# Let's get "InspiRE-D" for RE by Other Disciplines – A Creativity-Based Approach

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## Abstract

[**Context and Motivation**] In the context of designing the next generation of digital systems, it is more important than ever to holistically understand future system stakeholders within RE. This includes thorough elicitation, analysis, and documentation of their motivation, their fears, their social relationships, their life experience, and last but not least, their needs regarding future systems within RE. [**Question/problem**] Due to this situation, a new and challenging context arises for RE, which opens up new research questions and activities aimed at the development of skills, knowledge, methods and techniques that support the aforementioned core RE activities. [**Principal ideas/results**] Our current research aims to get inspired by best practices, strategies, or techniques from non-SE disciplines such as psychology, criminology, law, marketing, or acting that support RE-specific goals and to ultimately adapt and incorporate these into RE activities. [**Contribution**] Learning from other disciplines offers huge potential for improving the field of RE, but bridging the gap between the different worlds is surely challenging due to expertise and effort required to make the necessary abstractions. We consider creativity as a strong enabler for overcoming these boundaries and share in this paper our experiences of applying the "InspiRE-D" method, which supports systematic identification and elaboration of synergies between RE and other fields with the help of creativity techniques. While the outcomes of this method are mainly visionary ideas, they serve as a valuable starting point for first evaluation activities and for the identification of promising future cross-disciplinary research and collaboration possibilities.



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## 1 Introduction

In this age of digitization, a new and challenging context arises for RE [1]. This argument is well in line with the special theme of this year's REFSQ conference, which claims that the next generation of digital systems will strongly affect the daily and social life of a multitude of people as they will have to interact with these systems in many different ways. Hence, it is essential for the RE community to provide suitable skills, knowledge, methods, and techniques that enable gaining a deep understanding of the needs and fears as well as the social and living context of a diversity of stakeholders, who may even have a negative attitude towards digital solutions. This situation poses new challenges to RE, which make it necessary to reflect on and assess existing RE methods with regard to their suitability for this new and highly relevant context [1]. This reflection might ultimately require the improvement or development of new skills, knowledge, methods, and techniques supporting the elicitation, documentation, and analysis of stakeholder requirements [1].

Back in 2005, Susan Robertson already promoted the ideas that the field of RE as a sociotechnical discipline can be improved by learning from other disciplines or professions, as these might have already solved problems and come up with techniques that we can reuse [2]. In her column, several authors reported on lessons learned from disciplines such as technical writing [3], family therapy [4], psychology [5], or medicine [6] within RE.

To the best of our knowledge, such published experiences on learning from other disciplines are sparse, despite the huge potential that best practices or techniques from other disciplines could offer to improve the field of RE. This could be attributed to the fact that the identification of synergies between other disciplines and RE is challenging and differs from our daily business, as it requires expertise and effort to make the necessary abstractions.

To tackle this challenge, we consider creativity as a strong enabler for building a bridge between the different worlds, and hence we would like to share our experiences of applying the so-called "InspiRE-D" method, which supports systematic identification and elaboration of such synergies with the help of creativity techniques. We successfully applied the "InspiRE-D" method during the interactive breakout sessions in three editions of the D4RE workshop series [7], which we established in 2018 and which aims to answer the question "What can RE learn from other disciplines?".

In the remainder of this paper, we introduce the various creativity activities and corresponding templates of the "InspiRE-D" method in section 2 and discuss experiences and limitations in section 3. The paper concludes in section 4 with a summary as well as an outlook on future work.

Our work contributes to the goals of the CreaRE workshop by supporting the topic of creative use of techniques originally designed for other purposes that could be applied as techniques in RE. Moreover, we aim to motivate and enable both researchers and practitioners to take the first step into different worlds and apply our method (or parts of it) in their particular work context in order to get inspired for RE by other Disciplines ("InspiRE-D") and ultimately incorporate best practices into RE techniques, which is surely a worthwhile endeavor [2].

