Using Simulation to Explore the Dynamics of Organizational Knowledge

ISDC 2003

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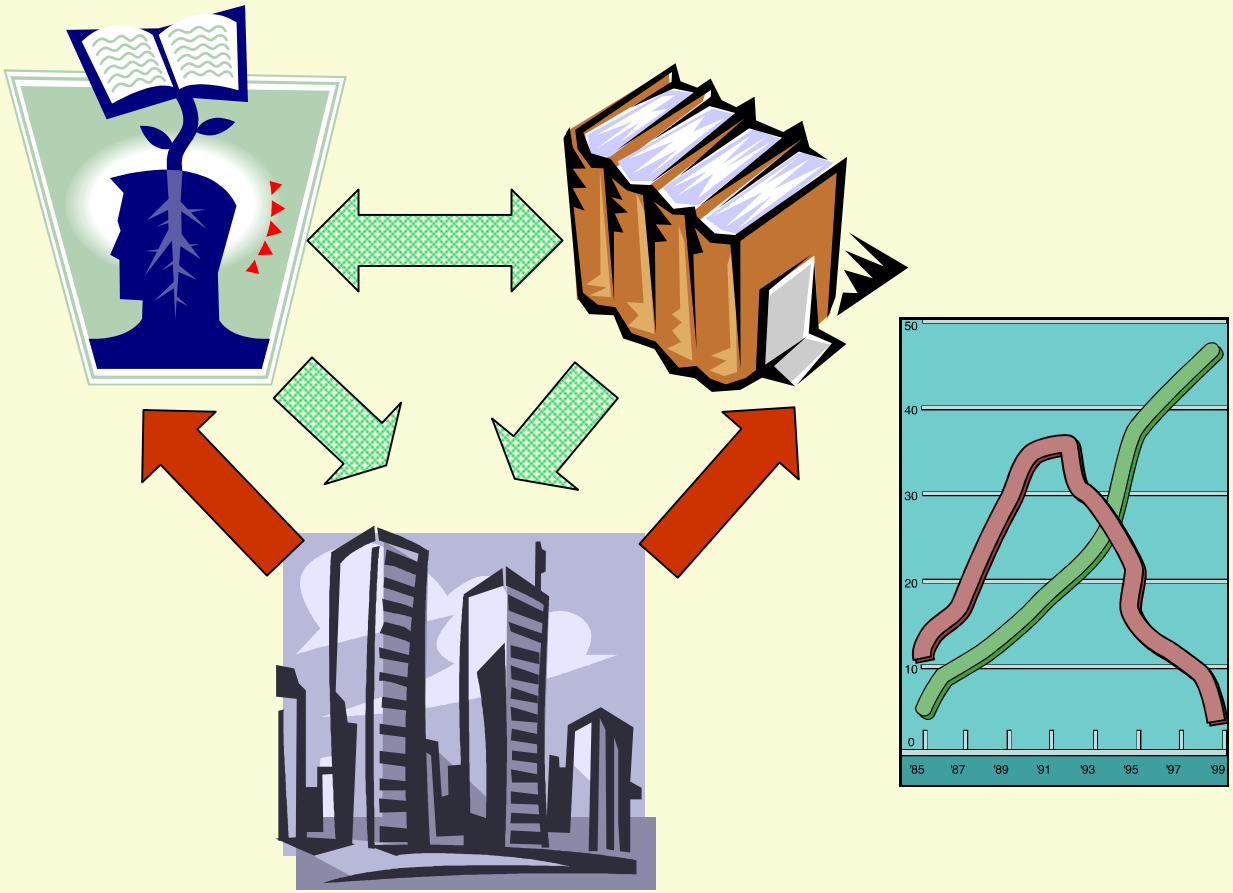
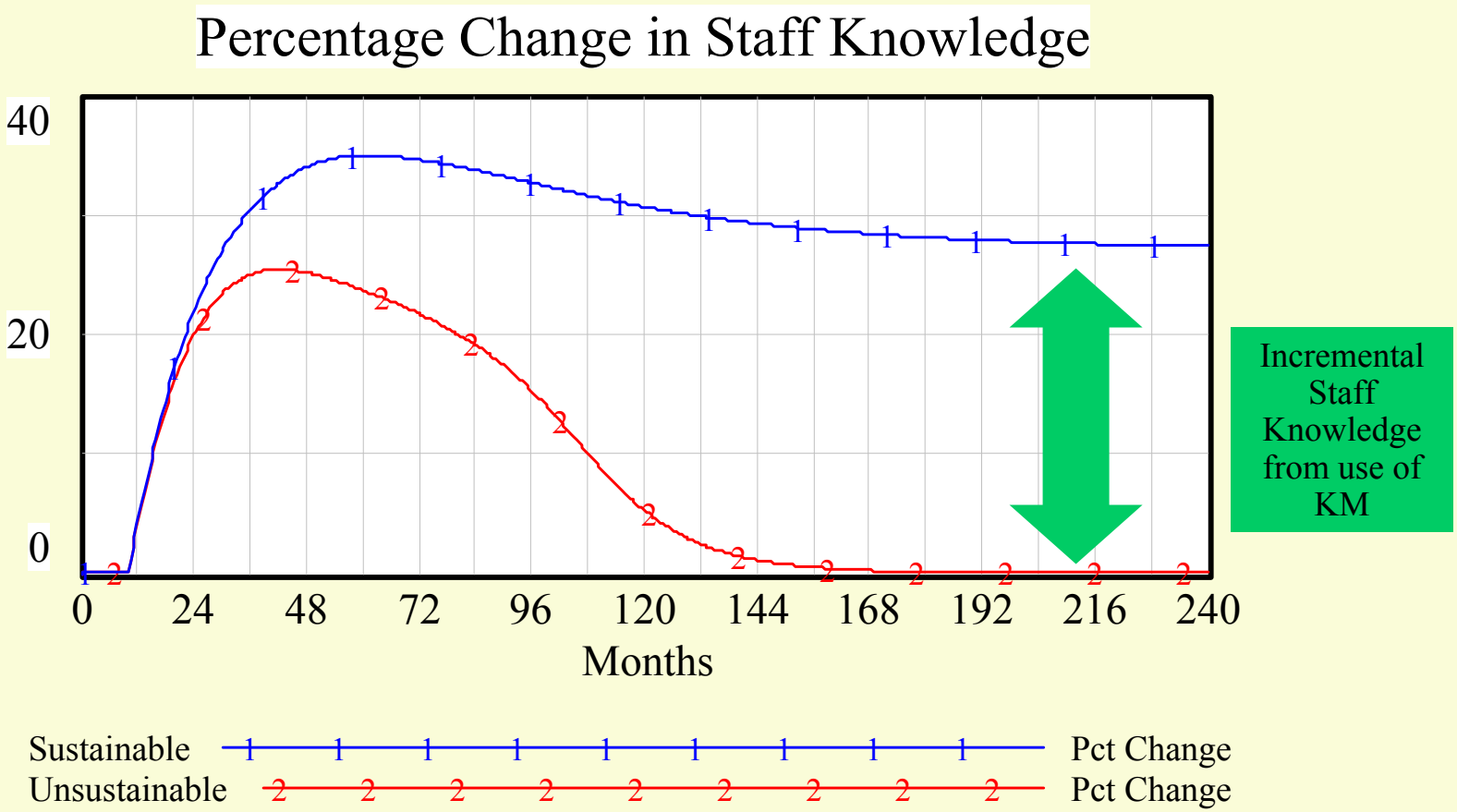
Knowledge Management Dynamics

How does the firm affect KM, and KM affect the firm over time?

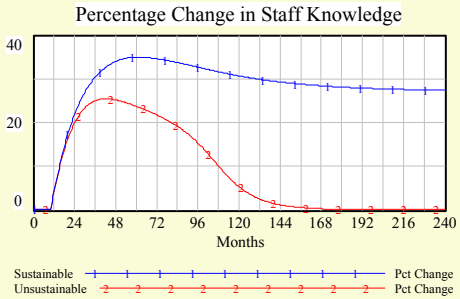


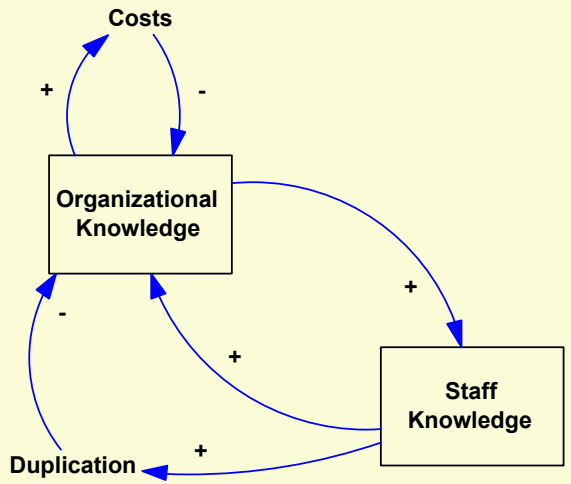
Sustainable or Unsustainable KM?



