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EIS Implementation Research: Assessment and Suggestions for the Future

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Plan

- An assessment of implementation research
  - The early years
  - The middle ages
- Suggestions for the future: two examples
  - A broader conceptualization of system use
  - A multi-level, multi-model approach
- Conclusions

Implementation research paradigms

(Hevner et al., 2004)

- Design science
  - creation of intellectual and computational tools
- Behavioral science
  - study of individual, organizational, technological, and societal factors that influence implementation phenomena

Behavioral Research View of Systems Implementation

The

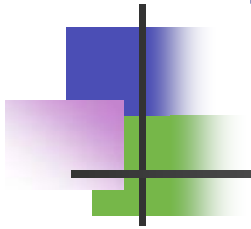
- Development
- Introduction
- Use

of IT-based solutions in order to improve organizational efficiency and effectiveness

Behavioral Implementation Research: The Early Years (1970s)

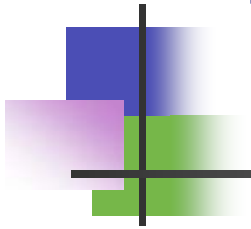
- The issue
  - developing and using OR/MS solutions and IS in organizations
- Major difficulty
  - lack of use
- Focus and Theoretical foundations
  - information requirements determination and user-analyst relations (Churchman and Schainblatt, 1965; Ackoff, 1967)

Behavioral Implementation Research: The Early Years (1970s)



- Research approach
  - Case studies and factor studies
- Findings
  - User participation
  - Top management support
  - User training
  - Other factors

Behavioral Implementation Research: The Middle Ages (1980 to now)



- The issue
  - Developing, introducing and using different types of systems (e.g., MIS, DSS, ES, Case tools, MRP/ERP) in organizations
- Major difficulties
  - high project costs and delays, low levels of usage and user satisfaction
- Focus
  - user acceptance, project management (project risk and control)

Behavioral Implementation Research: The Middle Ages (1980 to now)

- Theoretical foundations
  - TRA/TPB (Fishbein and Ajzen, 1975) and its variants: from TAM (Davis et al., 1989) to UTAUT (Venkatesh et al., 2004)
  - Social cognitive theory (Bandura, 1977)
  - Diffusion of innovations (Rogers, 1983)
  - Media richness theory (Daft et al., 1987)
  - Information processing theory (Galbraith, 1974)
  - Control theory (Ouchi, 1979; Kirsch, 1996)
  - Structuration theory (Giddens, 1984)
  - Etc.

Behavioral Implementation Research: The Middle Ages (1980 to now)

- Research approaches (Markus and Robey, 1988)
  - variance and process approaches
  - technological imperative; organizational imperative; emergent perspective
  - levels of analysis

Behavioral Implementation Research: The Middle Ages (1980 to now)

- Findings
  - TAM to UTAUT: perceived usefulness, perceived ease of use, social influence, facilitating conditions
  - TAM to UTAUT ++: cognitive absorption, trust, self-efficacy, computer anxiety etc.
  - Management actions: user participation, top management support, user training, champions, managing conflict, managing risk
  - Duality of technology, appropriation

Behavioral Implementation Research: taking stock

- Strengths:
  - Strong theoretical foundations
  - Methodological rigor and multiplicity
  - Some practical implementation guidelines
- Shortcomings:
  - Continued implementation problems in practice
  - Limits of variance and process approaches
  - What influences antecedents?

