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Introducing the Creative Idea Solution framework

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Corporate creativity: introducing the Creative Idea Solution[©] framework

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Abstract: In this paper, the Creative Idea Solution[©] framework (CIS) is presented as a response to the call made by Kozbelt et al. (2010), Lubart (2001) and Rietzschel et al. (2009). The CIS framework integrates theory and methods from creativity research into an open and continued innovation process, and the authors argue that this interdisciplinary approach diminishes the gap between the two literatures. To indicate the value of the proposed framework in practise, a nine month action research case study was conducted in an international technological manufacturing company. The results and the learning outcomes from this action research are presented and the indications which emerged are compared to the existing literature.

Keywords: creativity; radical innovation; continuous innovation; open innovation; learning; action research; project manager's dilemma; innovation as a function; Creative Idea Solution[©]; CIS; interdisciplinary approach.

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1 Introduction

Innovation and learning are two of the most important words in businesses today (InnovationInside, 2010; Kess et al., 2010; Sanchez de Pablo Gonzalez del Campo and Skerlavaj, 2011), and it has been so for many years. Managers and CEOs continue to stress the importance of being innovative and they stress that learning is one of the means to an end (cf., Billet, 2001; Brix and Lauridsen, Forthcoming; Kanchana et al., 2011; Krot and Lewicka, 2011). But the fact is that innovation still seems as a black box which is impossible to decipher (Fagerberg, 2005), and when organisations have had success with their innovation projects, the managers and CEOs are often not satisfied with the result (cf., Christensen and Raynor, 2003; Graham and Bachman, 2004; InnovationInside, 2010). With the level of well-educated and experienced workforce working in most organisations, it is argued that the potential for success is large and that the reason for the high failure rate and the experienced in-satisfaction derives from half-hearted attempts when starting the very innovation projects (also cf., Clapham, 2003; Csikszentmihalyi and Sawyer, 1995; Haapasalo and Kess, 2001).

Based on the authors' experiences, it has been realised that brainstorming sessions (Osborn, 1953) are often applied in practise in a business perspective when starting a new innovation project. This conventional wisdom is also found in practise by scholars (Hansen and Birkenshaw, 2007). However, there is a clear paradox present in the literature, because applying brainstorming sessions is a good decision when consulting the innovation process literature (i.e., Kelley, 2001; Tidd and Bessant, 2009) and a bad decision when consulting the creativity literature (i.e., Csikszentmihalyi, 1997; Nijstad and Stroebe, 2006; Runco and Albert, 2010). Thus, when corporate managers in general juxtapose creativity with brainstorming, they do not, according to creativity literature, exploit the full potential of the future innovation project(s). The argument for this perceived shortcoming is the fact that the event-based brainstorming sessions are not put into a systematic framework and that the sessions are characterised by sporadic ideation, which according to the authors is not desirable.

Instead of claiming yet another middle-range or grand theory (Merton, 1949) of creativity in a business perspective, the authors reply to the call made by Kozbelt et al. (2010), Lubart (2001) and Rietzschel et al. (2009), and an integrative framework for applied creativity in an open and continuous innovation process is presented (cf., i.e., Chesbrough, 2003; Scharmer, 2009), where focus is on the creative sub-processes. This integrative framework is referred to as Creative Idea Solution (CIS) (Jakobsen and Rebsdorf, 2003; Brix et al. 2010; Brix, 2011). By focusing on the creative sub-processes the CIS framework

- 1 explains the importance of the micro- and macro-environment
- 2 it demonstrates the tools/methods practitioners should utilise
- 3 it indicates when practitioners should use these tools/methods in the process
- 4 CIS informs about the mentality and mindset which the practitioners should strive to have during the different phases in the process (ibid).

The justification for introducing CIS into a theoretical discussion is thus the focus on the creative sub-processes, which according to scholars (Csikszentmihalyi, 1997; Nijstad and Stroebe, 2006; Runco and Albert, 2010) are needed to be explored empirically.

To be able to claim knowledge about the CIS framework, a longitudinal case study made by the authors constitutes the empirical evidence for where CIS was utilised. More specific, new knowledge is claimed about the CIS framework itself, and based on the indications from longitudinal case study new knowledge is claimed for how corporate managers can learn to exploit existing creativity theory and methods as relevant tools in the innovation context. This paper thus strives to reduce the presented gap between the innovation and creativity literature.

First, the CIS framework is presented, in which the relevant literature is reviewed and then the longitudinal case study in which CIS was utilised is elaborated upon.

