

# THE VALUE OF DESIGN RESEARCH

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## RICH-PROSPECT BROWSING FOR DESIGN SCENARIO INFORMATION

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### ABSTRACT

*In this paper, building on previous work on scenarios in theatre, design, and business, a series of 4 exercises were carried out in order to identify factors that differentiate design scenarios from scenarios in other fields. These factors include the need for a sufficient duration to accommodate the learning aspect of writing scenarios, the tendency for scenarios in design to be positive in nature, and the inclusion of visual prompts rather than just text. Further, the research proposed capturing and reusing the various kinds of information that were produced during the writing of design scenarios. In this case, this information was treated according to the principles of rich-prospect browsing, which suggest that individual items, meaningfully represented, be made available to scenario writers in design for organization and use. Several such collections were produced, some physical and some virtual, each of which contained fewer than 100 items. By combining this atomized form of overview with affordances directly associated with the information, rich-prospect browsing simultaneously preserves and makes accessible the kinds of ideas that are prevalent during the process of creating design scenarios.*

*Keywords: Design Scenario, Conversation, Information, Rich-Prospect Browsing*

### 1 INTRODUCTION

Design research has been discussed for at least the last 50 years. It has its own peculiarities. Usually the academic community tries to define boundaries and concepts to consolidate the research in the area. Borders may be important but can also create barriers with other areas of knowledge. In fact, design research often shares techniques and methods with other fields; these methods may or may not have been subject to significant change in the course of their translation into usefulness in design. This paper focuses on one special concept often used: design scenarios. We seek to establish a review of the various ways the word scenarios is used; to observe some scenario building exercises; and to contribute to a better understanding of how to build scenarios in design, as opposed to scenarios as used in other disciplines.

The origin of the word scenarios favors its various understandings. Scenarios, in the common sense, are associated with a theatrical or cinematic context. A scenario can be seen as a space where a narrative is constructed and where actors perform. We use the word "actor" here in the sense of someone who is pretending to be someone else, where that someone else represents a particular character. In a theatrical scenario, the actions are, in general, partially controlled by a narrative or script. Even so, many factors are beyond previously imagined forecasting and they can generate actions that are not expected. That said, in general terms a scenario is a predictable space. It is expected that

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certain actions will happen there. The word prediction can be considered as a preview, the materialization of something that does not exist. Each of these words presented in the theatrical concept of scenario (narrative, actor, actions, and prediction) could be decomposed and made explicit.

According to Vilém Flusser (2007), design, in building the artificial, has a "Machiavellian" character that subverts the pure form. A theatrical scenario, similarly to design, encourages the viewer to temporarily accept a fictitious environment, where actors "pretend" to live in it, surrounded by objects, special costumes, makeup, and artificial light. A part of the process typically also involves prediction by the audience of what will occur: they share in the scenario. As Roberts-Smith (2014) puts it, they hold in their minds both an understanding of the artificiality and a tacit agreement to go along with it. The result is that the participants (actors and audience) simultaneously produce artificiality and are modified by the artificiality produced. It makes the context complex and dynamic. Human complexity is not only due to the large number of factors that are interconnected. It also resides in the continuous transformation of awareness, memory, and prediction.

To put it another way, according to Edgar Morin (2005), complexity arises from the fact that we produce things and they produce us. All these concepts are useful in understanding the word scenarios as it is employed in this article, i.e., the human ability to construct possible worlds, to anticipate time, to postulate futures.

Moving away from the theatre, the concept of scenarios in business stems from Strategic Planning (Godet 1987; Schwartz 1996; Heijden 2005). For a given context, several scenarios can be formulated, typically associated with risk avoidance or damage control, although occasionally for the pursuit of opportunities. For each scenario, an action project is developed. It is a strategy for making decisions, in case any of the imagined scenarios becomes reality. The projects here connote control over a possible indeterminate situation that may happen in the future. A highly predictable future, even though important to strategic planning, is less interesting for scenario building.

Scenario building does not follow a completely structured path, and diverse techniques can be used, according to the experience of the scenarist. It is a process where intuition and technical rationality coexist in a mutually stimulating manner. The beginning of the construction of a scenario may be an informal conversation between two people or a survey with 2,500 respondents. For Heijden (2005), the process of building scenarios is essentially a process of conversation. This process thus requires time for dialogue between actors and the context. Heijden uses Senge's iceberg metaphor (Senge 1990 cited in Heijden 2005) to define three categories of knowledge involved in the scenarios: 1) events, 2) patterns, and 3) structure. Above the waterline of the iceberg, one visualizes the events as perceived phenomena. These events may build patterns. Holding events and patterns together, there is a submerged structure that is often defined as a "theory". A theory is a set of articulated concepts that seeks to understand or predict a particular phenomenon (Given 2008, p.876).

