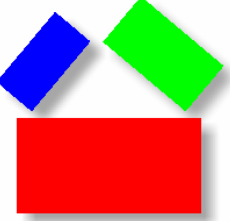


Integrating Marketing Science with Logistics/Supply Chain Management

Edmund W. Schuster

MIT Data Center

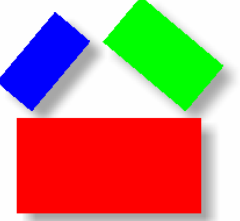
Ching-Huei Tsou, and John R. Williams



Research Interests

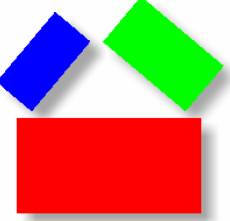
- The Data Center and M Language
- EPCGlobal Network and RFID
- Harvest Analytics
- Production Scheduling Lab
- Achieve for Process Manufacturing





Several Types of Webs

- The Web of Information
HTML and the World Wide Web
- The Web of Things
Linking physical objects together using the EPCGlobal Network and RFID
- The Web of Abstractions
Building a network of mathematical models
Link models together
Link data to models
Computer languages & protocols to create a free flow of models in a network (Internet or Intranet)



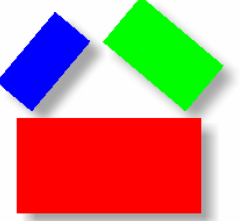
The Future...

Supply chains that sense and respond to the physical world.

This requires an **Intelligent Infrastructure** for management, control, and automation.

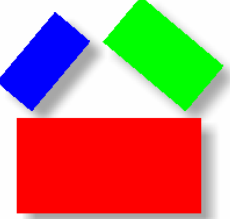
The initial base of the infrastructure is the Electronic Product Code (EPC).

A serial number does not adequately describe an abstraction like a model.



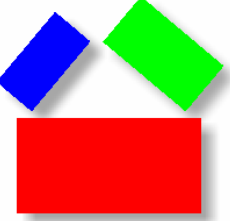
M Language – The Goal

- Building an intelligent network that links models to data
- Translating data at the edge of computing systems
- Internet Search tool that uses the definition of the word
- Various forms of visualization of data through a tangible user interface
- Improve Data quality



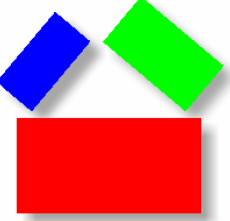
M Language - The Goal (continued)

- Communication of models between computers to create **interoperability**
- Run **distributed** models across the Internet
- Increased model **sharing** and **re-use** of model elements
- Increase the **productivity** of modeling
 - Reduce trial & error
 - Improve mathematical intuition
 - Reduce dependence on literature search
- Redefine the **link** between models and data...and data to data
- Share models across **domains**



Implications for Supply Chain Management

- Supply Chain Management depends on the flow of data for effective management.
- EPCGlobal Network and RFID Technology and other technologies will increase the flow of data.
- Practitioners will need models to interpret data streams
 - Inventory, transportation, warehousing, customer service, purchasing...

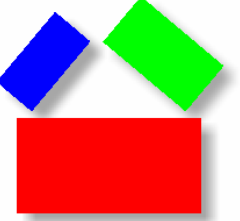


Basic Questions

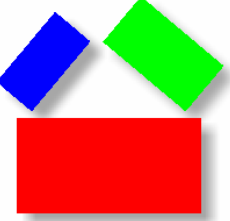
What are the relationships between models?

How are models connected?

In the future, the definition of a model and the sharing of models through a network will become as important as the model itself.

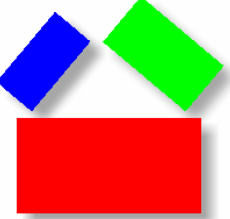


Meaning arises by the way one model is connected or related to other models



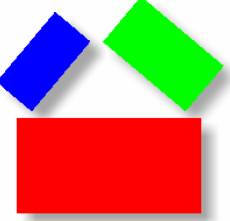
Early Work in the Field

- GEOFFRION, A.M. **1987**. “An Introduction to Structured Modeling.” *Management Science* 33:5.
- GEOFFRION, A.M. **1989**. “The Formal Aspects of Structural Modeling.” *Operations Research* 37:1.
- MUHANNA, W.A. and R.A. PICK. **1994**. “Meta-modeling Concepts and Tools for Model Management: A Systems Approach.” *Management Science* 40:9.