Elements of a Dynamic Causal Model

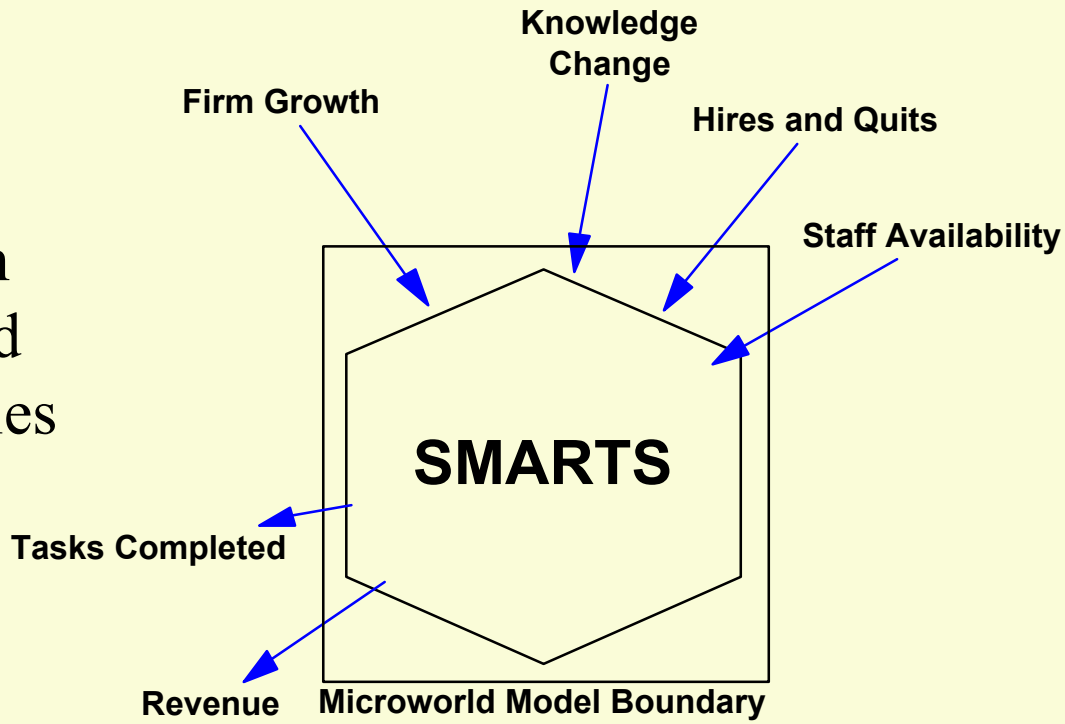
- Knowledge growth and decay from turnover and obsolescence
- Successful knowledge management increases demand for knowledge
- Increasing demand for knowledge increases costs
- Incremental contributions have less value than fundamental ones



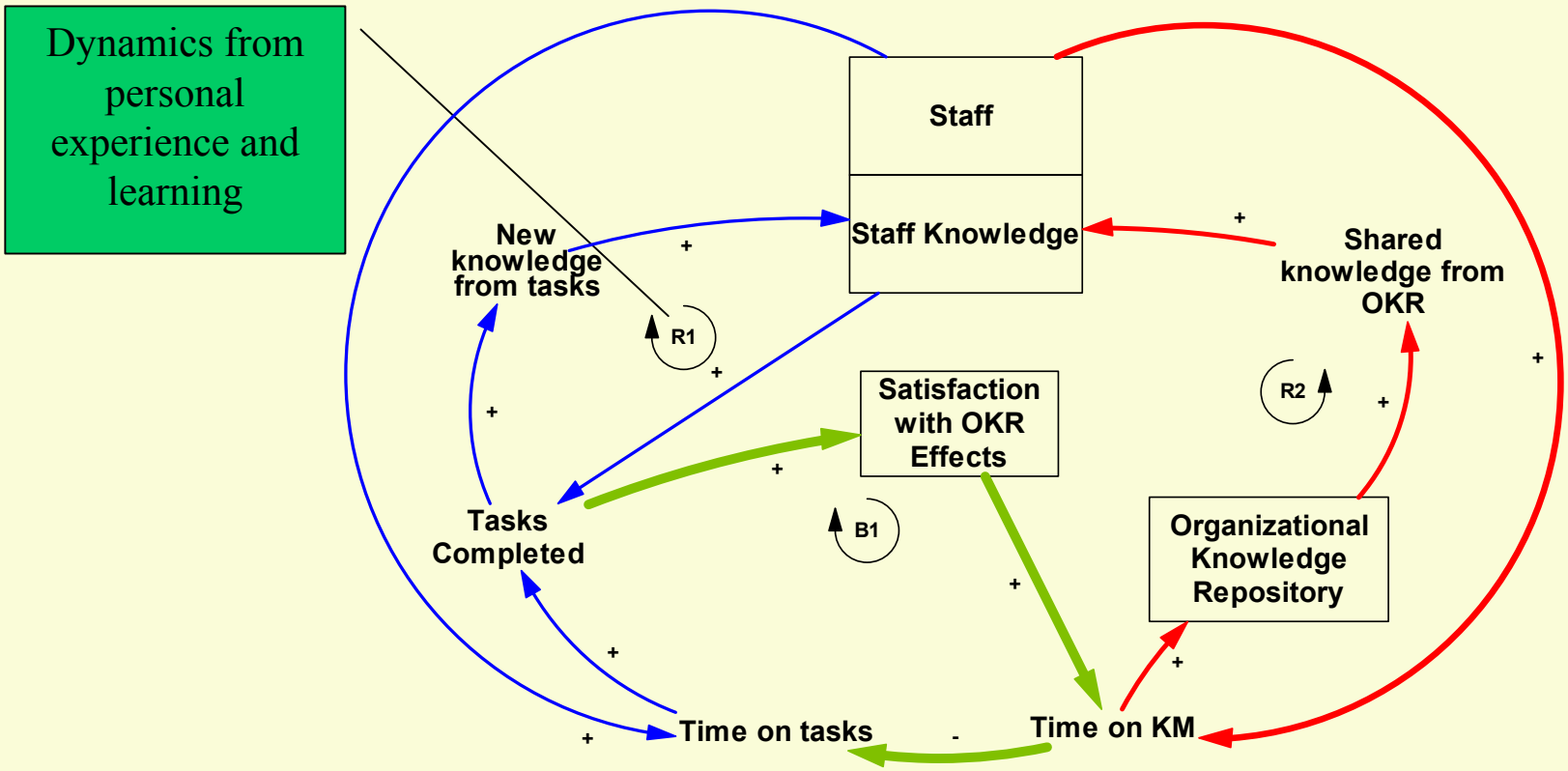


The KNOWLEDGE1 Simulation Model

- Model of knowledge processes of firm with well-defined domain boundaries
- Structures and behaviors from literature and interviews



