the questionnaire:

- “Happy to see BASF is going in this directions, please continue!”
- “Open innovation platform is a great source of feedback and inspirations”
- “ULIC was a great opportunity to involve our employees into the innovation process”

4.4 Summary

The findings of the data analyses presented in this chapter can be summarized through a number of major points:

1. Research and development units had the highest participation rate in ULIC.
2. Approximately one third of the submissions were submitted by individuals. The success of the project proposals with more than 5 members was evident. However, to identify the reasons behind this success requires further research.
3. All five regions had a balanced participation during ULIC and in the final pitch all regions had at least one representative.
4. Small percentage of BASF employees² participated in the ULIC.
5. The beginning and the end of the contest experienced higher engagement levels.
6. The social aspect of the ULIC (e.g. discussions, comments, feedback, etc.) was little, and therefore did not meet the expectations.
7. Online reporter and promotional postcard distribution had the strongest influence among other communication tools.
8. Nearly 40% of the total proposals were submitted in the two weeks before the deadline.
9. One third of the project proposals did not contain any information about the business potential, needed resources and the timeline of the project.
10. Majority of the submitted ideas had a timeline of more than one year to develop the proof of concept.
11. Approximately, half of the total votes were casted during the first week of voting.
12. In the Top 30 most voted ideas, only five proposals were not in the Top 30 after the first week of voting.
13. The majority of the ideas who received the most number of votes did not advance to Top 10.

² Total number of BASF employees by 2014 is 113,000, which only 40,000 are registered on connect.BASF.

14. To acquire the needed resources and share their ideas were mentioned as the main reason to compete in ULIC.
15. Voting process and connect.BASF were mentioned as the main challenges for the contestants of ULIC.
16. Addressing social and environmental issues was mentioned as the contestants' main motivation to compete in ULIC.

In this chapter a portfolio of datasets was presented and analyzed in order to answer the question of “How ULIC functioned”. This analysis enabled the identification of a number of improvement suggestions that are presented in the next chapter. Furthermore, it is necessary to mention that ULIC was the first OI and co-creation activity with BASF’s employees at such a global scale. Therefore, it is important to learn from the process and improve the framework for next years. It is hoped that this chapter contributes to the creation of better data collection and analysis in order to assess the functionality of an innovation contest within BASF.

5 RESULTS

The findings presented in the previous chapter are the basis for the work in this chapter. This chapter is divided into two sections:

1. Defining the key elements of internal idea contest
2. Identifying a set of improvement suggestions for future years

The first section, describes the elements of an employee idea contest. These elements are the results of the literature review conducted in the second chapter and case study of ULIC presented in the third chapter. The second section, suggests a number of improvements for the next generation of an employee idea contest in BASF. The improvement suggestions are structured under the defined key elements.

5.1 Key elements of an employee idea contest

The review of literature on crowdsourcing and contests in chapter 2, and the analysis of the ULIC shows that ULIC was not a typical idea contest. Therefore, it requires to observe it from a different perspective. Boudreau and Lakhani (2013) categorized crowdsourcing approaches into four different types:

1. Contests
2. Collaborative communities
3. Complementors
4. Labor markets

ULIC was a combination of contests and collaborative communities and created a unique approach to generate and evaluate ideas. It provided an environment for the employees to compete by presenting their ideas, form teams, give feedback to one another, and vote to select the best ideas. The openness and social aspect were at the core of ULIC, which made it a different approach compared to other typical contests.

Based on the functionality of ULIC, and its process, the following key elements are presented:

- Challenge statement
- Platform
- Idea submission process
- Evaluation process
- Participants
- Communication
- Culture
- Conversion and Diffusion

It is necessary to mention that due to high flexibility of this approach, the elements may vary in different use cases. For example, establishing the prize is considered to be a critical design decision for an innovation contest (MacCormack et al. 2013), which mainly focuses on external target groups. For an employee idea contest it is important to set the right incentives and environments, so the intrapreneurs can arise. Therefore, setting the prize is not necessarily a critical element of an internal idea contest.