## 2 The "InspiRE-D" Method

This section introduces the different activities of the current version of the "InspiRE-D" method that supports the identification and elaboration of synergies between RE and other disciplines. We applied and continuously improved this method in the aforementioned D4RE workshop series [7], which were all organized as full-day workshops. In each of these workshops, the first part was dedicated to keynotes / inspirational talks as well as paper presentations in order to introduce the participants to the workshop goals and themes and to inspire them for the subsequent breakout sessions. In these breakout sessions, we organized the participants into groups of 4–6 people for collaborative discussion of the following leading questions:

- Which best practices / techniques of other disciplines have synergy potential for RE-related activities and could be adapted in an RE technique?
- What would the application of the adapted RE technique look like?
- Which benefits would the adapted RE technique provide?
- Are there any risks related to the application of the adapted RE technique?
- Which open issues exist that require future research?
- Which next steps are required to realize a first proto-version of the envisioned RE technique?

To support these group discussions, we guided the participants through four different creativity activities that will be introduced in the remainder of this section:

- Activity 1: Idea Collection (Duration ≈ 45 Minutes)
- Activity 2: Elaborating Synergies (Duration ≈ 45 Minutes)
- Activity 3: Minimal Version of RE Technique (Duration ≈ 45 Minutes)
- Activity 4: Wrap Up (Duration ≈ 45 Minutes)

Each of the described activities will be illustrated by a continuous example that is inspired by the discipline *criminology*. Particularly, the example illustrates the usage of *conspiracy walls* in RE. As illustrated in Figure 1, these walls typically store and visualize collected evidence data, assumptions and gained insights about a crime including their relations (e.g., by connecting the data with the help of pins and stitches). All this information is continuously updated and analyzed by detectives to solve a crime [8].

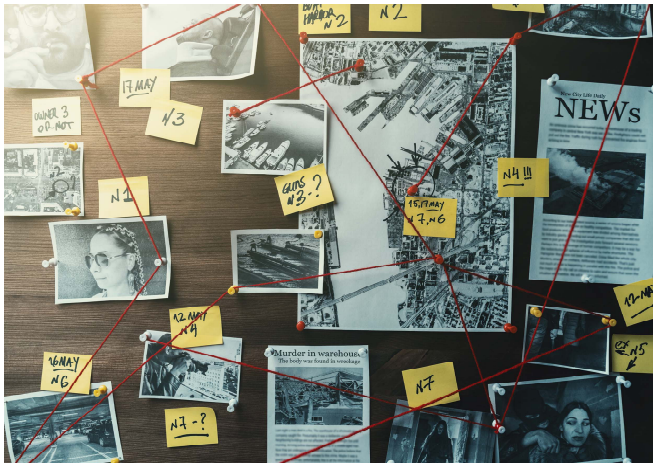


Figure 1: Conspiracy Wall

### 2.1 Activity 1: Idea Collection

Based on a given workshop theme or discipline (like psychology, criminology, or law), the goal of this brainstorming activity is to first collect as many ideas as possible with regard to best practices of the given discipline with synergy potential for RE. To document these ideas, we created a template that formulates the idea in the form of a simple statement:

**Learn from** <discipline>.
**Use** <best practice, technique> **applied by / in / at / during** <discipline context> **for** <RE activity>.

The corresponding template and example are visualized in Figure 2.

### 2.2 Activity 2: Elaborating Synergies

The goal of this activity is to elaborate synergies in more detail by outlining and sketching a future RE technique that incorporates and adapts one or two best practices from other disciplines selected from the idea collection (see section 2.1).