Causal Model of Knowledge Management



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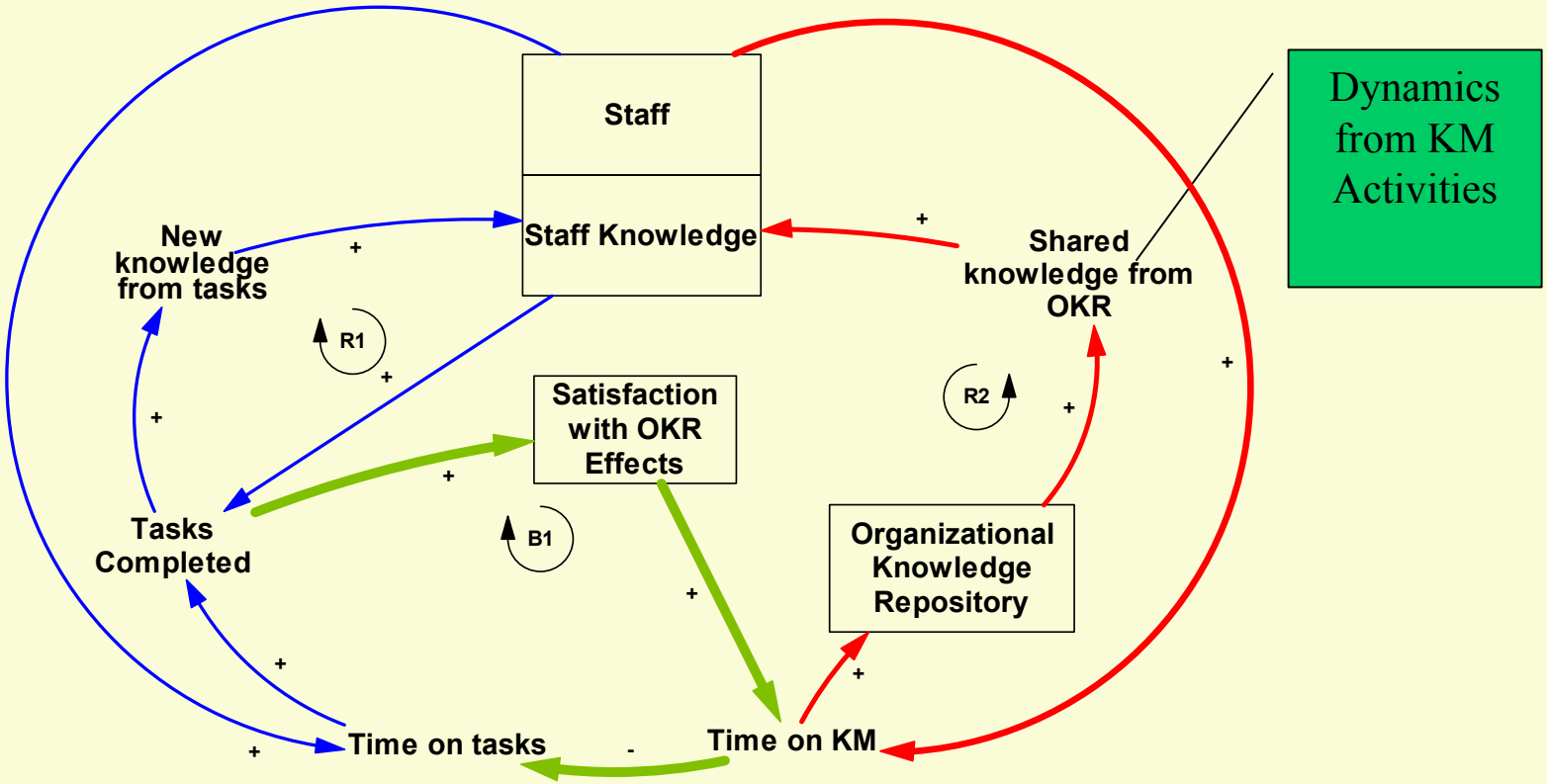

