



Factors Influencing the Success of Radical Technological Innovation Projects

A Strategic Perspective

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Purpose: To create a cross-discipline framework which will support to identify and to manage the processes that will influence the innovative capacity of a project and as a consequence will increase the success rate

A radical technology may be a source of competitive advantage to a firm that successfully adopts it. At the same time, such technologies can also destroy firms that fail to adopt the technology

Substantial investment are needed for the development of innovative products or services, while failure rates are high

Very little research has touched upon the issue of how the success factor is related to the success criteria

Most research has contributed to innovation knowledge through uni-dimensional studies such as new product development or new process development

Agenda

1. **Strategic Perspective**
2. **Types of Innovation**
3. **Determinants of Innovation Projects**
4. **Research Framework**
5. **Operational Measures**
6. **Preliminary Results**



Strategic Theoretic Perspectives for Innovation

Industrial Organization

“First Mover Advantage”

Transaction Cost Economics

Firms and markets are alternative governance structures that differ with respect to transaction costs

Resource Based View

The accumulation of resources and their characteristics determine a firm's performance

Population Ecology

Stable routines become resistant to change and contribute to organizational inertia

Evolutionary Theory

Tacit routines that are difficult to replicate lead the firm a sustainable competitive advantage

Knowledge Based View

Performance differences between firms are a result of their different knowledge bases and differing capabilities in developing and deploying knowledge

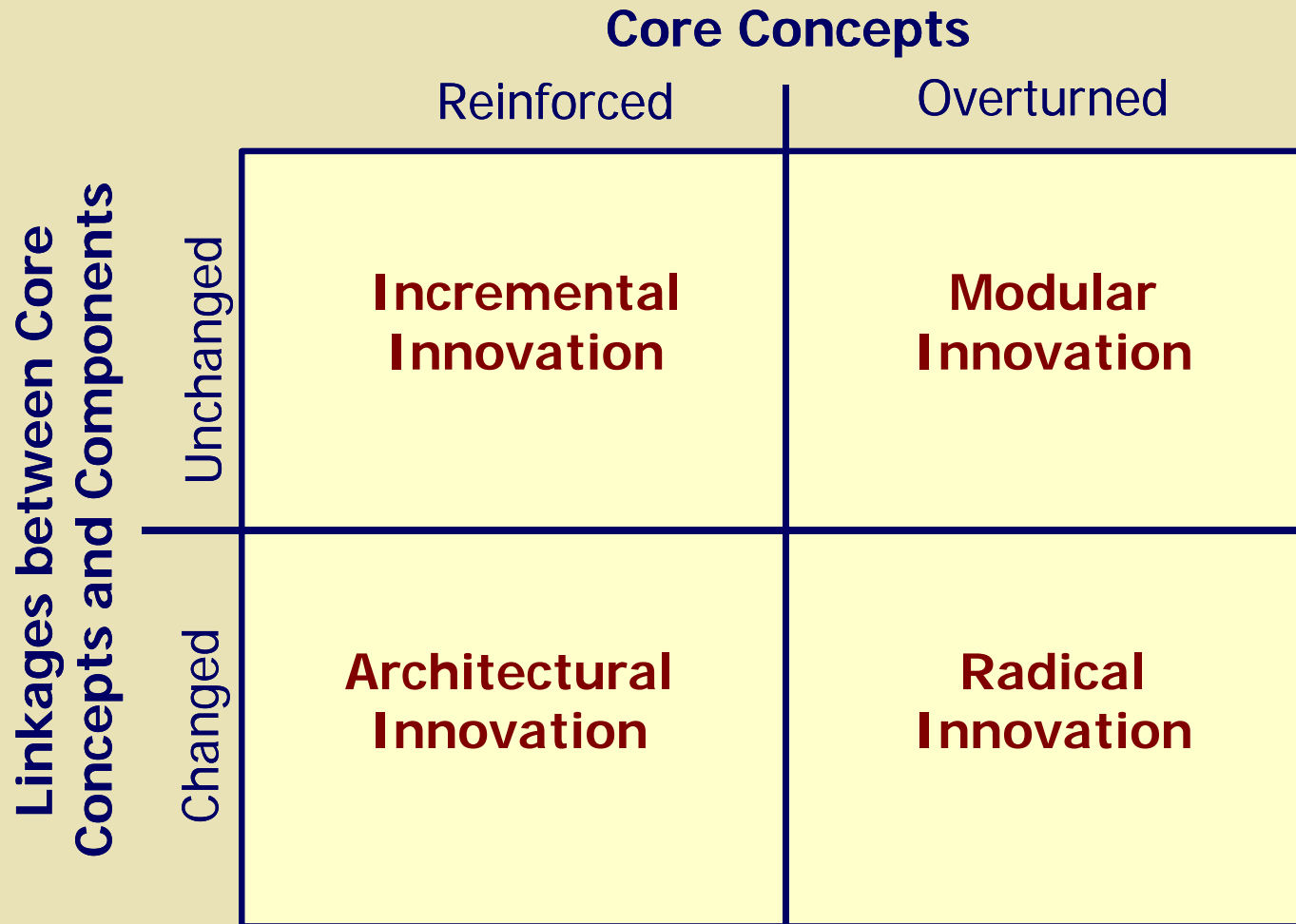
Dynamic Capabilities

Ability to move beyond local search (to identify the changing market environment, to sense the opportunity, then to seize it)

Strategic Networks Theory

Relational-specific assets, knowledge exchange, effective governance and complementary resources and capabilities are the determinants of inter-organizational advantage

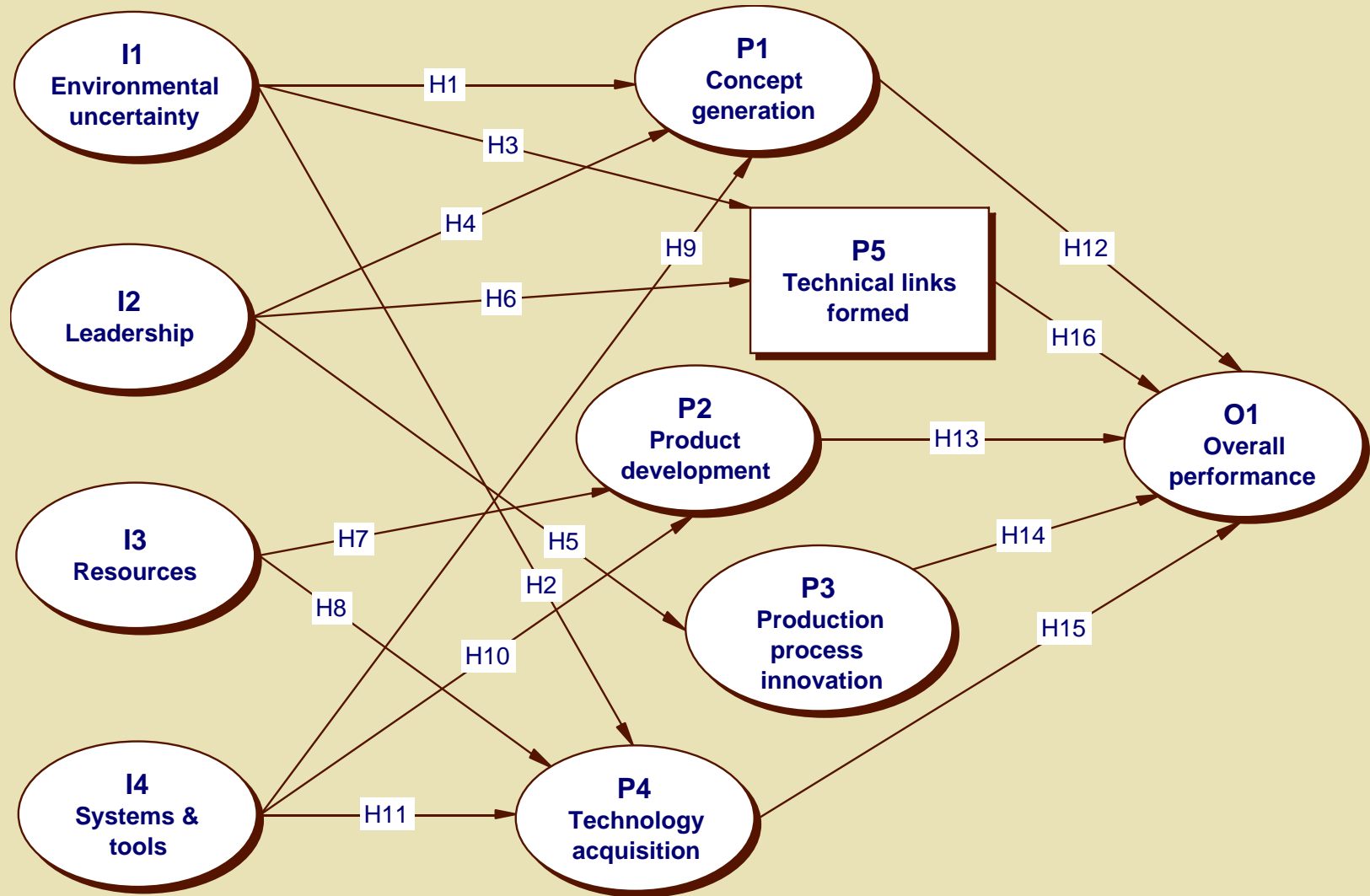
Types of Innovation (Henderson & Clark, 1990)