2 The CIS[®] framework

Creativity is not a completely new phenomenon in innovation literature. The number of articles of creativity in businesses (i.e., Puccio et al., 2006), creative processes (i.e., Finke et al., 1992; Simonton, 1997; Wallas, 1926) and organisational creativity (Amabile, 1988, 1996; Ford, 1996; Puccio and Cabra, 2010; Woodman et al., 1993) is exploding at the moment (Kozbelt et al., 2010), and it is argued that the business world is starting to understand the value of knowing how to use creativity as a tool in an innovative setting (also cf., O'Connor and DeMartino, 2006). According to Kozbelt et al. (2010) there is a need for creating a framework for how to apply creativity in practise in organisations; a framework which includes the sub-processes and the broader theoretical and empirical perspectives created in the creativity literature (also, cf., Amabile, 1996; Haapasalo and Kess, 2001; Isaksen et al., 2006; Lubart, 2001; Shalley et al. 2004). The authors claim that the CIS framework can reduce this knowledge gap.

Because the CIS framework integrates different theories and methods from creativity literature, the paper does not apply one single definition of creativity. Following the suggestion of Amabile (1996) the creative process is divided into a conceptual and an operational definition. The way in which creativity is operationalised in the different steps of the CIS framework is presented in the introduction to the CIS framework. The working conceptual definition of the creative process is:

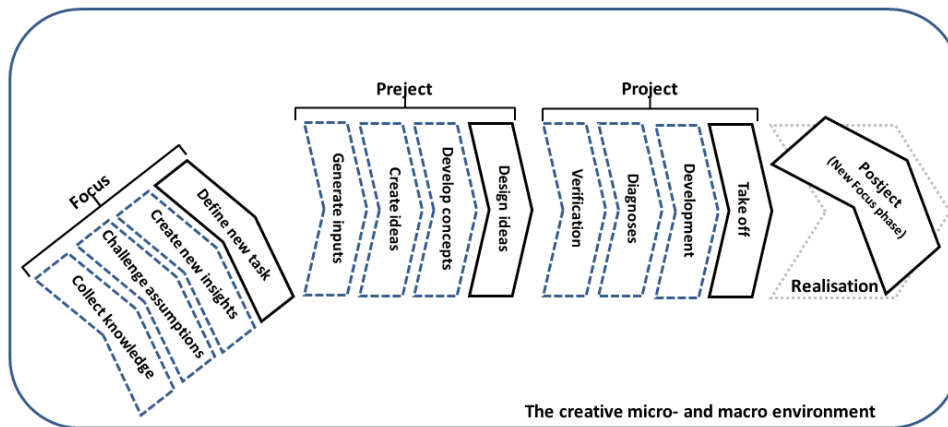
“The focused gathering of knowledge regarding the existing wish/problem, the questioning of the assumptions behind this knowledge and the intentional exploration of how the unknown through thought-breaking methods can assist the project team in creating new inputs, on which ideas can be created and developed by a persistent individual into designed ideas.”

In the CIS framework innovation is defined as *the successful implementation of designed ideas*. As a compliment to this, innovation is categorised into two perspectives: the area of innovation and the (expected) effect (cf., Damanpour, 1987). The area of innovation is divided following the nomenclature created by OECD in the Oslo Manual. This nomenclature is divided into: product, process, marketing and organisational innovations (OECD, 2005). The effect of the innovation is following McFadzean's (1998) tri-partition of 'the creative magnitude' by focusing on:

- 1 paradigm preserving (incremental innovation)
- 2 paradigm stretching (radical innovation)
- 3 paradigm breaking (transformative innovation).

It is argued that this categorisation can assist in clarifying the specific type of innovation, and its (expected) effect on both the organisation and the market, when successful. Below the CIS framework is presented in Figure 1:

Figure 1 The CIS[®] framework (see online version for colours)



Note: Authors' elaboration

The CIS framework is inspired by Amabile's (1996) revised componential model of creativity and Parnes' (1967) creative problem solving model (also, cf., Treffinger et al. 2006). The CIS framework thus stresses the fact that the immediate environment, the social environment and the organisational context – both internal and external – have significant effect on the creative innovation process (i.e., cf., Anussornnitisarn et al., 2010; Dobny, 2011) in which individuals are working together. Hence, to demonstrate that information from outside the project team is both needed and used, the displayed arrows are stippled. CIS is divided into three different, however complementary, phases which together constitute the process that is central for the framework. These phases are not to be treated separately if a successful process is demanded (also, cf., Amabile, 1996; Parnes, 1967). CIS is thus divided into:

- 1 Focus (Postject)
- 2 Preject
- 3 Project (Brix, 2011; Jakobsen and Rebsdorf, 2003).

The CIS process should, when implemented for the first time in an organisation, run on a continuous basis in the process of Preject, Project, Postject (Focus). The postject is the activity to be done parallel with the realisation as a lateral process (De Bono, 1977) to ensure continued improvement and innovation based on the learning – success and mistakes – done in the Preject and Project phases. Postject is a new Focus which is the basic to a new Preject, etc. The implementation of CIS will add to the organisations existing business process and the authors state that the implementation will create synergy between them. However, this argument needs more empirical evidence to be regarded as valid.