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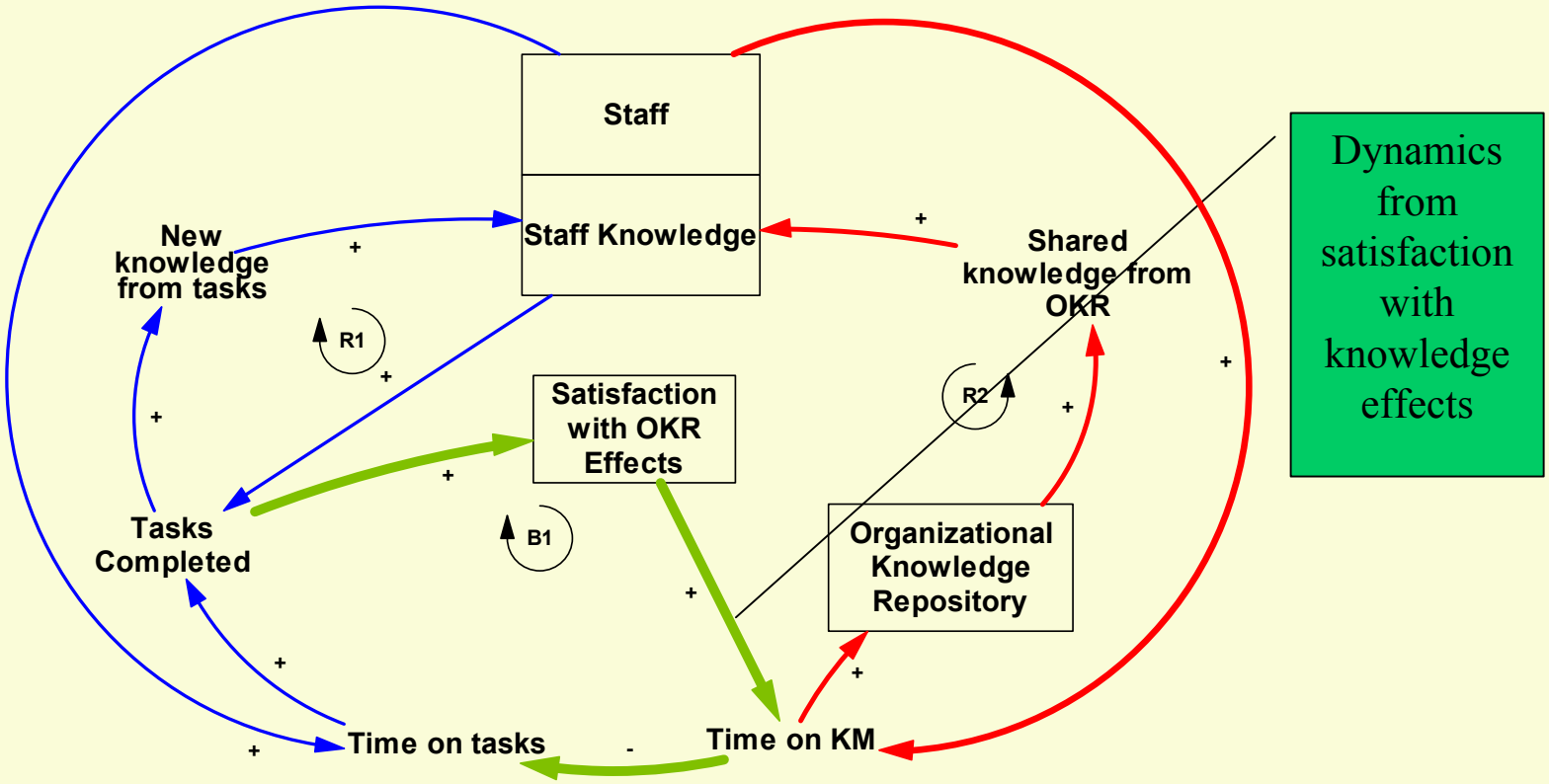
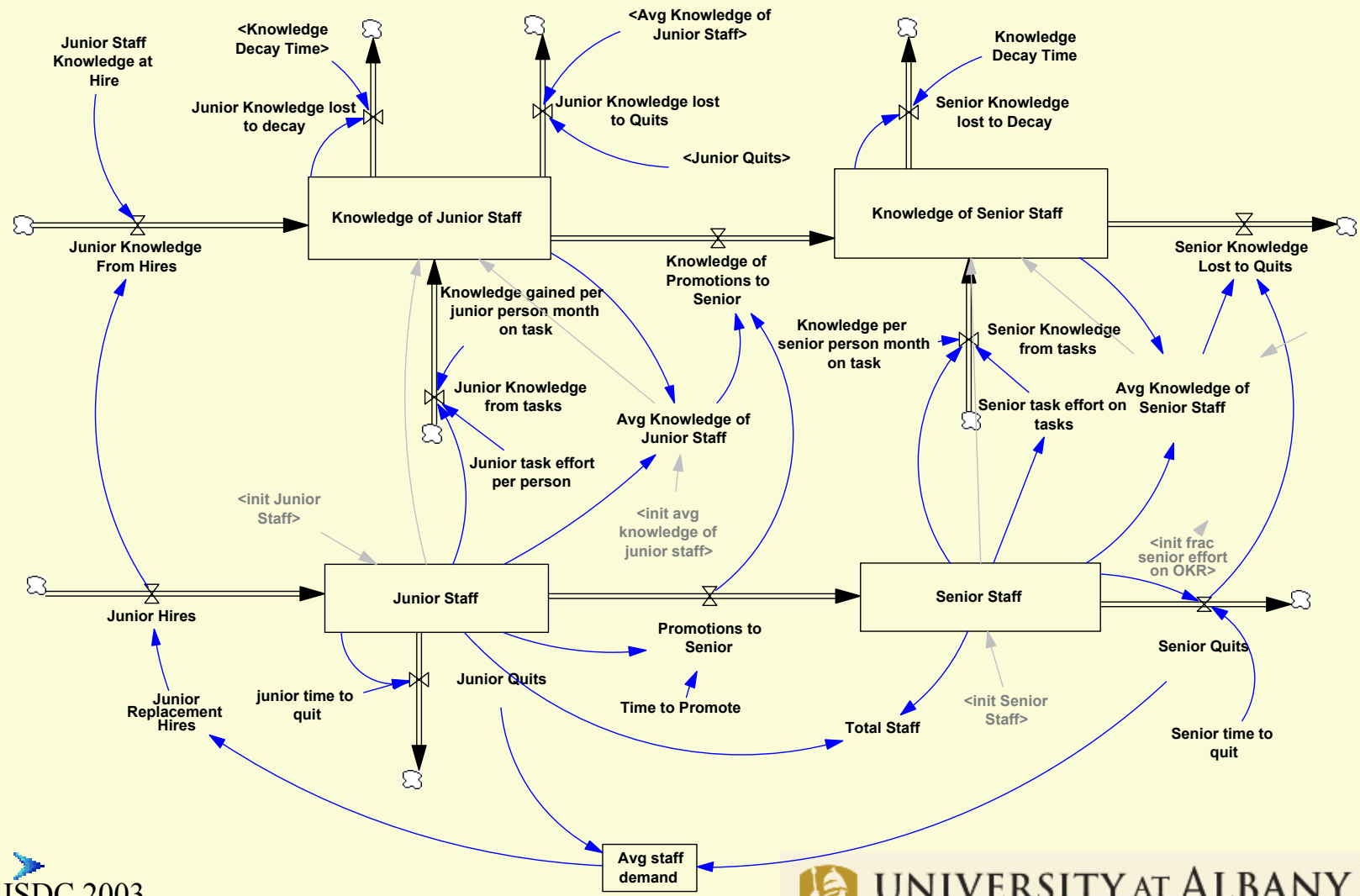


