Experimentation cycle and SSUR models in Innovation prototyping methodology

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Experimentation cycle

Innovation prototyping methodology utilizes experimentation cycle that contains six stages to research ubiquitous computing (ubicomp).

1. **Knowledge acquisition** means finding from literature existing research, including methods appropriate for the field. Also, results from earlier experimentations are considered.
2. **Processing and selection** prepares the gathered material for use in experimentation planning. Also, potential hypotheses, methods and approaches are chosen to set the focus for the experimentation.
3. **Experimentation planning** stage starts with explicating the main hypothesis. The methods for data analysis and gathering are selected to allow proving or disproving the hypothesis. Also, the methods set the requirements for experimentation setting and instrumentation, and therefore allow defining what needs to be implemented.
4. **Realization of the setting** stage produces the concrete experimentation setting, i.e. networks, prototypes, software and other instruments that are needed to carry out the experimentation.
5. **Experimentation** stage means carrying out the experimentation plan. In this stage, the experimentation data is gathered. Experimentation requires careful application of the methods and execution of the plan, in order maintain validity.
6. **Organizing and analysis of the data** means first structuring the data from the experimentation stage, and then applying the chosen analysis methods to produce results that validate or invalidate the hypothesis.

Experimentations in real world environments allow discovering and analysis of complex relationships, implications and interoperability issues. Innovation prototyping methodology is experimentation-driven, due to focusing on common denominators and analyzing the problem, instead of producing product prototypes.

To maintain consistency and coherency through whole experimentation cycle, and to ensure transparency, explication and persistence of information, all the generated information is stored in SSUR models.

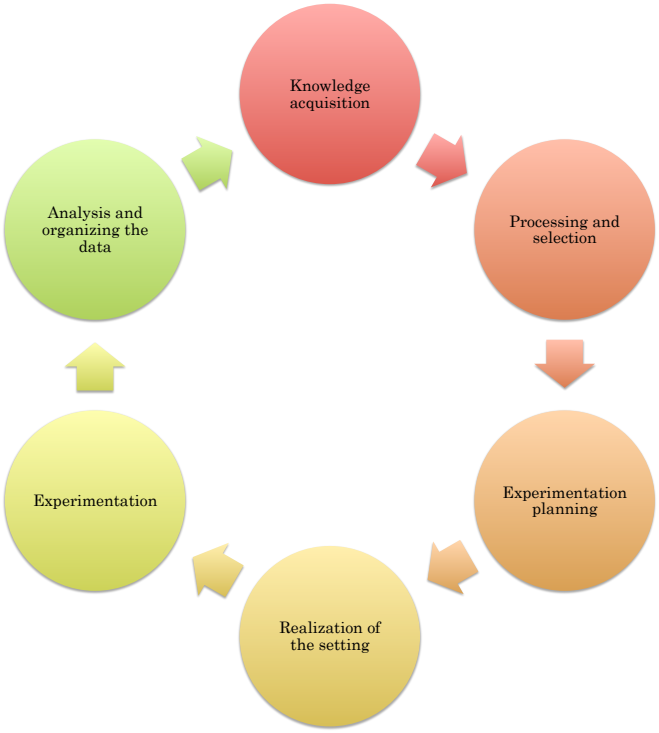

Figure 1 – Experimentation cycle

SSUR models

SSUR consists of four distinct models, i.e., scenario, service, use case and realization. Each model has a different purpose, and they are targeted at analysis and brokering of different aspects needed in Innovation prototyping.

1. **Scenario** explicates the real life manifestations of the service. Scenarios contain information on situations in which the users utilize the service. Scenarios are written in colloquial language and in narrative form.
2. **Service** describes the profit model, stakeholders and contracts needed to provide a ubicomp service to consumers.
3. **Use case** describes the interfaces between the constituents of the service, which can be humans, companies, systems etc. Ubicomp services are typically not monolithic entities, but rather systems of systems. Use cases explicate what information is transferred between the constituents, instead of describing a protocol or the transmission process. Use cases ultimately explicate the semantics of the transferred information. Use cases act as handles to the enablers that allow a ubicomp service to be created.
4. **Realization** model explicates the experimentation setting, selected data gathering, organization and analysis methods and the hypothesis.

Ubicomp requires advanced technology, but the point is in how the user perceives the ubicomp service. Ubicomp does not itself define any specific set of technologies that can be utilized in the creation of the service.

In Innovation prototyping methodology, a service is designed just to prove common denominators of the ubicomp services and properties of the enablers. Designing and carrying out valid experimentations is the goal of the whole methodology. Instead of creating just one product, Innovation prototyping produces knowledge that can be used to create completely new types of services and understanding all the consequences of ubicomp.

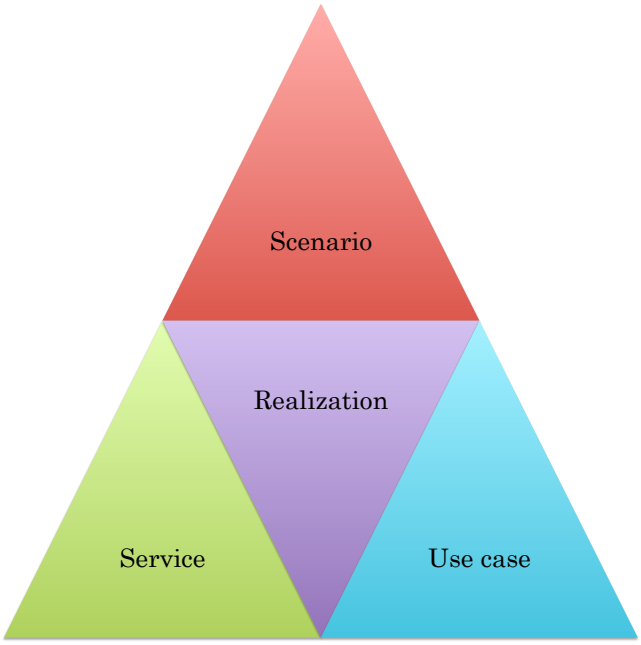

Figure 2 – SSUR models

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