Creative People are great Thieves with lousy Dealers

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Abstract

As "software is eating the world" the importance of creativity continues to grow, especially in business. Because it is the people who design software, we need creative people who use their creative ideas to create and invent requirements for new products and services; and we need a lot of ideas as the innovation cycle is getting shorter and shorter. In this position paper I describe my point of view on creativity in requirements engineering, reveal my most important insight regarding creativity (creativity is all about 'stealing'), name my one recommendation for creativity in requirements engineering (improve distributed virtual creative work) and reveal my greatest challenge for creativity in requirements engineering (turning creative inventions into innovations).

Keywords 1

Creativity, Requirements Engineering, Innovation, Invention, Cross-disciplinarity, Virtual Distributed Work

1. My View on Creativity in Requirments Engineering

Creativity has always been important in most areas of our lives. Yet the importance of creativity continues to grow, especially in business. "Software is eating the world." [1] There is no better way to sum it up than Marc Andreessen. Software has been changing our world for a very long time. Almost every industry has been permanently changed by digital products, digital processes, digital services and digital business models. Even though this article is now more than 10 years old and the insight in it probably much older, still (too) many companies, especially in Germany and the rest of Europe, have still seen software as a necessary evil or nice accessory to their main product the car, the production machine or the building. But even these stragglers have long since been convinced. Mike Cannon-Brookes summed it up aptly: "All companies fit into one of two buckets: either becoming a software company or being disrupted by one." [2] Thus, companies need to transform their business using the number one innovation driver: software.

Software is no end in itself; it always supports or enables business. We can therefore use software in two dimensions: First, to make existing products and services more efficient and cost-effective. Second, to design products and services that could not exist at all without software and thus create new value. Unfortunately, too many companies still focus (almost exclusively) on the first dimension. Of course, you'll have to be even more creative to use software in this second dimension. Nevertheless, we find it incredibly difficult to dare to do something new, especially if this is something that is largely or even exclusively digital.

It's hard to say exactly what this is due to. Most likely, there is not just one reason either. Certainly, to a certain extent, the fact that software is intangible and is therefore probably difficult to understand is a contributing factor. Software does not follow the laws of physics, but it still follows rules. Martin Fowler has said: "Software is not limited by physics, like building are. It is limited by imagination, by design, by organization. In short, it is limited by properties of people, not by properties of the world." [3] Because it is the people who design software or design with software, we must also start with the people.

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So we need creative people who use their creative ideas to create and invent requirements for new products and services that are implemented with the help of software. In fact, we need a lot of creative people to come up with more and more creative ideas, because the innovation cycle is getting shorter and shorter. Customers are demanding more and more features or even completely new products and services at ever shorter intervals.

At Fraunhofer IESE, we have therefore been dealing with the use of creativity and innovation techniques as well as the design of creativity and innovation workshops, especially in the context of requirements engineering, for very many years.

During the nine-year history of the CreaRE Workshop, there has always been at least one Fraunhofer IESE staff member on the organizing committee, and always at least one staff member on the program committee. Over the years, Fraunhofer IESE staff members have contributed at least ten papers, tutorials, or interactive sessions to the CreaRE Workshop series [4,5,6,7,8,9,10,11,12,13].

In our projects, we have analyzed and categorized hundreds of creativity techniques from state of the art and state oft he practice to best apply them in our own creativity and innovation workshops. We always tailor our creativity workshops to the problem of each client and select the most appropriate creativity techniques. In most cases, existing techniques are slightly adapted to even better address the challenges at hand. We have published some of the lessons learned in the CreaRE Worshop series [4,6].

We have also developed our own creativity techniques for specific challenges [12,14], in particular our Tangible Ecosystem Design Method (TED) for the design of Digital Ecosystems [15,16].

As a domain-independent institute, Fraunhofer IESE has customers in a wide variety of domains. Thus, we have already conducted our workshops with customers and researchers from diverse domains and industries: agriculture, insurance, banking, tax, military, lotteries, pipeline maintenance, refrigeration, retail, smart cities and communities, smart rural areas, smart mobility, disaster management, road construction, aircraft manufacturing, medical facilities, automotive, manufacturing, foundries, document management, infotainment, sporting goods, energy, chemical industry, ... and many more.

During the last years I have personally organized and moderated a large number of creativity and innovation sessions and workshops. Most of them were full-day or even multi-day workshops. To be honest, I've forgotten the exact number but it's definitely well over 100, not even counting the ones where I was just a participant. Of course, I could write down a lot of things I learned during this time, but in this paper I would like to focus on three things: my biggest insight regarding creativity, my most important recommendation for creativity in requirements engineering, and my biggest challenge regarding creativity in requirements engineering.