Staff Demand and Aging



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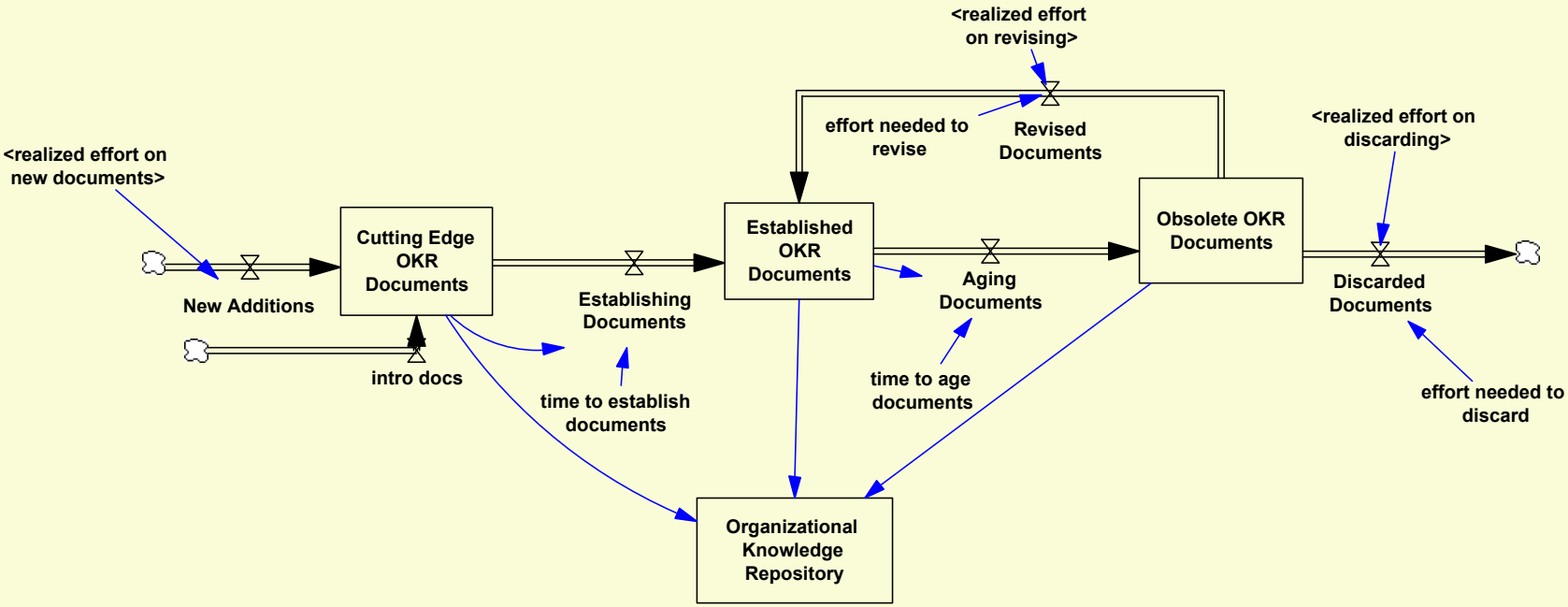
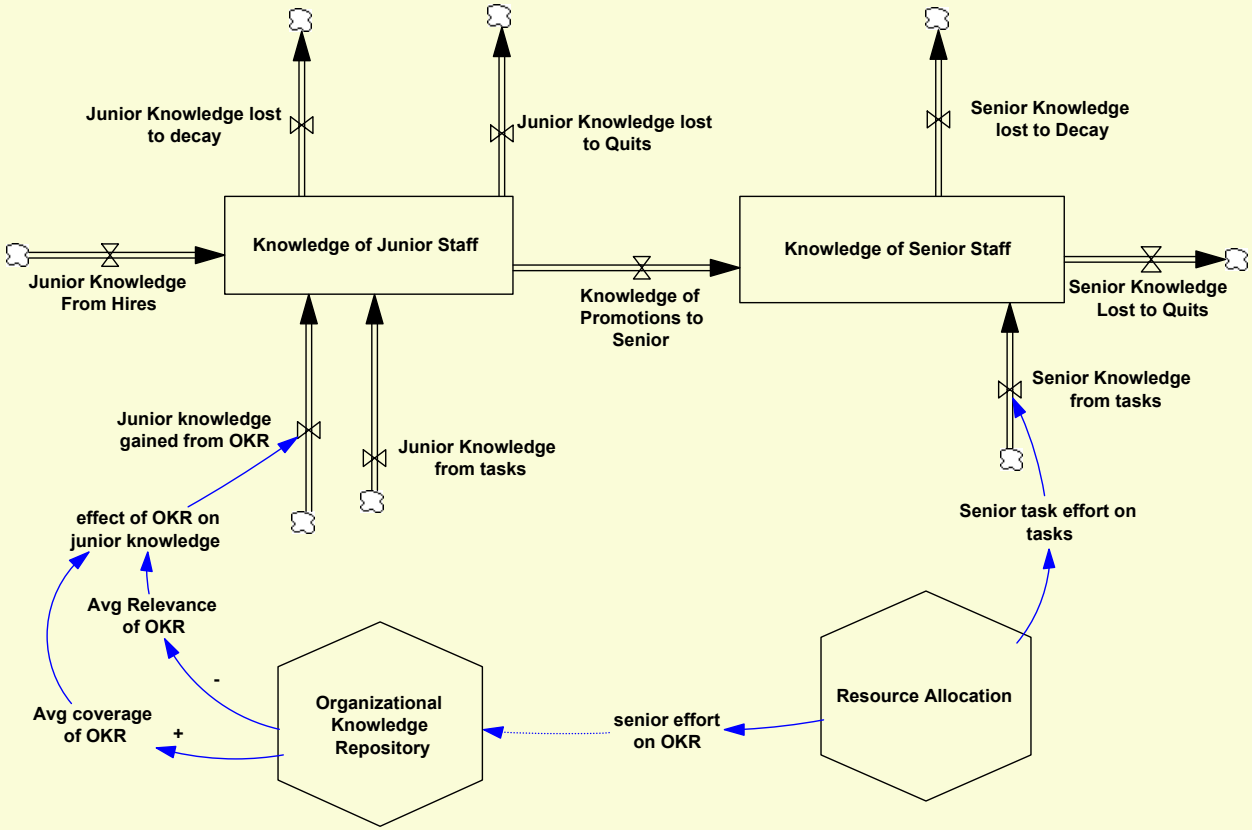
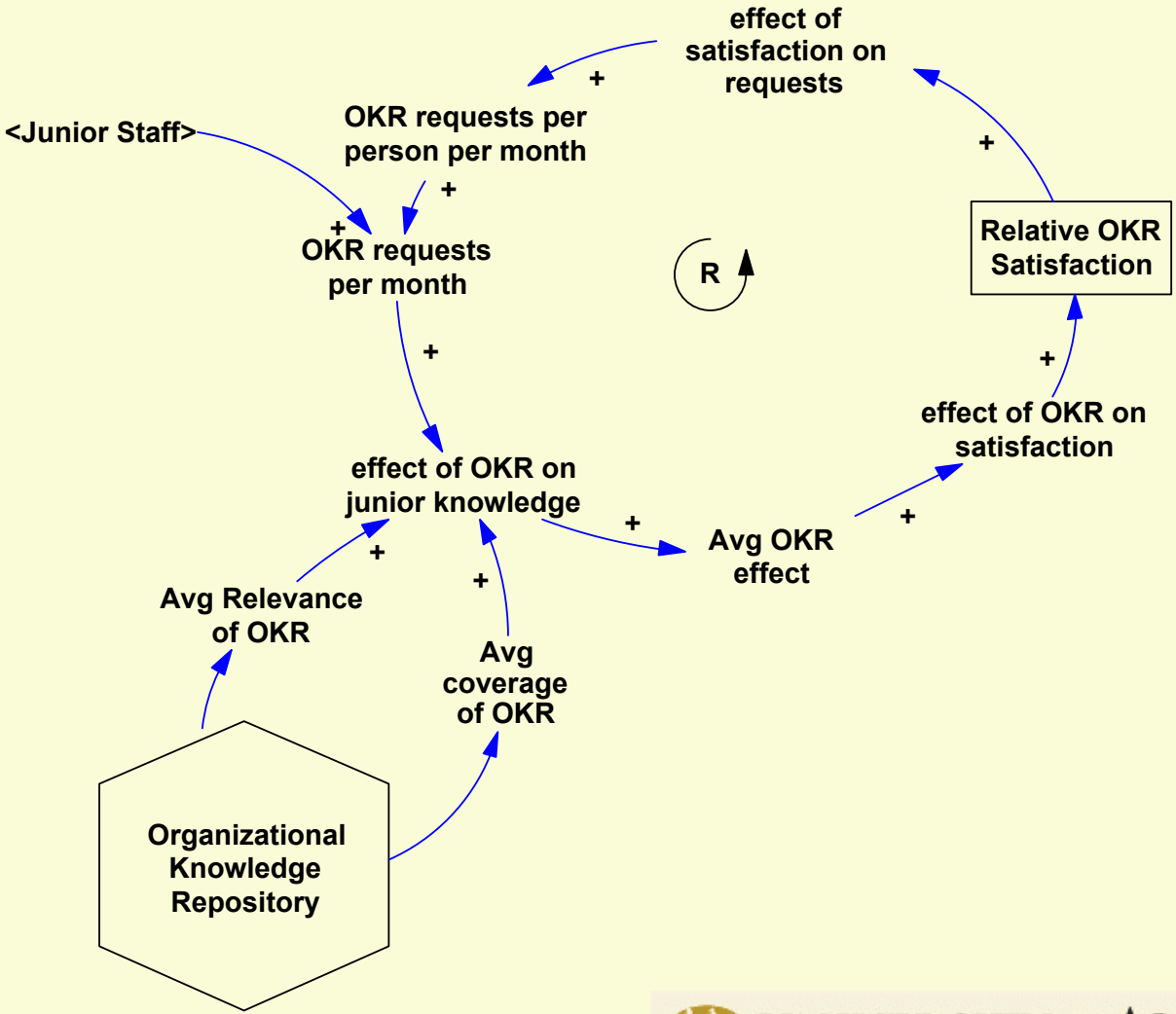
Organizational Knowledge Repository