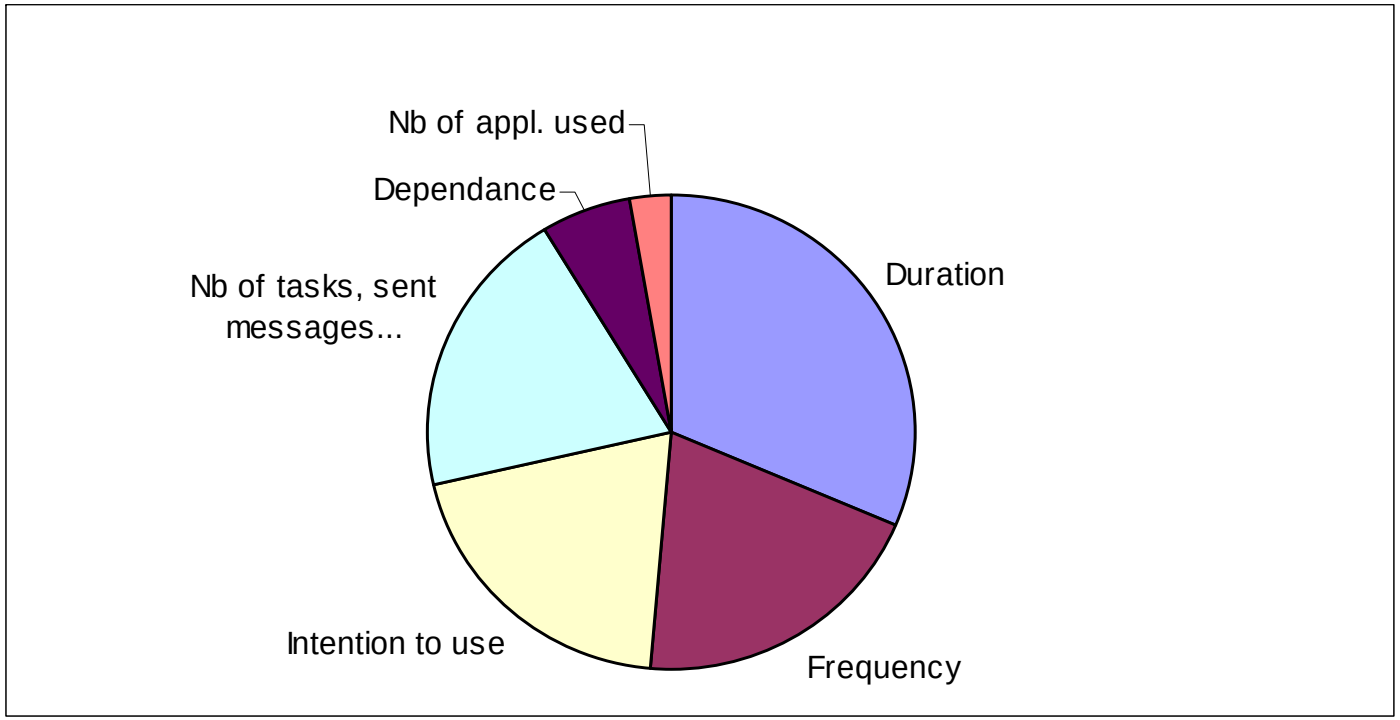
Behavioral Implementation Research: suggestions for improvement

- Improving our conceptualization of constructs
  - Realism and richness
- Avoiding theoretical silos
  - Combining findings from process and variance approaches
  - Multi-theory, multi-level models

Example 1: Expanding Our Conceptualization of System Use

- "a core variable in IS research" (Straub et al., 1995)
- "one of the most frequently reported measures of success" (DeLone & McLean, 1992)

Measures of Individual System Use
(MISQ & ISR 1992-2004)



Limitations of System Use Conceptualized as an “Amount”

- The multidimensional nature of system use (Doll & Torkzadeh, 1998)
- “Sufficient” level (Szajna, 1993)
- Mandated use (Brown et al., 2002)

A Multidimensional View of System Use

- Task accomplishment as system use
- Adaptation activities as system use
- Learning activities as system use

(Based on a longitudinal, qualitative study of 12 users of an ERP implemented at a dynamic, multi-national organization; Users observed and interviewed following go-live, go-live plus 4-6 months, and go-live plus 12-14 months)

A Multidimensional View of System Use

- Task accomplishment as system use

  Users' direct (i.e., hands-on) or indirect (i.e., via intermediaries) interactions with a system in the accomplishment of their organizational tasks

  - Problem solving
  - Decision rationalization
  - Horizontal integration
  - Vertical integration
  - Customer service (Doll & Torkzadeh, 1998)

  Assessed via amount, frequency, duration etc.