Thus, the challenge for the construction of scenarios lies in the identification of this structure that can sustain future scenarios. It seeks to identify the driving forces that will guide the scenarios. In order to identify these forces, there are a number of possible strategies to represent these futures through textual and

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visual narratives. It is a cyclic learning process. Each new representation generates a new conversation among the scenarists. The main aspects of interest in this research refer to: 1) the process of information capture and organization; 2) the new knowledge generated; and 3) the ongoing dialogue among the actors involved in the construction of scenarios. The theme of control, required for Strategic Planning, is not considered relevant when applying the concept to design scenarios. Control is a word that is often wrongly perceived when related to the necessary creative freedom of the design process.

It sometimes happens, however, that creativity is a factor in what might best be described as the loss of process-related data. Although there are a variety of processes and even repeatable methods of generating new ideas and other forms of innovation, the messiness involved often means that intermediate concepts, sketches, and even prototypes are discarded along the way, with no thought that they might serve a valuable function either further along in the project, as metadata about the creative process, or else as components of some future project. With this in mind, we decided to take a rich-prospect browsing (RPB) approach (e.g. Ruecker et al. 2011), where some meaningful representation of each informational artifact is combined with some mechanism for organizing and using those artifacts. Although RPB was originally construed as a way of theorizing a particular kind of collection interface, we felt that its principles could equally well apply to the information developed along the way in a design scenario-building exercise.

The advantages of RPB are these: every meaningful item is collected and stored for possible reuse, the people reusing the items are given, by default, access to the entire collection, as well as any associated metadata, and the collected items provide some insight into the thinking of the people who created them, allowing us to reuse information developed during the creative process.

## 2 DESIGN SCENARIOS

Design scenarios can be understood as a way of thinking about a particular given problem context, seeking its transformation. The concept of design scenarios often goes beyond a specific project. In the sense of construction of knowledge, it can be associated with learning processes. Any learning process has the power to transform the actors involved in it. That is, the production of knowledge and the consequent learning involved are not antagonistic to the world in which a project is located.

In fact, the creation of possible futures is at the root of the word that most closely defines design, i.e., the word project, which can be simultaneously understood as both a noun (the project) and a verb (to project – in this case, into the future). When designing something, regardless of what is being designed, one builds up different alternatives. These alternatives are often opposing and exclusive. In this process, designers (usually) live with many uncertainties, bifurcations, walls, returns, and many other words that suggest a nonlinear way. It is a generative and evolutionary process.

To simplify somewhat, a scenario is a story that describes an event. However, design scenarios can be deployed in more than one way. For Lim and Sato (2006), for example, scenarios range from something that describes a problem or a context to even a generated concept. Their primary concern is to

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demonstrate the analytical potential present in design scenario building. Using a mechanism called the Design Information Framework (DIF), the authors propose a means for not only creating scenarios, but also documenting them. DIF is a "structured scenario generation mechanism that accommodates multiple aspects of the situation by decomposing complex use of their situations into chunks, structuring them, and representing their interconnection" (p.59).

Manzini and Jégou (2000), on the other hand, propose the concept of Design Oriented Scenarios (DOS), where the scenario is seen primarily as a tool to promote conversation. The authors reinforce this concept, which originated in Strategic Planning, and reaffirm that scenarios are not built to plan for the future. Scenarios are spaces to promote conversations and shared visions that can help guide design. The authors also emphasize the idea of complexity, where a scenario is both a narrative that results from conversation, while at the same time fostering new conversations and narratives. The proposed scenario visions are not utopias of a new world. They are "only" possible new worlds. Strategic Planning typically works with negative and catastrophic scenarios such as the famous and successful case of scenario building for Shell Oil Company. In design, according to Manzini and Jégou, one works with possible and positive scenarios, providing a satisfactory situation determined by constructed visions. The design scenarios are seen as an essential part of the project.

### 3 METHOD

To meet the objective of interrogating the particularities of scenarios in design, we carried out five steps. The first was a literature review on the topic of scenario building. This review was then followed by four design exercises, all based on the very same briefing, regarding a particular company in the US:

A large manufacturer is interested in understanding the context of information ecosystems in its industry, as well as in other large manufacturing industries in general. Their goal is to find ways to leverage the information they already have, and to identify new kinds of information that they should also be managing.

The first two exercises were performed in a couple of hours with masters students. The last two exercises took longer than a day and were carried out with professionals. All exercises were videotaped and analyzed in an exploratory and qualitative research.

