

InnoDeck: Card based Innovation Support - A Modular Human-Centered Approach to Facilitate Innovation Workshops

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Abstract: Innovation drives economic growth and today innovation workshops are widely used to create new products, production methods etc. The InnoDeck is a low-tech knowledge management concept for information that is relevant for the facilitation of innovation workshops. In this context, InnoDeck is a tool for information sharing and organizational learning. It consists of two-sided self-contained cards that provide either methodological or inspirational content. Facilitators can choose a subset of cards for their design thinking project. The InnoDeck is human-centered because the main focus of each card is to be a quick read, easy to grasp and memorable. It not only engages its users but also is highly participatory. Everyone is encouraged to add cards to the expandable accumulative card deck. The concept has been developed, used and evaluated within a network of insurance companies and has proven to be beneficial for creating an innovation culture within these companies.

1 INTRODUCTION

tl;dr stands for *too long; didn't read* and was the motto of the conference on digital society re:publica 2019 (Republica, n.d.). The lack of time is a problem that needs to be addressed amongst others in knowledge and innovation management.

Accessing a knowledge management system is often a hurdle, since it may require e.g. permission, login data and the understanding of the way knowledge is organized within the system. In our busy world, time is a scarce resource therefore the email providing the mentioned information on the newly introduced knowledge management system is often not even read. In this respect, communication on knowledge management is an important topic.

With the InnoDeck we address the omnipresent lack of time with a new low-tech approach on knowledge management which is easy to communicate throughout the organization. We concentrate on knowledge that is relevant for innovation, but the InnoDeck concept may be expanded or adapted to different needs.

While knowledge management often concentrates on elaborating smart systems for knowledge discovery, storage and access, the InnoDeck concept provides an application-oriented low-tech approach to facilitate innovation both by providing guidance

for innovation methods and inspiration for innovation topics. Although the InnoDeck may be combined with a knowledge management solution it can itself represent a knowledge management solution for innovation management and therefore also suits small and medium enterprises that have not implemented such solutions.

The need to develop such a concept arose in a network of insurance companies working together towards the digital transformation and innovation in their domain. The InnoDeck was created, tested and improved within this setting.

The paper is structured as follows: Section 2 describes related work in the fields of knowledge management, innovation and innovation management. In Section 3, the concept of the InnoDeck is presented in detail. Section 4 gives an insight in use cases. Evaluation of the main use case follows in Section 5. Finally, the key findings and an outlook for future work have been summarized in the conclusion section.

2 RELATED WORK

To set the InnoDeck concept into context this section contains a brief overview of knowledge management on the one hand and innovation and innovation management on the other. Communities of Practice

(Wenger, 1998) and learning theory in general would be another good foundation for our practitioners' approach. However, in the conservative insurance company network we are working in, the knowledge management approach seemed more appropriate.

2.1 Knowledge Management

Nonaka and Takeuchi (1995) state that there are two types of knowledge: explicit knowledge that is written down in textbooks for example and tacit knowledge within individuals e. g. their intuition. Capturing tacit knowledge and transforming it to explicit knowledge and the constant creation of knowledge are major success factors for companies and therefore an important goal of knowledge management.

A variety of information technology (IT) solutions support the process of creation/identification, documentation and distribution of knowledge: from document management tools to content management tools, collaboration solutions or e-learning platforms (Janev and Vranes, 2005). But often these systems lack of participation and contributions as Standing and Kiniti (2011) point out for company-wikis. A promising approach to master this challenge can be to communicate and emphasize the objectives for the use (Stocker and Tochtermann, 2009). Ownership and individualization and the mere length and format of the presented information may be other levers.

The lack of time (Riege, 2005) to acquire new knowledge is a current challenge knowledge management needs to address the easing of the access to knowledge. Another lever is reducing the time to acquire new knowledge and making it more memorable e. g. by presenting summaries or new formats like videos (Pohl et al., 2018). Concentration on the communication aspect of knowledge gains importance. Educational Card Games have a long history and are applied in all kinds of different fields of knowledge as they are highly visual, easy to use and are particularly suited to engage the users (Baker et al., 2003). Golembewski and Selby (2010) emphasize the advantages of card-based systems in design processes, especially by providing general support to overall design process.