A Multidimensional View of System Use

- Users' adaptation activities as system use

  User behaviors directed at changing or modifying a system, or how it will be deployed or used in an organization, i.e., reinvention behaviors (Rice & Rogers, 1980).

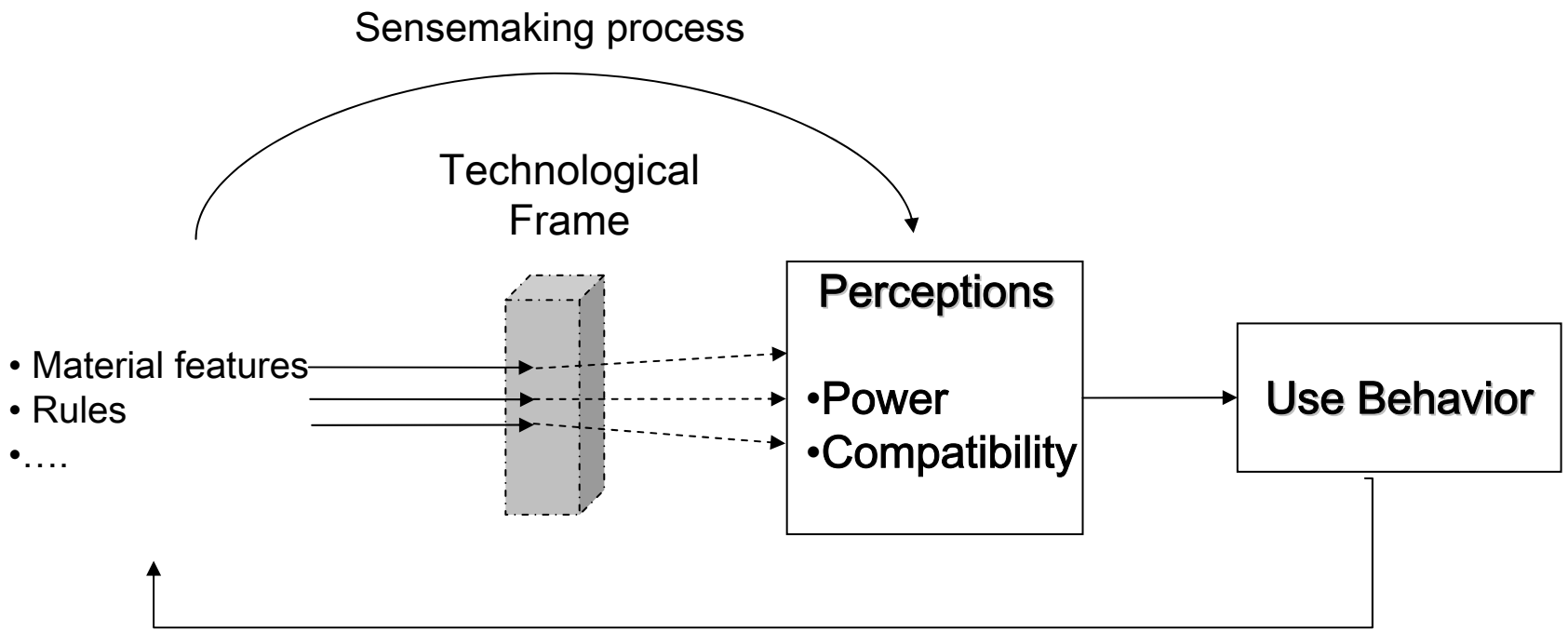
  - Technology adaptation activities
  - Operational adaptation activities
  - Organizational adaptation activities

A Multidimensional View of System Use

- Users' learning activities as system use
  - Information exchange and interaction behaviors (Papa & Papa, 1992), and self-directed information acquisition behaviors (Vandenbosch & Higgins, 1996)
    - Communication activities
    - Independent exploration activities

A Perceptual and Behavioral Framework of System Use

General Framework



Perception of Power

- How powerful/powerless an individual feels with respect to a system
  - Related to
    - Perceived behavioral control (Ajzen, 1991)
    - Computer self-efficacy (Compeau & Higgins, 1995)
  - Understanding the socially constructed nature of a system (Orlikowski, 1992)

