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Lego® Serious Play® as a Business Innovation enabler

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Abstract

Improvements in innovation and quality processes can be achieved through the use of novel approaches such as LSP, which enables abstract thinking and advocates an open-mind for unconventional solutions. Within the scope of business processes and structures, the LSP methodology enables collaborative reflection on both single and complex procedures (regardless of rank) in the form of a 'thinking space' based on a flat hierarchy. The employment of total engagement using games and virtual worlds are used to change the working world and businesses activities. The collaborative nature of the work necessary for creating a Lego model establishes a shared comprehension of a certain problem or issue.

Hence, LSP is found to be a suitable methodology for identifying improvements by delineating the actual situation and procedures in the business structure. These initial steps involve the development of learning and comprehension of the current system through consideration of varying stakeholders' perspectives and understanding of the challenges associated with the existing conditions and structures. LSP acts as a learning enabler by creating clarity and support mechanisms for innovation developments and improvement.

In this paper, the authors present how the LSP method can enable Business Innovation based on case studies from the authors' own experience in industry. Therefore, the participants compose two different target groups – either a mixed group consisting of employees from different SME respectively multipliers or a group of employees from one enterprise. The group composition and the participants' background influence the LSP workshop related to structure, procedure and results. Conditions, challenges and factors for successful LSP workshops are evaluated.

Keywords: LSP, Business Innovation, Serious Games

1. Motivation and objectives

The increasing importance of innovations (Franke et al., 2016) results either from the increasing market requirements (Reguia, 2014) or from the necessity to improve products and processes taking new technologies and digital approaches into account (Radziwon et al., 2014; Lasi et al., 2014). Innovations are only successful if the products and services offered meet the needs of end consumers by offering added value (Cavaye, 1995). Business Innovation is therefore an essential competitive factor for the design of innovative products, services and processes (Reguia, 2014). In this innovation process, itself it is crucial to integrate knowledge from different stakeholders. With their knowledge and experience, employees in particular contribute to ideas for improvements in the work process having a high degree of effectiveness, quality and practicability, which in turn positively influences the efficiency of the innovation and improvement process. In addition, participation strengthens trust, loyalty and commitment, so that the jointly developed solutions receive a higher degree of support during the implementation process. (Riedel et al., 2017) Nevertheless, it is essential that the group fits together to create a productive and effective team spirit promoting creativity, exchange of ideas and a dynamic working atmosphere itself (Mathieu et al., 2014).

Since the deployment of “Serious Play” in the context of Business Innovation, it is recognized that Lego® Serious Play® (LSP) can assist in creating ‘action research’ capacity and contribute to academic understanding and practical value (Kristiansen & Rasmussen, 2014). Gamification concepts can also encourage total engagement using games and virtual worlds and can positively influence the way people work and how businesses compete (Roth, Schneckenberg, & Tsai, 2015). This results in creating a different approach to the development of people and how they also create abstract thinking for real conditions and contexts through the use of metaphors. Multilayered problems and complex processes or structures become tangible in the form of a model and result in the development of a common understanding of the issues as they are visualized by reducing complexity through the use of metaphors and the creation of a 3D model. (Schulz et al., 2015)

The successful innovation process and methodological procedure of LSP depend on the workshop topic, the participants regarding their professional background, experiences, skills and the overall workshop group composition. (Tawalbeh et al., 2017; Emanuel et al., 2018) Hence, the conditions, challenges and factors to be successful as well as methodological adaptations for these two target groups are juxtaposed in this article leading to valuable insights into the mechanisms of that special type of serious games.

This article starts with an overview referring to Business Innovation, serious play in general and the method Lego® Serious Play®. The application of the LSP method in different contents by varying participation groups is in the focus of the following case studies. Hence, two main case studies show the challenges, benefits and factors to be successful by working with participants of a different professional background.