2.2 Innovation and Innovation Management

The doing of new things or the doing of things that are already done, in a new way is Schumpeter's definition of innovation (Schumpeter, 1947). Not only new products, but also new production methods,

new markets, new suppliers or other new resources or organizational changes can be innovations and are the drivers for economic growth. Therefore, they need to be managed.

From today's perspective: Innovation is an outcome, a process and a mind-set and companies need to concentrate on all of these qualities to be successful innovators (Kahn, 2018). New products, services, business models etc., but also the methods to generate them and the organizations culture towards innovation are necessary.

In IT organizations knowledge acquisition from the customer base enables innovation (Badr, 2017). Design thinking is today a widely used human-centred process for innovation and comprises the following steps: inspiration, ideation and implementation (Brown, 2008). The HPI d.school defines design thinking in six steps: understand, observe, point of view, ideate, prototype and test (Plattner, 2009). Many tools and pieces of knowledge support such innovation processes, for example future personas – a compact instrument to facilitate the creation of products and services for the customer of the future (Kasper et al., 2017). Traditionally companies often implement more complex processes like the Stage-Gate® process which today is also integrated with agile methods (Cooper, 2016).

Openness, servitization and digitalization currently transform the innovation landscape (Frishammar et al. 2018) and this requires adaptation of innovation management and the related knowledge management. Design sprints (Banfield et al. 2015, Knapp et al. 2016) are based on design thinking and offer a contemporary self-contained approach to innovation. The InnoDeck concept also provides the necessary knowledge base to facilitate innovation workshops. In addition, it is more open and suits more use cases than design sprints including participatory management of knowledge and innovation.

3 INNODECK CONCEPT

For innovation projects two types of knowledge is necessary – methodological knowledge on the one hand and inspirational/informative knowledge on the other. The InnoDeck offers this knowledge as a set of two-sided cards a facilitator can choose from to prepare a workshop or project. The modular InnoDeck approach is therefore suitable for agile contexts. The InnoDeck acts as a toolbox, a source of inspiration and an idea repository. It is intended to meet the needs of innovators. Like the design thinking process itself, it is not constructed sequentially, but

allows revisiting certain points and individual deepening as needed.

Design Thinking uses a variety of methods. Which method to use in which stage of the process not only depends on the problem to solve but also on the people involved in the project: which methods are they familiar and comfortable with and which methods do they actually understand and consider suitable for their challenge? The facilitator answers these questions for himself and the design thinking team and provides the group the corresponding card as quick reference. Due to its shortness a method card can be read and referred to during a workshop, but it is usually not sufficient to master a method from scratch. Design thinking facilitators should have experienced the methods they suggest themselves or at least have further discussed them with an experienced facilitator. However, with an InnoDeck method card a workshop participant after having experienced the method will have a starting point to facilitate the method himself. The InnoDeck therefore is a tool for information sharing and organizational learning. The handy two-sided format is also used for other information necessary in the innovation process (inspiration cards).

3.1 Overview

The two-sided self-contained InnoDeck cards are written with the objective to easily and quickly communicate their content and make it memorable by appropriate visual cues.

In the design thinking process InnoDeck cards provide methodological and inspirational knowledge and can be also a format for outputs of the process (Table 1).

Table 1: Examples for InnoDeck cards in different stages of the design thinking process.

Design Thinking Stage	Example InnoDeck Cards that may facilitate this stage
Understand	Method: Qualitative Interviews
Observe	Method: Cultural Probes
Define Point of View	Method: Design Thinking
Ideate	Inspiration: Virtual Reality
Prototype	Method: GoAnimate
Test	Method: Focus Groups

The InnoDeck is expandable and accumulative: new cards can be added over the time to respond to the users' needs. User participation in the creation of the cards is essential to make the InnoDeck a sustainable source for innovation knowledge of a company. By encouraging people to write InnoDeck cards tacit knowledge is becoming explicit and

available throughout the company. Therefore, we call the approach human-centered.

