

Categorical Information Theory

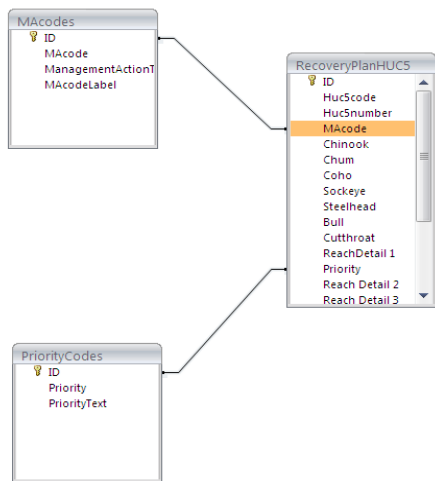


Figure 1. Database schema relating different tables.

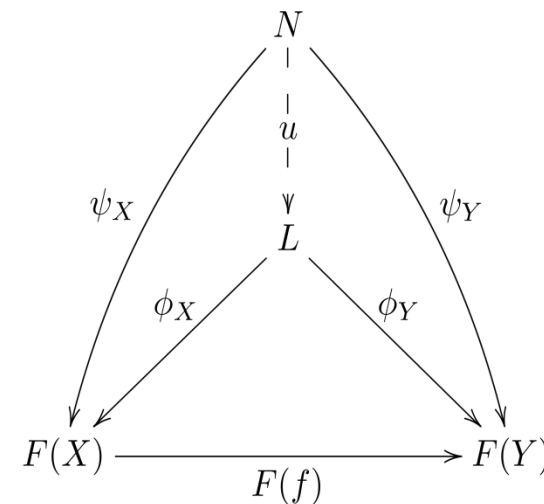
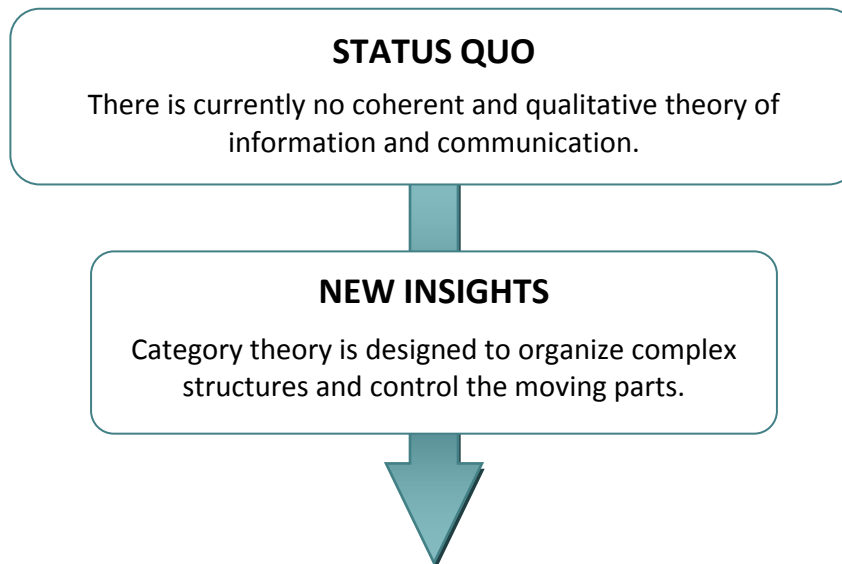


Figure 2. Diagram comparing objects in different categories.

Complex systems have a pressing need to process information efficiently, and the Navy is no exception. A group only functions as a unit when all the parts are in good communication. Data from one part of the structure needs to be transferable to and understandable by other parts. Short-term solutions, such as creating links between data sets in an ad hoc manner, will inevitably fail as the system evolves and becomes more complex.

Needed is a more encompassing and foundational viewpoint about how information should be modeled. Category theory not only provides this foundation, it is a powerful tool for organizing information in a way that is flexible, transferable, and scalable.

QUALITATIVE IMPACT

Working within the category-theoretic model of information will make the Navy more efficient and accurate when processing and communicating information, both internally and externally.

END OF PHASE GOAL

To present a categorical relationship between databases and ontologies, and to formulate a protocol for communication between disparate entities in terms of their respective ontologies.

Category theory provides a base for reliable information and efficient communication.