Moreover, the data collection and analysis in chapter 4 provided insights on the importance of a number of these elements. For instance, communication plays a crucial role in the engagement level of the employees, therefore the organizing team must consider it separate from the process. Another influential factor in the performance of an internal idea contest is a culture of intrapreneurship which supports creativity and change. The next section of the chapter provides a more comprehensive insight on each of the eight elements.

5.2 Directions for improvements

This section of the chapter presents the suggested improvements to the defined key elements. These improvements can provide new ideas on improving the concept of an internal idea contest within BASF for future years.

5.2.1 Challenge statement

The challenge statement sets the stage for the contestants. It must be clear and easy to understand whilst directing the crowd to generate ideas that BASF needs. By considering the following points into the definition process of a challenge statement, the organizing team can reduce the failure risks.

1. Ask related businesses within BASF to identify top customer needs that when turned into practical solution contributes to growth. From this inquiry create the top customer needs to incorporate into the challenge statement.
2. Do an aggressive mining of the scientific literature, patent databases, and other sources before defining a challenge statement. If the required solution is already existing, there can be easier ways to acquire it.
3. Idea contests can also focus on social and environmental issues and not only business.
4. Look at the market to identify the existing strong trends and define challenge statements which can contribute to the outside needs.
5. Incorporate an outside stakeholder such as a partner or customer into the definition process of the challenge statement. For BASF the final deliverable of the contest should be a sustainable solution that generates profits for the company. This involvement increases the possibility that the generated ideas will satisfy the real needs.

5.2.2 Platform

The online platform that hosts an internal idea contest has a significant impact on its concept. Therefore, different aspects of potential online platforms should be analyzed and discussed. For instance a feasibility study on the desired ideation and evaluation processes is necessary in choosing the correct platform.

For the ULIC, the internal business and social network, connect.BASF was chosen to host the contest. Its size and variety of features makes it difficult to create of a custom tailored environment for a specific contest. Moreover implementing a new feature requires a long process which may last for weeks. Thus the platform's existing resources and features must be recognized and utilized by the organizing team.

For improving the connect.BASF platform, the following points are suggested:

1. It must have the ability to collect and analyze data.
2. Enhance the social aspect of the contest (e.g. enabling tags, recommendations, etc.).
3. It should provide more visibility to new submissions.
4. It should provide the ability to combine similar ideas.

In the questionnaire that was sent to the employees, connect.BASF was mentioned as one of the main challenges of the ULIC. Therefore, it is crucial to improve the platform through enhancing its strengths and eliminating its weaknesses. Through putting the employees in the center of the design and development of the new contest platform, BASF can enhance the user experience. A co-creation tool that can be utilized by the development team is the jamming sessions. Jamming sessions is a great tool to understand the users' point of view and generate a large number of ideas. Furthermore, it is very important to capture the lessons learned of the ULIC and translate them into ideas to improve the contest's features on connect.BASF.

5.2.3 Idea submission process

An internal idea contest is a great tool to generate a large number of ideas across the company. A well designed idea submission process ensures the generation of quality ideas and enhanced user experience.

The following points provide improvement directions for the next generation of contests:

1. Enable an open and trusting culture across the company to overcome the innovators' reluctance to disclose ideas.
2. Enforce requirements in the idea submission template to present the information about business potential and required resources.
3. Make team submissions necessary or incentivize it.
4. Shorten the duration of the idea submission phase.
5. Prepare well designed and aligned ideation workshops to facilitate idea generation among employees.

6. Use embedded online forms to eliminate download and upload hurdles.

5.2.4 Evaluation process

Screening and evaluating a large number of generated ideas can be a great challenge to companies. Here companies can benefit from the wisdom of the crowd by allowing the employees to comment and vote to select the ones with most potential. In case of ULIC, after the crowd voting, a team of experts evaluated the most voted proposals and selected the ones which were aligned more to BASF's strategy. Both crowd voting and expert evaluation have their own advantages and disadvantages. Therefore, it requires a comprehensive research and analysis to set the right process that facilitates idea screening and evaluation.