2. Business Innovation

Business innovation is the creation of a new value which the customer or the enterprise earns from new products, processes or services (Sawhney et al., 2006). Hence, business innovations are crucial for enterprises to satisfy clients’ needs by protecting and extending their competitive situation (Gakkai, 1988). Whereby, innovations are the drivers of the whole national economics (Bauer, 2013).

Each kind of innovation is based on new ideas resulting from many different stakeholders – e.g. end users, customers – or results from new procedures, structures and technologies. Business innovations are divided into two groups; product innovations and process innovations – creating different impacts on the company in general. The competitive strategy of the enterprise is especially influenced by each kind of innovation. Furthermore process innovations can form the economic efficiency of the value chain of the company. The key aspect is the improvement of business and production processes (Gakkai, 1988), which can vary in terms of their temporal effect and the extent of such an effect. Subsequently, differentiation can result in radical and incremental innovations. Consequentially, "radical" innovations can lead to far-reaching changes, whilst "incremental" innovations continuously drive the change process forward. (Schumpeter, 1942)

Hence, it is necessary to study challenges across the enterprise with open innovation approaches considering internal as well as external ideas in the development of innovative processes (Gassmann, 2008). One prominent approach is ‘serious play’ which is described in the following section.

3. Approach of Serious Play in Business Context

The term “play” can be defined as throwing aside the rules of "normal life" for a certain time to follow new rules or try out new possibilities. Playing is a voluntary activity with active (often physical) commitment. The term "serious" attempts to distinguish playful activities in a work situation or in the life context of an adult from those activities carried out by children in which play is used for its own sake. (Rieber et al., 1998)

Hence, the term ‘serious play’ can be used to describe activities in which fun-oriented, intrinsic motivated actions are used to achieve serious and extrinsic motivated goals from the work context (Statler et al., 2011). This apparently paradoxical approach is based on the positive aspects of playing (Statler et al., 2009). Cognitive abilities grow (Vygotsky, 1978) while the productivity in the work context increases (Starbuck & Webster, 1991). Furthermore, organizational scientists prove that through playful interventions we can promote learning and critical reflection (Schulz, 2006). Last but not least, experience, new methods and concepts can be conveyed in game situations (Tröger et al., 2011). In addition to these individual effects, it is attributed to serious play that it serves to promote a shared understanding in groups (Oliver & Roos, 2007).

Serious Play should be particularly suitable for situations that require creative, out-of-the-box or holistic thinking and a high degree of personal commitment. Playing games is also seen as an interactive way of telling stories effectively, which is fundamental for cognition and learning. Formal game research has led to the

establishment at least three game levels: (1) participation (fun and games); (2) problem solving (development of physical and mental perceiving tools); (3) catalytic action (that allow an individual to intuitively tap into opportunities, to become spontaneous). Play research has strong anthropological roots and is divided into four thematic areas: play as progress, play as fantasy, play as self and play as power (Rieber et al., 1998).

The Serious Play's approach uses the above combined mechanisms by raising players' awareness of problems and ideas and fostering of their creativity whilst enabling teamwork etc. The content or context of the play is "serious" in that it deals with questions relating to real life or working life. In practice, there are various approaches to 'Serious Play', e.g. theatre games, physical modeling, and also the use of Lego for building metaphors and stories, namely the Lego® Serious Play® approach. (Kelly & Riedel, 2014)

4. The method Lego® Serious Play®

Lego® Serious Play® (LSP) was originally developed to facilitate the strategy development function of the Lego Company. LSP is a facilitated workshop in which participants respond to tasks by creating symbolic and metaphorical models from Lego bricks and then present those models through storytelling to other participants in order to achieve a common understanding of each other as well as the topic. The LSP method is based on following basic values: 'The answer is in the system'; 'Everyone has to express his/her reflection'; 'There is no ONE right answer.'

In this way, the method enables a more unbiased, free-thinking and playful interaction between the participants, which leads to a common understanding, creative ideas, etc. (Kristiansen et al., 2009; Hansen et al., 2009).