Frequency of the appearance of innovation determinants (Read, 2000)

Authors	MS	CF	CN	HR	TM	KN	LS	CD	SP	FS	CI	TE
Atuahene-Gima (1996)	X	X		X	X							
Balbontin et al. (1999)	X	X	X				X	X				
Spivey et al. (1997)	X	X	X	X	X							
Tang (1999)	X		X			X	X					
Sirilli & Evangelista (1998)		X										X
Ozsomer et al. (1997)									X	X		
Soderquist et al. (1997)		X									X	
Cho (1996)			X	X	X					X		
Zhuang et al. (1999)	X							X				
Hurley & Hult (1998)	X								X			
Keogh (1999)				X		X						
Shaw (1998)		X	X			X						
Birchall et al. (1996)	X	X	X								X	
McGourty et al. (1996)	X			X								
Zien & Buckler (1997)	X	X	X		X							
Total	9	8	7	5	4	3	2	2	2	2	2	1

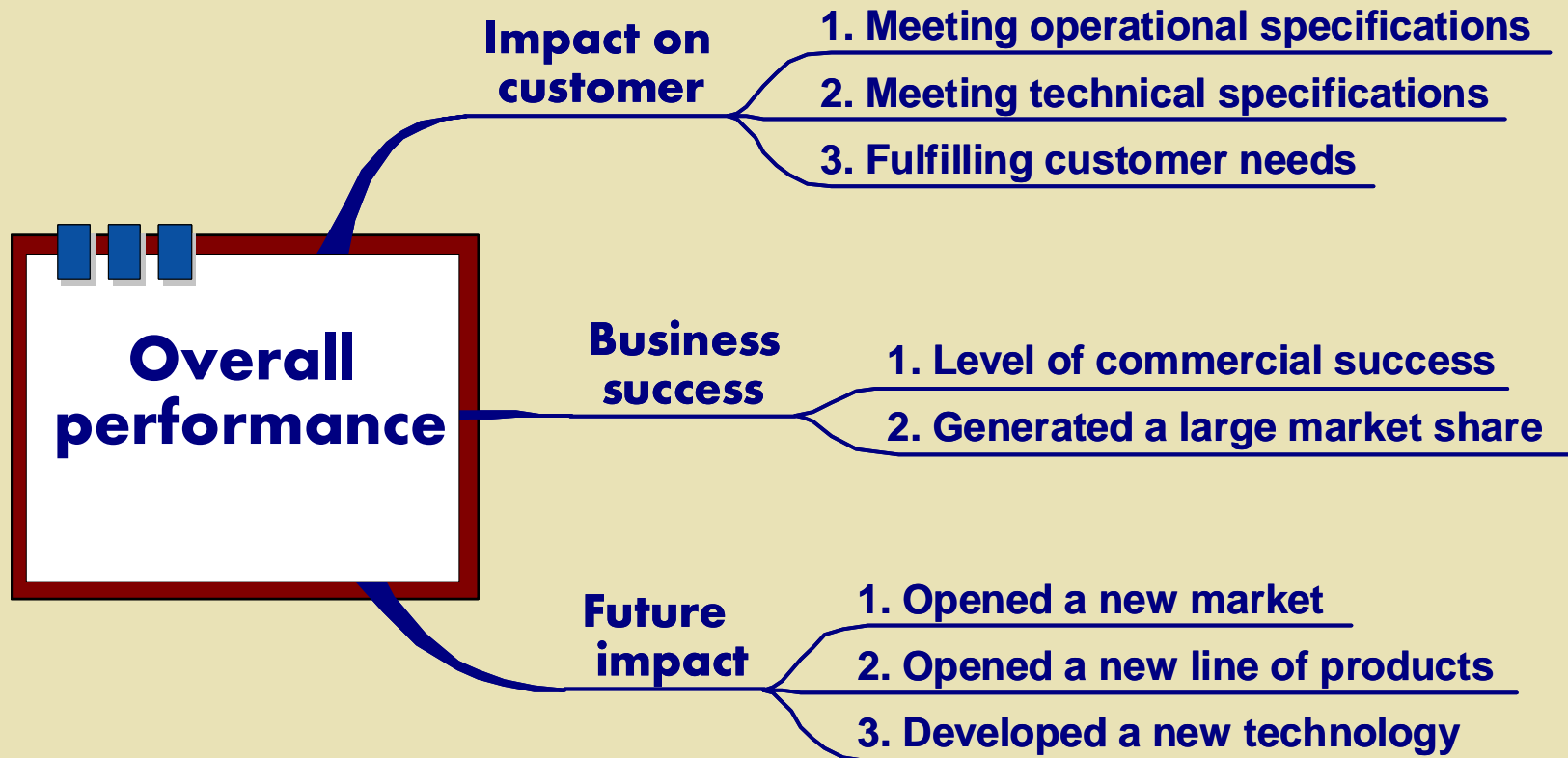
Research Model



Structural Equation Modeling (SEM)

- SEM is a priori and requires researchers to think in terms of models.
- Causal processes under study are represented by a series of structural (i.e., regression) equations.
- Structural relations can be modeled pictorially to enable a clearer conceptualization of the theory under study
- Allows the explicit representation of a distinction between observed and latent variables (possibility to test a wide variety of hypotheses)
- Standard statistical procedures like multiple regression, canonical correlation, factor analysis, ANOVA, are special cases of SEM
- SEM is a large-sample technique

Overall Performance – Operational Measures



Theoretical anchor

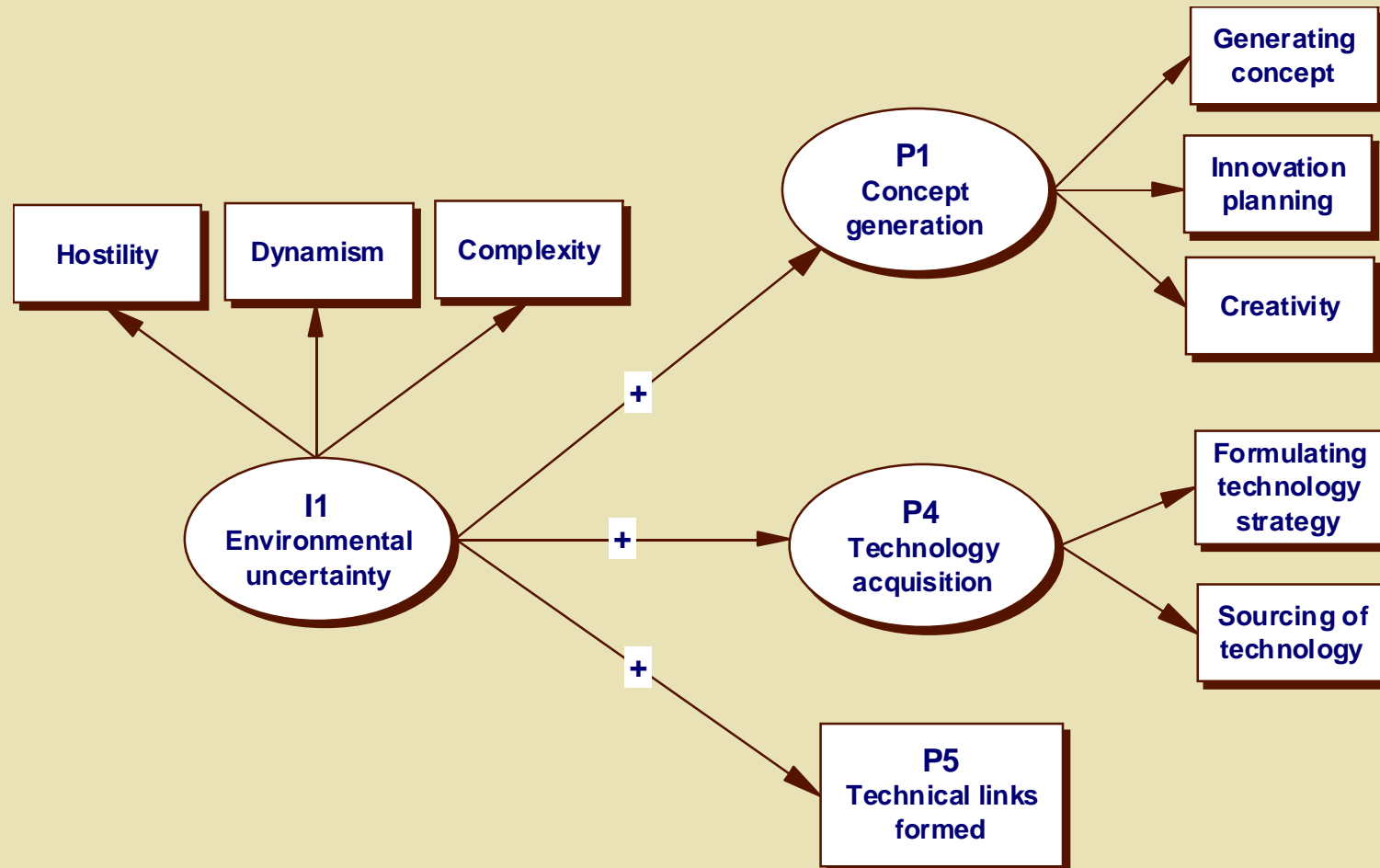
Theory	Nature of Theory	Process				
		Concept generation	Product development	Production process innovation	Technology acquisition	Technical links formed
Industrial organization	Structure-oriented/static	Low	Low	Medium	Low	Low
Transaction cost economies	Structure-oriented/static	Low	Low	Low	Medium	Medium
Resource based view	Structure-oriented/static	Medium	Medium	Medium	High	High
Population ecology theory	Process-oriented/static	Low	Low	Low	Medium	Medium
Evolutionary theory	Process-oriented/dynamic	High	High	High	Medium	Low
Knowledge based view	Process-oriented/dynamic	Medium	Medium	Low	High	High
Dynamic capabilities	Structure-oriented/dynamic	High	Medium	Medium	High	High
Strategic network theory	Structure and process-oriented /dynamic	Medium	Low	Low	Medium	High