To achieve this, the participants are asked to elaborate a storyboard with the help of a template (see Figure 3) structured into three parts. In the upper part (i.e., boxes in first row), the participants should textually describe different steps of the envisioned technique. This textual description should be supplemented with a visualization of the steps in the form of simple sketches in the middle part (i.e., boxes in second row). Finally, the third part (i.e., boxes in last row) offers the possibility to annotate any open issues, such as possible risks, ideas for future research, people to involve, etc. related to particular steps of the envisioned method.

| | | |
|---|---|---|
| LEARN FROM | Criminology | DISCIPLINE |
| USE | Conspiracy Walls | TECHNIQUE |
| APPLIED BY | Detectives | ROLE |
| IN/AT/DURING | Criminal Investigation / Profiling | DISCIPLINE CONTEXT |
| FOR | Requirements Analysis | RE ACTIVITY |

Figure 2: Template and Example of Idea Collection in Activity 1

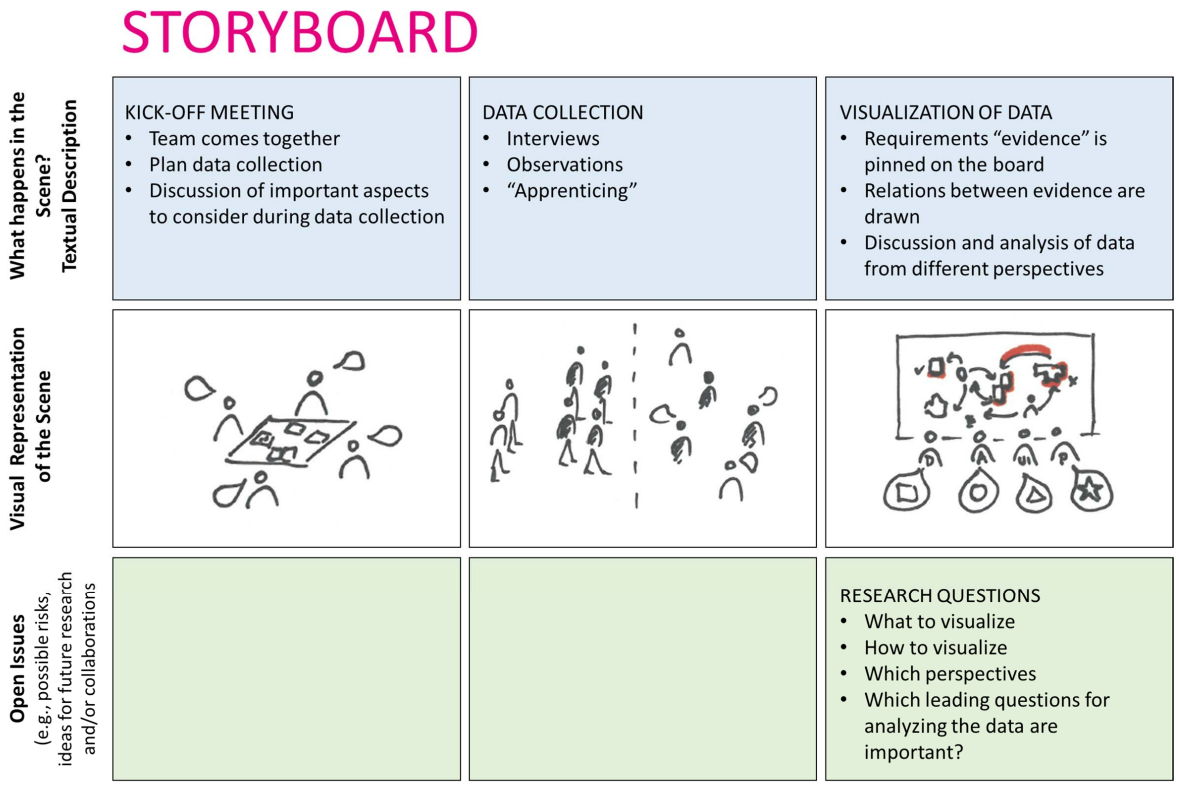


Figure 3: Template and Example Excerpt for Elaborating Synergies in Activity 2

When elaborating the new RE technique, the participants are instructed to explicitly think about preparation steps, ("*What do we have to do every time the new technique will be executed?*"), execution steps ("*How do we execute the new technique?*") and wrap-up ("*How do we wrap up after each execution of the new technique?*").

Figure 3 illustrates the structure and the different parts of the template, including an extract of an elaborated storyboard example for a new RE technique inspired by the idea of using conspiracy walls for requirements analysis (see Figure 1 and Figure 2).

