COLLABORATION TOOLS AND PATTERNS
FOR CREATIVE THINKING

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ABSTRACT

Creativity and lateral thinking are key skills to innovate, develop new ideas, get deeper insights, address challenges and resolve conflicts. Digital tools can support creative thinking processes in many ways. To understand how collaboration tools can be used to foster creative thinking we need to understand the underlying forces that help or block the generation of new ideas. Design Patterns capture proven good practices and discuss why, when and how creative thinking methods match various situations of collaboration. Moreover patterns connect different forms with each other. Therefore they can guide knowledge workers through different phases of the creative thinking process and point to supporting digital tools. In this paper we will reason about the benefits of the pattern approach for creative thinking and reflect upon the opportunities digital tools offer.

PATTERNS FOR CREATIVE THINKING

Many descriptions of creativity methods and tools exist. What motivates the description as patterns is the generalization of similar methods, the reasoning for the actual form in terms of forces, and the contextualization and connection of the methods/tools. A design pattern captures recurrent solutions that fit to recurrent problems in specific contexts; they also explain how a solution addresses the conflicting forces and which consequences can be expected on applying the pattern (Alexander, 1979). Very often a specific method implies other methods to follow up or it can be combined with other methods. A pattern language captures such relations (Alexander et al., 1977). There are already some beautiful attempts to capture patterns about creative collaboration, presentation and learning in pattern languages (Iba, Ichikawa, Sakamoto & Yamazaki, 2011; Iba, Matsumoto & Harasawa, 2012; Iba & Isaku, 2013).

Patterns for creative thinking can be clustered into different categories (Kohls, 2014): patterns to understand the situation and goal, patterns to rapidly generate ideas, patterns to evaluate ideas, patterns to implement ideas and patterns about the right environments and supporting tools. The last category is of special interest in this paper. There are several ways in which digital collaboration tools can support creative processes. The benefit of pattern languages is that they can point to specific tools that are useful for each pattern. On the other hand we can design new tools that provide access to both single patterns (such as apps that provide a card deck of pattern descriptions) and pattern languages (such as online wizards that guide through creative thinking sessions).

DIGITAL TOOLS FOR CREATIVE THINKING

There are some properties of digital tools that often support creative collaboration. First, digital files and templates provide easy access to highly structured creativity methods that channel multiple perspectives, the generation of ideas and collection of thoughts. Second, the interactivity of digital media allows re-structuring and elaboration of concepts. Third, texts and drawings can be saved at any time to store intermediate results, explore what-if scenarios and enable collaboration over several sessions. Fourth, connected devices and cloud services offer simultaneous writing and editing of shared whiteboards, texts or presentation spaces. Fifth, tools to stimulate ideas are easily integrated: inspiring images, random impulses, or concept mapping functions. Sixth, voting mechanisms and arranging objects help to judge and evaluate concepts. Seventh, tools can help to prepare, organize and facilitate collaboration sessions: group generators can assign teams, cloud storage simplifies data exchange between breakout sessions and project tools such as Evernote help teams to organize and document their creative processes.

SUPPORTIG DEVICES

Personal devices can be the primary tool for creative thinking. There are already apps that provide thought triggers in the form of random words or random images. Moreover, smart phones come in handy when it comes to writing down heureka moments, observations, or inspiring thoughts. It is also very easy to take pictures of curious items or situations at all times. Personal paper notebooks are often reported as a primary tool of creative people. Digital notebooks make it easier to store, share, recombine and randomly select inspirations of the past. But apps on mobile devices also simplify the use of structured methods. There are apps to support established methods of creative thinking such as SCAMPER (S-ubstitute, C-ombine, A-dapt, M-odify, P-ut to another purpose, E-liminate, R-everse), Edward DeBono's Six Thinking Hats, or Reframing methods. Another category of devices that strongly supports the flow of creative thinking are interactive whiteboards and panels. Interactive whiteboards replace the static whiteboards and offer several opportunities for the creative work process, including unlimited pages to structure different views, unlimited work space to develop sketches and idea lists, restructuring of content for clustering and prioritizing contributions, duplicating pages to explore alternatives without loosing results, preparing impulse questions, integrating thought triggers and continue collaboration sessions over several days as all content can be saved and restored. The real power, however, is unleashed if the two forms of devices are combined. Both personal devices and shared workspaces on an interactive screen can connect to cloud based services that enable sharing between devices and different locations. Online services such as Wikis, GoogleDocs or Mind Mapping tools enable knowledge workers to develop ideas collaboratively. Twitter can be used for brainstormings where ideas are typed on a personal device and shared on a Twitter wall. XC Collaboration for SMART Notebook is another tool that allows sending ideas from mobile devices or laptops to a shared interactive screen. Thus, many participants can contribute at the same time and see ideas on the wall immediately, allowing swarm effects. Similar approaches are taken by ConceptBoard, Lino.it, or Mual.ly.

RESEARCH ON PATTERNS AND TOOLS

The question remains whether these digital tools actually lead to more efficient and better results in collaborating and developing new ideas. Technology with all its benefits can also distract or make things "too easy", i.e. stop people to dig deeper for even better ideas. Therefore it is important to backup the claims with empirical studies that compare the effectiveness of various methods as well as the effects of tool use. For example, will the use of interactive whiteboards or mobile devices generate more and better ideas in comparison to classic pen and paper approaches? While one can measure the quantity of generated ideas by simply counting the contributions it is very difficult to make judgements on the quality of generated ideas. After all it is in the very nature of creative thinking that the best ideas are unexpected and most original and therefore not tested. Nevertheless there are ways of empirical testing. For simple problems one can evaluate the correctness or the degree of newness. For more complex problems one can rely on the experience reports from practitioners, i.e. did a method or tool help them to better solve a problem? Patterns also provide a means for testing methods of creative thinking because they explicitly state the contexts in which a method is assumed to work. The context acts as the IF statement of an empirical hypotheses. Without stating the context one could easily claim that a method has not worked because it was used for the wrong situation. However, patterns are an escape to such tautologies (a method either works or does not work) as they make statements about the situations in which they should work. We can summarize several benefits of the pattern approach: patterns are an effective way to share knowledge about effective collaboration and creative thinking. They reason about the way creativity methods work, link different methods to each other, point to supporting tools, and they make the effectiveness testable.

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