This paper elaborates on the Focus (Postject) and the Preject phases and the four steps in each of them. When introducing the CIS framework for the first time in an

organisation, one takes departure in the Focus phase by collecting knowledge. Then, when a project team has been through all the steps in the CIS framework, the new Focus (also called Postject) is to be started. To be a continuous innovation model, it is argued that the goal is to have the CIS framework as a function in the organisation running on equal basis as, i.e., marketing (cf., Jakobsen and Rebsdorf, 2003).

3 Delimitation of the paper

This paper is delimited by leaving out the third phase *Project management*, because this is already well described by many other scholars (Kerzner, 2009; Mikkelsen and Riis, 2005; Olsen and Pedersen, 2006; see also PMI – *Project Management Journal*). Hence, the paper demonstrates the integration of different tools and methods from creativity literature in the Focus and Preject phases and how the in total eight steps complement one another in the CIS framework (Brix, 2011; Jakobsen and Rebsdorf, 2003). Moreover, the CIS framework is unlike Parnes' (1967) and Treffinger et al.'s (2006) creative problem solving model, because CIS is created to find potential and to explore this potential in a business setting. CIS is thus not created for problem-shooting situations. The authors argue that it would be applicable for problem-shooting situations, but research is further needed to demonstrate this.

Additionally, the authors experience that CIS is less applicable in cooperation with sub-contractors and with artisans in general. CIS is, however, applicable in the service industry, in cooperation with public authorities, i.e., municipalities; and in small and medium sized private organisations, both national and international. The characteristic of these groups is that they proactively desire radical product and/or process innovation. Hence, CIS is relevant for organisations who themselves wish to work proactively with innovation, and CIS is therefore less applicable for organisations who are forced to be innovative to survive the future.

Below, the CIS framework is presented in detail. The underlying assumptions which the CIS framework builds upon are made explicit in the left side of the tables, and the activities that have should be organised during the process of going through the CIS framework are presented in the middle. At last, the references which are used for inspiration are written in the right side of the tables.

4 The creative micro- and macro-environment

Table 1 describes the impact which the micro- and macro-environment have on the creative innovation process. The microenvironment is the immediate setting in which the team is present, and the macro-environment describes the organisational surroundings (both internal and external) in which the team members navigate.

4.1 Focus (Postject) phase

The CIS framework begins with the Focus phase as being a lateral process (De Bono, 1977). The Focus starts with the collection of knowledge regarding existing processes

and products/services of the organisation. Thus, Focus is on what the organisation is working with, how it is working with it and why it is working with it. The Focus phase is a very important part of in the CIS framework, because managers in general take for granted that they know what causes the perceived problem (Kerzner, 2009; also, cf., Csikszentmihalyi, 1997). Hence, the Focus phase assists managers in postponing judgement and evaluate if the perceived potential/problem is adequate to explore.

Table 1 The creative micro- and macro-environment

<i>Directions and assumptions</i>	<i>Activity</i>	<i>References</i>
The microenvironment influences the creative innovation process. It is of great importance that this is understood and accepted before applying the CIS framework in practise	<i>Micro-environment:</i> New and stimulating surroundings encourage and catalyse creative output during the creative process. Judgement is not allowed. Being away from the organisation is important to avoid functional fixedness and to increase change of perception	Csikszentmihalyi (1997), Amabile (1996) and Glucksberg (1962)
The macro-environment influences on the creative innovation process. It is crucial that the macro-environment does not inhibit the strivings of the project team	<i>Macro-environment:</i> The social and institutional context must understand and accept the creative strivings if success is desired. (Readiness and openness to new initiatives is a must)	Csikszentmihalyi (1997) and Christensen (1997)
Focus must be on the <i>process</i> and not the outcome of the process. The CIS framework is applied when organisations wish to learn from the unexpected to cope with the future (to seek radical innovation)	The CIS framework is systematic and it has clear steps which include tools/theories from creativity research to gain new emerging insights for new knowledge creation. (disciplined creativity)	O'Connor and DeMartino (2006) and Christensen (1997)

Note: Authors' elaboration

Table 2 demonstrates the four steps which should be completed in order to be able to reformulate the original focus into the new task (the 'real' focus) which is regarded relevant for the rest of the creative innovation process.

In the Focus phase, creativity is operationalised as *the intentional transformation of existing patterns of thought regarding the total organisation*. In short, the elements which the team take for granted and the assumptions which the team have are challenged by laddering methods and by provoking new insight by visiting other industries, which at first may not have anything to do with the team's core competencies. Because CIS has an open innovation perspective based on a context-oriented framework, it is imperative that external sources, i.e., other industries and/or people from other professions are invited to provoke new insights based on the found assumptions. This intentional provocation assists in creating additional new insights for the group; insights which can be used when defining and/or redefining the new task.