Throughout the process, we reflected on the relationship between the information that we were handling and the concept of rich-prospect browsing.

### 4 DESIGN SCENARIOS FIRST AND SECOND EXERCISES: PILOTS

The first two exercises, conducted with Masters in Design students from Institute of Design, IIT, served as pilots. The two pilots lasted only a few hours. In both exercises, the students passed through several traditional scenario-building

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techniques such as: brainstorming sessions; organization of words by semantic proximity; identification of possible forces that would provide visions of possible futures; narrative construction; and visual representation. Figure 1 presents four scenarios imagined in exercise 2. For these subjects, the main forces that govern the future of the information system would be linked to technological/analogical and individual/group output. The intersection of these forces generated four scenarios that were represented by small texts and some simple drawings.

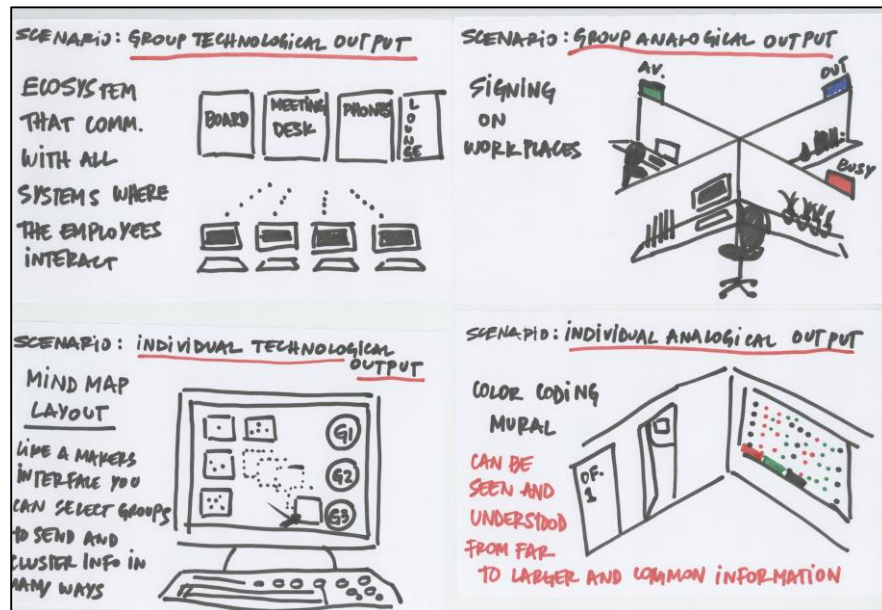


Figure 1: 4 scenarios produced in the second exercise.

The two pilots presented some important insights. First, it led us to recognize that scenario building should be understood as a dialogic process of learning new knowledge. The implication of this way of thinking is that the time factor proves to be very important. The implementation of short exercises in only a few hours did not seem to allow an accurate evaluation of how subjects construct new knowledge and what they learn with future scenarios. Another problematic factor refers to the subjects' professional experience. In both cases, the groups were composed of students with little experience in relation to the brief. They had little concrete experience with how information is managed in a large organization. A lot of basic knowledge was necessary to further reflect on the topic. These two pilots were thus important for an improvement of the research method, which were: 1) to provide more time for participants; and 2) to promote a dialogue process between the researchers and the experimental subjects.

The first two exercises also provided our first collection of RPB material, in the form of the key terms that were generated by the teams in the course of going through the brainstorming activity, the choice of guiding forces, and the application of those forces in the scenario diagrams.

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## 5 DESIGN SCENARIOS THIRD EXERCISE

The third exercise involved a set of stages: 1) conducting a preliminary virtual exercise with participants before the meeting, 2) conducting focus groups in two stages (before and after the exercise of scenario building), 3) application and observation exercises. Unlike the first exercises, this one took an entire day, and was conducted with five professionals who had concrete experience with the topic of the brief. Four researchers were in the field to carry out the activities: one acted as moderator, being responsible for coordinating and mediating activities; a second was responsible for recording audio and video, and the other two were instructed to apply and explain the exercises to participants.

Firstly, a preliminary activity was sent via email to participants, 3 days prior to the first meeting. It was a virtual presentation of a RPB collection, containing images, where each participant would seek to use the images to describe 'how you see the use of the information in your company.' Then it was proposed that participants build a mood board, where they should have developed a small narrative. The goal of this task was to encourage participants to start thinking about the problem that would be proposed. Furthermore, contact with this material was also valid to promote a kind of starting point during the first focus group.