The LSP concept is based on several key theories: (1) the importance of play as a learning method by exploring and telling stories; (2) constructionism; (3) the hand-mind connection as a new way for creative and expressive thinking; and (4) the role of the different types of imagination.

The first step for a successful implementation of LSP is to ask participants – after some simple tasks for skills building – to create a model of a particular problem with Lego. So everybody gets in touch with modeling and metaphorical thinking. In the subsequent spontaneous construction process, the participants give the models meaning by "tapping into their brains". When the construction phase is complete, each person explains their perception (or story) to the other participants. The other participants can ask for clarification of details, but they must respect the model and also the importance attached to it. During the reflective part of the workshop, insights are created for the individual and the team as a whole. (Frick et al., 2013; Kristiansen et al., 2009; Hansen et al., 2009).

Using individual models, the participants are then be challenged to build a common model, produce relations between the individual models and create a landscape that also models external "agents". This newly collaboratively constructed model can then be the basis for testing, for the analysis of certain scenarios and finally for the extraction of guiding principles. (Kristiansen et al., 2009)

Since LSP is a more generic principle, it can be applied to a variety of problems, e.g. strategy, product or organizational development, change management processes, mergers and acquisitions (Hadida, 2013; Jentsch et al., 2011; Frick et al., 2013; Hansen et al., 2009). Considering the mechanisms and theories inherent in the LSP method, it is proven that it is also suitable for positive impacts on contexts of reengineering of any kind of processes (Dempsey et al., 2014), participative engineering (Kelly & Riedel, 2014), team development (Jentsch et al., 2011) and knowledge sharing related to digitalization (Tawalbeh et al., 2016).

5. Case Studies on group composition as an influencing factor on LSP

Ontology of design activities so that proponents of models or theories of design and practitioners have a shared understanding of what each specific design activity entails (Sim and Duffy 2003). Although methods for generating research questions are not mutually exclusive, nevertheless they support a more reflective scholarly attitude due to mixed method approaches to create more complex research designs (Sandberg and Alvesson 2011). 'How to' guides and resources focusing on key themes, create a structured approach to research activity (Cousin 2009) whilst also supporting guidance and the flexibility to adapt, refine, expand or trim. In addition to questionnaire surveys (Emanuel et al., 2018) participant observation as a qualitative research method (DeWalt, & DeWalt, 2011) is used to explore how LSP enables abstract thinking and an open-mind for unconventional solutions. . A case study approach is used in this study, as it will provide an appreciation of these issues in its natural real-life context (Crowe, Cresswell et al. 2011). The study will derive knowledge

from theory with the empirical context of conducting this study based on LSP instructor's observation which will also derive knowledge from the experience of LSP facilitation and implementation.

The wide range of fields associated with LSP show that it is applicable for varying objectives in business, training, educational, family, and mentor contexts (Peabody, 2015). Just as the field of application varies, so too does the target group. As a result, the groups of participants are made up of people from different backgrounds, qualifications and experience influencing the dynamics of the group and therefore also the process and the results of the serious game. (Mathieu et al., 2014) Therefore, it is decisive to understand those influencing factors. Perspectively, those factors should be taken into account when designing and running the workshop.

A selection of case studies with different groups of participants will be presented. A case study is a "detailed examination of a single example of a class of phenomena" (Abercrombie et al., 1984 p. 34). It is useful to create hypotheses which can later be systematically tested on a broader empirical basis (Flyvbjerg, 2006).

This is the first case study based on a mixed group of participants. Therefore two use cases are described in a combined way. Following, there is one example with multipliers (case study 1a) and another one with entrepreneurs from different SME (case study 1b). Additionally, a complete different concept is shown in form of a case study with employees of a single company (case study 2).

By having those deep insights in the case studies, the examination of challenges, benefits and success factors of the LSP approach in conjunction with its characteristics will be possible.