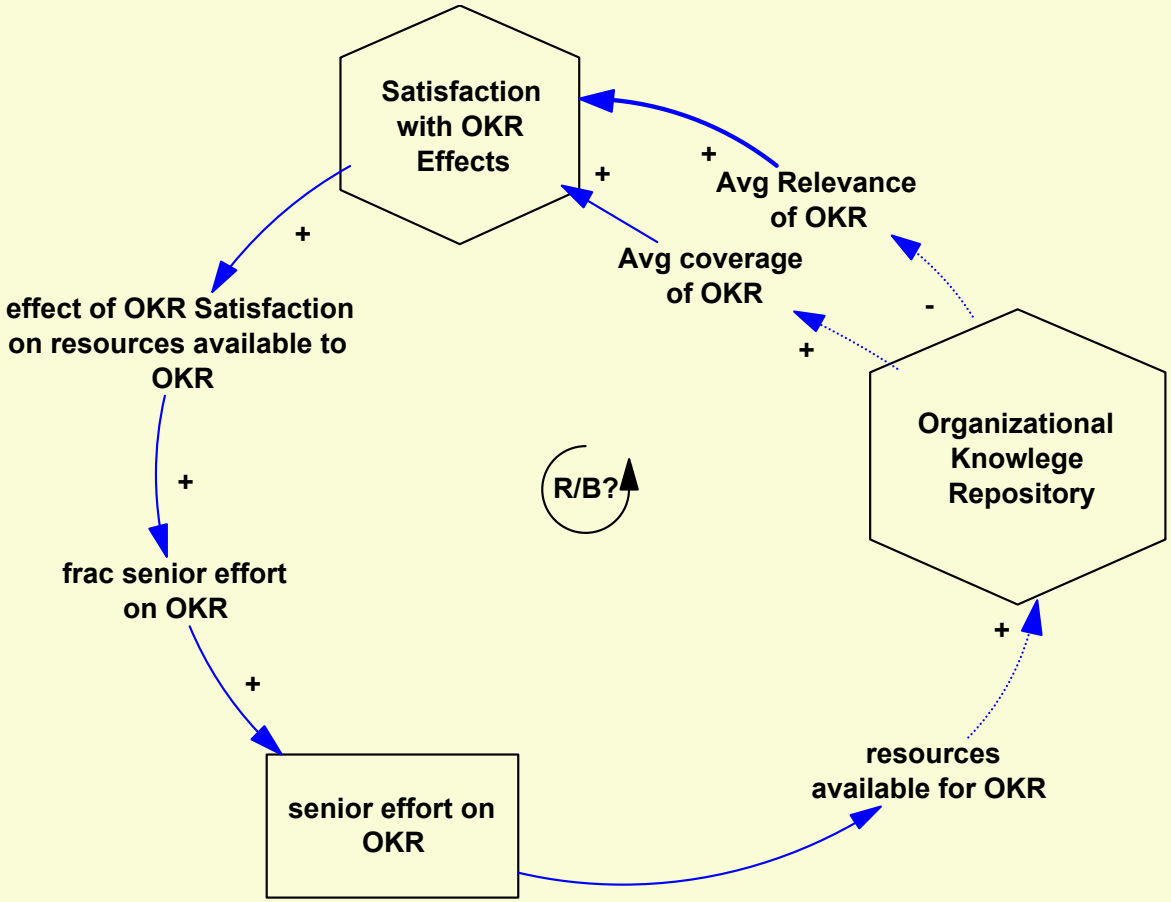
Learning from OKR



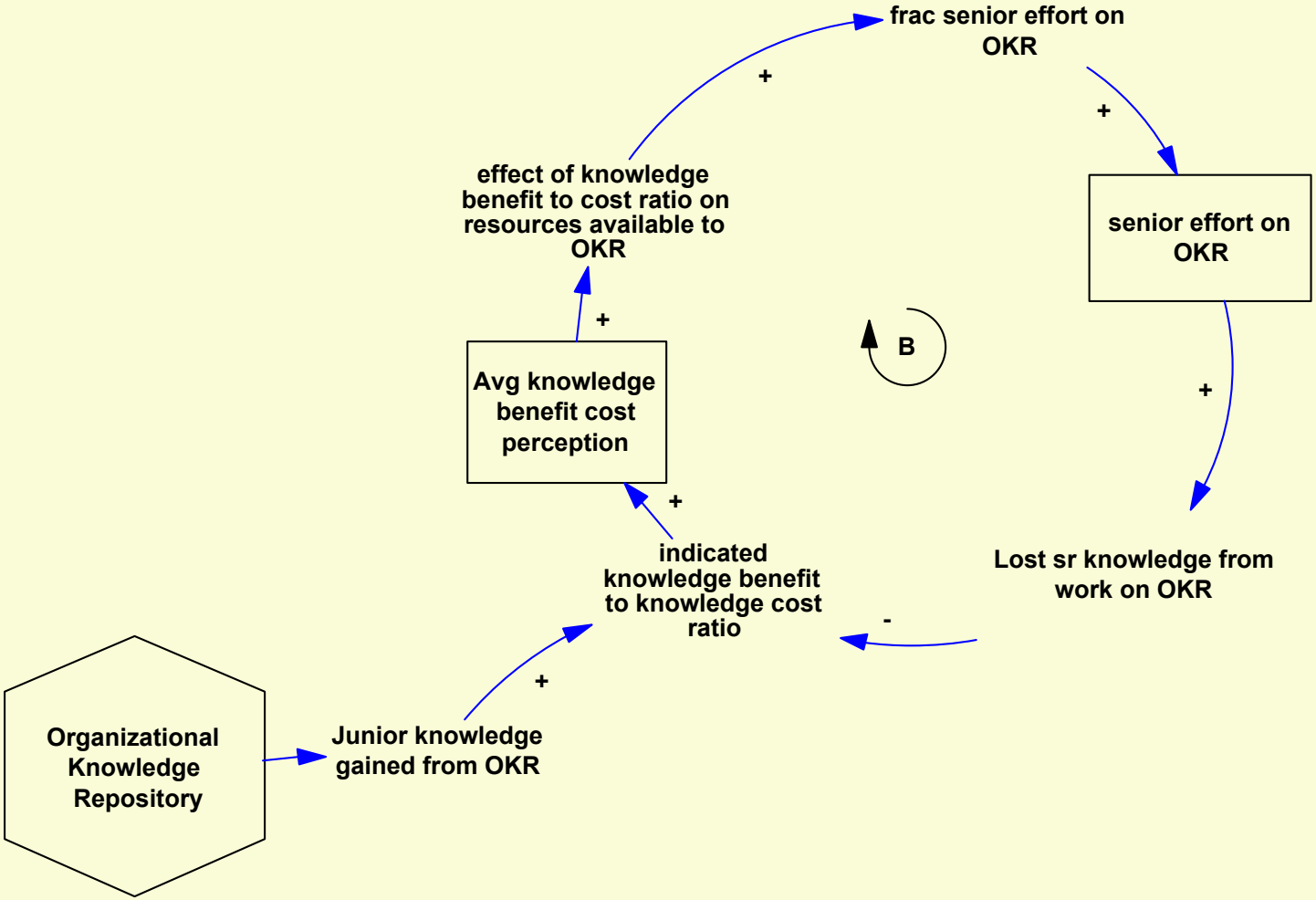
Satisfaction and Demand



Satisfaction and Resources



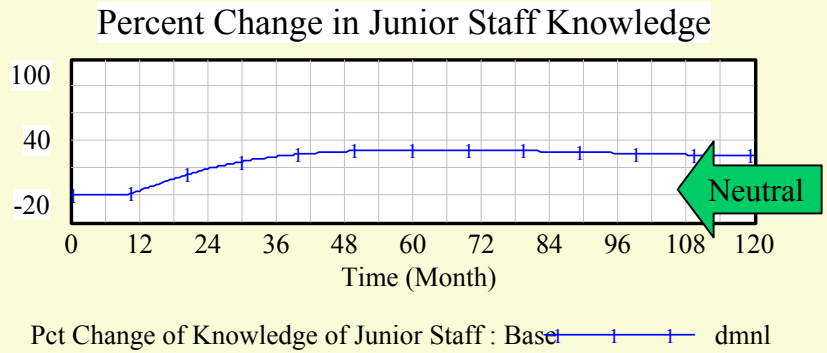
Benefit Cost and KM Resources

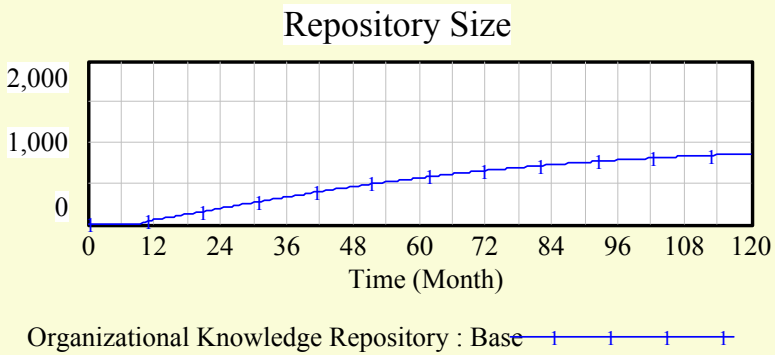


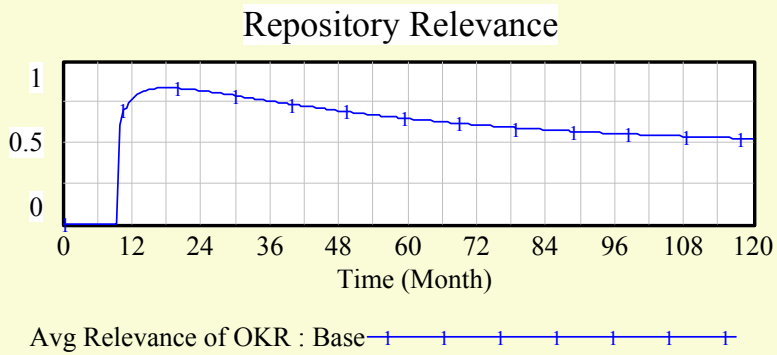
Sustainable Scenario (Base Run)

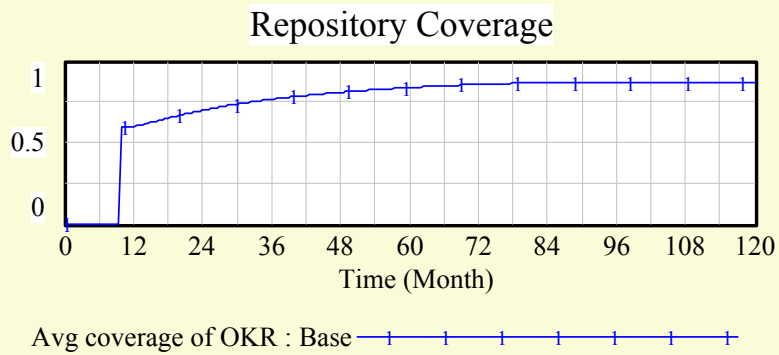
- Initial Conditions
  - Knowledge decay rate constant (~33 month h/l)
- KM Start (time 10)
  - 5% senior staff time diverted to OKR
  - Small seed into OKR of highly relevant documents