Table 2 The Focus (Postject) phase

<i>Directions and assumptions</i>	<i>Activity</i>	<i>References</i>
<p><i>Collect knowledge:</i> The Focus (and thus the Postject) starts with the question: what do we know: use open and closed questions</p>	Collect the existing knowledge – both related to what is known and what is not known; find existing assumptions on which decisions are made	Csikszentmihalyi and Sawyer (1995), Isaksen et al. (2006), Parnes (1967) and Darsø (2001)
<p><i>Challenge assumption:</i> Challenge our knowledge: do we really know what we know? When the assumptions have been challenged, it is easier to invite relevant experts to participate in the next step of the process</p>	Make a reality check of the existing assumptions by applying laddering techniques and provocation, remove false assumptions; view the assumptions from different perspectives (also referred to as removing paralysis)	Csikszentmihalyi and Sawyer (1995), Von Oech (1983), Jakobsen and Rebsdorf (2003) and De Bono (1977)
<p><i>Create new insights:</i> Search and find new insights and perspectives by exploring unknown domains (in general) in which new potential areas might emerge. These new insights will assist in removing part of the existing paralognism in the project team</p>	Search for new insights by changing focus; illumination (aha-experience after time of incubation); adaptive originality and breaking existing rules (Big-C and little-C). New direction demand new insights which have to be found/created and explored	Amabile (1996), Csikszentmihalyi (1997), De Bono (1977), Perkins and Salomon (1989), Wallas (1926) and Winnicott (1971)
<p><i>Define new task:</i> Based on the three previous steps the task is re-defined which direct focus for the upcoming preject and thus the innovation project(s)</p>	What originally was considered (expected) to be the focus is re-formulated to fit the new insights which have been created. This redirected focus is the basis for first step in the Preject phase	Amabile (1996) and Jakobsen and Rebsdorf (2003)

Note: Authors' elaboration

4.2 Preject phase

In the Preject phase creativity is operationalised as *a radical exploration of the defined task by use of pattern-breaking methods*. During the entire Preject phase, judgement is suspended, which imply that references to economy, earlier bad experiences, impossibility etc. are not allowed (Jakobsen and Rebsdorf, 2003; Osborn, 1953; Parnes, 1967). In short, emphasis is on breaking patterns and exploiting the thoughts the individuals have during this type of process, where the quantity of input are more important than the quality (Runco and Albert, 2010; Rietzschel et al. 2009; Simonton, 1997). However, because the inputs which are created in the CIS framework have been generated according to a specific task (from the redefined task in the Focus phase), rather than being created in a random process of 'freewheeling' (i.e., cf., Treffinger et al., 2006; Osborn, 1953), it is argued that the created inputs from the CIS are more applicable to the future innovation process than the inputs derived from a brainstorming session.

In Table 3, the theories and methods which inspire – and which are utilised in the Preject phase are demonstrated:

Table 3 The Project phase

<i>Directions and assumptions</i>	<i>Activity</i>	<i>References</i>
<p><i>Generate input:</i></p> <p>Everyone can learn to think creatively. Patterns are broken by provoking creative thinking and high energy level is needed to create multiple inputs</p>	<p>Paradigm preserving, stretching or breaking methods;</p> <p>Divergent thinking; lateral thinking; provocative operation; suspended judgement; synectics (analogies). (Insights from the Focus phase are likewise sources of inputs)</p>	<p>Amabile (1996), De Bono (1977), Guilford (1950), McFadzean (1998) and Osborn (1963)</p>
<p><i>Create ideas:</i></p> <p>Exploring extreme radical suggestions always results in higher level of originality and creativity. Going for Big-C always leave small-C; not vice versa. When creating ideas this way, a project team searches for multiple breakthroughs. Additionally, inputs may not be combined; all inputs must be treated as an individual entity; there is no democratic judgement for 'the best idea'.</p> <p>Multiple inputs can be elaborated upon parallel to different designed ideas.</p>	<p>Creative magnitude – smaller C or larger C; controlled sporadic process (geisterblitz); develop multiple ideas by adding more knowledge and information to each of the input to search for some kind of breakthrough (horizontal development) by adding more and more knowledge in each input regardless the final use</p>	<p>Csikszentmihalyi (1997) and Winnicott (1971)</p>
<p><i>Develop concepts:</i></p> <p>Each breakthrough found when creating ideas have to go through a 'vertical process' to become a concept. This is done by creating additional ideas related to the original breakthrough in all of the steps of a business model</p>	<p>Explore the created ideas in multiple perspectives still without judgement (vertical development). Regardless what type of idea the breakthrough is created upon all other areas related to the breakthrough must be worked through, i.e., the breakthrough must be related to: product, process, system, business, social, financial, cultural and a political/legislative perspective before it is considered as being a concept</p>	<p>Amabile (1996), Christensen and Raynor (2003), Finke et al. (1992) and Jakobsen and Rebsdorf (2003)</p>
<p><i>Design ideas:</i></p> <p>The developed concepts should be presented according to all aspects in a business model. Moreover, different business models can be created based on the same idea. (Each business model involves some compromises which influence the other ideas in the business model)</p>	<p>Each idea provides different possible concepts – some more radical than others. Each of the concepts have to be described as a business model based on the vertical process to be considered a designed idea; described and illustrated, so the functions of the designed ideas and the tasks/problems they fulfil/solve are clear and transparent, i.e., as rapid prototyping, 3D illustrations, etc., including text.</p>	<p>Csikszentmihalyi (1997), Wallas (1926) and Jakobsen and Rebsdorf (2003)</p>