5.1. Case Study 1: Lego® Serious Play® with a mixed group of participants

Content-related Objective

Lego® Serious Play® workshops were used to raise awareness of the digitalization and their potentials for SME and multipliers. Multipliers like the Chambers of Industry and Commerce, Chamber of Crafts and business development agencies who work with SME (Case Study 1a) respectively entrepreneurs from different SME (Case Study 1b) were asked to interchange their own knowledge about potentials and challenges of digitalization for SME and then develop a common understanding of this area with a playful approach.

Case Study 1a: Lego® Serious Play® for multipliers

In general, getting to know the method LSP is more in the focus than the deviation of concrete following implementation steps for Industry 4.0.

Case Study 1b: Lego® Serious Play® for entrepreneurs from different SME

Getting to know and using the LSP method as deriving the following steps for the further development of the company in the sense of Industry 4.0 and digitization are in focus.

Methodological requirements

The workshop takes place in a **neutral environment**, whereby a room with **sufficient space and large tables** is a prerequisite. However, there should also be room to move, for example, to change seats at the table and provide for a new/different perspective. The participants take part in an **external workshop**, which removes them from their everyday working environment and therefore reduces the influencing factors. Nevertheless, it is necessary to **directly ban technologies** such as smartphones, tablets and laptops from the workshop environment.

The **5 to 8 participants** of the workshop must get the possibility to prepare for the workshop by **getting an overview** related to Industry 4.0 topics. This preparation is a prerequisite for a successful workshop where everybody is able to bring own ideas into the innovation and creation process.

Methodical approach and the resulting challenges

At the beginning there was a sensitization for the method Lego® Serious Play® and its use. This was needed in order to exercise metaphorical building, because none of the bricks would represent the thoughts of the builder in a way, such that every other participant would have the same interpretation of the model in his mind. That was why exercising story telling followed. Afterwards, the participants dealt with their previous idea of Industry 4.0 in a small individual model. Since the workshop participants were from different SME as well as business areas and each had different technical backgrounds and experiences, the individual ideas of Industry

4.0 differed greatly. Telling stories about the individual models thus opened up new perspectives of Industry 4.0 to the participants without additional activities by the moderator.

Nevertheless, there was a great challenge in developing a common model. The different backgrounds of the participants thus brought with them a different understanding of business processes, structures and organizations. However, in order to build a common model for a common understanding, an appropriate starting point had to exist. For this reason, a fictitious company was introduced. In the following step each participant was assigned a corresponding role in the company. This assignment was based on the professional background and the origin of the participant so that the entrepreneurs could identify better with the respective role and could also incorporate their own experiences. In contrast, the roles of the multipliers were distributed randomly. The identification of the participants involved with the fictitious company tended to take longer with multipliers than those in workshops with entrepreneurs because multipliers often come from state institutions. As these people do not work in a manufacturing company, they may therefore not be familiar with the individual processes and structures, which can be influenced by Industry 4.0 in general.

In the interests of the fictitious company, everyone developed first their own vision for the year 2022 as a digital pioneer among SME. The objective was to dissolve themselves from an actual state and start thinking in a target state. In this context, the question was raised as to how the pioneering role was achieved and which digitization technologies, services and structures were to be used in the corresponding corporate departments whilst considering the involvement of employees. This was provided for a sequence of step by step questions. Mainly, multipliers approached this challenge with an open mind and used visionary thinking to lead them to novel and unbiased results, whereby they had to judge, if the company could really implement these ideas by the year 2022. In comparison, the imagination of the entrepreneurs was more realistic, as the concrete target situation was thoroughly thought through.

After storytelling and completion of the common, the Lego model was developed with stakeholders and external factors scenarios were examined. This led to a deeper understanding about how to actually change imaginations and develop links between the individual models. However, if the focus was entirely on getting to know the methodology a tendency to distance oneself from reality resulted. This weakened the meaning of emergences, which led to the argument that the fictitious company was "naturally" prepared for the developments.