Note: Table entries describe the degree to which the identified process for innovation are viewed, directly or indirectly, by different theoretical frameworks in strategic management as important for the overall performance of an innovative project.

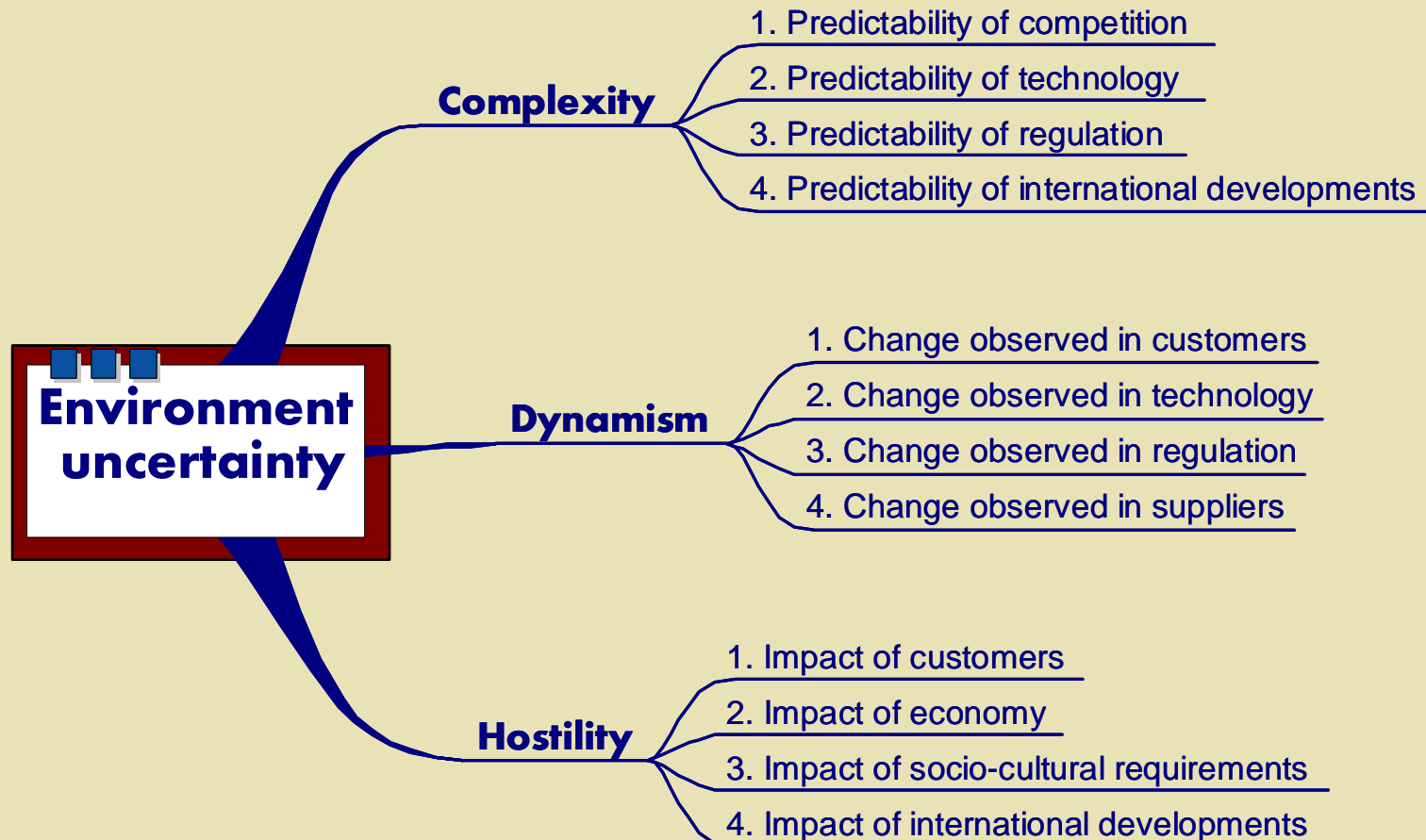
Theoretical anchor

Item	Main argument	Hypotheses
Industrial Organization	First Mover Advantage	H12-H16
Transaction Cost Economics	Firms and markets are alternative governance structures that differ with respect to transaction costs	H15-H16
Resource Based View	The accumulation of resources and their characteristics determine a firm's performance	H4 – H16
Population Ecology Theory	Stable routines become resistant to change and contribute to organizational inertia	H1-H3; H12-H16
Evolutionary Theory	Tacit routines that are difficult to replicate lead the firm a sustainable competitive advantage	H1-H3; H12-H16
Knowledge Based View	Performance differences between firms are a result of their different knowledge bases and differing capabilities in developing and deploying knowledge	H4-H16
Dynamic Capabilities	Ability to move beyond local search (to identify the changing market environment, to sense the opportunity, then to seize it)	H1-H16
Strategic Networks Theory	Relational-specific assets, knowledge exchange, effective governance and complementary resources and capabilities are the determinants of inter-organizational advantage	H12, H15- H16