Recent Conceptual Work

- BROCK, D.L. **2000**. “Intelligent Infrastructure – A Method for Networking Physical Objects,” *MIT Smart World Conference*.
- BROCK, D.L. **2003**. “The Data Project – Technologies, Infrastructure and Standards for Distributed Interoperable Modeling and Simulation,” *MIT Data Project Workshop*, September.



Recent Applied Work

- GAZMURI, P and MATURANA, S. **2001**. “Developing and Implementing a Production Planning DSS for CTI Using Structured Modeling.” *Interfaces* 31:4.

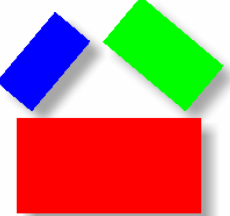
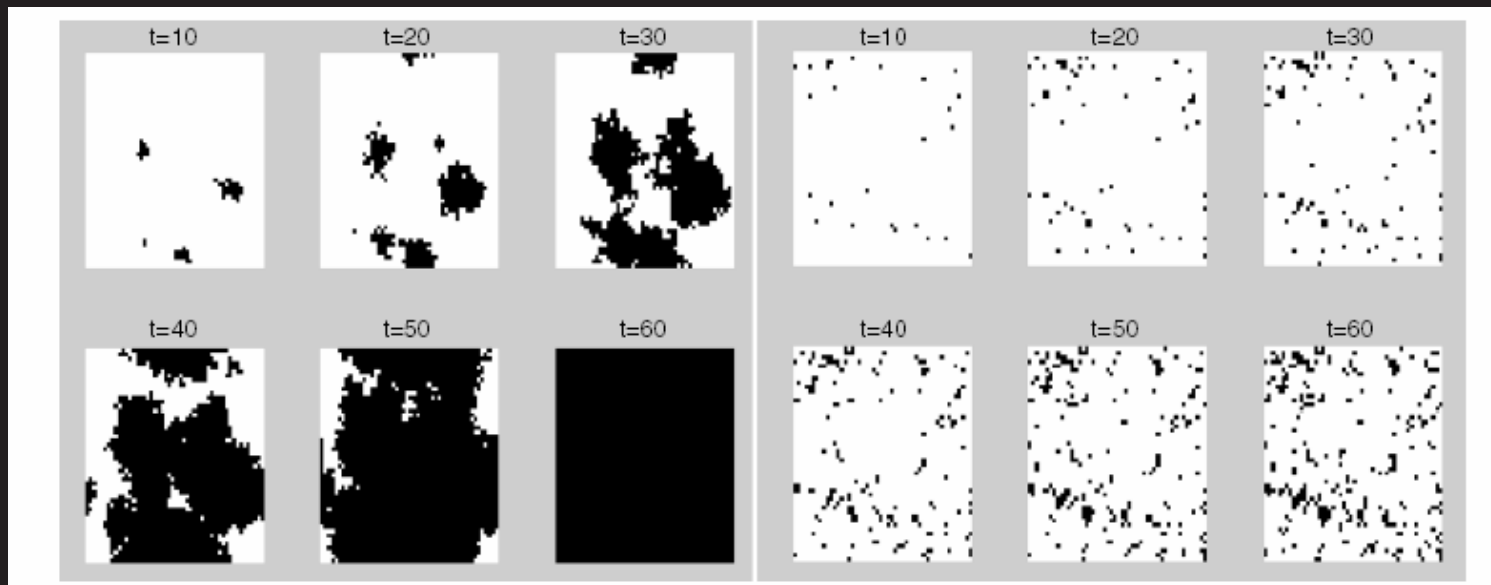