Note: Authors' elaboration

In the Preject phase the first two steps treat the generation of inputs and the creation of ideas. Inputs are thoughts which have been registered on a piece of paper, in a software system, in a drawing etc. First, the project group generates all the inputs which it possibly can (according to the new or redefined task from the Focus phase). This is done in one formal step where relevant external persons must be invited to assist in the radical exploration of the new insights. In the period following the formal input generation, the participants register additional inputs, which come to their mind as 'illumination' after time of 'incubation' (cf., Wallas, 1926). Then, in the next step of the Preject phase, the participants create ideas by adding what they believe to be relevant information to the different inputs, i.e. a short description. This is what the authors refer to as horizontal development. When the ideas have been created by adding the short descriptions, the participants have to select one or more ideas, which they will develop further. The team members then develop the ideas in depth, where they seek new insight and inspirations from different perspectives, cf., De Bono's (1977) exploration of valleys theory. When the different 'valleys' have been explored, the new insights are described and illustrated, so the potential the idea(s) seek to strive after is clear. It is important to note that there is no guarantee that an input is turned into an idea and afterwards a successful innovation (Rietzschel et al., 2009). Based on this perspective, it is stressed that it is of most importance that it is one person who is responsible for developing an idea, and not a group of people, who is responsible for carrying the developed idea through the CIS framework. The authors argue that this personal ownership increases the conditions for the potential growth of the idea(s), because no underlying knowledge has been lost in the process due to the shift of responsibility (Jakobsen and Rebsdorf, 2003; also, cf., Brix et al. 2010). In addition, it is possible to move back and forward between the four steps in the Preject phase, however, the Preject phase is not to be considered completed before each of the four steps have been scrutinised. In sum, the first two phases of the CIS framework constitute a prolonged pre-innovation process, where judgement is suspended until necessary, cf., project manager's dilemma (Mikkelsen and Riis, 2005; Kerzner, 2009) regarding available information and knowledge, and the importance of the decision-making in the process. The results and the implications of utilising the focus and Preject phases from the CIS framework will now be presented by means of a longitudinal case study. First, the method and the unit of analysis (UoA) are presented.

5 Method

The authors carried through nine months of clinical action research (Schein, 2009) with the UoA. The clinical action research was completed as Brix and Lauridsen (forthcoming), where the authors participated in the processes and where they explored these processes both directly and retrospectively (Brix and Lauridsen, Forthcoming; Schein, 2009). Based on the clinical action research methodology, the authors collected data and gained in-depth personal insights of the application of the CIS framework by using participant observation, participation and post-project interviews (Crotty, 2005; Yin, 2009). To ensure the validity of the authors' understanding and their personal reflections regarding the complete case material (the data), the authors presented this material to the UoA, and the UoA commented upon this material and then validated it for usage in an academic setting (also, cf., Brix and Lauridsen, forthcoming). The paper thus demonstrates the application of the Focus and Preject phases from the CIS framework in

a context of unusual research access (Yin, 2009), where new technology and machinery were to be produced in a confidential setting. The authors investigated the application of CIS's first two phases in depth and within its real-life context, where many variables of interest and multiple sources were present (Yin, 2009; also, cf., Eisenhardt and Graebner, 2007). Based on these arguments, it is argued that this single-case study stands strong in claiming new knowledge to the call made by Kozbelt et al. (2010), Lubart (2001) and Rietzschel et al. (2009) concerning the utilisation of CIS as an integrative framework. Additionally, the longitudinal case study will present indications that demonstrate how the theories and methods from the creativity literature react to innovative practise (also, cf., Eisenhardt, 1991).