For a knowledge management process that e. g. incorporates the four steps: creating, structuring, sharing and applying (Barbosa et al., 2009) the InnoDeck can be regarded as a low-tech/easy access knowledge management system (Table 2). The InnoDeck concept allows involving employees from different departments of an organization in the creation process. All members of an organization can generate ideas for inspiration and method cards. Occasions for the creation of cards can be workshops or hackathons, where new ideas evolve. Cards can also be created after the event, e. g. when a method has been proven and tested in a workshop. The cards are written with Microsoft Word, structured by simple guidelines and by the filename, shared on a fileserver, via email or printed out and applied in innovation projects for input and as output format.

Table 2: InnoDeck as a low-tech Knowledge Management Process KMP.

KMP steps	How InnoDeck implements steps
creating	make cards with Microsoft Word
structuring	method/inspiration, overview card, filename
sharing	on fileserver, via email, printed out
applying	used in innovation projects for input and as output format

3.2 Types of Cards

To make the InnoDeck as easy to use as possible, we designed a set of categories. Each card is classified into one category to make it simple for employees to find a suitable bit of knowledge for their specific need. To keep the complexity on a low level, it is important to set up a manageable amount of categories.

The naïve approach is to use three different kinds of cards as they are employed in workshops: (1) method cards, (2) information cards and (3) inspiration cards.

Method cards describe empirical, innovation and creativity methods, which come into operation for example in innovation processes in companies, especially in innovation workshops. On the one hand a method card can contain the brief introduction to broad methods like Scrum, Design Thinking or Lean Startup, which is important if these build the foundation of a workshop. On the other hand practical method guides can be provided, e.g. for agile estimation, qualitative interviewing, focus groups etc. *Inspiration cards* contain information about trends

and technologies and thus serve as inspiration in the ideation phase, for example in product development workshops. For example we produced cards on trends like Coworking or Virtual Reality. *Information cards* are used to give workshop participants additional information about their surroundings, about sites and events, but also to present results in a well-arranged way.

After the first applications and practical experiences with the InnoDeck user feedback showed that the distinction between “inspiration” and “information” is difficult from the users’ perspective. Results of a workshop could as well seen be as “information” and “inspiration” for further innovation projects. With the growing InnoDeck and accruing of cards, the categories were adapted. The categories “information” and “inspiration” are subsumed in the “inspiration” category (Table 3). The “method” category remained unmodified.

Table 3: Contents and aims of the different card types.

Inspiration cards	Method cards
<i>Contents</i>	
Information about technologies, trends, events, projects, companies or whole industries	Information about empirical, creativity and innovation methods supplemented with examples and tips
<i>Examples</i>	
Coworking Cultural Diversity Virtual Reality Communication Trends Technology Trends New Business Trends <i>Location Info</i> <i>Project Results</i> etc.	Scrum Agile Estimation Design Thinking Lean Startup Qualitative Interviewing Focus Groups Premortem Cultural Probes etc.
<i>Objectives</i>	
Give inspiration in innovation processes and encourage employees to share their knowledge about certain issues and technologies	Convey methodological knowledge and give concrete instruction for applying the method in innovation projects

Supplementary to the method and inspiration cards, an overview card summarizes the aims of the InnoDeck and lists all the cards available with their name and ID number subdivided into the two categories. The overview card provides a low-threshold access to the existing cards, making it easy to pick the right card for the particular scenario.

3.3 Formal Guidelines

Standardization is an important step in knowledge management. The most important formal feature of an InnoDeck card is that it only comprises two pages (1), so it can be printed on one sheet of paper. This is in order to make it a quick read, but also for printed versions not to get separated in a workshop environment.