### 2.3 Activity 3: Minimal Viable Version of RE Technique

In the previous activity, the participants elaborated envisioned RE techniques inspired by best practices of other disciplines. But how to realize these techniques? What steps should be taken? Who should be involved? Which resources are required to realize these techniques? We consider such reflections a very important outcome of the "InspiRE-D" method, as the realization and application of the envisioned RE techniques might take a very long time – possibly even years – which might be demotivating.

Hence, we incorporated the activity "Minimal Viable Version of RE Technique" into the "InspiRE-D" method. The goal of this activity is to discuss and describe activities and related assets that could be executed within a month ("4-week sprint") in order to be able to develop and run a proto-version of the envisioned RE technique (see Figure 4). This proto-version could be subjected to first evaluation activities towards expected benefits of the technique and continuously be improved based on the insights gained during its application in real projects.

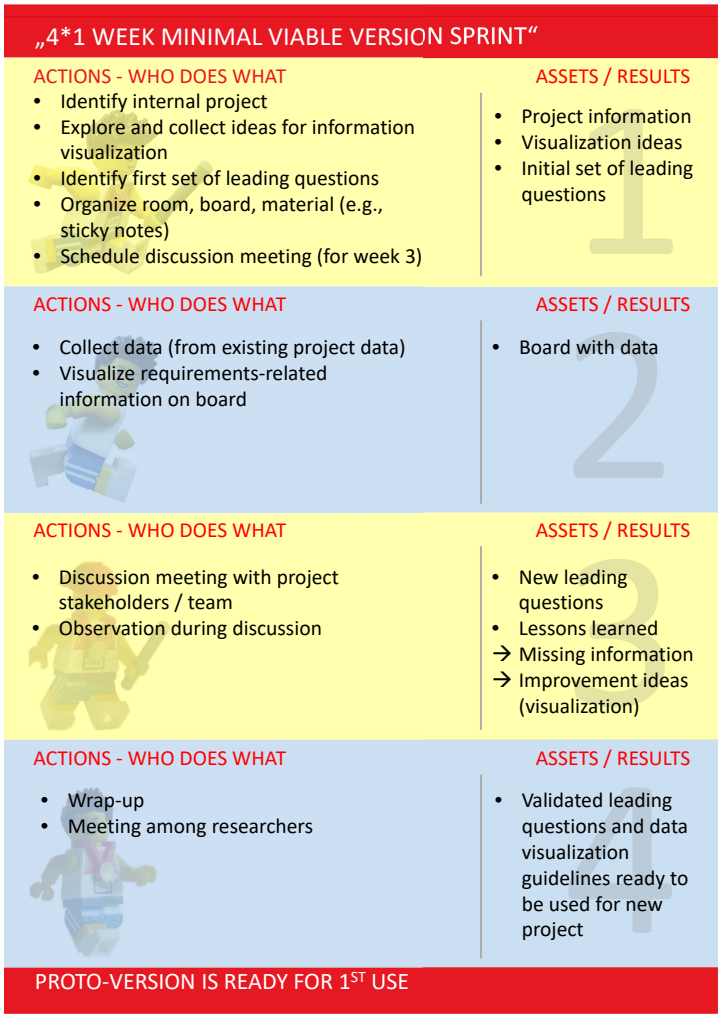


Figure 4: Template and Example of Minimal Viable Version Sprint in Activity 3

### 2.4 Activity 4: Wrap-up

The goal of this activity is to summarize the core ideas of the newly elaborated RE techniques inspired by best practices from another discipline while particularly highlighting their expected benefits. To support this activity, we provided the participants with a template to create a *tweet* briefly summarizing the main idea, the challenges addressed, and the expected benefits of the technique with a maximum number of 280 characters. The template and an example tweet are illustrated in Figure 5.