Then the first focus group, following a semi-structured plan, was held. It lasted about an hour. Participants were asked about (1) the kind of information they were normally used to dealing with, (2) the way they rate or evaluate such information and (3) future projections related to information systems. After that, the scenario exercise itself was conducted (following the stages previously described). Once the scenario exercise had finished, a second focus group session was conducted, which took an hour. It covered topics such as: 1) Talk about the scenarios that you built; 2) What is the main difference between these scenarios and what you experience here at your organization? 3) Make new predictions on how the flow of information could be improved.

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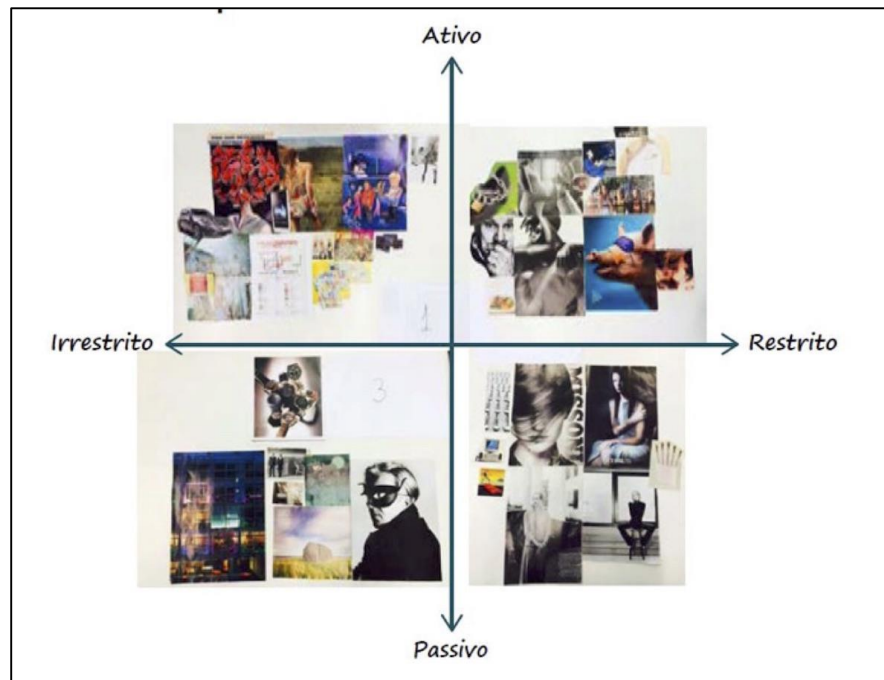
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*Figure 2: scenarios produced in the third exercise (axis: unrestricted, restricted; active, passive).*

In a nutshell, participants were more willing to propose modifications (on the flow of information) after going through the scenario-building exercise. During the second focus group session, the team started working hard on the construction of a particular new idea. They suggested that the researchers provide them with a location where they could work with privacy, where no one could disturb them. However, this focus group session had restricted time, and no other possible ideas came to the fore. Possibly a longer time for such a discussion would provide more ideas related to the investigated issue. This third exercise also served as preparation for a final exercise.

## 6 DESIGN SCENARIO FOURTH EXERCISE

The fourth and last exercise was the most important. The participants were two experienced professionals from the organizational partner, and it was conducted in four distinct stages, as presented in Figure 3.

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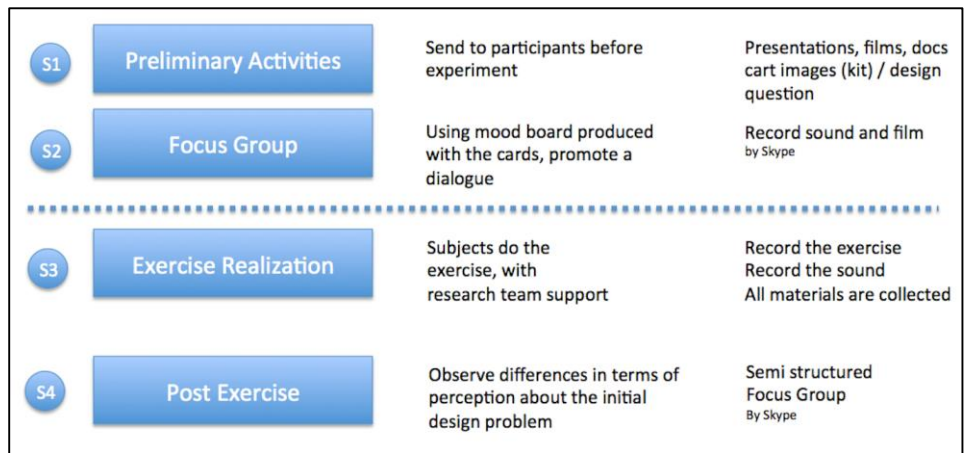


Figure 3 – Exercise 4 organization.