5.1 *Unit of analysis*

The UoA wishes to remain anonymous in the paper. The UoA is a Danish department of an international technological manufacturing corporation. The core competence (Drejer, 2006; Prahalad and Hamel, 1990) at the UoA is the production of machinery which processes waste for recycling and for the direct heating industry. Today, the UoA delivers technology and machinery worldwide to its public and private customers. Based on increased competition and a two year internal incremental process innovation project (McFadzean, 1998; OECD, 2005), where the UoA had reduced production costs around 25%, the UoA wanted to advance the core competences and strengthen the organisations market position (Barksdal et al., 1982) by acting proactively with radical product and process innovation (OECD, 2005). Based on these strivings, the authors were invited to carry through the first two phases of the CIS framework at the UoA. The results and indications are presented below:

5.2 *Results*

The UoA invited the authors to solve the following task: *to find/create a process/machinery that could complement the existing core competencies at the organisation.* That is, the UoA wanted to focus on an innovation activity which could complement the existing technology offered to the customers.

5.2.1 *The creative micro- and macro-environment*

Before starting the Focus phase, the assumptions regarding the micro- and macro-environment for the CIS framework were explained to the team and to the management. This clarification of how the authors in the following process would organise the creative microenvironment and how the organisational macro-environment influenced the process seemed relevant for the team, however on beforehand they found it hard to really understand why they should, i.e., have meetings away from the organisation and why they should go visit other organisations. During the Focus phase, the team started to notice the change of mind-set as they experienced that being away from the organisation assisted them in changing perception and remove functional fixedness regarding the upcoming innovation project. In the post project interview, the manager stated that the organisation of the creative process should be done by an external facilitator, because he argued that the organisational culture would inhibit an internal person in facilitating the process, because s/he would be too biased and find it hard, if not

impossible, to change perception and pose questions which could remove focus from functional fixedness.

In short, the results which were found when presenting the creative environment supports Csikszentmihalyi's (1997) strong focus on 'setting the stage' for working with creativity (the microenvironment) and Amabile's (1996) and Christensen's (1997) focus on full acceptance from the macro-environment to go through a project which will result in organisational change.

5.2.2 Focus phase

The management at the UoA presented the organisation, its history and afterwards the team members presented the existing technology and machinery which the UoA offered to its customers. As part of the process, the authors and the team visited two customers, one in Germany and another in Denmark together, to see how the machines (both new and older models) worked in practise. Moreover, the authors wanted the team members to speak with the daily operators of the machines to get new perspectives. The meeting with the daily operators gave the team new insights, because the team members, i.e., realised that 'soft' materials often could generate problems because this kind of material would plug the machinery and slow down the process, and they realised that the outlet where the processed material was accumulated, was difficult to access with the crane shovels. Moreover the authors visited another customer, without the team, and asked the customer for additional information regarding the daily operation. This was done to get additional knowledge about how the technology and machinery could be thought in a larger context. This visit was meant to inspire the authors later in the process.

After the collection of knowledge, four different people from different professions were invited, who should assist the authors in challenging the assumptions and thus remove the team members' states of paralysis. These external people were: a laser physicist with a speciality in fusion, a biologist with a speciality in how crocodiles flense their prey, a software engineer with expertise in Visio detects and repair, and finally a practitioner who used the machinery sold by the UoA on a daily basis. Together with the team members, the authors started to consult the invited experts regarding how they could see the team's task from their perspective, and the authors asked the invited experts to challenge the team members' assumptions and what they took for granted.

Afterwards the team members stated that it was fruitful and very insightful to have 'most' of these people in the process, because they were not coloured by the team's internal 'way of thinking', because the invited professionals questioned the assumptions which the team had and took for granted, which gave the team new perspectives on the organisation's core competences, which, according to the team, was really insightful.

The tendencies the team experienced from the Focus phase indicate that De Bono's (1977) exploration of valleys do result in important insight for the team members when they are to avoid functional fixedness and change perception (Glucksberg, 1962). Additionally it is stressed that Csikszentmihalyi and Sawyer's (1995) and Von Oech's (1983) focus on creating a thorough 'reality check' can assist a team in removing paralysis and find new perspectives on the task which is to be completed/explored.

Finally, based on the extensive exploration of opportunities and the provocation of the assumptions in the team, a new task was defined by the team members based on the new insights found in the Focus phase. The new defined task was: *to create a new process (technology) which could create a radical new way to process scrap/waste/refuse*

into directly recyclable material. This, redefined task was accepted to be explored in a focused manner in the Preject phase and in the rest of the CIS framework.

5.2.3 Preject

During the Preject phase the team generated 543 input (inputs both from formal workshop and the following time of incubation – illumination), and 359 ideas were created by description. 73 concepts were developed based on these descriptions, and 30 idea designs (business models) were initiated, where 6 of them were completed. The process thus resulted in six individually designed and ready to be implement projects, where the remaining 24 not completed idea designs were somewhat close to be completed.