Perception of Compatibility

- How compatible an individual perceives a system to be with the tasks to be accomplished
  - Related to
    - Task-technology fit (Goodhue & Thompson, 1995)
    - Relative advantage (Moore & Benbasat, 1991)
    - Perceived usefulness (Davis, 1989)

A Typology of User Perceptions and Behaviors

		Compatibility	
		Low	High
Power	Low	**Restrictive**	**Conformist**
	High	**Rebellious**	**Sophisticated**

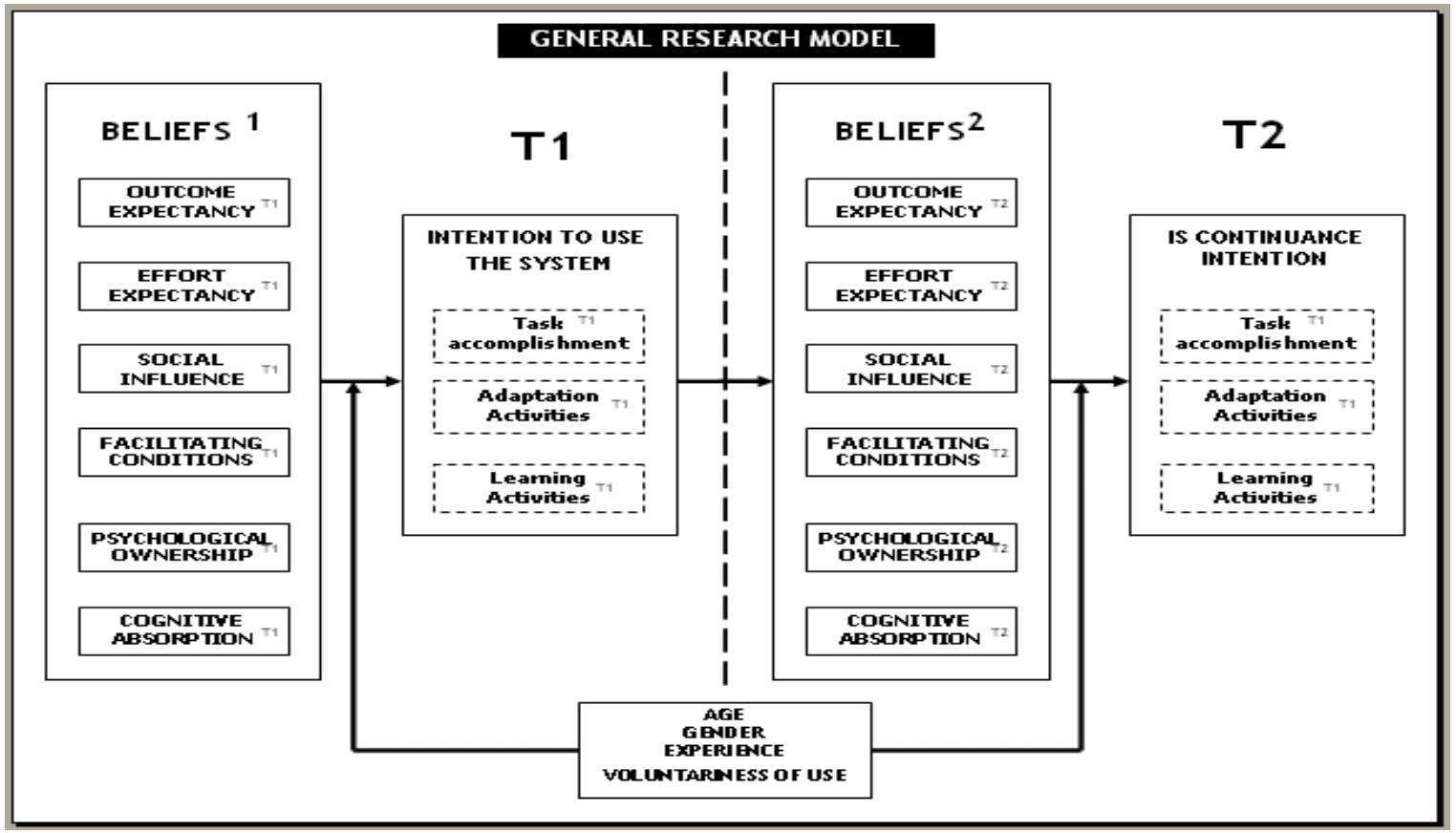
Example 2: Studying Implementation via Multi-level, Multi-model Approaches