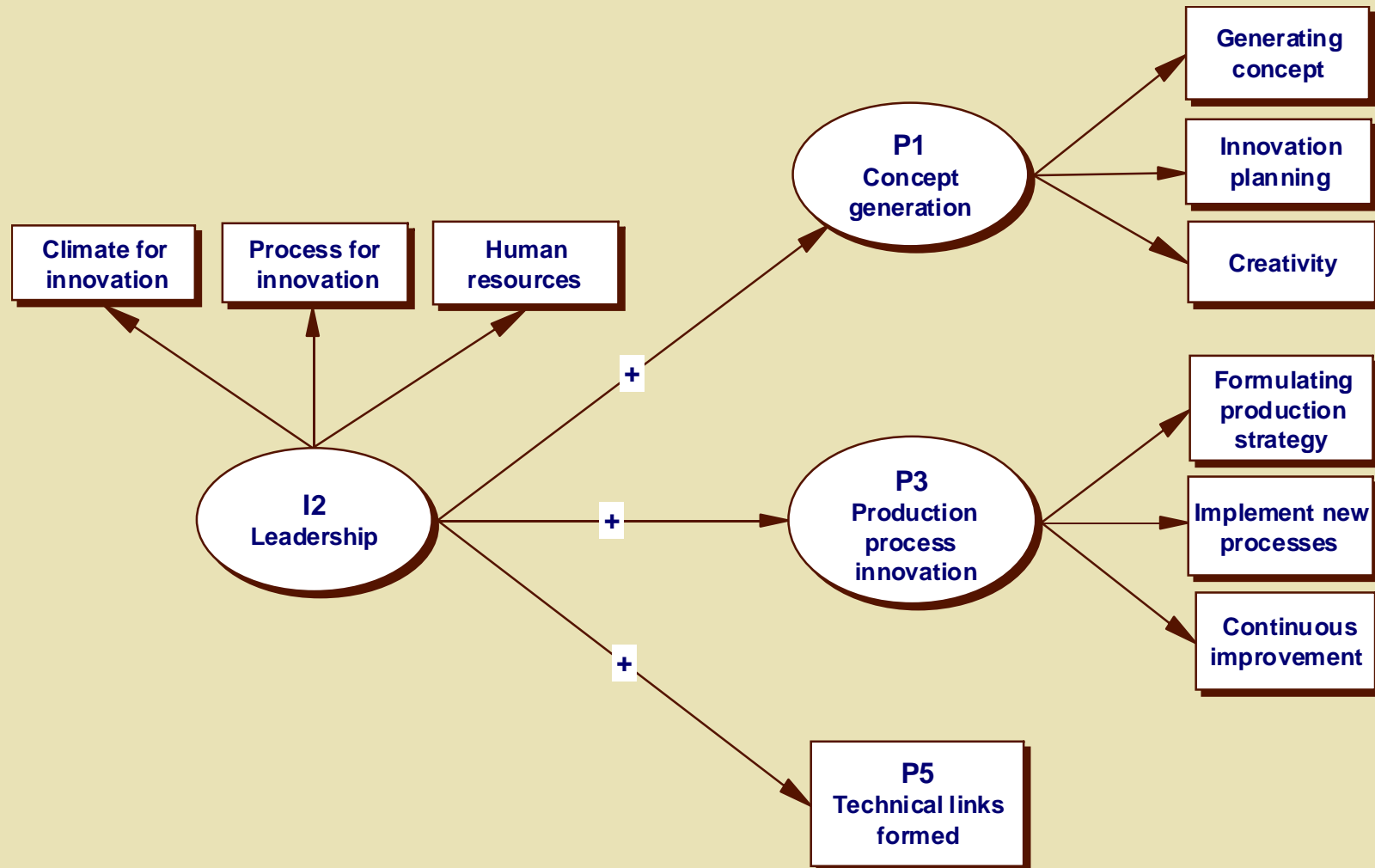
Hypothesized relationships between Environmental Uncertainty and various innovation processes



Assessing the project environment



Hypothesized relationships between Senior Management Leadership and various innovation processes



Assessing Leadership



Leadership

Human Resources

1. Building innovation strategies into corporate strategies and plans
2. Including representatives of innovation and technical functions on the board

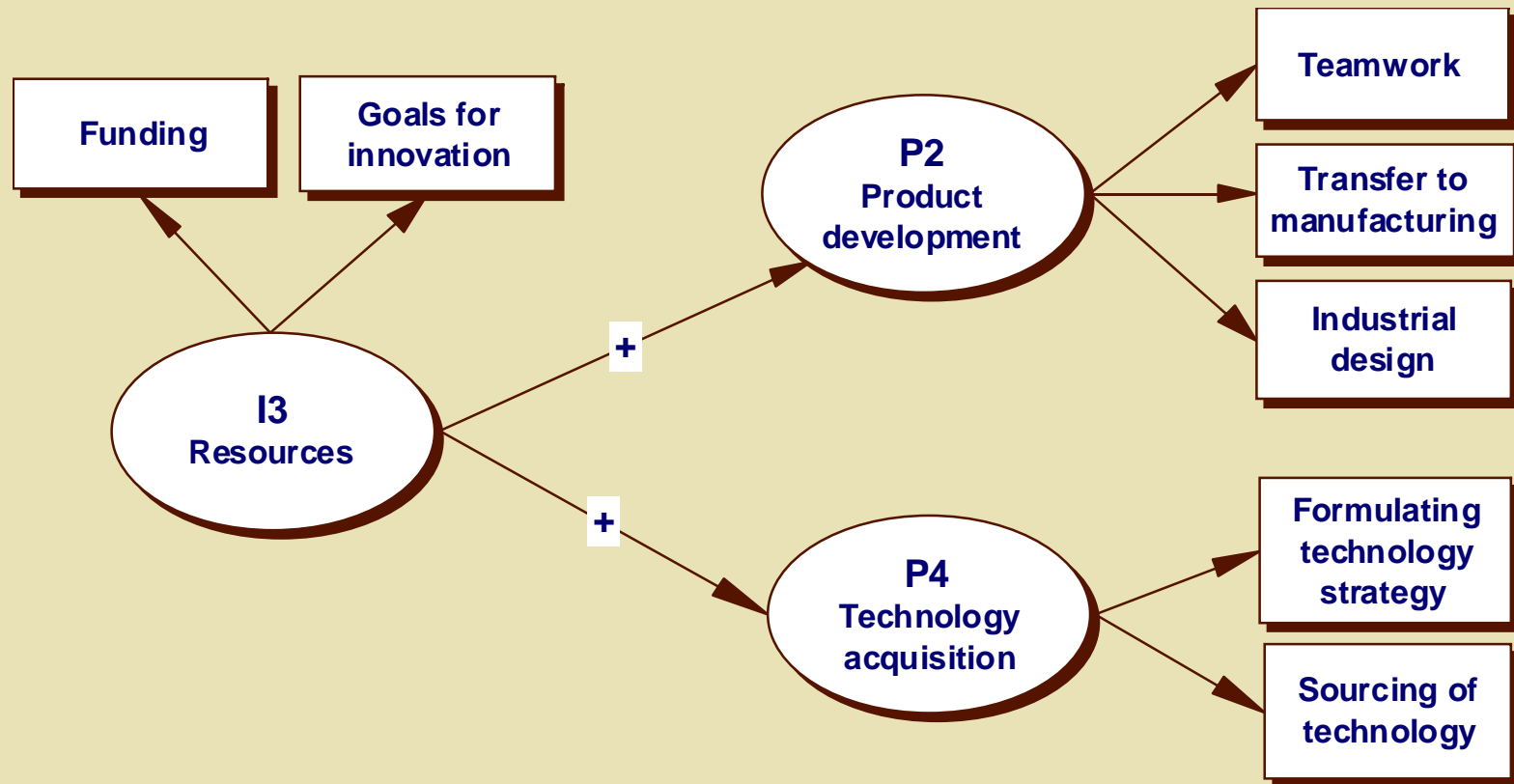
Process for innovation

1. Evaluating processes for generating and implementing innovations
2. Making innovation processes visible to top management
3. Benchmarking processes for innovation against best practices