In Stage 1 (S1), the subjects were sent some examples about information ecosystems in the format of little films or some sort of stimulus. Leveraging the idea of RPB, they were also sent a kit with 68 image cards. These images came from the preliminary brainstorm activities that had been carried out in the two previous exercises. The collected words were represented by corresponding images obtained using the Google Images Search Engine. Figure 4 presents the image cards kit. The main question was: Using these cards, can you represent the context of the information system in your company? The objective of this stage was to encourage initial reflections about the main problem by reusing the creative work that had been carried out in an earlier stage by different participants.



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Figure 4 – Rich-prospect image cards kit.

The two professionals work in the graphic design department and are used to exchanging information with the other sectors of the company. Usually they are responsible for the graphic manuals, labels, technical information, product diagrams, and other graphic communication. They received the kit and sent back to the research team 8 mood boards representing 8 aspects of the company information system. The subjects photographed the mood boards by themselves (Figure 5)

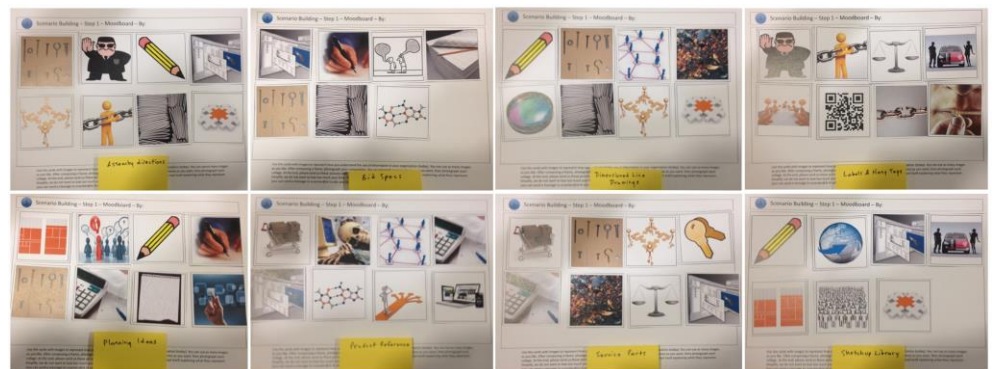


Figure 5: A rich-prospect collection of mood boards in Stage 1, Exercise 4.

A week after receiving the mood boards, a first semi-structured interview was conducted with the subjects. After describing their work and background, the subjects were asked about this first task. They seemed surprised by the fact that working with the cards has turned out to be an interesting and useful way to describe the company information system. This interview was recorded using a simple video camera oriented to the computer screen and, at the same time, using a software program that directly recorded the screen (Figure 6). In the

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interview, the questions addressed three main topics: 1) the participants' background; 2) how they saw the information system in general and at their company in particular; and 3) how they imagined it might be possible to improve communication, given the natural diversity of the different actors. Subjects were also asked to give a little description of each mood board – in essence, producing additional metadata about the image collection. This second stage of the investigation corroborated the previously discussed importance of time in promoting conversation about the design context. During one hour and 7 minutes, it was possible to productively discuss the main problem, using the image cards as a support to conversation.



*Figure 6: Company Information System conversation, Stage 2, Exercise 4.*

The next stage (S3) of the exercise was the scenario building itself. Before meeting in person with the participants, the research team analysed the S2 conversation and identified keywords, creating another RPB collection. These keywords were organized as a set of possible driving forces that could orient scenario-building. This analysis was sent to the subjects. The idea was to continue to create an atmosphere of conversation between the subjects and their produced ideas. Figure 7 shows the keywords and the possible key forces governing probable future scenarios for the company information system.

