

Project Summary

In this Science of Design (SoD) project, we propose to design and implement a new testbed called “SoDeT” (Science of Design empirical Testbed), which will be based upon the Hackystat Framework. SoDeT will enable researchers to attach software “sensors” which capture process and/or product data to the tools used by participants evaluating the SoD design innovations. The testbed will be designed to facilitate empirical research by individual Science of Design projects, as well as facilitate new research opportunities in which multiple tools or techniques are combined together and measured to see if positive or negative interactions occur.

The SoDeT project is organized into six phases: (1) Detailed feasibility analysis, (2) Testbed kickoff, (3) Testbed implementation and enhancement, (4) Trial adoption, (5) Testbed deployment, and (6) Testbed findings. The goal of this project structure is to maximize the potential benefits and minimize the testbed adoption overhead for both individual SoD projects and the program as a whole.

The intellectual merit of this research includes the application of novel data gathering and analysis techniques for development of standardized, comparable ways to operationalize the empirical measurement of design characteristics produced by individual SoD projects. A preliminary feasibility analysis indicates that the SoDeT approach may be appropriate for a significant number of existing SoD projects. SoDeT is intended to reduce the cost to individual researchers of data collection and analysis. Finally, the testbed will enable practical measurement in industrial contexts as the design innovations produced by this program move into real-world settings.

The broader impact of this research includes the development of a sophisticated, freely available, open source software system for use by researchers and practitioners to measure design characteristics, and its availability for use in educational settings. As the University of Hawaii is a university with 75% minority students in an EPSCOR state, this project will provide novel research opportunities to underrepresented groups.