- Limitations of single-level, single-model approaches
  - Different theoretical foundations are used to explain phenomena occurring at different levels
  - Theoretical silos
  - Links between constructs at organizational, project, and individual levels are ignored

Studying Implementation via Multi-level, Multi-model Approaches

- Individual-level theories
  - e.g., TRA/TPB (Fishbein and Ajzen, 1975) and variants: from TAM (Davis et al., 1989) to UTAUT (Venkatesh et al., 2004)

A General, Individual-level model



Studying Implementation via Multi-level, Multi-model Approaches

- Project-level models
  - e.g., Managing Project Risk (Barki, Rivard, and Talbot, 2001)
    - DV: project success (cost, satisfaction)
    - IV's: external integration, internal integration, formal project management

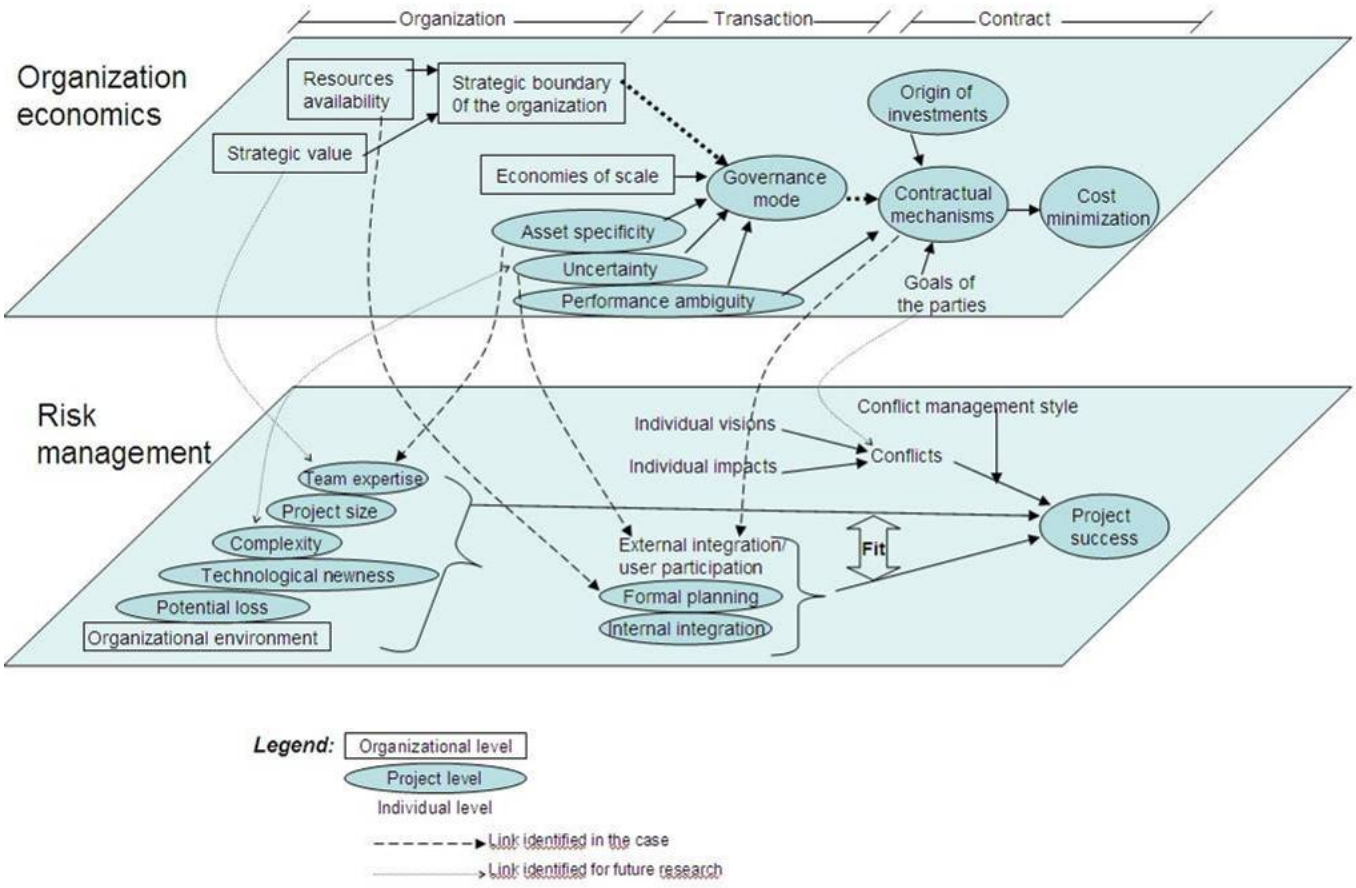
Studying Implementation via Multi-level, Multi-model Approaches