Just by using LSP, the participants got a vision for the fictitious company and derived general action strategies as a result. However, an unanswered question remained, especially asked by entrepreneurs: Where do we start to implement Industry 4.0 components? That was why there were integrated some more moderating elements and approaches of agile project management. By returning to the actual state of the company the participants were led to choose a pilot and the technologies and structures with regard to Industry 4.0 resulting in possibly highest effects. Therefore, the degree of prior knowledge or preparation for the workshop was crucial, as a lack of knowledge made it more difficult to mention concrete ideas for implementation and linger on a more abstract level like "We have to implement linkages between our products and services". In general the definition of concrete measures was rather difficult for the multipliers. On the other hand, entrepreneurs gave a lot of input, which made it difficult or even impossible to keep to the time frame.

One of the most important findings of such a Lego® Serious Play® workshop is that participants are often astonished at how quickly they can come to joint results with stranger participants (Emanuel et al., 2018).

5.2. Case Study 2: Lego® Serious Play® for employees of a single company

Content-related Objective

The Lego® Serious Play® method is used in the company to examine existing processes and identify optimization potentials with regard to lean management.

Methodological requirements

Especially for a LSP workshop in an enterprise, **preexisting relationships** are crucial to convince the enterprise to consider taking employees out of their regular work activities. To get the employees' capacities is easier, if trust and credibility preexists. Such a preexisting relationship can convince the management to take a risk in running an LSP workshop. Senior management commitment is also a key success factor because it leads to an ease of implementation and resource management for the workshop.

A LSP workshop should take **place onsite**. Having zero distractions is vital for the innovation process and the reason why each **technology is not permitted**. The participants must be provided with an opportunity to concentrate on the task without any distractions via mobile technology.

Prior discussions (at least 2) around the topic are vital to generate the topic including reasonable tasks to accomplish in the provided time. Hence, the shape of the theme of the workshop is defined. **Planning** the theme, **schedule** (including estimated timing) and **location facilities** are critical as well as risk assessing the plan in terms of fewer or more participants than planned. Especially for the location facilities, as there are some specific layout requirements. For example, a U shaped layout facilitates participants' access to models and movement around the workshop with flexible and comfortable furniture with recommended tables of approximately 4x3 ft.

Nevertheless, the **expectations of the participants** have to be gathered at the start of the workshop to determine whether the workshop did not meet, met or exceeded these expectations. In this context, the setting of the rules of the workshop is necessary by a clear description to ensure that all participants engage and that respect is maintained.

Managing participants who do not wish to participate involves innovative strategies. Reluctance to engage with the workshop needs patience and understanding. This can be understood in the pre-planning phase and overcome during the workshop delivery if additional background is provided by the enterprise.

Methodical approach and the resulting challenges

Participants from the same unit in an organization were introduced to the LSP method to develop a shared improvement strategy for their service unit. Participants first became familiar with the Lego bricks through two icebreaker exercises and they then focused on building individual models to identify improvement processes related to their individual role in an organization. This facilitated a sharing of knowledge about participant's perceptions of their role in an organization, together with identifying enablers and challenges associated with their role. Although the participants were from the same Unit, their rank and length of service in the organization varied from junior to senior and did not correlate with number of years' service which also resulted in a variance in ideas around improvement. The mix of experience with new perspectives together with a variety of levels across roles led to an interesting diverse range of opinions and discussions around improvement. This storytelling effect of LSP facilitated this diversity of conversation through a forum which created equality across participants regardless of grade or length of service. The majority of the participants were positive about their involvement in the development of the strategy but a reluctance to engage was a factor for one participant who did not see the value in playing with Lego for 6 hours. When negativity is a factor, it can impact on the workshop. However, an experienced facilitator can mostly manage these participants through coaxing techniques and continuously involving and praising said participants. In this case, the reluctant participant was transformed by the end of the workshop and effectively contributed to the development of the strategy for the Unit.

