A Flow Visualization Practionary

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Overview

My papers Triple System Analysis (3SA) and Adaptive Analysis ( ) explain how to use multi-level knowledge graphs for system analysis. A Flow Visualization Practionary ( ) uses the combined material/data flow model from , simplifies the symbols, and shows how to create interactive models and narrative documents like from the ground up. Review 3SA and before reading further.

Semiotics

Humans can consider roughly 3 classes of objects related in one dimension, which can be seen as players, tools, and teams towards various goals (Tomasello et al. 2005). We have limits on how much information we can consider in real-time to make decisions (Zheng and Meister 2025). Semiotics are cognitive shortcuts that can help. I use icons for 3SA , , and , rather than titles, to make it clear that I mean the idea of the entire paper. I use other conventions in the model that help the reader understand complex systems without dense dialog. Charles Peirce developed more sophisticated versions of these ideas, and the title of this paper is an homage to Michael K. Bergman, a follower of his (Bergman 2018).

Fig. 1 Shows the complete set of symbols. It is a top level hybrid material and data flow. The rounded blue boxes are transformations of data or materials. The teal boxes are agents that are the sources or sinks of data or materials. The reddish-brown boxes store data or materials at rest. Each symbol is a node that is connected with other nodes, and is called a graph. Besides color and node shape, dotted lines within the node represent data. Solid lines represent materials. As I explained in , data flow diagrams are behind agents that operate transforms. This is why I think it is OK to mix the nodes, as most of the function is behind the screens, the black box of the device or report that assists the transform. Magenta dots in the corner of a transform/process node mean you can zoom in to it by clicking. An orange dot means you can hover for notes and narrative. I will not bog this paper down in the philosophy or ideas and repeat and 3SA ; however, semiotics is a critical part of enabling humans to comprehend complex systems without servers, administrators, or experts. (H. 2023) (H. 2024).

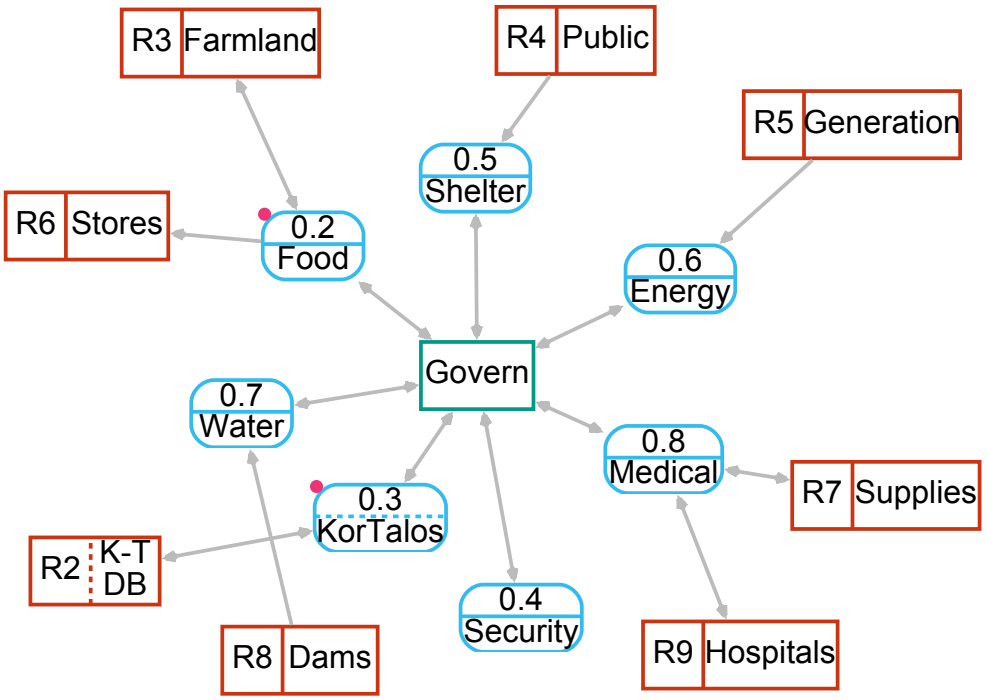

Figure 1: Top

First Graph

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