THE USE OF SCENARIOS IN DESIGN

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WHAT IS A SCENARIO?

A scenario is a description of a set of users, a work context, and a set of tasks that users perform or want to perform. A scenario sketches future technologies that will help users do the things they want to do. A scenario blends a carefully researched description of some set of real ongoing activities with an imaginative futuristic look at how technology could support those activities better.

The purpose of a scenario is to provide an explicit concrete vision of how some human activity could be supported by technology. Within a research lab, there are several good uses for such a vision. Scenarios provide a basis for discussion among researchers working on different aspects of the technology. They allow researchers to explain to others what they are doing. Scenarios depict a holistic activity in a well-defined setting; hence they can be used to show which aspects of a technology a lab will actively work on, which it will get from somewhere else, and which it will ignore (at least for some period of time).
Scenarios are one good reference point for making design decisions. By showing the actual circumstances under which people work, scenarios provide guidelines on how a technology should perform. The very act of making things explicit and clear also helps in making design choices.

An important feature of a scenario is that it depicts activities in a full context, describing the social setting, resources, and goals of users. It is not a narrowly focused task description, but the "big picture" of how some particular kind of work gets done. Having a description of the fuller context in which people work provides a means of allowing us to think about such issues as collaborative work, distributed data, and the diversity of resources that people actually use in solving problems. Rather than confining our imaginations to the simplistic, unrealistic user-computer dyad (one user, one computer) we begin to see a much bigger set of links that we can support – collaborating groups of users creating and sharing many kinds of diverse data with an array of technology supports such as printers, scanners, instruments, multimedia devices.

For a scenario to be good, it must realistically depict some actual human activity. A scenario must "bring to life" for its readers the activity that is to be supported. A vivid compelling description is grounded in a coherent story that has the imprimatur of reality, and the kinds of illustrative details that stimulate interest and understanding. It is also important that researchers be able to go back to the source of the scenario and fill in gaps as questions arise. The "database" of a real world activity makes this possible.

The appropriate methods for scenario generation are a combination of ethnography (naturalistic study of everyday human activity) with a sort of technological free association. Just as it is important to obtain a faithful rendering of some actual work activity, it is also important to be creative, even far-reaching, in imagining new technologies. Scenarios combine a rigorous anthropology with a shake-loose technical creativity.

WHAT A SCENARIO IS NOT

A scenario is not a description by end users – their interests are far too parochial to develop a scenario useful in a research lab. While it is very important to understand things from users' perspectives, the data from interacting with users (i.e. interviews, observations, and the collection of artifacts such as lab notebooks or instrument output) must be sifted and analyzed by someone who has research goals in mind.

A scenario is not the same as user requirements. A scenario contains ideas for future technologies that may go far beyond what users are capable of imagining could even be supported. Users' goals and needs are of course important data for a scenario, but they are not the scenario. User requirements tend to be laundry lists. A scenario is a description of an activity, in narrative form.

A scenario is not the answer to all our problems. It is not a strategy; it is one aspect of tactics. Scenarios are selected and informed by wider organizational strategies, business needs and technical opportunities. Here at HP, for example, we are likely, to select a medical or manufacturing scenario, but not likely to select a banking scenario, as banking it not a central HP focus. We are likely to select a scenario in which open distributed systems play a role, but not a scenario of single user PC's.

WHAT EXACTLY DOES A SCENARIO LOOK LIKE?

A scenario is a narrative. A basic scenario should be one to two pages long, though it might contain appendices with further detail and clarification. A scenario is meant to suggest and express; it cannot be a daunting weighty document that discourages perusal, but should be a pithy, lively page or two of well-crafted prose. The true test of a scenario should be that everyone in the lab has read it and can verbally explain it.

The properties of a good scenario include believability (hence the importance of the ethnographic research that backs up the scenario as well as informed technical input), relevance to business needs, fascination (a remote consultation during open heart surgery makes a better scenario than a remote conference attended by accountants), and simplicity (we can all remember and repeat it).

HOW TO USE SCENARIOS

A common reaction to the idea of scenarios is that they focus too much, they eliminate possibilities, they put researchers in a straitjacket. Some of what a scenario reveals is relevant only to the particular area that it describes. The use of one distinguished scenario for all of a lab could possibly have these effects. For this reason, multiple scenarios are called for. Different scenarios develop different interesting aspects of problems to be worked on. At the same time, through the study of multiple scenarios the discovery what is common to all becomes possible, and that will suggest areas of interest.

Scenarios are a complement to demonstrator systems. A set of carefully chosen scenarios, taken together, will help reveal the larger problems a lab has

chosen in a way that demonstrators cannot. A demonstrator system, no matter how well executed, cannot provide the breadth of a collection of scenarios. This is particularly important for infrastructural work that does not "demo" well. A demonstrator also runs much more risk of bogging down as a set of "point solutions" to one problem. We should balance and integrate the use of scenarios and demonstrators. Scenarios provide input to demonstrators, while maintaining much more scope as they describe a bigger picture than a single demonstrator can. While we work on demonstrators, scenarios will help us to maintain the big picture.

Scenarios can be used to drive "vertical slice" analysis. A vertical slice specifies software requirements at each software layer for some aspect of functionality that is to be supported. For example, a hypertext system may have requirements at many levels – the user interface toolkit, the object system, a database. Such software layers may interact or conflict or be completely inadequate in some way. An analysis of needs and problems that looks across the various layers is critical in the design process. A scenario allows designers to anticipate requirements at each level and to make provisions for them.

A scenario can be perturbed to good effect; that is, its baseline assumptions about technology can be changed to stimulate new ideas about future technologies. For example, we might imagine the kinds of technologies we would build given the widespread availability of high speed networks.

THE LIVES OF A SCENARIO

Scenarios, like everything else, have a natural life cycle. They are especially valuable at the beginning of a research effort, but less so as time goes on, and

prototypes of the technology under development begin to emerge. As this happens, scenario development segues into testing of prototypes and empirical studies of their use. A scenario is by nature sketchy, and remains that way. Though it will evolve from its first beginnings as its gaps are filled in, it does not significantly deepen or ripen over time, but is cast off as its function of stimulating technology development yields research prototypes. Scenarios may continue to be useful into their old age in explaining what a lab is up to, but they do not exert significant influence over the design process as projects mature. Design is then, ideally, guided by empirical studies of actual use of the prototypes.

GETTING STARTED WITH SCENARIOS

To start with, a lab can develop one scenario that will serve as the exemplar for further scenarios. Two people working full time for three weeks should be allocated to complete one scenario. Scenario development involves selecting a problem area, interviewing knowledgeable people in that area, brainstorming new technologies to support the users' activities, and writing a 1-2 page scenario description.

Scenario developers need interviewing and writing skills as well as technical imagination and understanding. These skills could be distributed across two people, e.g. one researcher might be an especially good interviewer while the other has strong writing skills and technical depth.

Once one good scenario is in place, the lab can go on to develop other scenarios, generating a portfolio of multiple scenarios to provide the scope and coverage needed for research activities.