

# Designing Flexible Creative Spaces

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**Abstract.** Creative processes are an integral part of requirements engineering (RE) activities and are facilitated by physical environments such as creative spaces. Often, these spaces are built to foster creative work within a company but are rarely adopted by users. We have created a creative space that is usable for both short creative sessions and full day workshops. In this case study, we present our requirements for the design of creative spaces. We also share our experiences and lessons learned from creating a creative space, underlined with concrete examples of equipment that satisfies requirements, regarding flexibility, adaptability, an experimental nature, large whiteboard spaces and high-quality equipment.

**Keywords:** Requirements Engineering · Creativity · Creative Spaces.

## 1 Motivation and Context

Creative processes and techniques are an integral part of requirements engineering (RE) [2]. Creativity not only depends on the skills and talents of an individual but also on the environment, the individual is placed in. External factors can influence people's creativity, either positively or negatively. One of the key aspects is the physical surrounding. A relaxed, good and interesting atmosphere facilitates creative thinking. For instance, unusual places, colorful illuminated rooms, interesting furniture, etc. can create such an atmosphere [4]. Moreover, creativity is boosted by collaborative work and a combination of creativity techniques, which can be integrated in a creativity workshop format. That places very specific requirements on the location they are held when they should be performed optimally.

Creativity workshops and sessions appear to profit from extensive use of equipment such as whiteboards, pinboards and the like (e.g., for cards, sticky notes, drawings, sketches). Hence, the larger the available room and wall space, the easier it is to plan and conduct a creativity workshop or session, as these are held with multiple participants. When conducting a 1.5- to 2-day workshop, it typically consists of 5–8 individual sessions that produce new artefacts such as paper cards with problems written on them, sheets of paper with elaborations on problems found, a large number of sticky notes with ideas from ideation sessions, pinboards with solution concepts and the like [1] [3]. Office rooms typically are not providing enough space and equipment for creative work. Most meeting

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rooms are built to support presentations with a projector, rather than interactive work on whiteboards or flipcharts, even though such equipment might be present. Still their atmosphere is aimed towards presentations and discussions, not creative sessions. Therefore, investing in a dedicated creative space that facilitates the creative work done by employees is worthwhile. But then, how do you design a creative space and what should such space provide?

Well-known examples of creative spaces mostly come from technology companies such as Google, that heavily invest in office rooms with expensive equipment and open spaces for collaborative, creative work. Nevertheless, the regular adoption of creativity in the daily work should be a case for more than just technology giants. We have observed many examples of companies investing in creative spaces that did not find appropriate adoption from employees and remained unused. When designing a creative space, its potential for supporting creativity is as important as the actual adoption and regular usage, creating a return on investment.

We perform several creativity workshops per year, internally as well with external clients and also want to facilitate shorter creative sessions as regular elements of work. Therefore, we needed a creative space, but no existing concept fit our needs. For over one year, we have designed a creative space that is easily usable by groups of colleagues for spontaneous creative sessions but also for workshops that last one or more days. With this work, we want to share our experiences and lessons learned others can use to create their own creative spaces. The remainder of this paper is structured as follows. In Section 2, we present the requirement for the creative space. Their implementation is shown in Section 3. Section 4 concludes with a summary of lessons learned.

## 2 Room Requirements

Creative spaces support creative work through the design of the physical surrounding itself (e.g., the use of colors, a stimulating atmosphere) and the choice of appropriate equipment (e.g., large whiteboards, interesting furniture, easy access to material). In order to determine the qualities such rooms and their equipment should have, we analyzed examples of creative spaces from online research. These were all different, for example in terms of room size, which colors were used, how colors were added to the room, the types of chairs and tables, available whiteboard space, the use of decorative elements, etc. Only two main patterns could be identified. Colors are used in most examples of creative spaces, either on the walls or through colorful equipment and large whiteboard spaces seem to be preferred. Ultimately, we composed the following six requirements for our creative space.

*Experimental Nature.* Creative spaces themselves shall be considered an experiment in the sense of being open to constant change and supporting the evaluation of their actual support of creative work. They should easily adapt to new requirements emerging from new techniques and methods (e.g., varying setup of tables and chairs, the use of different colors or decorative elements).

*Flexibility.* Creative spaces should be extremely flexible and adaptable. Any user shall be able to remove any equipment from the room without the help of supporting organizations such as facility management. Within minutes, the setup of furniture should be rearrangeable, the color of the illumination be changeable and ideas for new creative sessions be testable.

*Colors and No Colors.* The room should be flexible and adaptable to new setups. This limits the use of colors and requires them to be introduced only by exchangeable furniture, decorative equipment and illumination, in stark contrast to many examples of creative spaces, but having a fixed ambient color would not support the requirement of flexibility and changeability of the room's effect on users. Hence, the creative space should be of neutral color ceiling, floor and walls, leading to the subsequent requirement of users being able to add different colors to the room. Lighting equipment should be able to shade the room in various colors, preferably any color.

*Whiteboard Surfaces.* As previously shown, creativity workshops produce a large amount of artefacts that should be visible to the participants throughout the whole workshop. Magnetic whiteboard surfaces combine many positive aspects: users can write on them, draw sketches of ideas and concepts, or attach cards, paper and other materials on them with small magnets. Hence, we wanted to maximize the available whiteboard surface in the room. Ideally, it should cover all walls from the floor to the ceiling.

