

**A framework for the explicit use of specific systems
thinking methodologies in data-driven decision
support system development**

by

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ABSTRACT

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Data-driven decision support systems, such as data warehouses, are extremely costly to develop. Forty one per cent of data warehouse development practitioners have experienced project failures. These projects were either completed after exceeding budget and time limits, or not at all. Some influential data warehousing authors advocate user involvement as a solution, while others focus on technical factors to improve data warehouse success. This study proposes a framework for data warehousing success based on systems thinking methodology.

Systems thinking implies a holistic approach to problem solving. A system is a set of interrelated elements. A systems approach represents a broad view, taking all aspects into account and concentrating on interactions between different parts of the problem. This study investigates the practices of data warehousing professionals from a systems thinking point of view, before proposing a framework for the explicit use of specific systems thinking methodologies in data warehouse development.

Interpretive case study research is used to investigate practices of data warehousing professionals in three different organisations. Pattern matching is used to analyse collected data. This is done by mapping practices to different systems thinking perspectives. However, the theory component of the thesis is not a description of current data warehousing practices from a systems thinking point of view, as in typical interpretive research. The theory component relates more to critical research in that it is meant to change data warehousing practices towards specific systems thinking methodologies.

The proposed framework incorporates three sources of information. These are a literature study on systems thinking philosophy, methodology and practice; a

literature study on data warehousing and data warehousing success factors; and the results of case studies on current practices of data warehousing professionals analysed from a systems thinking perspective. The framework gives a methodological foundation for a holistic approach to data warehousing with maximum user involvement. It views a data warehouse as a system with typical systems characteristics, such as specified objectives relating to the organisation's objectives, an environment, available resources, specified components and effective management.

I declare that

**A framework for the explicit use of specific systems thinking methodologies in
data-driven decision support system development**

is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

R Goede

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