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Book review

Improvizational design
Suguru Ishizaki; MIT Press, Cambridge, MA, 2003, ISBN 0-262-09035-X

Motivated by the lack of models and languages for visual designs to address design solutions that continuously change over time, Suguru Ishizaki proposes a common model for designing dynamic information. Such a design embodies harmonious and complex interactions of design parameters, analogous to the three-dimensional colour model (hue, value and chroma). The author identifies three characteristics unique to digital communication:

- dynamic changes in information (such as a traffic information system updated over time);
- dynamic changes in the information recipient's intention (such as a news system learning the viewer's interest over time); and
- the capability of temporal presentation (such as a gradual colour shift conveying complex emotional quality).

These characteristics are indeed found in multimedia presentations, Web systems, and more recently emerging mobile user interfaces. Designing such a digital communication system to adequately address these dynamic issues is a challenge. The first characteristic can arguably be designed by human designers. The second and third characteristics would be difficult for human designers to design without the assistance of automated intelligence. Ishizaki distinguishes this work from previous design systems by focusing primarily on a theory of design rather than on a software architecture for generating design solutions automatically.

In this book, Ishizaki envisages that a design system ought to be used when and only when human designers cannot perform designing, and may change its expression based on the emotional state of the information recipient at the time of the interaction. The author argues that it is important to create a design that continuously adapts in response to the dynamic changes in information content and the information recipient's intention. In the proposed model of improvizational design, a design solution is considered a performance consisting of a number of design agents (like performers in a dance troupe). Each design agent is responsible for its own role in the design, and responsive to the change in its environmental context. The collaboration of all the design agents results in a design solution.

The book describes in detail five case studies on design solutions that were developed with the model of improvizational design and characterized with the

multi-agent distributed processing. Various temporal forms are extensively used, such as stretch, grow and fly actions of words and phrases over a period of time. The five case studies are: dynamic news display, email display, interactive poetry, geographical information display, and expressive typography, of which we will summarize two in the following.

The email display case study discusses the design of a visual interface for a typical email system. The design attempts to make the system playful with a sense of life, by associating dancing texts and defocused texts with actions of email handling. Such effects are achieved independently by designated agents. This case study also demonstrates collaborative behaviours of design agents, orchestrated by a leader agent, in creating a sequence of email presentations.

The case study, interactive poetry, is a more artistic design. A poem is presented slowly word by word with typographic changes in an attempt to convey the original poetic message and its sense. The words in the poem are represented and controlled by groups of agents and each agent is responsible for a character. The poem is played like a theatrical performance such that the words are like groups of dancers and each dancer has its own show time.

In the later two chapters, the author compares the traditional design with dynamic digital design and argues how temporal forms can be used to describe dynamic solutions and why design strategies may evolve over time so that a design tool is necessary. Similar to any traditional design methods, the proposed digital design model recommends the test of a design solution against realistic situations as comprehensively as possible, as it does not guarantee that design failures can be avoided.

In exploring a framework for developing computational design systems, Ishizaki prefers not to use the term "automatic" that may mislead readers to think of mass production of average-quality products. Instead, individual characteristic designs are emphasized when using such computational design systems. Ishizaki envisages four channels of communication in such a design system: information content channel, design channel conveying designer's specifications, feedback channel interacting with the reader, and output channel that presents design solutions.

The proposed architecture of design systems resembles that of visual language generation systems at a more abstract level. A design building tool is a programmable meta-tool that can be used to generate a solution to a particular class of design problems. The set of criteria for the development of design systems (perhaps except the last criterion) is also applicable to the development of visual language generation systems and human–computer interfaces in general:

- Expressivity—being able to communicate a rich range of dynamic design solutions.
- Programmability—allowing design specifications to be easily and naturally encoded.
- Predictability—demonstrating clear correspondence between the designer's intention and solutions.
- Normative independence—not imposing significant evaluative design decisions based on some general guidelines.

Finally, Ishizaki briefly reviews and compares the model of improvizational design with some other design approaches, including formal languages such as APT (Mackinlay, 1986), grammatical models such as that of Weitzman and Wittenburg (1994), and design by examples (Lieberman, 1993). Different from any visual languages, the model of improvizational design does not impose a general grammar or semantics but rather provides a meta-language for describing dynamic design solutions. Ultimately the goal of the design is different from that of automation. As Ishizaki stated in the final remarks: "I have tried to develop the model of improvizational design so that it does not compromise the richness of design for merely technological reasons".

The book is a vastly updated version of Ishizaki's Ph.D. thesis from MIT in 1992. Although some newly emerging technological design forms are not discussed, for example, the interface design of mobile devices such as PDAs, the book is generally thought-provoking with many interesting ideas that are applicable to any of such new forms. The design model and ideas would certainly benefit modern digital designers, human–machine interaction researchers, visual and diagrammatic language designers, and authors of multimedia presentations, just to name a few.

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