Climate for innovation

1. Encouraging new idea development
2. Making innovation policies shared and understood in the organization

Hypothesized relationships between Resources and various innovation processes



Resources – Operational Measures

Resources

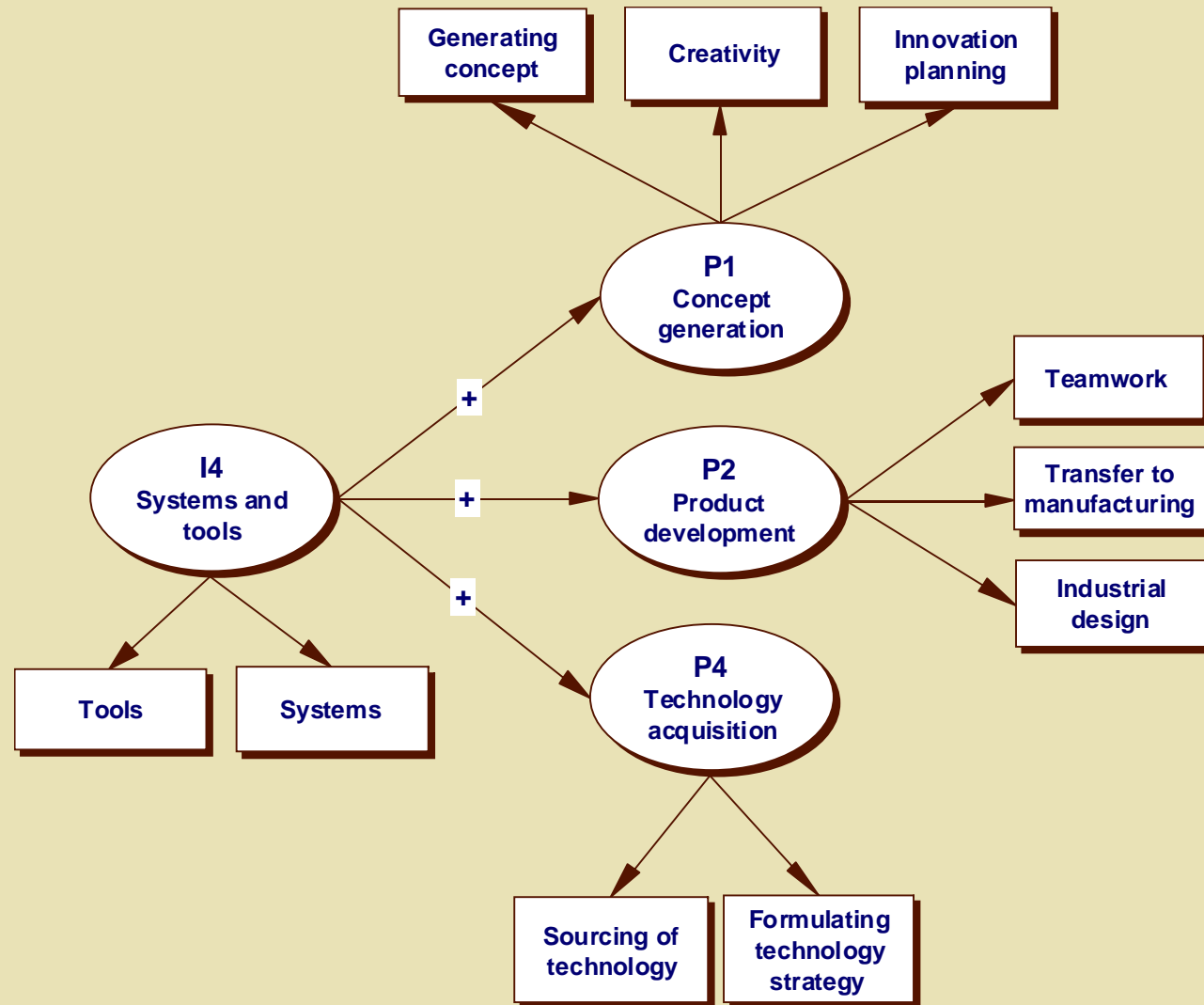
Goals for innovation

1. Identifying the key roles needed for managing the innovation process
2. Establishing career development paths for technical people

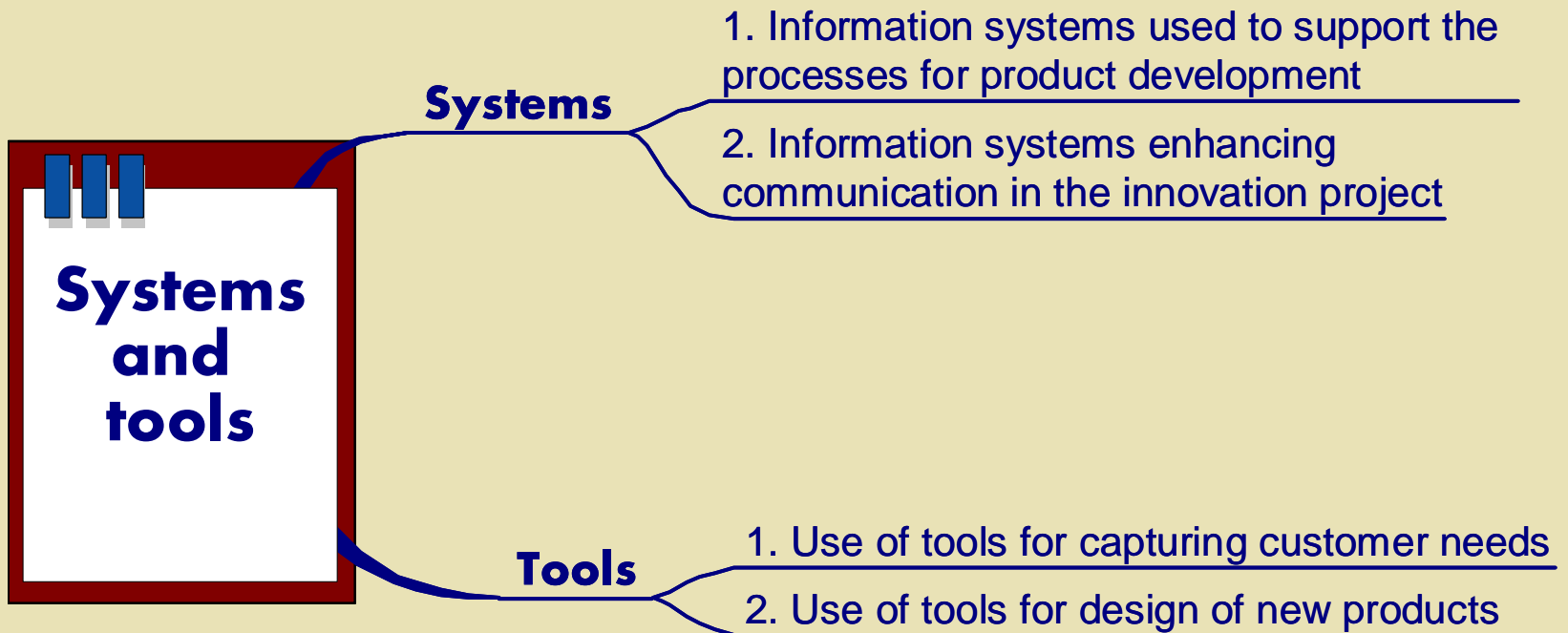
Funding

1. Stability of funding of R&D activities
2. Reducing costs of innovation through alliance networks

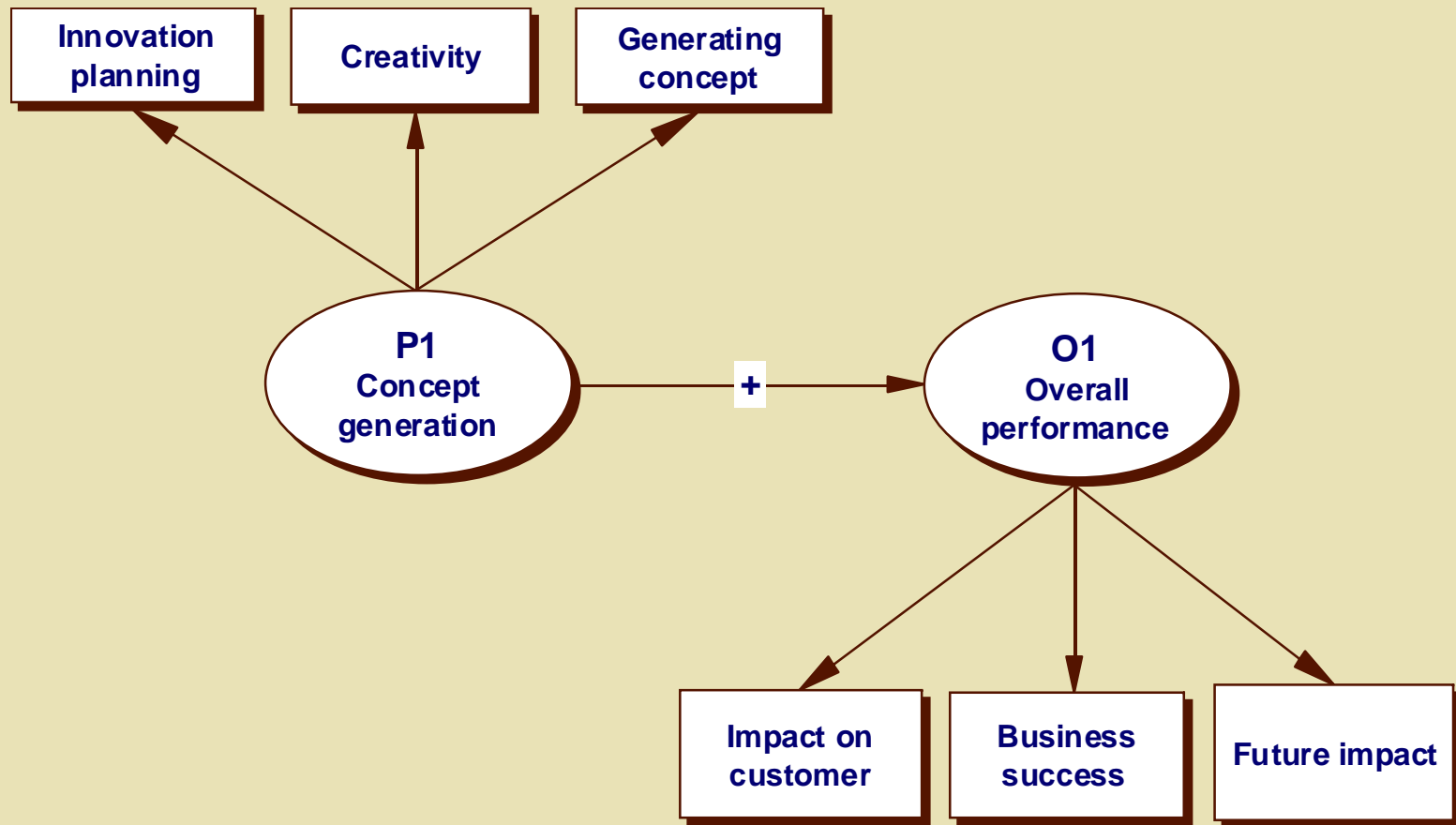
Hypothesized relationships between Effective Use of Systems and Tools and various innovation processes