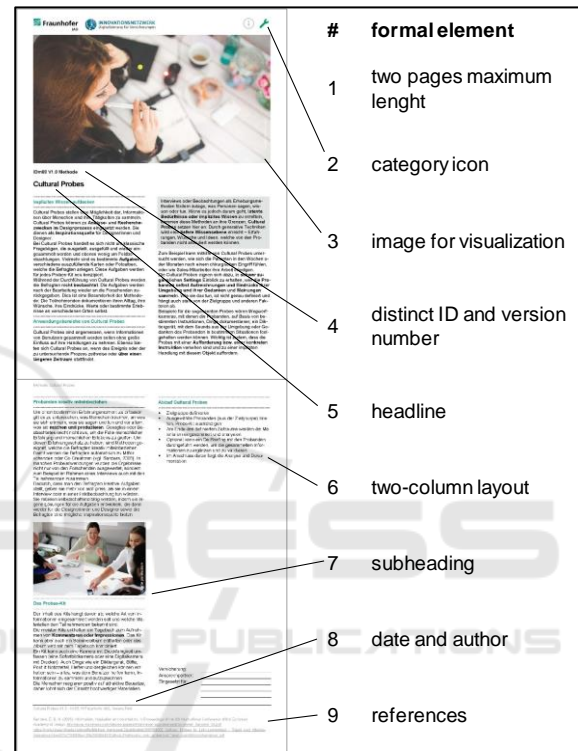


Figure 1: Formal guidelines of the InnoDeck.

Since the InnoDeck is an expandable treasure of knowledge that is intended to be expanded by many, it is necessary to define formal guidelines that create a uniform appearance and ensure the discoverability of the cards. Each card is equipped with a definite ID (4), consisting of a consecutive number and the letter “m” for method or “i” for inspiration. To provide transparency concerning the update status of a card, a version number is obligatory. References need to be specified (9), as well as the creation date and authors of the card (8). Note that InnoDeck cards are not scientific publications – only one or two references should be stated on a card. Additionally few other sources may be linked within the text. Both links and references should be an optional read – an InnoDeck card should be self-contained.

As explained before, the InnoDeck cards are classified into different categories. Using an icon for the specific category helps to assign the particular card to a certain category (2). An appealing key visual (3) arises interest, illustrates the topic and makes it more memorable. Subheadings (7) structure the content and give useful information about the particular paragraph. The main headline (5) needs to be as clear and short as possible. The two-column layout (6) ensures readability and clarity.

3.4 Content Guidelines

An InnoDeck card is self-contained, that means it can be read and understood without any other card. Therefore, InnoDeck cards can be freely combined into subsets for workshops. References to other cards are optional.

Due to the limited space, it is necessary to pay attention to concise and understandable language when creating the content for an InnoDeck card and in addition to clearly structure the content. The content needs to be presented in a lively way to the target group. As the workshop participants in design thinking come from diverse backgrounds and may not bring pre-knowledge with them, special language and terminology should be avoided or when unavoidable at least be explained.

InnoDeck cards can contain all sorts of inspirational content, starting with current trends and developments of social or technological nature and may also include reports from events like conferences on future topics. Method cards focus on design thinking practices. An InnoDeck card typically follows the subsequent structure: (A) introduction, (B) description, (C) examples and experiences. Method cards can additionally contain paragraphs about (D) advantages and disadvantages and (E) tips for application.

The *introduction* gives an outline on the issue and explains the relevance of the method or the inspirational content. The *description* gives answers on the “how” by specifying the characteristics of a method or of a technology. The section about *examples and experiences* provides insights into the way a technology is used or a method is employed. Personal experiences can be added in this section over time. By doing this the dissemination of the growing knowledge within the company is ensured. The optional paragraph about *advantages and disadvantages* in method cards summarizes the pros and cons of a method and helps the facilitator in deciding whether a method is suitable for the use case. The *tips for application* section in method cards

gives a short overview of the procedure and effort, e. g. required material, time and people.

All of the paragraphs of an InnoDeck card commence with a descriptive subheading. Pictures are useful not only as a key visual element for the whole topic but also for adding vivid information to specific sections and making the content memorable.