The following points are suggested to improve the evaluation process of an internal idea contest:

1. Balance the control and autonomy when implementing crowd voting.
2. Encourage topic experts to engage in the crowd voting phase to give guidance and directions.
3. When evaluating the ideas scout both internal and external environments to compare existing solutions.
4. Studies have shown that the crowd may not be the best decision maker in the idea selection phase. Keep the current framework if you want to include the crowd in idea selection through voting, but include a team of experts to provide direction from early on in the contest. Therefore they could be able to endorse an idea and give special badges to a specific idea which is in the vision and scope of BASF.
5. Consider adding a third party (business partner, supplier, NGO, etc.) to jury. This may create ownership feeling by the third party whom their collaboration is needed to develop an idea.

5.2.5 Participants

The participants of an idea contest can differ depending on multiple variables. There could be a number of design decisions, which changes the potential participant groups:

- Whether targeting topic experts or the general crowd.
- Accessibility limitations caused by selecting a certain platform.
- Opening the idea submission to external parties.
- Crowd voting versus expert evaluation.

After the participant groups are identified, a company must set the correct incentives for each of the groups to encourage their engagement. For instance, the younger, lower level employees are more likely to engage in scouting behaviors (Park et al. 2014). BASF should adopt a more empowering strategies and ensure information symmetry toward the younger employees in the workforce. The winners of the ULIC were only 25 and 27 years old.

Apart from the idea submitters, the crowd must receive the suitable incentives in order to screen and vote for the ideas with most potential. These incentives can encourage a larger number of employees to engage in crowd voting and thus reduce the risk of “friends-voting”. Moreover, the establishment of these incentives has a positive result on the overall quality of the submitted ideas as more employees screen, evaluate and comment on the submitted ideas.

5.2.6 Communication

After identifying the participant groups, a comprehensive communication plan is needed to ensure that suitable information is given to each group on time. This communication plan should be developed with the guidance of an expert who understand the internal channels and the information needs of the participant groups. It is necessary to emphasize on the high importance of thorough and well executed communication strategy and its direct influence on the outcome of the contest.

The following points are suggested in order to ensure the execution of a well-planned communication strategy:

1. Include a communication expert in the contest organizing team.
2. Communicating the dates, objectives, and the process of the contest early.

3. Clearly explain the type of ideas the company is aiming to receive from the employees.
4. Utilization of both online and offline communication channels.
5. Promote the contest among employees working in operating and functional divisions and explain that innovation does not necessarily need to generate from R&D units.
6. Combine both bottom-up and top-down communication strategies.
7. Provide suitable knowledge resources to employees in order to prepare them for the contest.

5.2.7 Culture

The BASF's 150th anniversary and the Creator Space™ program had many objectives at its core. One of these objectives was to improve the innovation culture of the company. Presumably, in a chemical company such as BASF, R&D units are expected to generate the majority of the new ideas. However, Creator Space™ invited all employees, regardless of their organizational divisions to participate in the innovation process of BASF. Multiple inspiring co-creation activities were designed and executed to tap into the company's internal knowledge pool. To establish an entrepreneurial environment within a company, a culture that encourages creativity and failure is an essential element. A culture that removes innovator's reluctance to disclose their novel ideas to public, promotes knowledge sharing and constructive feedbacks.

The data from ULIC displayed that only a small portion of the company's employees participated in the contest. The suggestions below offer directions to improve BASF's innovation culture.

1. Increase the difficulty of the application form, however provide the right incentives for the innovators inside the company to put the sufficient effort and deliver a workable solution.
2. Encourage creativity and idea generation across the whole company.
3. The monetary and non-monetary supports from the top and middle management encourage employees to invest their time and resources to generate quality proposals.
4. Recognize and award the sponsors who encourage their employees to participate in the contest and assist the innovators in developing their ideas.
5. Celebrate both the winners and non-winners.