2. My most important Insight regarding Creativity

If there's one thing I've learned from my work with creative people and creativity techniques, it's that creativity is all about ‘stealing’. There is nothing new at all that is not based on something that has been around (for quite some time). By the way, I'm not just referring to software, I'm referring to everything. Kirby Ferguson summed it up perfectly: “Everything is a remix” [17]. Every song, every movie, every book, every feature, and every product is based on something that existed before. In [17] Ferguson introduces the three basic elements of creativity: copy, transform and combine (see Figure 1). That means everything we ever invent (and have invented) is based on something that is either a copy of something, or is a transformation of something, or is a combination of several things that existed before. Everything is a remix and that's perfectly fine the way it is. Thus, we don't need to feel bad at all if we take inspiration from other things to create something new based on them. The only thing that is reprehensible is to pass off a direct copy of something existing as your own creation. Austin Kleon calls this “bad theft” [18] and we should avoid this by all means. To be creative thus means ‘simply’ to create a remix, a collage, a derivative, a citation, a parody, a cut-up, a montage, a pastiche, a cover, a mash-up, an imitation, an appropriation, a bricolage, a contrafact, a remake, a transformation, a combination, etc. from existing things.

But in order to ‘steal’ well, you have to know what is worth stealing and from whom. I have therefore extended the basic elements of creativity by one: collect [19] (see Figure 1). We need to collect as many things and impressions as possible in order to be able to process them creatively. In my opinion, this is

even the most important element of creativity, as it is the most elaborate and difficult to implement. It does not only mean that we have to know well the state of the art and the state of the practice in our work domain, we also have to study carefully the history of our discipline. Bill Buxton points out that anything that is a true innovation (which is determined by it becoming a billion dollar industry) is based on something that is already at least 20 years old [20]. Thus, we need to know the history and present of our discipline very well to know what we should 'steal' from whom.

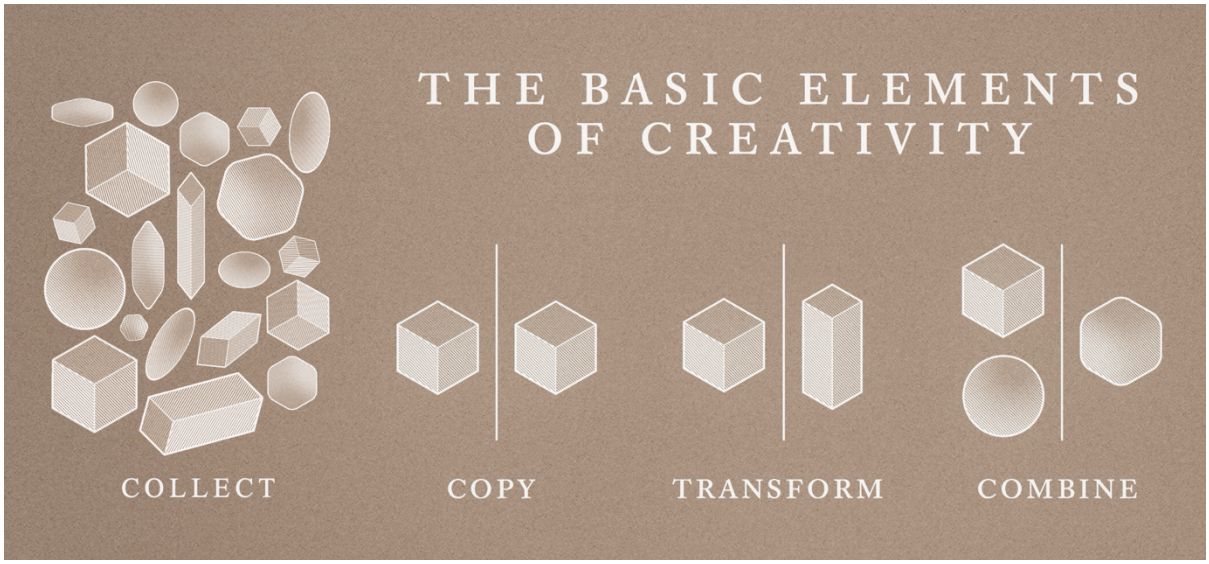

Figure 1: The Basic Elements of Creativity: Collect, Copy, Transform, Combine [19] (based on [17])

However, it is far from sufficient that we are very familiar with our own discipline in our own domain. Many, often even the best innovations come from transferring something from another discipline, from another domain, into our own. This is not only about business, but also about things from our free time. We should always go through the world with open eyes and ears and absorb everything. Only then can we (at some point) check whether it is worthwhile to build something on it in our business. To strengthen this approach, we launched the International Workshop Series on Learning from other Disciplines for Requirements Engineering (D4RE) in 2018 [21,22,23,24]. In the last years, we explored together with with workshop participants the domains of sports, publishing, police, law, movie making, and finance, looking for things that may improve requirements engineering. Among other things, this led to the development of the conspiracy wall technique, which was presented at the CreaRE workshop in 2020 [12,13].

During a creativity and innvation session, if the participants have good background knowledge, then the workshop facilitators 'only' have to do one thing well: prepare the right triggers to retrieve the right experiences from the participants where they can 'steal' from.