The content guidelines address the style and structure of InnoDeck cards, but also the creation process itself must not get out of the focus. As cheap quality can compromise the whole concept, the workflow of content creation needs to include a quality control instance. To ensure a high quality level, all InnoDeck cards need to be proofread by a second set of eyes. The quality control instance makes sure that the distributed produced content meets the quality criteria.

3.5 Individualization

The figure displays a sample InnoDeck card for 'Lean Startup' and a form for individualization. The card includes a header with logos, a main image of a person writing, and a circular diagram with 'BUILD', 'LEARN', and 'MEASURE' nodes. The form below the card has three main sections: 'Organization:' with a blank line, 'Contact person:' with a blank line, and 'Used for:' with a large blank area for text.

Figure 2: Individualization component of a method card.

Information sharing is closely connected to persons. The level of information sharing in organizations is not only depending on the openness regarding passing information on to others but also on being approachable for those eager for knowledge. Getting in touch with colleagues who were facing similar challenges and have applied a method to create a solution can motivate employees to follow this example and thus lead to the spreading of methodologic knowledge in the organization.

To support this exchange of information within organizations, the method cards of the InnoDeck contain a component for individualization (Figure 2). Each method card comprises a segment, which can be filled with the name and the organization and examples of application of the method. By handing the individualized method cards on to others, the initiator can be reached for further information and exchange of experiences. Albeit the usefulness of the individualization component, experience shows that it is only used rarely. Filling out this segment and refreshing it constantly undoubtedly means more effort for those employing the cards. A proper knowledge management system may address/solve this issue by automatically collecting this information. Star-rating the cards would be another helpful asset.

3.6 Challenges in Adoption and Use

Like all tools used for information sharing and knowledge management, the main challenge the InnoDeck is facing is to reach a high adoption and participation among the users. The InnoDeck itself stimulates communication and can thus lead to a more vivid innovation culture within an organization. Another challenge is remembering or employing methods one knows. Here the InnoDeck offers an easy possibility to code existing methodological knowledge and making it assessable to others. By providing concrete information, the InnoDeck as well addresses the challenge of spreading the knowledge across the companies. The individualization component moreover lowers the impediments to contact initiators and build a network of innovators within an organization, which may benefit the distribution of knowledge throughout all hierarchies and departments.

4 USE CASES

The InnoDeck has come to use in different application settings. The InnoDeck concept has been developed and refined within a network of insurance companies working together towards the digital transformation and innovation in their domain. Selected employees of the insurance companies have been equipped with the InnoDeck in order to use the cards for seminars and innovation projects as well as to share the information with their colleagues.

The first set of cards was produced for a three-day boot camp where innovation methods were used to find the next big insurance product. This hands-on

experience was essential to demonstrate the usefulness of the InnoDeck and make the boot camp participants ambassadors for the InnoDeck and its contents. Participants of the network meetings are now called Innovation Angels and are supposed to foster innovation within their companies.

In June 2018, one of the insurance companies launched in-house innovation circles where 4 to 7 people of different departments were selected to work together on all kinds of different innovation projects, concerning products, processes, sales and customer structures as well as on specific issues like mobility. Before starting the work on the innovation project the participants received special training by the Innovation Angels. For the preparation of these training seminars, the facilitators used cards, especially method cards, of the InnoDeck. In the seminars, the printed InnoDeck cards were handed to the participants. A digital version of the cards was provided on a project platform for download. Until today, 6-7 seminars of this kind have kicked off several innovation projects in this insurance company. We do not have data on how often InnoDeck cards have been used within the innovation projects themselves, but it has been confirmed that the InnoDeck has enabled a cultural change towards innovation. In an interview the facilitators stated that the InnoDeck benefitted the seminars directly, because the participants gained inspirations from the inspiration cards. The method cards served especially the facilitators by giving them necessary tools for the preparation of the seminars. From the facilitators' point of view, the InnoDeck should be enhanced to serve as an enduring source of methodical and inspirational content in their companies, for example by using short videos clips to explain complex issues. The facilitators also expressed the wish for an easier possibility to share the contents of the InnoDeck with their colleagues – via intranet, blog or wiki.

