Service Engineering and Design Support System for High Creativity

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It is well known nowadays that mass-production of artifacts does not link directly to happiness of human beings. Society, however, cannot get out from the paradigm of mass-production. The mission of engineering needs to be reformulated. Under this context, an objective of the "artifactual engineering"[1)] is the investigation of a new style of engineering, which would increase directly the happiness of mankind and our environment. A key of "artifactual engineering" is design of artifacts as devices to transfer, supply and amplify services. In the past engineering activities we focused only on the function of artifacts, but from now on we design consumers' satisfaction rather than designers' interests. "Service engineering" is an engineering technique to yield increased value and satisfaction by providing services as defined in Fig. 1; it is also leading to a cost reduction, useful not only for service sectors, but also to the manufacturing sectors as a method to increase added-value.

We have proposed a "service CAD" called Service Explorer, which gives an aid for engineers in the design procedure of service. The purpose of the CAD is to serve as a design environment for the development of a service that would be difficult to develop with the designer's knowledge alone. This CAD system supports designers by storing knowledge about existing service designs in its database and applying various operation rules of service design.

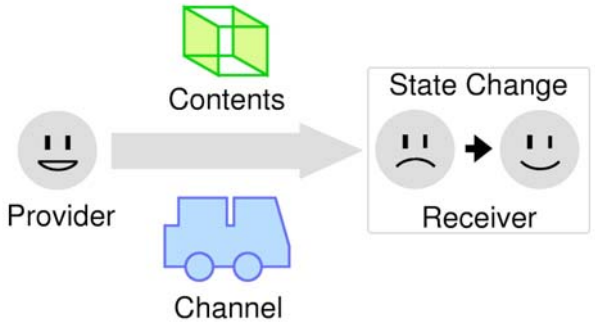

Fig. 1 Definition of a service

A novel CAD system is implemented to describe the relationships among various agents whose parameters are evaluated. To realize this system, a method for creative design is introduced using dynamically integrated knowledge in different design domains. We argue that abduction for integrating theories can be a basic principle to formalize such design processes. Based on this principle, Prof. Shimomura and his research group have proposed "Universal Abduction Studio," a design environment in which designers combine different theories to arrive at better design. In this new approach to computational support of conceptual design, the system should offer various types of abductive reasoning from which designers can select an interesting design method.

Keywords: Service Engineering, Service CAD, Design Methodology, Abduction

References

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