So, in summary, creativity is about 'stealing' and creativity sessions are about setting the right triggers to 'steal'.

3. My one Recommendation regarding Creativity in Requirements Engineering

It wasn't just the COVID-19 crisis that showed us that we can still improve a great deal in the area of virtual distributed working. But the crisis has forced us to address this improvement immediately. While some work can actually be done better in a distributed fashion, there is other work that benefits greatly from people being in the same room together. Creative work, in my opinion, falls squarely into the second category. Many creativity and innvation techniques aim to have people trigger each other and spur each other on to ever better performance. An entire area in creativity research is even concerned with how to further increase creative performance through spatial design. At Fraunhofer IESE, we have also spent a long time looking at how we can design a space that supports creative work

[10]. The training of moderators also aims at facilitating workshops where the participants are together in one place, in one room (see Figure 2, left). Many of the things we have learned for designing and conducting creativity and innovation workshops do not work (at all) when these workshops are now distributed virtually and the participants are sitting alone at home in front of their notebooks or PCs.

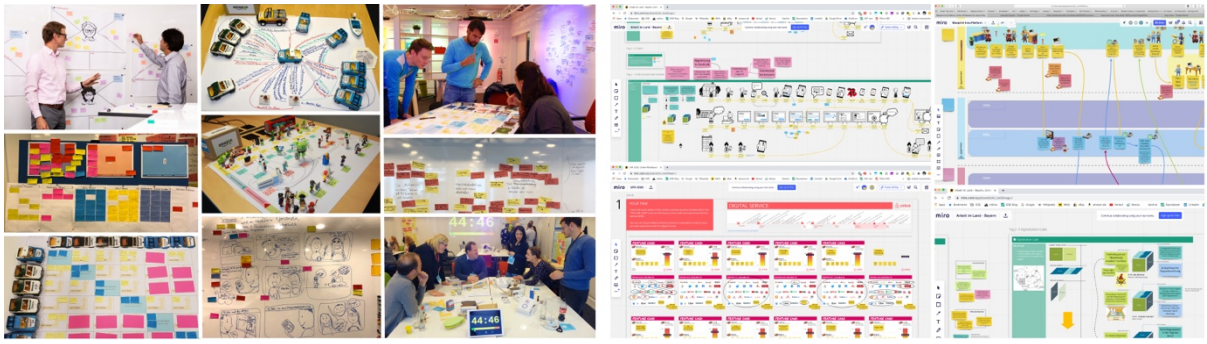

Figure 2: Left: Creativity Workshop on Premise, Right: Virtual Creativity Workshop

Therefore, I would like to clearly recommend to focus more on creative work under distributed virtual conditions and to call for adapting existing creativity and innovation techniques to this situation or inventing completely new techniques (see Figure 2, right). At Fraunhofer IESE, we have taken first steps in this direction [25]. In addition, we should also support the improvement and development of general tools and devices that enable any kind of virtually distributed work (e.g., meeting and conferencing tools). In particular, we should publicly share our experiences working creatively under distributed virtual conditions, both the positive and the negative ones. Of course, I hope that soon we will be able to work more together in one place again, but we will certainly work more distributed virtually in the future than we did before the COVID-19 crisis. We will never work the way we used to, it will be a new work.

Honestly, I don't think we will ever be able to collaborate creatively in a distributed virtual way as well as we can together in one place, but I am quite sure that we will soon be able to do it much better than we can at the moment.

4. My greatest Challenge for Creativity in Requirements Engineering

The greatest challenge for developing innovations is not the achievement of having a creative idea and turning it into an invention, it is the challenge of turning this invention into an innovation.

In all the workshops I have ever organized and facilitated for companies that needed to generate an innovation for their products, their services or their whole company, it was never a problem to generate a lot of creative ideas for it. Even if the participants claimed about themselves that they were not creative, they always managed to generate a large number of (good) ideas.

What most companies struggle with, however, is deciding which ideas are actually good, then selecting and pursuing them. Unfortunately, we have often witnessed workshop participants leaving the best ideas behind and selecting (obviously) worse ideas for incomprehensible reasons in order to continue working with them in the workshop. In most cases, companies cannot be persuaded to reconsider their selection, neither during the workshop nor afterwards.

Even worse, however, is that companies leave the actual implementation work of their ideas (regardless of whether they were well or poorly selected) far too long or even completely behind after the initial creativity and innovation sessions. We have had to witness so many times how great inventions are simply not considered further and thus never developed into an innovation. Quite often we have had to witness how competitors have implemented a similar invention and thus improved their business and market position.

I would therefore strongly recommend that we develop better methods and techniques to firstly drive the selection of good ideas and secondly, to improve the implementation of these ideas in companies until they have become an innovation. In this way, we can ensure that the talented thieves that are

creative people also have great dealers (‘fences’) at their disposal to turn their stolen goods into profit. Let's get creative in this area!

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