When starting the first part of the Preject, some of the team members found it difficult to turn off logic and judgemental thinking during the generation of inputs. Some of the team members stated that *“they had learned to think logically and evaluate throughout their entire education as engineers!”* The manager complimented this statement and further developed it: *“when we work with ‘wild ideas’, it is very hard to stop thinking ‘how can I send an invoice to the customers based on this in few weeks?’ (...) In the real world, we need to earn money every single day, and I guess that most people in organisations are trained to think short term and sales!”*

These statements stress the fact that it for some individuals is difficult in practise to aim at ‘the unknown’, when they are to generate focused input. An important perspective when referring to Csikszentmihalyi’s (1997) Large C – small c theory (creative magnitude), where aiming at the large C always result in many small cs, and not vice-versa. The participants did comment that the different methods which were applied in the CIS process, when inputs were to be generated, increased the number of inputs which the team generated. One team member stated *“I have learned that we can be creative and that creativity has to be organised in an innovation process; but I would stress that it is hard to organise it [creativity], but luckily not impossible!”* During the process, another team member argued *“Until now, we have relied on the ‘everyday creativity’, but now we have learned to organize creativity, so we know how to provoke it and to exploit the potential of it when necessary (...)getting an understanding of this [the organisation of creativity] is a great mind-set for us!”*

Based on these perspectives, it is argued that the UoA indicates an interesting potential in the application different methods from the creativity literature as complimenting tools in the CIS process (cf., Table 3 – ‘generate input’). This argument supports McFadzean’s (1998) creative continuum hypothesis, however, it needs further research.

In the same perspective, the authors experienced that the team members were fast to go from ‘exploration mode’ to ‘solution mode’ in the process, when they were to create ideas. The authors experienced that if something seemed promising, then the team members were ready to quit large parts of the CIS process and turn an idea into a project. This fast evaluation was excused by the above mentioned logical thinking and invoicing, and it further stresses the fact that researchers in general need to underscore that striving for radical innovation by exploring the extreme is a learning process which can be very difficult and time-consuming. Based on this finding, it is stressed that it is imperative for a team and its members get continuous support from both the micro- and macro-environment in the process, if not, it is likely that the team will down-prioritise

and/or fail its task. This argument supports Christensen's (1997) and Amabile's (1996) conclusions that openness and readiness to positively welcome new initiatives is a must from the macro-environment.

The idea development was initiated by freely letting the team members chose one or more fertilised inputs, to further develop into ideas. The manager stated in the post project interview that they had not tried to work with the parallel development of multiple ideas before, and he stated that it was not more difficult, than working with one idea. The only downside the manager could find was the fact that more man-hours had to be set aside to develop these ideas, because it took longer time than he expected. This statement stresses the fact that innovation is a time-consuming learning process, where the team members seek new information and insight, where there can be weeks between the incubation, where team members are confused and the illumination, where they get the 'aha-experience' (Wallas, 1926). When the authors asked for the reason for why the manager gave more resources (time) for the team to develop the ideas, he stated that he could see the potential and the benefits in having around 30 focused ideas developed in a parallel manner, which the board of directors would be able to choose from, instead of presenting them one single idea. The team members moreover stated that they found it more interesting and motivation to work with their own personal project(s) in the project, because they found it more inspiring and it gave them more energy, compared to the hitherto experiences they have had with user-driven innovation projects. This indication supports Amabile's (1996) perspective that motivation and ownership of something that has to be developed is imperative, if success is needed.

The findings from the Preject phase support the literature in different ways. The authors found indications which suggest that it can be difficult to work creatively if the participants are influenced by a result-oriented macro-environment (also, cf., Christensen, 1997). However it was realised that applying McFadzean's hypothesis of using different thought-breaking-methods increase and facilitate the participants work with creativity, which support Amabile's (1996) argument that everybody can learn to be creative, if they are given purposeful instruments.

5.3 *Following the CIS process*

The manager of the UoA stated that the organisation have had many innovation projects completed as user-driven innovation initiatives, and that they found these projects valuable because of the close cooperation with their customers. However, the manager stated: "*We learned from the CIS process that applying user-driven innovation projects are good for incremental innovation, but not for getting insights for creating something new or radical (...) this [the CIS process] has been an eye-opener for us and it has given us tools to seek and explore places where we would normally not go to get new insights!*". This opinion was also acknowledged by the team members, who stated that working with 'wild ideas' (paradigm breaking ideas) resulted in insightful and more relevant outcomes than expected. To sum up, the UoA realised that the original task they had presented was not as relevant for them to solve, because they saw the potential in exploring the transformational and extreme radical ideas, because they found that they could benefit from the indirect outcomes of this search, which could be directly implemented into their current technology. This indication supports Csikszentmihalyi's 'Big C – Little C' theory.

When referring to the entire Project phase, the manager stated in the post-project interview: “*the many developed ideas are not forgotten even though they have not been realized, they are just down-prioritised because two of the designed ideas are to be started up as innovation projects; one regarding the new technology and another regarding the machinery in which the technology is to be implemented!*” and he continued “*We did not expect a transformational breakthrough – and we do not know if we will get it, however, we have until now had so many spin-offs from the process, which are directly implementable in our daily business!*”

The manager finalised the interview with the statement: “*Normally, if we complete a user-driven innovation project, we sometimes increase productivity around 30-50 per cent, but if this new technology in few years is really going to work, our new machine will look very different from what we offer our customers today, and we expect that it will increase productivity by 70-80 per cent!*”

As such, even though the UoA has not completed the two initiated innovation projects, they have already taken a significant leap compared to the UoA’s hitherto innovation projects.