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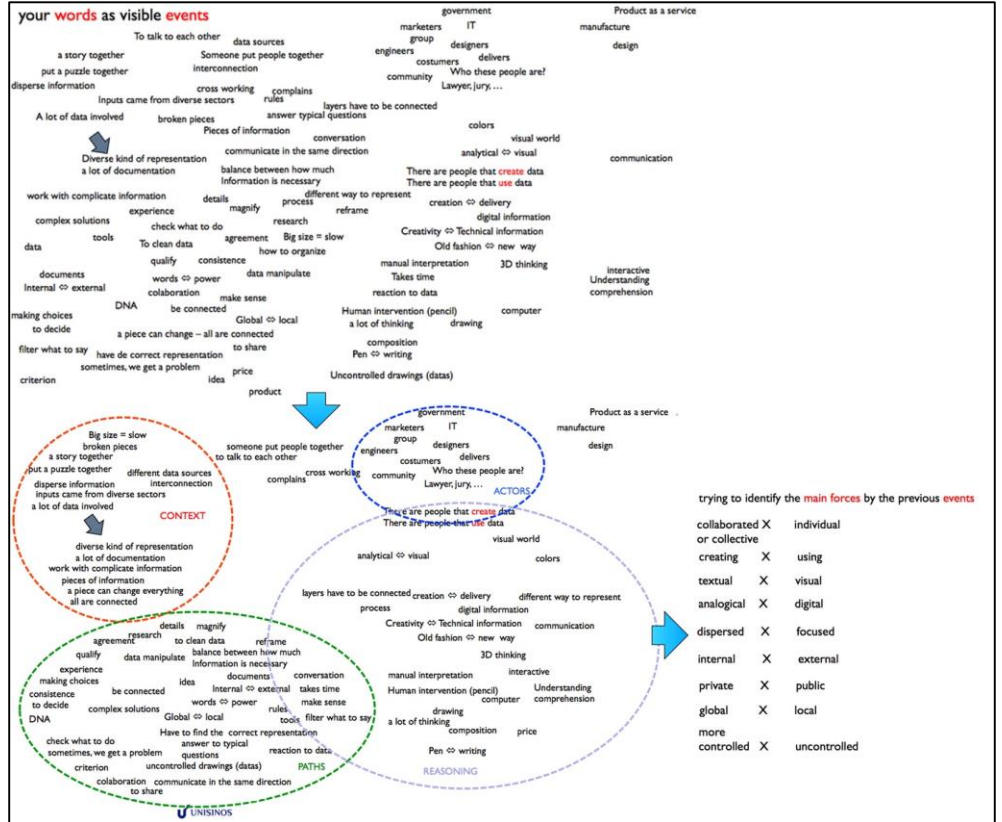


Figure 7: Organizing their conversation, Stage 3, Exercise 4.

Given the diagram in Figure 7, the two subjects began discussing the possible main forces for new design scenarios. They worked for about two hours. Both are professional engaged in the daily work of building visual elements that serve several departments in the company. It was difficult for them to abstract this context and imagine future scenarios. This difficulty pervaded the whole of stage 3. Finally, the subjects imagined fictitious projects where the scenarios could happen. The objective at this stage was to create a 2 x 2 matrix with 4 opposite poles. Each quadrant of this matrix could define a scenario. However, the subjects did not adopt this strategy, and instead considered the 4 quadrants as one scenario. They explained that they preferred a holistic way of thinking, which constituted a natural part of their reasoning. Their starting point was the two main forces which had resulted from stage 2: controlled/uncontrolled and collaborative/individual (Figure 8).