Another interesting scenario for the application of InnoDeck cards are hackathons. In February 2018 the InnoDeck was used for the preparation of a network-internal hackathon dedicated to the development of chatbots in the insurance sector. During the hackathon, the participants in four different teams were equipped with a set of cards compiled in order to contribute to the objective of the hackathon. The InnoDeck served both as a library of methods eligible to evaluate the created concepts and pieces of software and as a stimulus for the creation of ideas.

Another setting, where the InnoDeck came into use, were strategic meetings within an IT department of an insurance company. The meetings in this use case took place in March 2019 and focused on the

restructuring of the IT department. The initiators knew the InnoDeck from the innovation network and deployed it in this particular setting to find out about the needs and expectations of the employees regarding the new organizational structure of the department. The example shows that the InnoDeck does not only contribute to innovation processes but can also be employed in other contexts.

5 EVALUATION

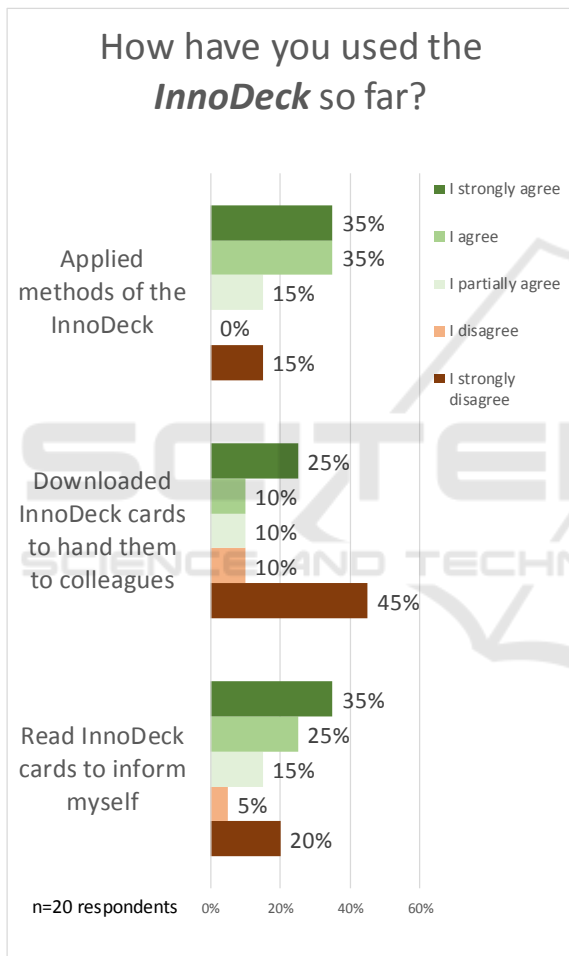


Figure 3: The InnoDeck in use.

The concept of the InnoDeck has been continuously evaluated and improved within the network of insurance companies. The evaluation presented here focuses on the way the InnoDeck is used in these companies. In the evaluation the needs of the users concerning the presentation of information in order to optimize the format of the InnoDeck are analysed. 70% that means 14 of 20 respondents stated that they

had applied the methods of the InnoDeck (Figure 3). This result underlines the usefulness of the method cards. 60% said, they had read InnoDeck cards to inform themselves. Only 35% answered that they downloaded the cards to hand them to colleagues. This result shows that there are still obstacles when it comes to the sharing of information. It may be because the process of downloading from the document sharing system is perceived as being too inconvenient and time-consuming or the role within the company does not involve such activity. The own insecurity with a topic or lack of time can also hinder the sharing of information. With the positive results seen above there is at the same time a necessity to improve the information flow.