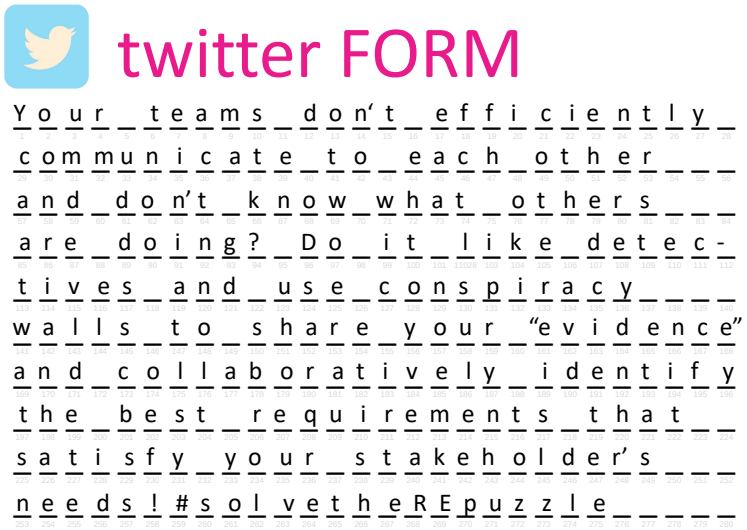


Figure 5: Template and Example Summary Tweet Description in Activity 4

To supplement the wrap-up activity, we also prepared a so-called *profiteer template* (see Figure 6), which can be used to briefly describe the role, responsibilities, and challenges of persons benefiting directly from the method.

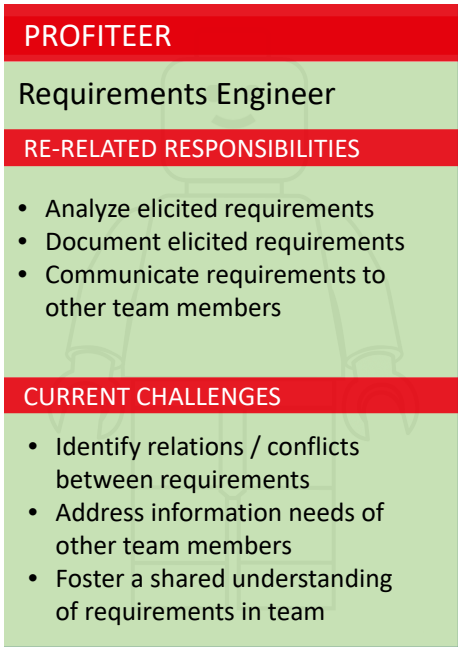


Figure 6: Template and Example for Profiteer Description in Activity 4

## 3 Discussion

As already mentioned above, we applied the "InspiRE-D" method during three editions of the D4RE workshop series that were collocated with RE'18 in Banff, Canada; with REFSQ'19 in Essen, Germany; and with RE'19 on Jeju Island, South Korea [7]. At the end of each workshop session, we asked the participants for their feedback and incorporated this feedback into the method. This especially applies to activity 3 ("Minimal Viable Version of RE Technique", see section 2.3), which had not been included in the first edition of the workshop. The participants of this first edition liked the story-boarding activity but missed having a list of concrete next steps at hand. Such an outcome would have motivated them to realize and apply the ideas they had elaborated in the workshop in their particular project contexts. In addition, they said that it would really be beneficial to elaborate the synergies collaboratively with experts from other domains. We were able to address this important issue in the second edition of the D4RE workshop series, where a former police officer working as a RE consultant at that time gave the audience insights into the daily work of a police officer, sharing his experience in applying techniques such as profiling, crime scene investigation, and how to secure evidence. Moreover, he shared his view on how RE elicitation techniques such as interviews and workshops could benefit from (psychological) questioning techniques typically applied during interrogations. However, while it is the best case to work with experts right from the beginning, our experience has shown that it is also possible to elaborate great ideas for potential synergies even without the involvement of experts when applying the "InspiRE-D" method. Surely, the experts should then be involved at a later point in time when it comes to the realization and evaluation of the envisioned RE technique.