*Movable Equipment.* Additionally, users shall be able to completely remove furniture and equipment from the room requiring easy access to a storage room, ideally directly attached to the creative space. Each piece of furniture and equipment should either be light enough to be carried around or placed on wheels. Rollable furniture allows any user to freely move it around the room or place it in the storage room if required. Regulations such as industrial safety regulations (e.g., the German Arbeitsschutzgesetz, which is the realization of EU directives) disallow furniture on wheels if employees could misunderstand their status (e.g., if the wheels are currently being locked in place) and take any harm by using the object. For example, a lounge seat should not have wheels that are easily unlocked for free movement, as employees might try to sit down on a currently movable seating.

*High Quality Equipment.* Although an experimental nature is often associated with quick solutions, low fidelity prototypes and the like, a high quality of furniture and equipment used is another requirement the room should satisfy. From our experience with creativity workshops, this holds true for all aspects (e.g., comfortable chairs, durable and clean whiteboard surfaces). Consider the example of a workshop, where one starts writing his first statement on a paper card and the pen she is using fails, due to it being empty from previous workshops or inappropriate for writing on paper (as it happens with most whiteboard markers). This initial negative experience immediately sheds a negative light on the participants attitude to the workshop, consciously or unconsciously. In our opinion, the quality of all furniture, equipment and materials used in creativity has a strong impact on the output, which also applies to the creative space.



Fig. 1: Draft of different room setups. (left) The planned standard setup for small groups. (right) The planned setup for full day workshops.

Sketching ideas, quickly creating low fidelity prototypes or “thinking outside the box” do not contradict high quality physical surroundings.

### 3 Approach and Results

Based on the requirements presented in section 2, we have created drafts of possible room setups and equipment that would satisfy most or all requirements. The drafts have been created in correct scale in an application that supports vector drawings. Figure 1 shows sketches of two different setups that can be realized in the same room, with an attached storage space. Multiple groups of users can share the room (Figure 1 left) as it can be segmented into different areas that are separated from each other through the use of furniture. For full-day workshops where no other users will be present, the furniture and equipment can be rearranged to create three large tables for the groups working in the workshop. We have iteratively refined the sketches, seeking feedback from colleagues and comparing the ideas with available products from furniture manufactures.

For expensive equipment such as the large whiteboard spaces (in our example ca. 52 m<sup>2</sup>) we suggest to check with equipment providers if a visit to an actual installation is possible (e.g., one of their customers office buildings). The description of the whiteboard material is similar for most companies, but the actual quality varies to a great degree, especially the ease of cleaning.

Furniture providers often have product lines that are advertised as supporting creative work, but are intended to be used as a whole. Their combination does not necessarily provide the best solution possible (with regards to the requirements, especially the flexibility aspect). Hence, we have focused on practical aspects of intended usage scenarios by installing furniture and equipment obtained from many different providers and domains, such as stage equipment or horticulture.

Figure 2 shows the resulting creative space at Fraunhofer IESE. In its standard setup, the room is roughly divided into four areas that allow different



Fig. 2: Exemplary images showing the creative space at Fraunhofer IESE.

groups of employees to work in the room simultaneously. Each area provides a different environment, allowing people to instantly work standing or sitting, use projectors or whiteboards, or be in an area with lounge furniture and synthetic grass for recreation and thinking. Full-day workshops are often held with larger numbers of participants divided into subgroups, in an open space. Room dividers are moved to the sides or out of the room entirely and each subgroup is given a table next to a large whiteboard wall. Large and medium sized room dividers, that also serve as shelves for materials (pens, cards, etc.), dampen the noise in the room. Users have easy access to whiteboard surfaces: on all walls and on the tables' surfaces. The tables are freely vertically adjustable, therefore can be used while sitting or standing, or as horizontal or vertical drawing surfaces. Colors are introduced through modular equipment and lighting. Figure 2 (bottom right) shows the colors added by the lighting equipment. Each lamp consists of ten LEDs that can be freely programmed to display any of 4 billion possible color combinations. The users can select one of six predefined combinations with light switches, shading the walls with rich colors and illuminating the whole room with colorful light. A steel construction on the ceiling allows for easy additions of hanging equipment such as projectors, lighting, posters, hammocks or curtains, further increasing the room's flexibility. Rollable or portable furniture allows the room's layout to be adapted to nearly every configuration needed. The high degree of multi-usable furniture and equipment paired with the focus on flexibility of the room as a whole allows us to experiment with different setups. Feedback from workshop participants and employees can easily be integrated by chang-

ing positions of furniture, equipment and materials in the room. As users can easily rearrange or change the room's setup, they can experiment with different configurations and try out new ways of supporting creative work.

## 4 Lessons Learned and Future Work

We have created a creative space with a strong focus on flexibility. As examples of creative spaces are extremely different and the exact influence of the physical surrounding on the outcomes of creative work are still unclear, flexibility and adaptability are suggested as the main requirements for creative spaces. These abstract terms need to be translated into concrete attributes of the room, its furniture and its equipment by iteratively envisioning best-case scenarios of room usage and deriving the desired functional and non-functional aspects. Equipment from more than one supplier and domains other than office furniture might provide a better value with regards to the concrete requirements than traditional or supposed "creativity boosting" furniture. An iterative approach that integrates tight feedback loops with colleagues and other stakeholders such as facility management helps to quickly identify requirements, matching them with potential solutions. Whenever possible, the quality aspect should be taken into account, especially for equipment that cannot be exchanged easily.

Creativity sessions and workshops are part of requirements engineering activities and with further spread and adoption of flexible creative spaces new methods and techniques can be proposed that make use of the available equipment. In parallel, the experimental nature of the creative spaces enables the evaluation of the specific impact of the physical surrounding on the success of creativity workshops.

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