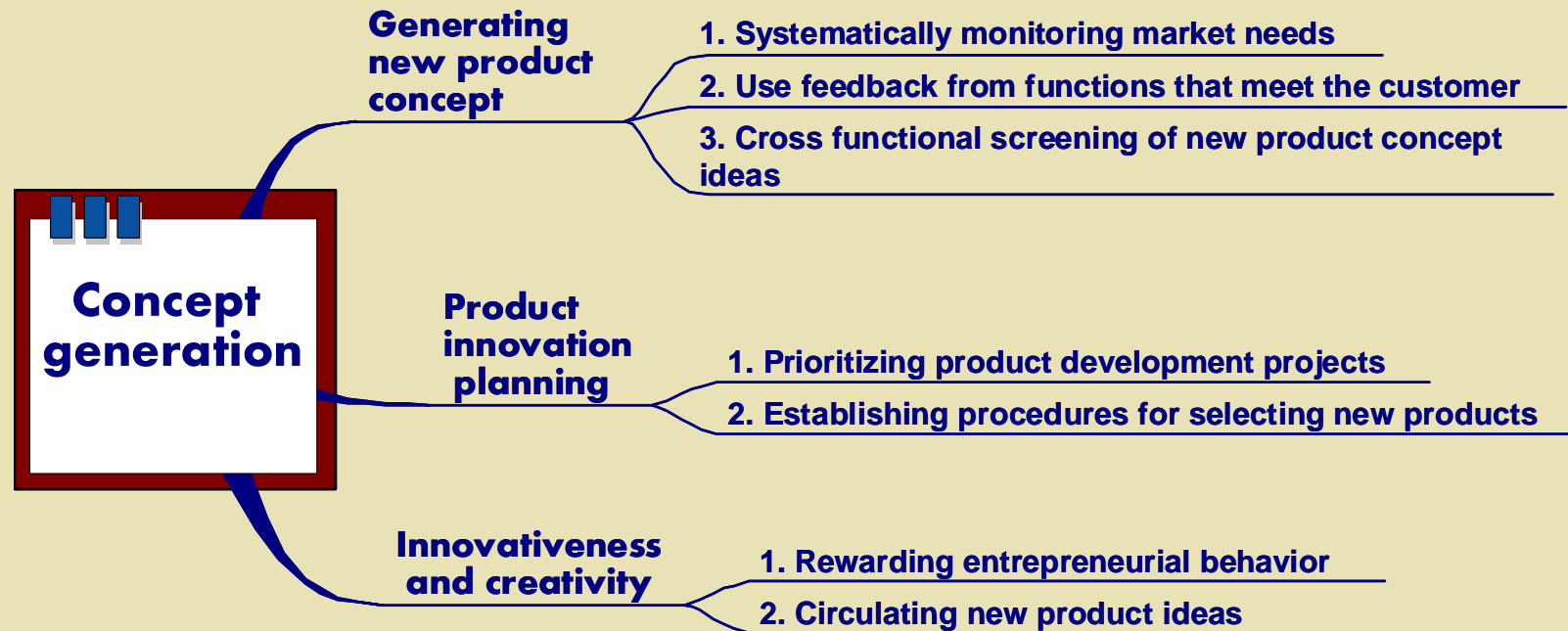
Systems & Tools – Operational Measures



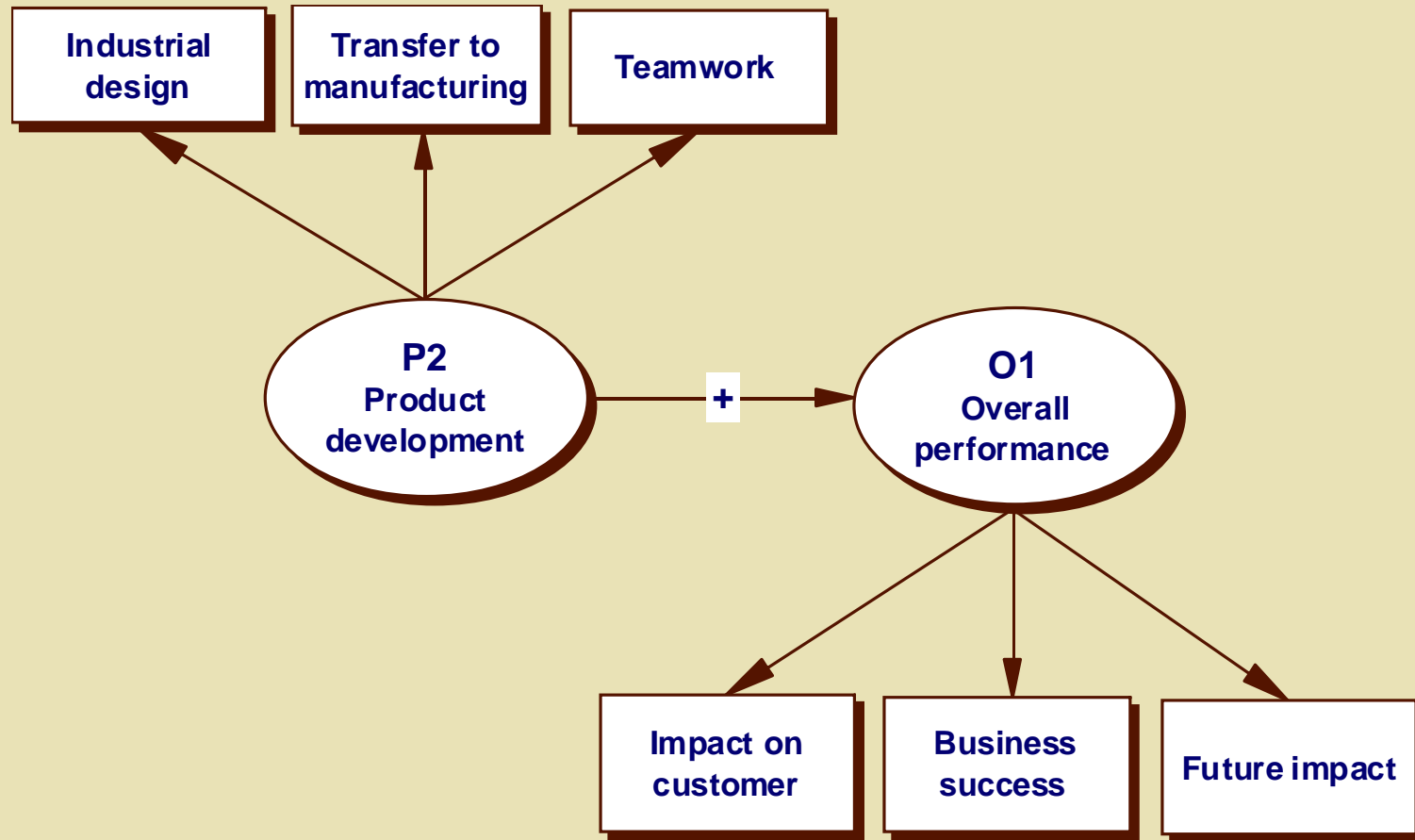
Hypothesized relationship between Concept Generation Process and the Overall Performance