Basically, the four activities of the "InspiRE-D" method follow typical phases of a creativity process, like exploration, combination / transformation, convergence, and evaluation. That is, based on a given problem or goal, a creativity process typically starts with the collection of as many ideas as possible that address the given problem or goal in a brainstorming manner. In the "InspiRE-D" method, this *exploration phase* is supported by activity 1 "Idea Collection" (see section 2.1), which aims to identify as many ideas as possible with regard to the best practices of a given discipline with synergy potential for RE. In fact, this activity worked really well in the workshops and we collected many ideas within the given time frame of 45 minutes (ca. 20 ideas per group). Of course, not all of the brainstormed ideas might ultimately be suitable for an RE technique, but he core idea or a combination with other ideas might be.

Such a combination of ideas and their transformation into the RE context is the goal of activity 2 "Elaborating Synergies" (see Section 2.2), which therefore resembles the aforementioned *combination / transformation phase* of a creativity process aimed at further extending the body of possible solution ideas for the given problem or goal. The storyboarding technique was also found to be suitable for describing the envisioned method, as it focuses on the visualization of what the execution of the RE technique would look like.

The *convergence phase* of a creativity process is supported by activity 3 "Minimal Version of RE Technique" (see section 2.3). That is, the solution space is reduced to the most promising solution ideas that are realizable, which in our case corresponds to the proto-version of the envisioned RE technique. As already mentioned, this activity was an important addition to our initial version and helped the participants to identify concrete next steps.

Finally, the *evaluation phase* of a creativity process is supported by activity 4 "Wrap-up" (see section 2.4), which aims to evaluate selected ideas (in our case, the envisioned RE technique respectively its proto-version) in terms of their expected benefits. Both the tweet template and the profiteer template helped the participants focus on the addressed challenges as well as the expected benefits of the envisioned RE technique in order to promote the synergy potential.

Overall, the "InspiRE-D" method has proven to be suitable for elaborating initial ideas for synergies between other disciplines and RE, and we have been able to run the method in the given time frames of the interactive breakout sessions. We are aware of the fact that the outcome of this method are "only" visionary ideas for RE techniques that were initially sketched and not described in full detail yet, which can surely be considered a major limitation of the method. However, we still consider the visionary ideas as a first important step towards overcoming the boundaries between the field of RE and other domains and becoming aware of the potential that cross-disciplinary work could offer to our community.

## 4 Conclusion and Future Work

To contribute to the goals and topics of the CreaRE workshop series, this paper introduced the "InspiRE-D" methodological approach that supports the systematic identification and elaboration of synergies between best

practices from other disciplines and RE with the help of creativity techniques. We successfully applied the approach during the three editions of the D4RE workshop series [7] and continuously incorporated feedback given by the workshop participants. While the outcomes of this method are mainly visionary ideas, they serve as a valuable starting point for first evaluation activities and the identification of promising future cross-disciplinary research and collaboration possibilities.

In the future, we aim to continue our D4RE workshop series and enrich our first body of knowledge with regard to best practices / techniques from other disciplines and their synergy potential for RE. In these future editions, we will identify and apply further (creativity) techniques that have the potential to extend the "InspiRE-D" method (e.g., using vision videos [9] to elaborate synergies in Activity 2). Moreover, we aim to develop and publish a web-based tool solution that enables us to share our knowledge and experience gained in the D4RE workshops to a larger community. A first tool concept has already been elaborated in [10], which is intended to primarily support the D4RE workshop organizers in documenting and publishing workshop results. Researchers and practitioners from various domains will be able to access and browse this knowledge to get inspiration for their own work.

Finally, we aim to apply and evaluate the idea of the envisioned RE technique that we used as an illustrating example in this paper. That is, inspired by the conspiracy walls typically used by detectives during crime investigations or profiling, we are currently preparing and visualizing real project data on a board. We aim to use this board to foster discussion and analysis of requirements among the project team members in the near future in order to evaluate first ideas regarding leading questions that might guide the discussions of the requirements from different perspectives as well as suitable visualization of requirements-related information on the board.

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