6. Establish a performance-contingent award mechanism for the winners of the contest.

5.2.8 Conversion & Diffusion

Internal idea contest is a competent approach to capture a large number of ideas across the company. However, innovation is the process of idea management and it is not solely ideation. Hansen and Birkinshaw described innovation as an end-to-end process and proposed the “innovation value chain” concept. The innovation value chain is consisted of three phases: idea generation, idea conversion and idea diffusion (Hansen et al. 2007). An internal idea contest mainly contributes to the idea generation phase of the innovation value chain. Thus it is essential that the company also establishes processes for the conversion and diffusion of the generated ideas. Therefore, the most promising ideas can be further evaluated in order to receive the needed funding for their development. Furthermore, after an idea is identified as a unique opportunity to generate profits, the company needs to choose a home to fit the idea within its organizational structure. The diffusion of innovation, also known as scale-up, is a challenge within large corporations, which requires planning from the organizing team.

To benefit from the full potential of an internal idea contest, BASF must screen and evaluate all the submitted ideas to identify the most valuable ones for further development. The following points summarize the suggested improvements regarding conversion and diffusion aspect of an internal idea contest:

1. Include experts who understand the outside market and the inside resources.
2. Document all the submitted ideas in a single database.
3. Provide incubation possibility for the ideas with potential.

6. CONCLUSION

The two objectives of this thesis were to analyze the performance of ULIC and propose improvement suggestion for future years. In order to achieve the first objective, more than 4,000 data points were collected and analyzed to answer a number of key questions. In addition, this collection and analysis of data enabled a data-based decision making process which had a meaningful contribution to the administration of the contest. It also provided fresh insights to how KPI can be conducted for a contest. Furthermore, the results of the data analysis helped BASF to have a detailed understanding of different aspects of the contest such as communication, ideation, and evaluation processes. However, the reasons that a phenomenon occurred during the contest requires further research. Furthermore, the author of this study suggested a number of directions for improvement of the idea contest for future years. These improvements were categorized under the defined key elements of an employee idea contest.

Employee idea contests can play a meaningful role in the innovation portfolio of BASF. It is a low cost, and highly flexible tool with an immense reach. It also encourages knowledge sharing and collaboration among regions and organizational units. Moreover, for a knowledge-intensive company such as BASF, idea contest is an effective tool to leverage the untapped potential of its employees through enabling a platform where everyone and not only the researchers and scientists can innovate. The conventional mindset of innovation in a chemical company emphasizes on new product development by R&D units. However, with the emergence of business model innovation, the role of operating and functional divisions in BASF is becoming more important.

The Creator Space™ and specifically ULIC were start for a journey of exploration, implementation and learning. A journey to start small, tryout a variety of diverse processes to evaluate which are most effective, and learn and adapt. This procedure requires to take risk, pay attention to details and to have a vision that encourages creativity and change. BASF is on a right path to transform its innovation culture to a more open environment where not only R&D employees are able to innovate, but also others have a chance to participate.