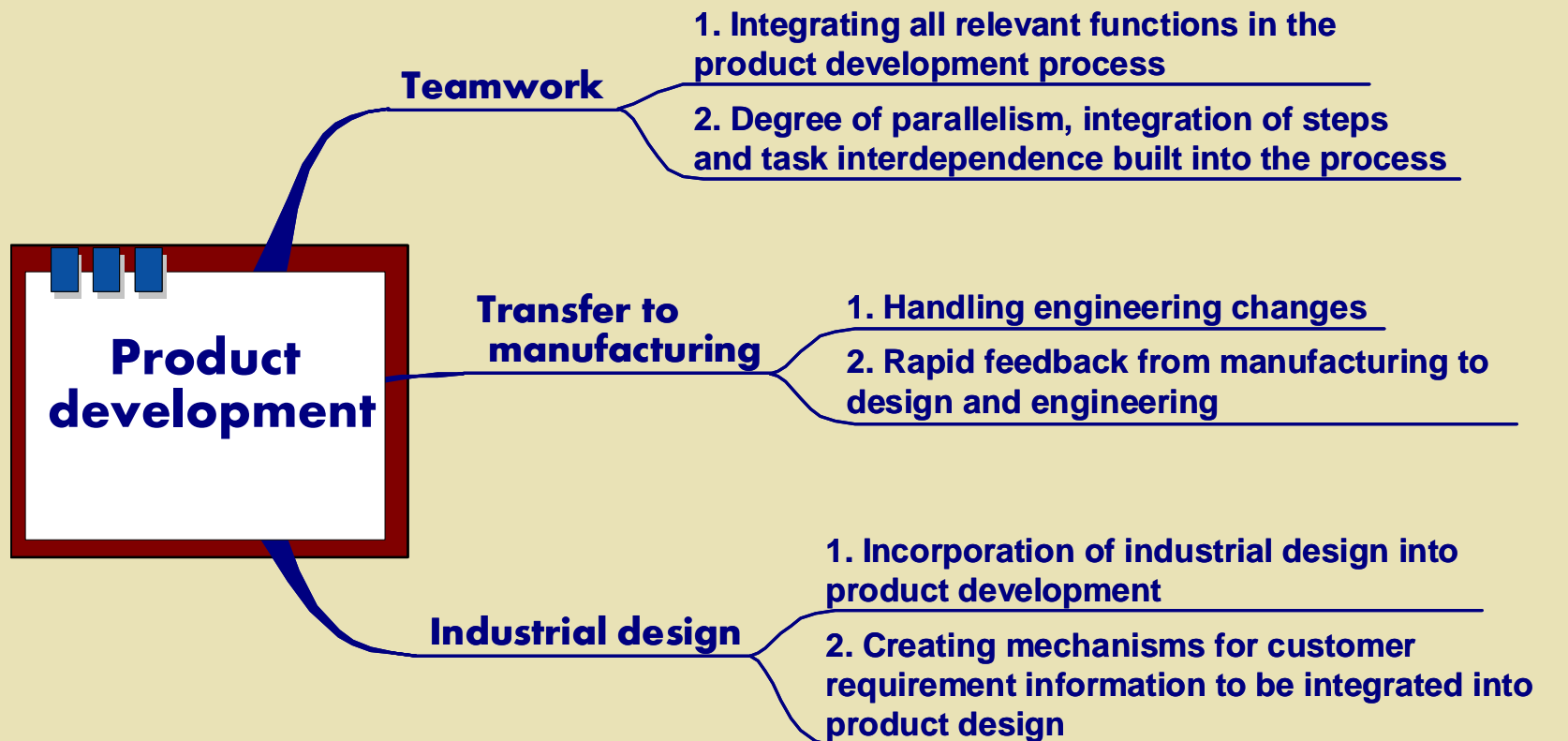
Concept Generation – Operational Measures



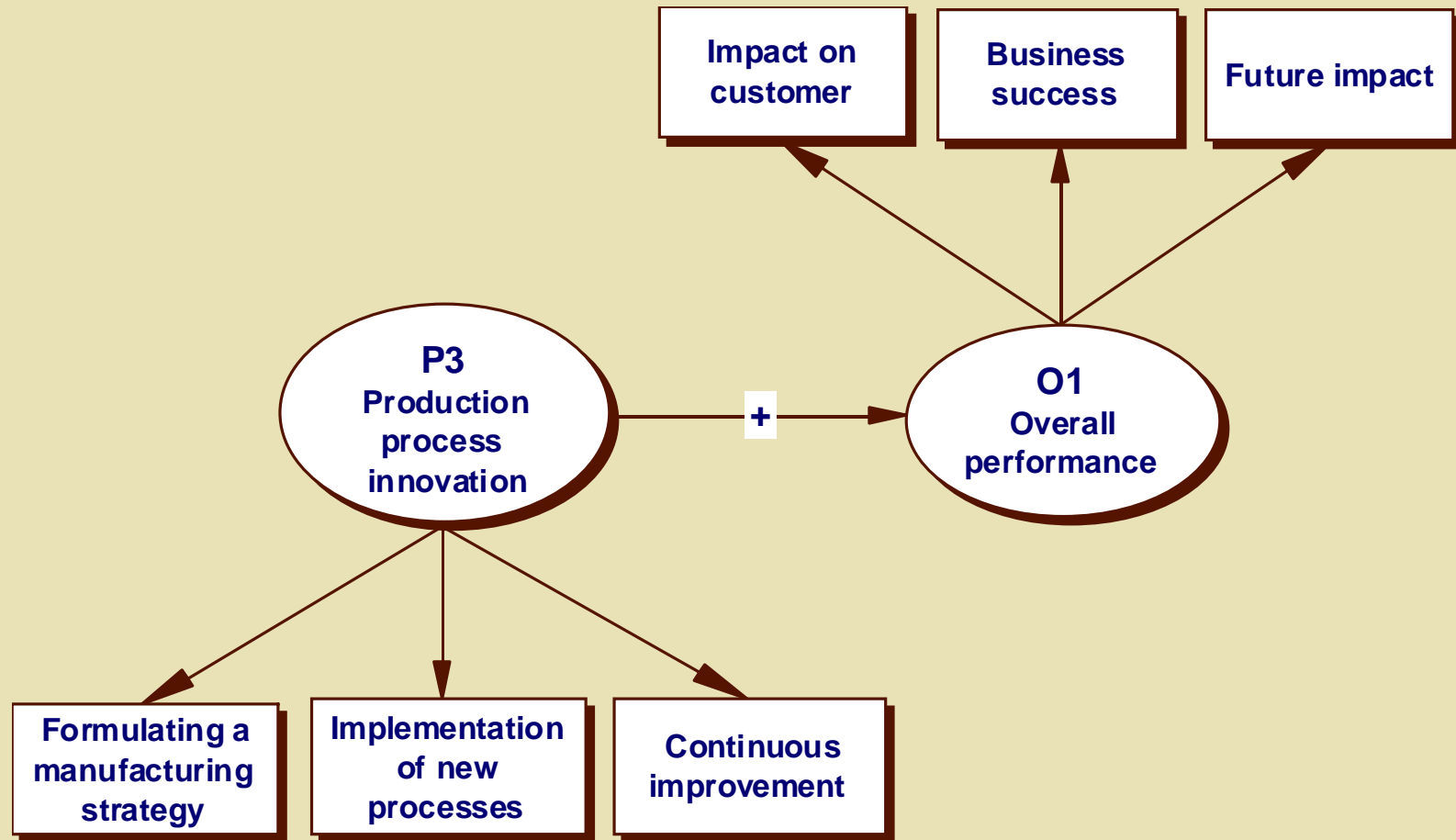
Hypothesized relationship between Product Development Process and the Overall Performance



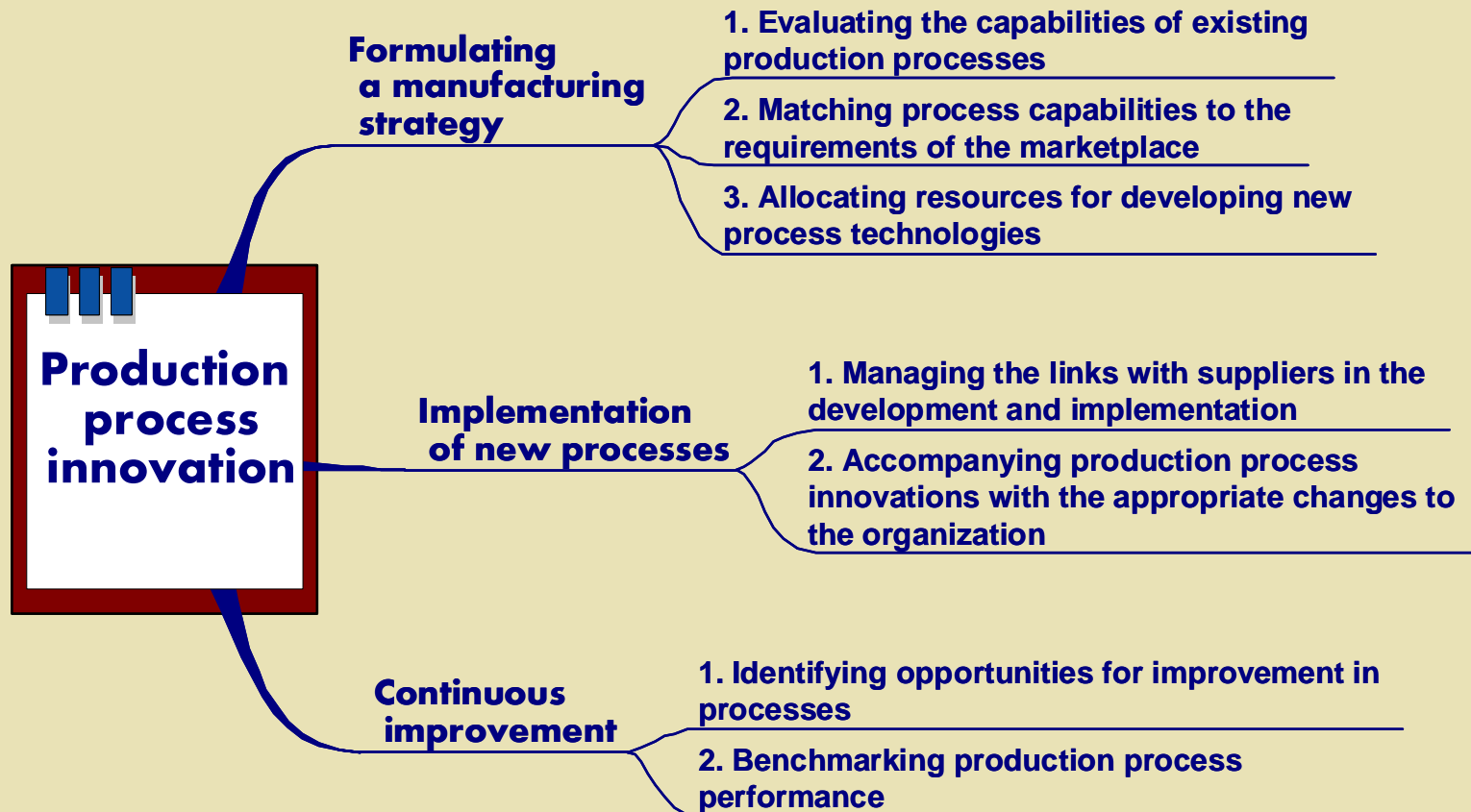
Product Development – Operational Measures