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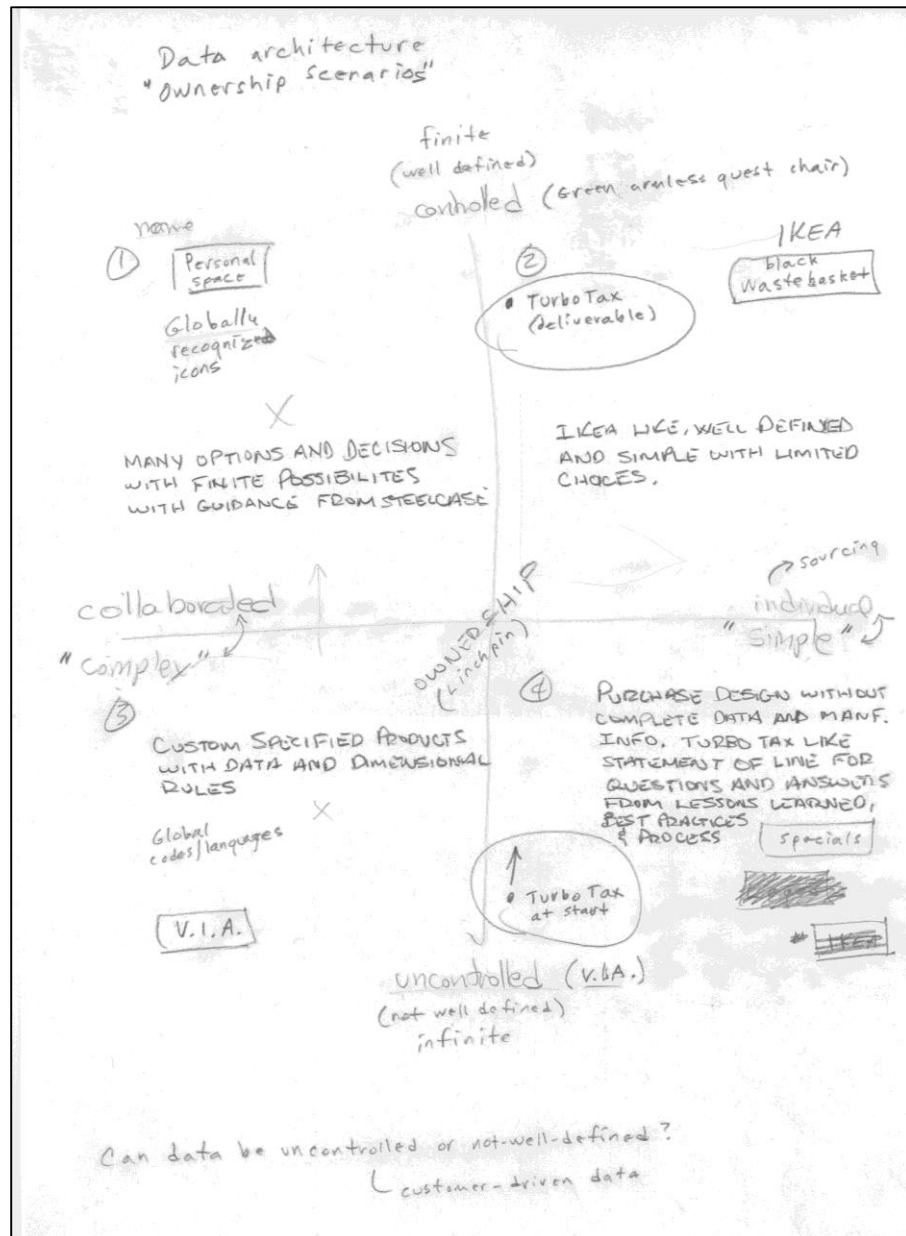


Figure 8: Organizing the conversation, Stage 3, Exercise 4

These forces came from their conversation in S2. They transformed or interpreted these forces in a specific way. The term "controlled" was associated with something well defined and finite, whereas the term "uncontrolled" was defined as information that was less defined and infinite. On the other axis, information that could be produced in a collaborative way was defined as "complex" while information produced by an individual was associated with "simple". They wrote a question: "Can data be uncontrolled or not-well-defined?" They indicate a solution to this question: the idea of customer-driven data. At this moment, one of the main ideas appeared, the concept that the information

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system user should be the owner of the system. There is a semantic move from someone that only uses the system to someone who is the system owner. This is a radical movement in the current system concept. They also proposed that the scenario should be represented not by a simple graphic plan but by a 3D model, a pyramid where on the vertex was placed the word "ownership". This word gained a significant importance in the concept proposed. The user is the owner of the system: he/she is a responsible part of the system. They associated the word ownership to "lynchpin", in the sense of something essential to the connection of the actors in the system. In a few hours, but after a large period of reflection before the scenario-building exercise, the 2 subjects managed to construct a powerful scenario for the information system of the company. This was not yet a formal answer to the design problem, but seems to be an important vision to the direction where one could act to build a new and innovative information system.

The research team organized a final Skype meeting (S4). As the subjects did not visually represent their scenario, the research team did it and sent the drawing to them. The research team task was to represent the idea of the subjects in a visual way, providing a new anchor for their conversation. This drawing was the object of conversation in stage 4, promoting other reflections.