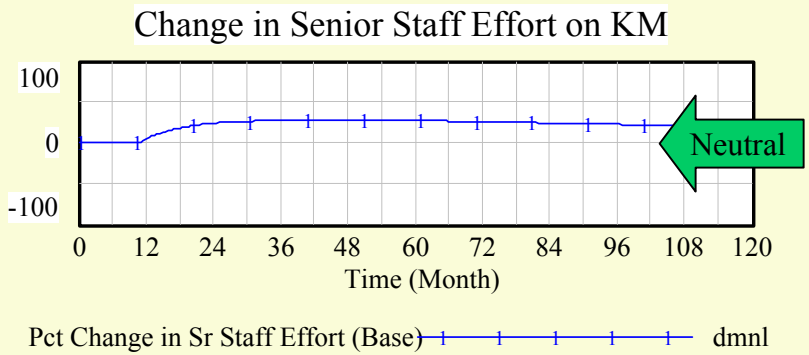
Sustainable KM



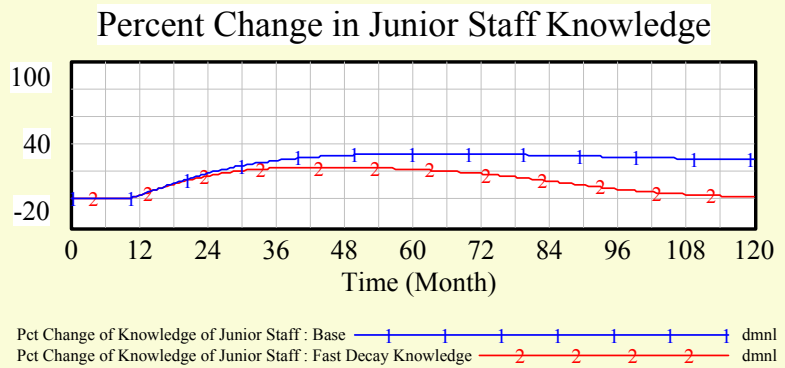


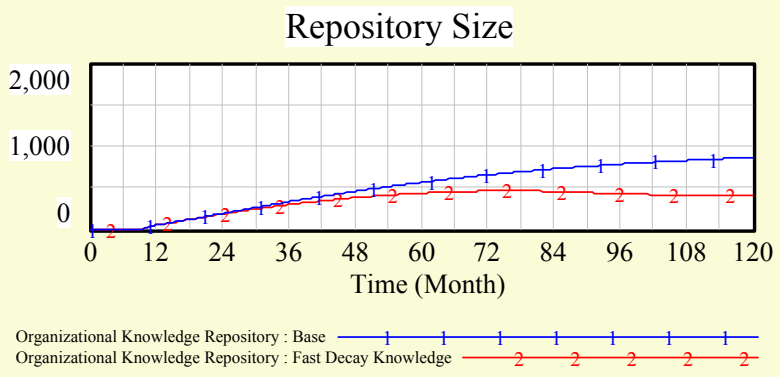


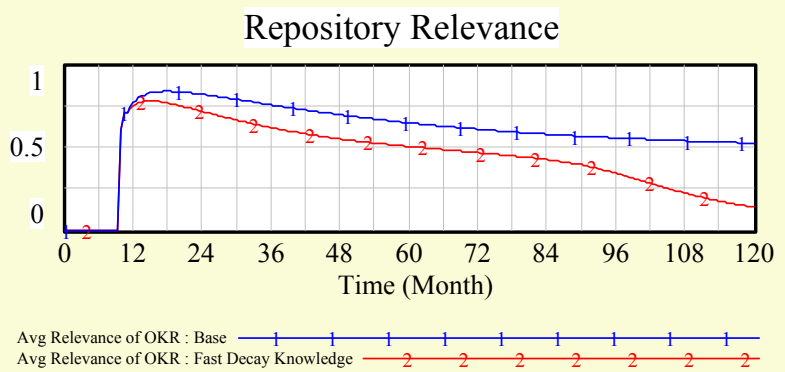


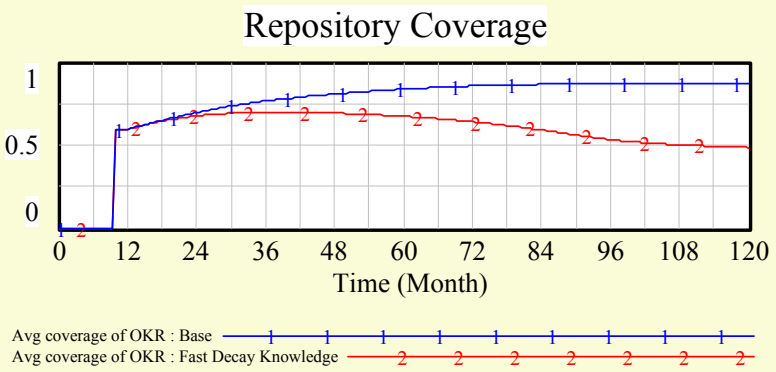


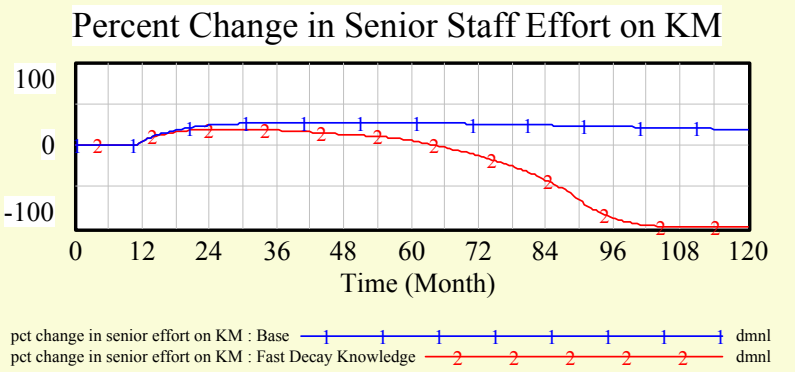
Fast Decay Knowledge: Unsustainable





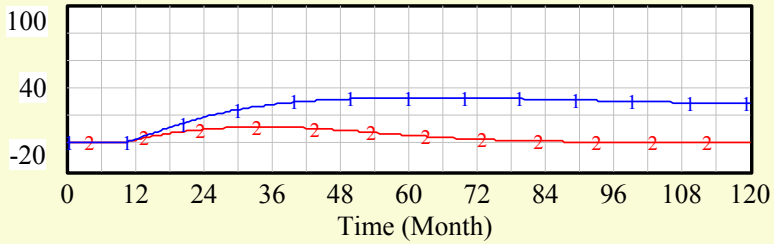






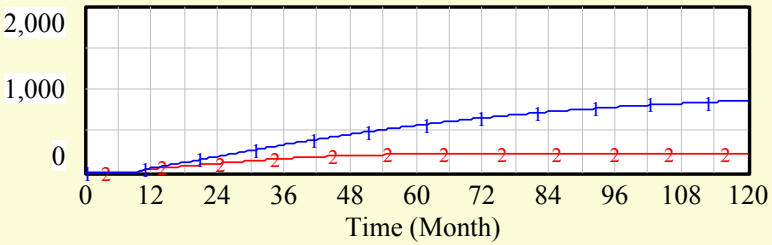
Underfunded KM: Unsustainable

Percent Change in Junior Staff Knowledge



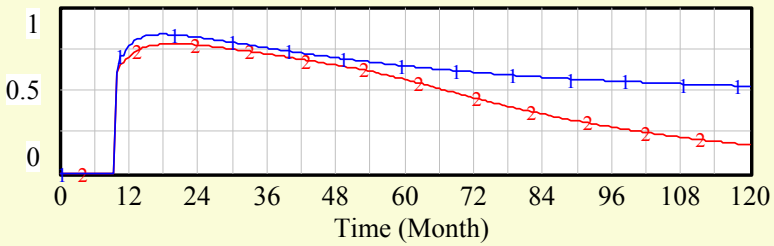
Pct Change of Knowledge of Junior Staff : Base dmnl
Pct Change of Knowledge of Junior Staff : Underfunding dmnl

Repository Size



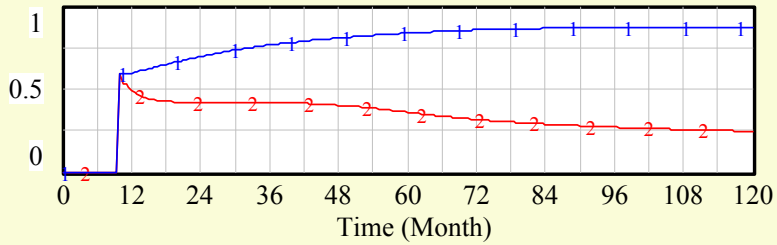
Organizational Knowledge Repository : Base
Organizational Knowledge Repository : Underfunding

Repository Relevance



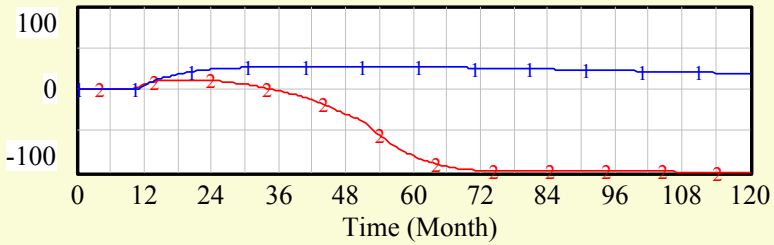
Avg Relevance of OKR : Base
Avg Relevance of OKR : Underfunding

Repository Coverage



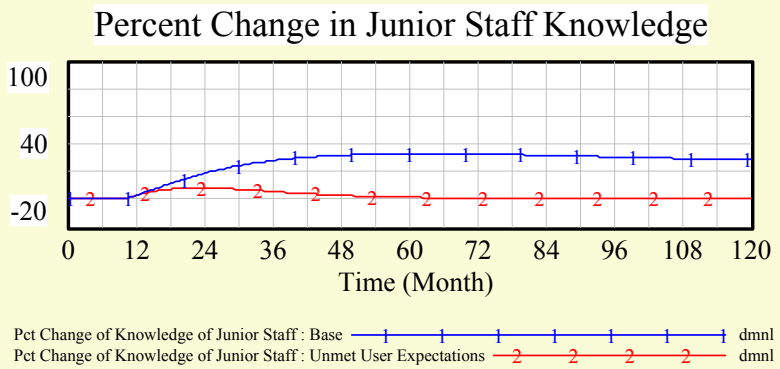
Avg coverage of OKR : Base
Avg coverage of OKR : Underfunding

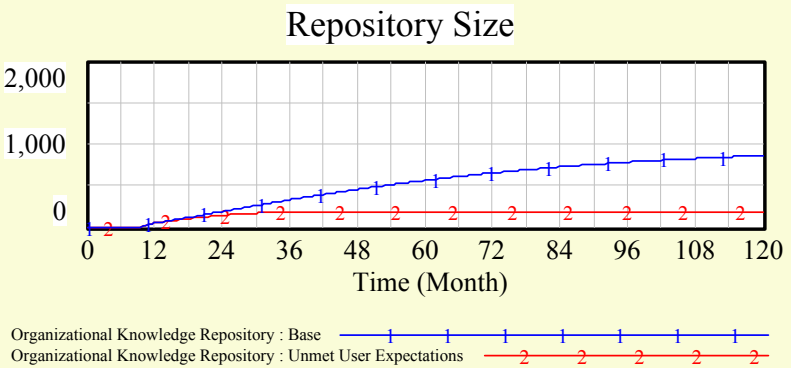
Percent Change in Senior Staff Effort on KM