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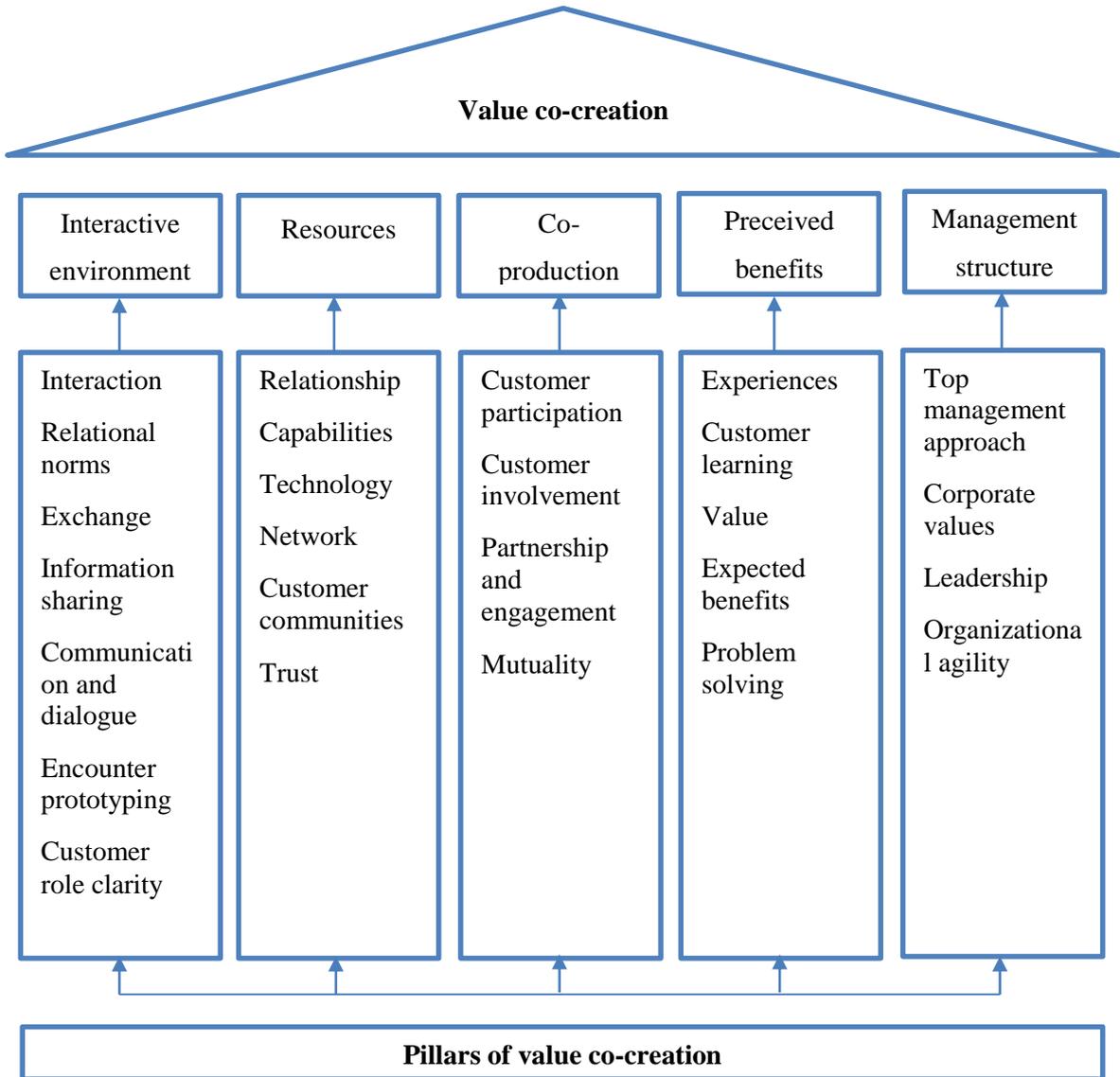
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APPENDIX 1. A CONCEPTUAL FRAMEWORK OF THE PILLARS OF VALUE CO-CREATION

(Bharti et al. 2015)



APPENDIX 2. ULIC IDEA SUBMISSION TEMPLATE

Challenge*	Idea Title:	
Idea Owner(s) (Specify if this is an individual or team submission)	Spokesperson Name:	Other team members (name/org. code):
	Org. Code:	
	Country:	
Describe Idea (<100 words)	<ul style="list-style-type: none"> •Describe the existing need/problem your idea addresses •What is your solution? What is the advantage over already existing solutions? •Which capabilities and competencies can BASF contribute to this idea? 	
Environmental impact (<50 words)	<ul style="list-style-type: none"> •What would be the environmental impact of this idea in terms of emissions, pollution and resource consumption? 	
Social impact (<50 words)	<ul style="list-style-type: none"> •What would be the social impact of this idea in terms of public health, safety and living conditions? 	
Business Potential (<50 words)	<ul style="list-style-type: none"> •What would be the business impact of this idea for BASF in terms of potential revenues and/or cost savings? (In case you know rough estimates, please provide them) 	
Resources (<50 words)	<ul style="list-style-type: none"> •What do you need to further develop this idea into a more concrete concept? (in terms of investment/resources) 	

***Note:** Choose one theme (air/transportation/water) and type it in.

APPENDIX 3. FINAL PITCH EVALUATION SHEET

The table below was used by the final jury to rate the top 10 projects. The scoring scale was from one to five, with one being the lowest and five the highest.

	Team name	Business	Environmental	Social	Comments
1	Example	1	3	5	
2					
3					
4					
5					
6					
7					
8					
9					
10					