- Organizational-level governance mode and contractual mechanisms models
  - e.g.,Transaction cost theory (Williamson, 1985)
    - DV: market vs. internal procurement
    - IV's: economies of scale, asset specificity of investments, uncertainty, performance ambiguity of the transaction
  - e.g., Agency theory(Eisenhardt, 1989)
  - e.g., Resource-based view (Barney, 2001)
  - e.g., Incomplete contracts (Grossman and Hart, 1986)

Studying Implementation via Multi-level, Multi-model Approaches

- Individual-Project links
  - e.g., user participation and involvement with project external integration
- Individual-Organization links
  - e.g., perceptions of social influence, equity and conflict with goals of the parties (AT)
- Project-Organization links
  - e.g., resource availability (RBV) with project team expertise; project external integration with contractual mechanisms

Studying Implementation via Multi-level, Multi-model Approaches



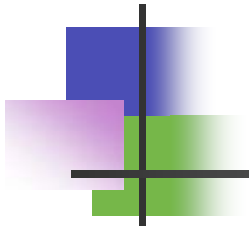
Better Conceptualization of Constructs and Multi-level, Multi-model Approaches: Conclusion

- Potential benefits
  - Rigor- linking theoretical silos
  - Relevance- richer and more accurate capture of phenomena
  - New insights- antecedents of antecedents
- Challenges
  - Within- vs. between-researcher diversity
  - Time and publication constraints

Thank you!

Example 2: Analyzing an EIS Implementation via a Multi-level, Multi-model Approach

- Case study of an EIS implementation and reengineering project in a large insurance company: the Canstar project at GNLG
- Three attempts at implementation: two failures and a partial success



The Canstar Project

- Try #1: Harman
  - Objective: reengineering and integrating customer service processes via a two-level centralized support center (a customer is to interact with one person).
  - Fixed-price contract
  - Four months later: Harman's contract is cancelled.
    - GNLG's view: Harman's approach too aggressive and ill fitting to GNLG's organizational culture.
    - Harman's view: GNLG is too soft.

The Canstar Project

- Try #2: Iris
  - Objective: a call center, i.e. front office, and a claim assessment and processing center, i.e., back office.
  - Cost plus contract
  - Four months later
    - Significant anxiety and resistance
    - Numerous changes in system requirements
    - Several important system requirements still undecided
    - Major delay
  - Eight months later
    - Iris contract cancelled

The Canstar Project

- Try #3: Internal Team and MHT Consulting
  - Objective: same
  - Partnership contract (MHT provides performance guarantees, partially assumes risk)
  - New project structure
  - Six months later
    - Both front office and back office operational
    - Improvements in key performance indicators (e.g., % of calls immediately answered)
  - Ten months later
    - Performance indicators above industry average
    - Front office: OK
    - Back office: ?
    - Cost reduction objectives not reached