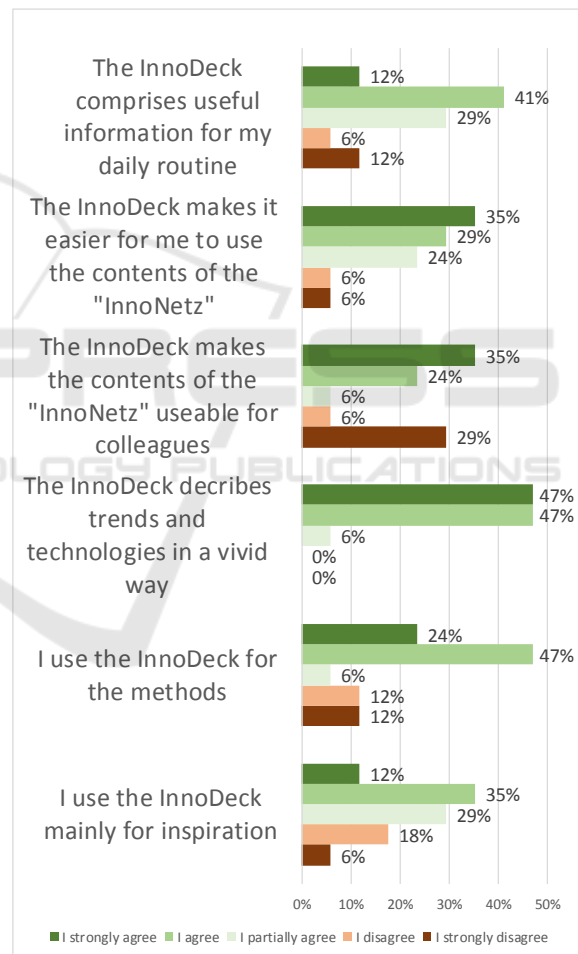


Figure 4: Benefit of the InnoDeck.

To evaluate the benefits of the InnoDeck, we asked the users of the InnoDeck about the advantages of the format. More than 90% of the respondents agreed on the statement that the InnoDeck describes trends and technologies in a vivid way (Figure 4).

This result underlines very clearly the amenities of the InnoDeck cards: the way the information is presented is perceived as being appealing, which supports the acceptance of the users. In the results, however, we also see room for improvement. More than 30 percent of the respondents disagree on the statement that the InnoDeck makes the contents of the network useable for colleagues. In further evaluation, we need to focus on this aspect and develop alternative formats and identify alternative channels to transfer contents not only to direct members of the network but also to other employees of their organizations. Nevertheless, the results show clearly that the InnoDeck makes an important contribution to the innovation culture within an organization.

6 CONCLUSIONS AND FUTURE WORK

In this paper, we describe the InnoDeck, an approach to share information for fostering innovation within companies and the implementation of the concept within several insurance companies. The main contribution of this paper are:

- (1) A template to provide knowledge for facilitating innovation workshops concise and time-friendly.
- (2) A description what information to include and how to make it usable and helpful.
- (3) An evaluation of the concept through questionnaire and user-interviews.

In the future, we will focus on enhancing the InnoDeck with other formats, like anchorvideos (Pohl et al., 2018) or e-papers, which offer the possibility to integrate videos. Especially when it comes to highly complex contents like technologies based on artificial intelligence, we see potential in linking the InnoDeck to actual demonstrators. Quality assurance and a way to implement this will be a major issue as the InnoDeck grows. The same accounts for a search and organization mechanism. We will study the Communities of Practice (CoP) model and explore the benefits of managing our project and the InnoDeck as a CoP of CoPs. Furthermore, we need to define a better solution to represent and distribute the InnoDeck, without losing the easy access provided by simply storing it to a filesystem. Compiling best practices on which combination of cards, what number of cards, which cards for which purposes etc. will create additional value.

To keep alive the InnoDeck concept that has proven beneficial to create a culture of innovation within the companies of the network, we are creating

a model of the innovation space consisting of three dimensions: the physical, the organizational and the digital. The physical dimension of innovation space comprises resources like people, actual venues and of course budgets. Organizational aspects of innovation are methods to use but also strategies. The digital dimension looks at how to make innovation sustainable when digitized to some kind of knowledge management system.

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