6 Implications

6.1 Research

This paper serves as a source of inspiration and it gives interesting indication to the call made by Kozbelt et al. (2010), Lubart (2001) and Rietzschel et al. (2009). The authors claim and support that applying theory and methods from creativity research into an integrative innovation framework (as the CIS framework) result in beneficial learning outcomes for organisations having innovative desires. The paper further indicates valuable insights regarding the parallel development of multiple ideas with individual ownership, which is where the CIS framework stands out from other creative innovation processes, such as the Creative Problem Solving model (Parnes, 1967; Treffinger et al., 2006). Based on the experiences of this paper, the authors stress that the parallel development of multiple ideas can contribute to accelerated innovation, because much more potential is sought and found during the process, compared to other processes where one single idea is developed. The authors call for further empirical research to document these indications. Finally, the paper demonstrates that parallel development of multiple ideas is more time consuming than developing one idea, but the value of having created multiple ideas is, however, much more valuable for practitioners because they learn from the mistakes and they create new insights when utilising this approach with the multiple development.

6.2 Practise

By integrating the Focus and Project phases of the CIS framework into innovation projects, organisations are forced to explore the unknown and learn from it. The value of the large extension of the initial innovation process makes the project managers dilemma (Kerzner, 2009) less relevant, because information is sought and insights are created before anyone is allowed to make a decision. Additionally, the presented case organisation got increased insight into applying pattern-breaking methods in practise; this

has given the professionals new tools to apply when they want to work creatively, instead of applying brainstorming sessions as the normal prescription. In short, the UoA found it highly relevant and insightful to work with and implement a systematic and continuous innovation process as the CIS[®] framework because they changed their ordinary way of approaching innovation projects.

7 Conclusions

Innovation and learning are two important phenomena in both literature and organisational practise. Both phenomena are considered as being logical that is, they consist of making sense out of chaos. As a compliment to the innovation literature, this paper claims new knowledge to the call made by Kozbelt et al. (2010), Lubart (2001) and Rietzschel et al. (2009), where theory and methods from creativity research are integrated into a creative innovation process. Hence, the authors present a framework which strives to create chaos out of order, where focus is on getting inspired from the unexpected, in order to learn and get new insight, which can be used before initiating an innovation project.

The utilisation of the CIS[®] framework claims new knowledge of how managers can learn to exploit existing creativity theory and methods systematically in innovative sub-processes. The claims are based on a longitudinal case study completed in a Danish department of an international technological manufacturing corporation, and the claims present a number of interesting indications and propositions which can add to the existing pool of knowledge.

First, the paper stresses the fact that managers must realise that pre-innovation work is a time-consuming learning process, where new information and insights are to be sought. Second, the micro- and macro-environment play a crucial role in the process. Moreover, the paper supports Csikszentmihalyi's (1997) strong focus on 'setting the stage' before working with creativity (the microenvironment) and the indications which were found underpin Amabile (1996) and Christensen's (1997) focus on full support and understanding from the macro-environment in the process. Third, the paper indicates that Csikszentmihalyi and Sawyer (1995) and Von Oech's (1983) focus on creating a thorough 'reality check' can assist in removing paralysis and find new perspectives regarding the task which is to be completed/explored. This reality check, supported by the visit at other locations and the provocative questioning by external experts, results in important insights which assist practitioners in avoiding functional fixedness and it facilitates the practitioners in changing of perception (Glucksberg, 1962). Fourth, the authors experienced that some of the participants found it difficult to work creatively if they were influenced by a result-oriented macro-environment. However, it was realised that applying McFadzean's (1998) hypothesis of using different thought-breaking methods increases and facilitates the participants work with creativity; indications which support Amabile's (1996) argument that everybody can learn to be creative, if they are given purposeful instruments. Fifth, the paper indicated that individual ownership of the project(s) in the project resulted in increased interest and enhanced motivation among the team members; results which released more energy to the process. This indication supports Amabile's (1996) perspective that motivation and ownership of something that has to be developed is imperative if success is needed. At last, the UoA realised that the original task they had presented as an innovation project was not as relevant for them to

solve, because they saw the potential in exploring the transformational and extreme radical ideas because they found that they could benefit from the indirect outcomes of this search. This indication supports Csikszentmihalyi's (1997) 'Big C – Little C' theory. To conclude, the authors argue that this paper represents a valuable contribution to the innovation and creativity literature, a contribution which needs more empirical research.

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