Faculty of Design

2023

Anatomy of System Notations: A comprehensive inventory of graphical devices

Stoyko, Peter

Relating Systems Thinking and Design
(RSD12) Symposium | October 6–20, 2023

Anatomy of System Notations: A Comprehensive Inventory of Graphical Devices

Peter Stoyko

System graphical notations are standardised shorthands for diagramming systems. Most take the form of node-and-link diagrams (hypergraphs), stacks, and spatial-map encodings. These graphical notations remain in widespread use but have not evolved significantly over the last thirty years. That plateauing is conspicuous given the many advancements in other forms of system visualisation and systems thinking in general. The Pattern Atlas of System Vulnerabilities was presented at RSD11. That work included a poster itemising 30 forms of problematic system entanglement. The new exhibit presents subsequent work that attempts to visually disentangle complex interactions within and between systems. A poster itemises and illustrates the various graphical devices used in system graphical notations. In a sense, this would be an anatomy chart of system notations in all their diversity. The poster identifies which forms work better, which are dysfunctional, and which are innovations that have been under-used (or otherwise neglected). Those insights provide a stepping stone to the creation of updated notations, ideally, ones better suited to our era in which multi-media maps are overtaking static ones. Those insights would also suggest good practices for those who integrate system notations into other forms of graphics, such as infographics, gigamaps, and synthesis maps. A narrated video (motion graphic) would provide context for the project's aims and guide viewers through the poster.

KEYWORDS: system visualisation, graphical notations, system mapping, system modelling

RSD TOPIC(S): Mapping & Modelling

Exhibit description

System graphical notations are standardised shorthands for diagramming systems. Most take the form of node-and-link diagrams (hypergraphs), stacks, and spatial-map encodings. General-purpose notations can be applied to any sort of system and include Petri nets, flow charts, and causal loop diagrams. Specialist notations include more elaborate encodings of discipline-specific system elements and include Systems Biology Graphical Notation (SBGN), Business Process Modelling Notation (BPMN), and various engineering drawing notations. System graphical notations remain in widespread use but have not evolved significantly over the last thirty years. That plateauing is conspicuous given the many advancements in other forms of system visualisation and systems thinking in general.

The award-winning SystemViz Project is an ongoing research and design project intended to advance the visualisation of systems. The Pattern Atlas of System Vulnerabilities was presented at RSD11. It itemised 30 forms of problematic system entanglement. Subsequent work is about finding ways to visually disentangle complex interactions within and between systems. The first step in that direction is the creation of an information design framework for evaluating systems diagrams (called Escalade), which was presented at the IIID VisionPlus Conference in May. The second step is the creation of a comprehensive inventory of graphical devices used in various notations. For example, what forms do link lines take across the various notations? What are the various ways line-ends are encoded? How are labels attached to lines? A comprehensive inventory of all these devices would help identify which forms work better, which are dysfunctional, and which are under-used innovations. This would provide a stepping stone to the creation of updated notations, ideally, ones better suited to our era in which multi-media maps are overtaking static ones. It would also offer good practices to those who integrate system notations into other forms of graphics, such as infographics, gigamaps, and synthesis maps.

The exhibit presents a poster that itemises and illustrates the various graphical devices used in system graphical notations. In a sense, this would be an anatomy chart of system notations in all their diversity. A narrated video (motion graphic) provides context for the project's aims and guides viewers through the poster.

Author

Peter Stoyko, Interdisciplinary Social Scientist and Information Designer, The SystemViz Project. www.systemviz.com | peter.stoyko@elanica.com

Related contributions to RSD