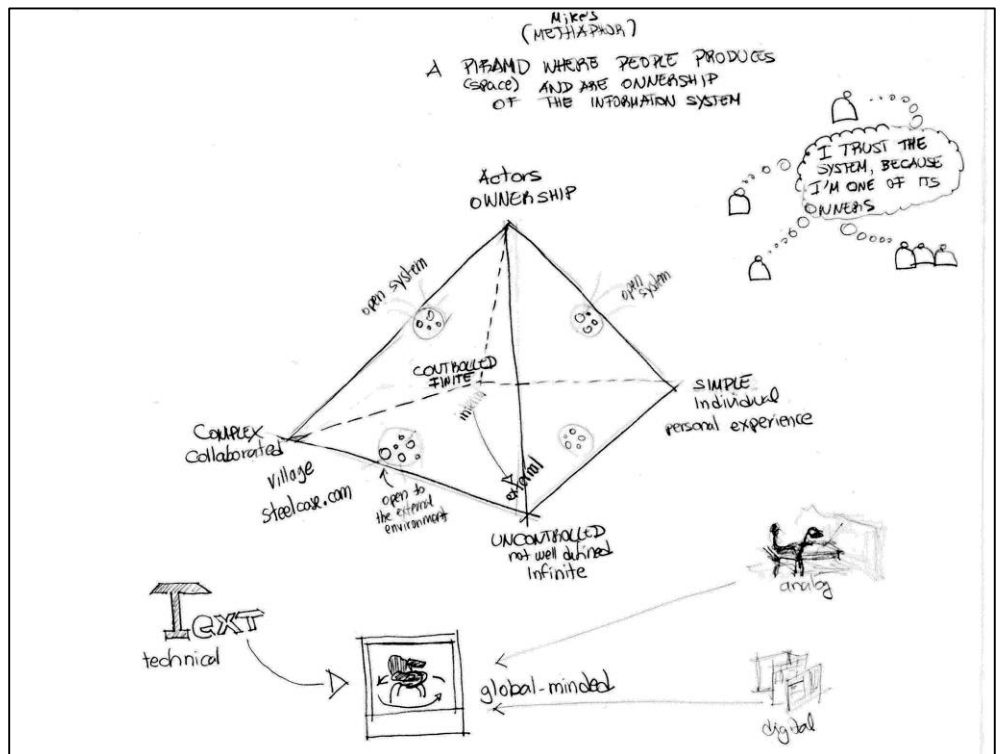


Figure 9: A visual representation of a built scenario, Exercise 4

The first reflections address the pyramid dynamic vertex. This model cannot be seen as a static figure. It represents different and adaptive contexts. This is a new idea that appeared in the discussion following the pyramid representation. The principle was that the vertex would not necessarily be placed at the center of the figure, but instead, the system could be adapted according to a specific

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project. They realized that the 3D model was a geometrical representation of the scenarios built in the previous stage. One subject proposed a kind of mathematical formula to calculate how the 3d model could be related to different projects through moving the location of the vertex. Once they started to explain their ideas they were reasoning in a visual way. The changing of the vertex position transformed the pyramid into a kind of 3D trapezoid. This apparently simple modification has a powerful conceptual implication, which we intend to unpack in a dedicated paper. In brief, it allows the users to transform the information system into a form where each face is different from the others. The idea of a unique and flexible system is represented by the visual geometry. The subjects proposed a metaphor of an "intelligent box" that can learn with time as an intelligent artifact. As an intelligent system, capable of learning, one could consider it as a live system. The notion of an ecosystem, which had been present in the brief, appeared again, even though not explicitly. In the end of the conversation the subjects said that the graphic representation really helped them to reflect about future design scenarios for the information system of the company. They also said that probably if they were to continue to look or to talk in the following weeks, they would have additional ideas.

## 7 CONCLUSION: DESIGN SCENARIOS AS CONVERSATION

It was hard for our study participants to think about the future in 4 different scenarios. They preferred to build a new geometry that represented only one scenario. This seems to be an important finding, because we can associate it to the heuristic way designers usually think, namely tending to integration rather than segmentation.

Professionals also had difficulties in abstracting concepts. They were always concerned with their professional practice. In figure 8, for example, they related each quadrant to a project, artifact or brand (IKEA). Subjects tended to represent their ideas by visual drawing. Figure 9 is an example of this visual way to render ideas, which is a typical design way of reasoning. This process allows subjects to see things that were not visible before the scenario exercise, such as the ideas presented in exercise 4 (i.e. live and dynamic system, 3d Model, adaptable to different context, an intelligent system, ownership).

After the activity, participants in exercise 3 and 4 exposed their feelings about being responsible and willing to build new futures, which had not been previously expressed. This reinforces the concept that design scenarios is a form of changing mind models. There is a movement to a possible future and this displacement can modify their present actions.

By capturing in RPB collections the various information artifacts produced during the creative process of building scenarios, we were able to avoid loss of intermediate forms of data, and to subsequently deploy some of that information in later exercises. This gave us the advantage of being able to leverage previous creative work, not just in its final form, but also as intermediate products that would otherwise normally have been discarded.

In future, we have to reinforce the scenario-writing process in order to capture, in a useful way, not just what is written and drawn, but also the conversations themselves. One can observe that while building the design scenarios, the

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*Rich-Prospect Browsing for Design Scenario Information*

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subjects were discussing and dialoguing both among themselves, and also with the design problem.

Scenario-building is in a sense a continuous conversation, with no essential endpoint. In this respect, it is both a kind of learning process and also a mediating object; the subjects joined the conversation, taking advantage of previous creative assets, and began to engage their minds with possible futures.

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