Following the individual model build and storytelling, the group were tasked with developing a shared physical model in order to assist the Unit in realizing a shared vision for an improvement strategy. This part of the workshop was very challenging for participants, as a consensus had to be reached before the model was built. Much discussion and debate took place between participants before alignment was reached and compromise was agreed between roles in considering how improvements could be achieved. During the discussions, all questions were asked directly to the model and this helped relieve potential tension. Participants suggested how to merge work tasks in order to achieve efficiencies and also consideration was given to swap tasks between roles. This resulted in participants being open to such implementation once the workshop was completed.

Once an agreed model was built, the participants then got another opportunity to risk assess the potential failings of the agreed model. Reality hit at this point of the workshop as participants realize that the strategy they have collectively agreed was in front of them in the form of a Lego model. Alterations took place to match resource constraints. The next stage was to agree the steps to be taken in order to realize the strategy.

Related to the main objective of the workshop, the group composition has to be chosen. There are multiple options for composition which are acceptable but which require consideration in the pre-planning phase: (1) cross disciplinary from various levels, (2) cross disciplinary from similar level or (3) discipline focused. Thereby, a small group of 4 to 8 participants is ideal because everyone has an opportunity to speak without everyone in the group getting bored of participants speaking around the same theme. Senior Level Leadership

support in both participating in the workshop and listening carefully to other participants is important because decision making to effect change is easier managed and more successfully implemented when leadership are involved.

During the workshop the group bonds in a way that is unique as each will have a similar amount of time to articulate their vision for the current state and the future state models. Everyone shares their vision. It is critical that respect builds among the participants as they begin to understand each other's roles, viewpoints and challenges. Therefore, maintaining the game rule that the questions are directed to the model results in removing the personalities and potential for conflict. The focus is on the issue/opportunity identified.

Enjoyment of the process, regardless of the outcome, is vital. Participants move from a narrow focus to a more holistic systems approach to problem solving. The result may surprise participants if they enjoy the process and let their minds become free. Open minds will enhance creativity and innovation and as a consequence, the workshop results in enhanced outcomes i.e. achieving the pre-set theme and additional outcomes.

6. Conclusion

Lego® Serious Play® is a powerful tool enabling a creative business innovation process through abstract thinking. However, its success depends on the methodological adaption related to the group composition and the workshop topic. The study derived knowledge from theory with the empirical context of conducting this study based on LSP instructor's observation and the experience of LSP facilitation and implementation. From the two different perspectives of the case studies, we learn that in an in-house LSP workshop, management support in both preparation and implementation as well as the prevailing team atmosphere (existing conflicts, communication barriers) has a decisive influence on the overall result. However, if the workshop is conducted with a mixed group of foreign participants, the focus is on building a common understanding of what can be achieved, for example, through a fictitious company. Additionally, building up knowledge and getting to know other workshop participants with different backgrounds and experiences represent interpersonal challenges that have to be solved at the beginning of the workshop in order to achieve a successful process.

In both case studies, storytelling elements were of utmost importance as ideas, imaginations and thoughts could be translated easily between participants. In this way, the individual participant contributes to the overall system, whereby different perspectives are taken into account.

Each workshop is different and each brings its own unique challenges. The group dynamic is determined by the problem that is to be solved. In the case of technical problem solving, it is a straightforward process with the only variance being the participants and their approach to solving the problem. In softer people and team issues, the approach is deeper and requires more carefully management.

Nevertheless, this research is characterized by limitations because only three case studies are compared regarding their success factors. The comparison is not based on a predetermined classification scheme related to the group composition or on a subjective judgment of success and its significant factors. Hence, there are a lot of opportunities for further studies in understanding how LSP can be more successful with varying participants.

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