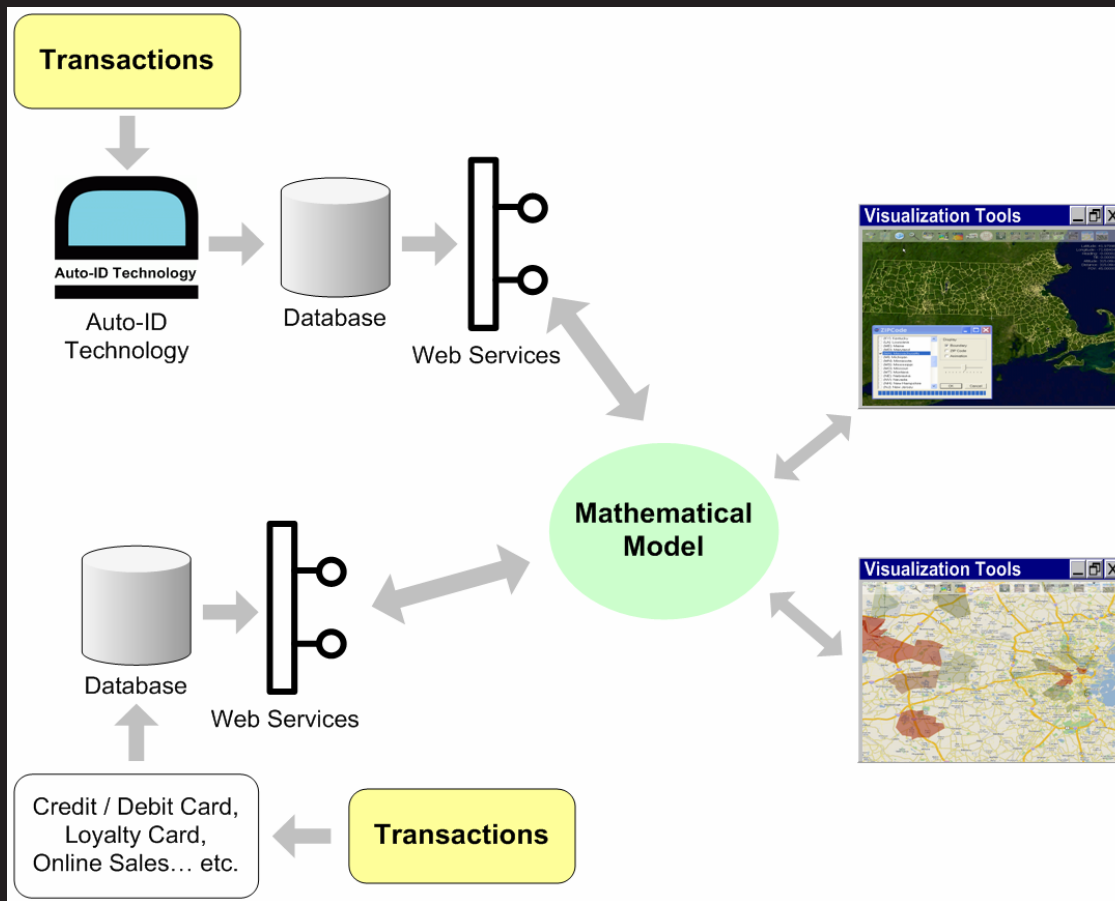
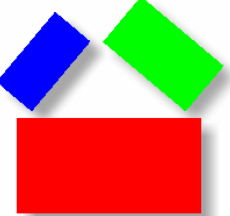


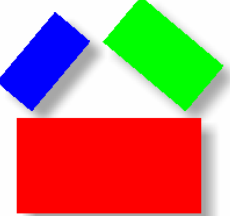
Figure 1 – Successful Introduction

Figure 2 – Unsuccessful Introduction



Garber, Tal, Jacob Goldenberg, Barak Libai, and Eitan Muller (2004), "From Density to Destiny: Using Spatial Dimension of Sales Data for Early Prediction of New Product Success," *Marketing Science*, Vol. 23, No. 3, pp. 419-428.





Allaway, Arthur W., David Berkowitz and Giles D'Souza (2003), "Spatial Diffusion of a New Loyalty Program Through a Retail Market," *Journal of Retailing*, Vol. 79, pp 137 – 151.