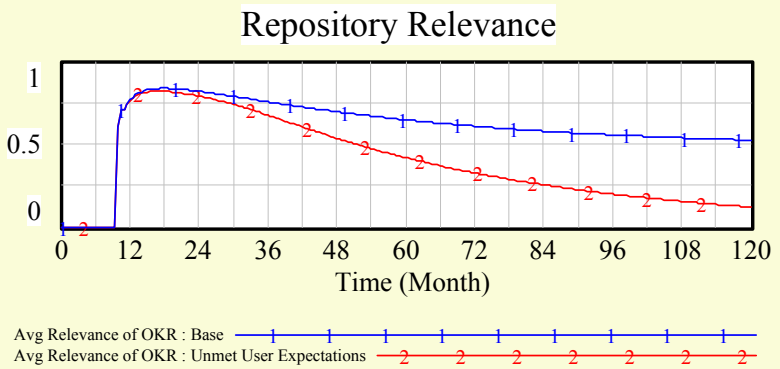


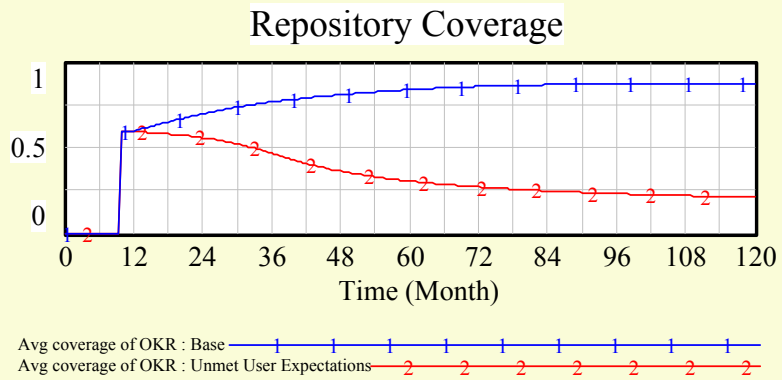
pct change in senior effort on KM : Base dmnl
pct change in senior effort on KM : Underfunding dmnl

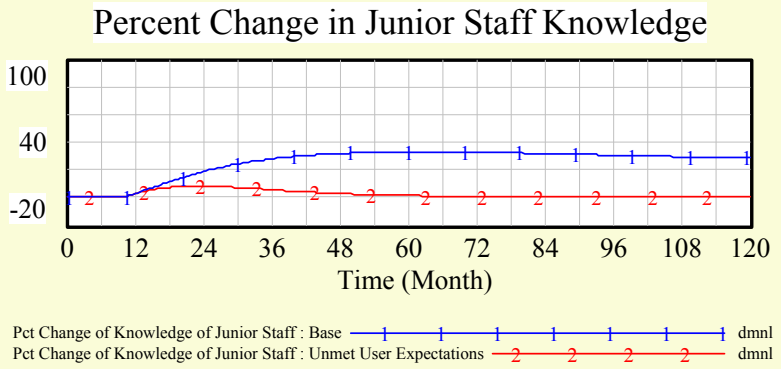
Unmet User Expectations: Unsustainable



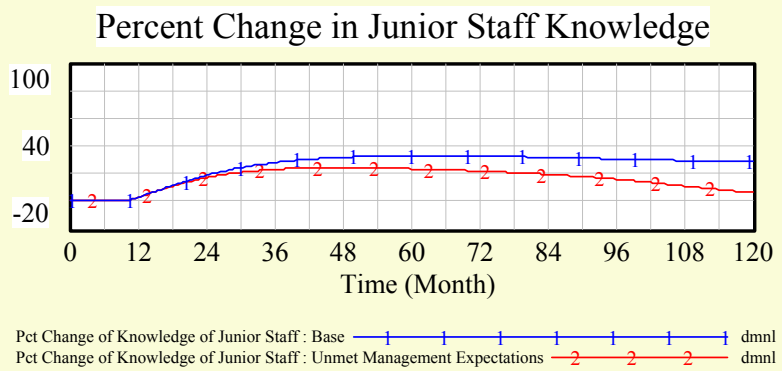


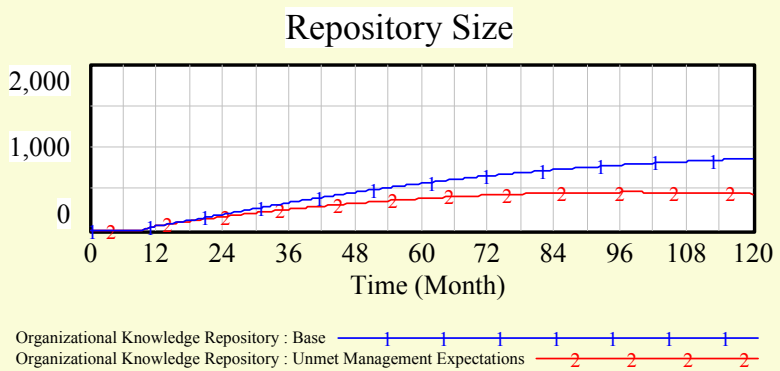


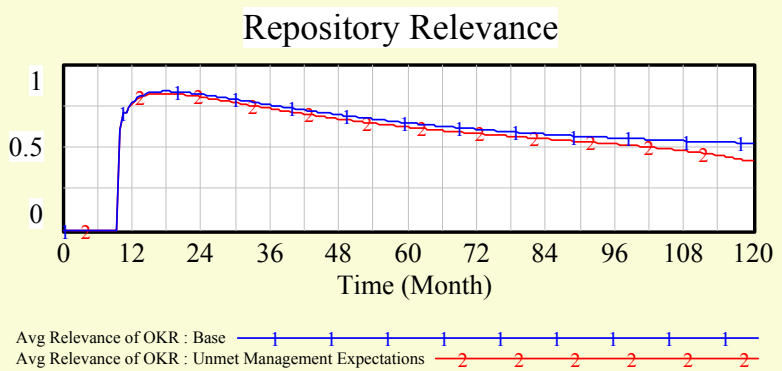


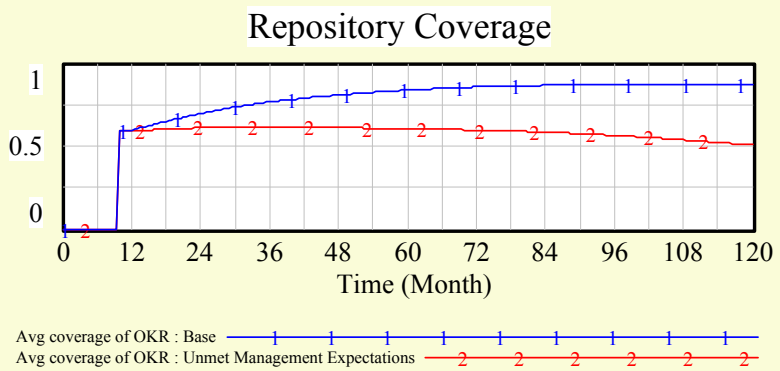


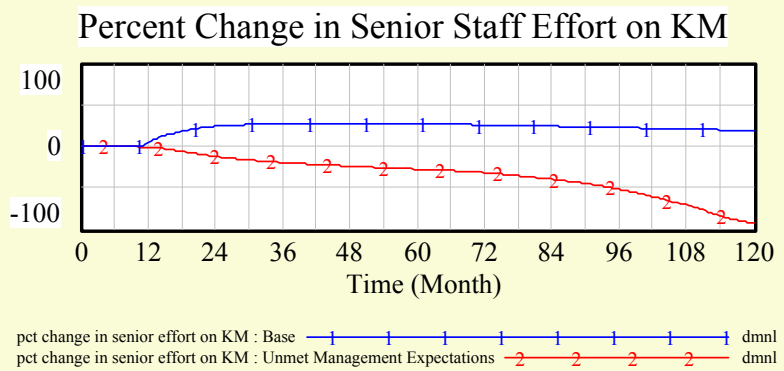
Unmet Management Expectations: Unsustainable











Simulation Results

- Sustainable KM programs:
  - Achievable if user and management expectations met in face of endogenous change
  - Effects may rise then fall over time
  - Apparently unstable equilibrium
- Unsustainable KM programs:
  - May start off similarly to sustainable programs
  - Tip into failure

Implications for KM

- Sustainability
  - Rests on several difficult to quantify factors
  - KM satisfaction must be refreshed in face of constant deterioration
  - Short-term gains and effects must be balanced with longer-term expectations
  - Resource shifts from development to review may be required

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