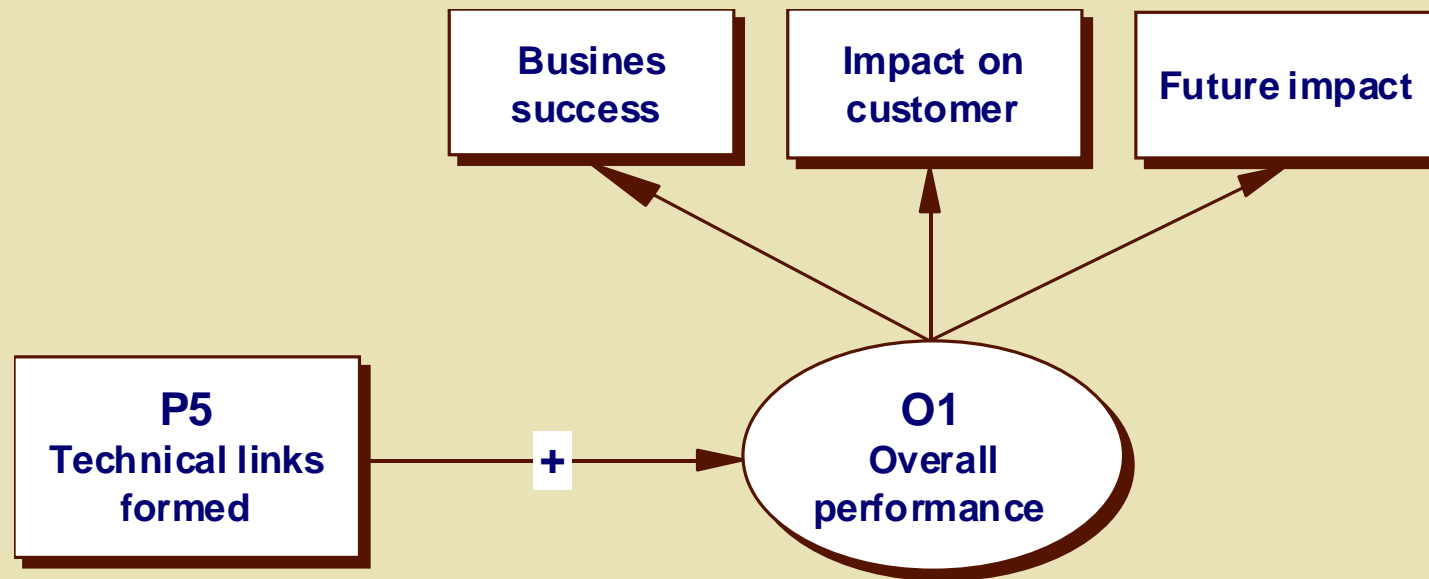
Hypothesized relationship between Production Process Innovation Process and the Overall Performance



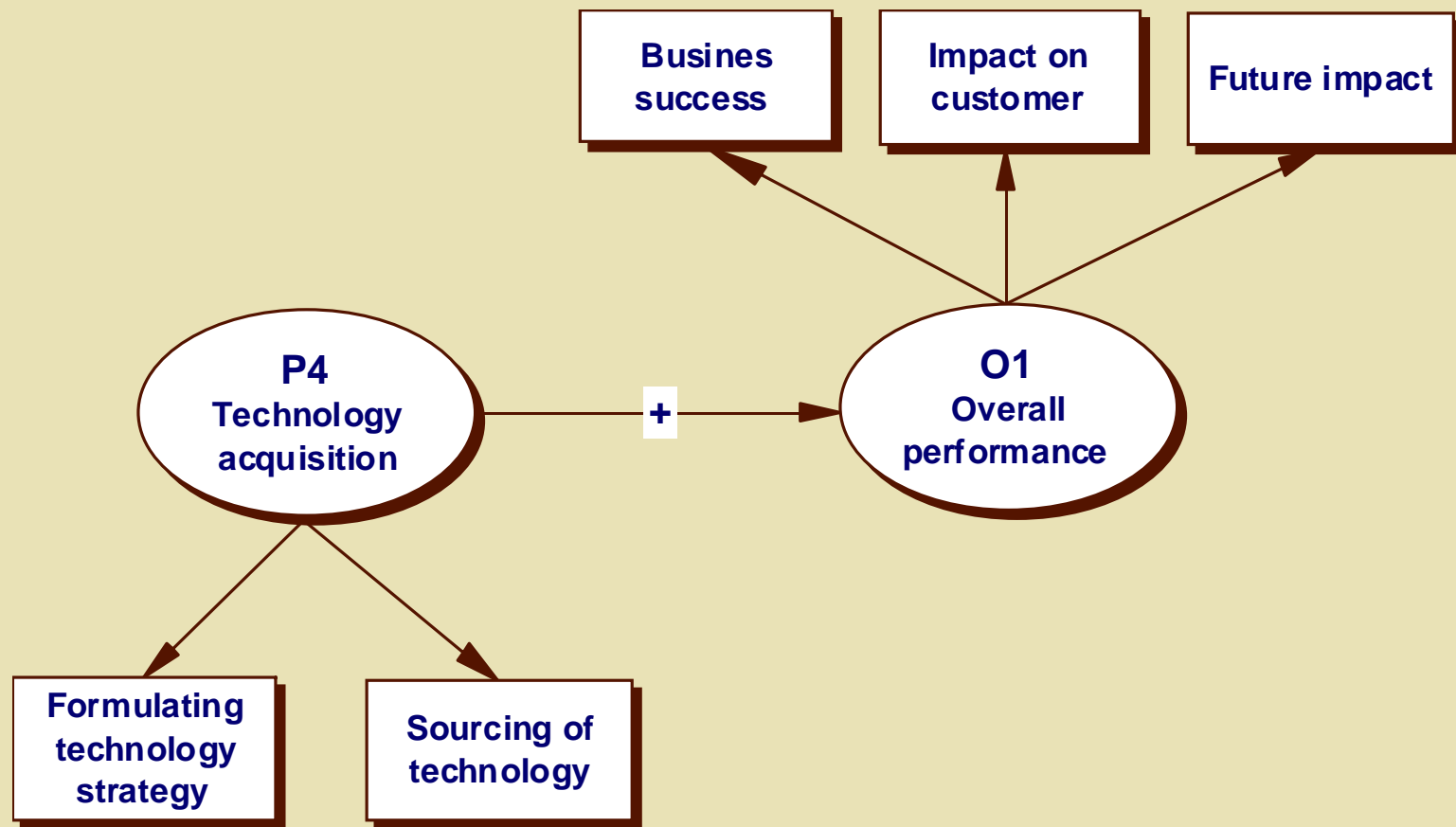
Production Process Innovation – Operational Measures



Hypothesized relationship between Technical links formed and the Overall Performance



Hypothesized relationship between Technology Acquisition Process and the Overall Performance



Technology Acquisition – Operational Measures



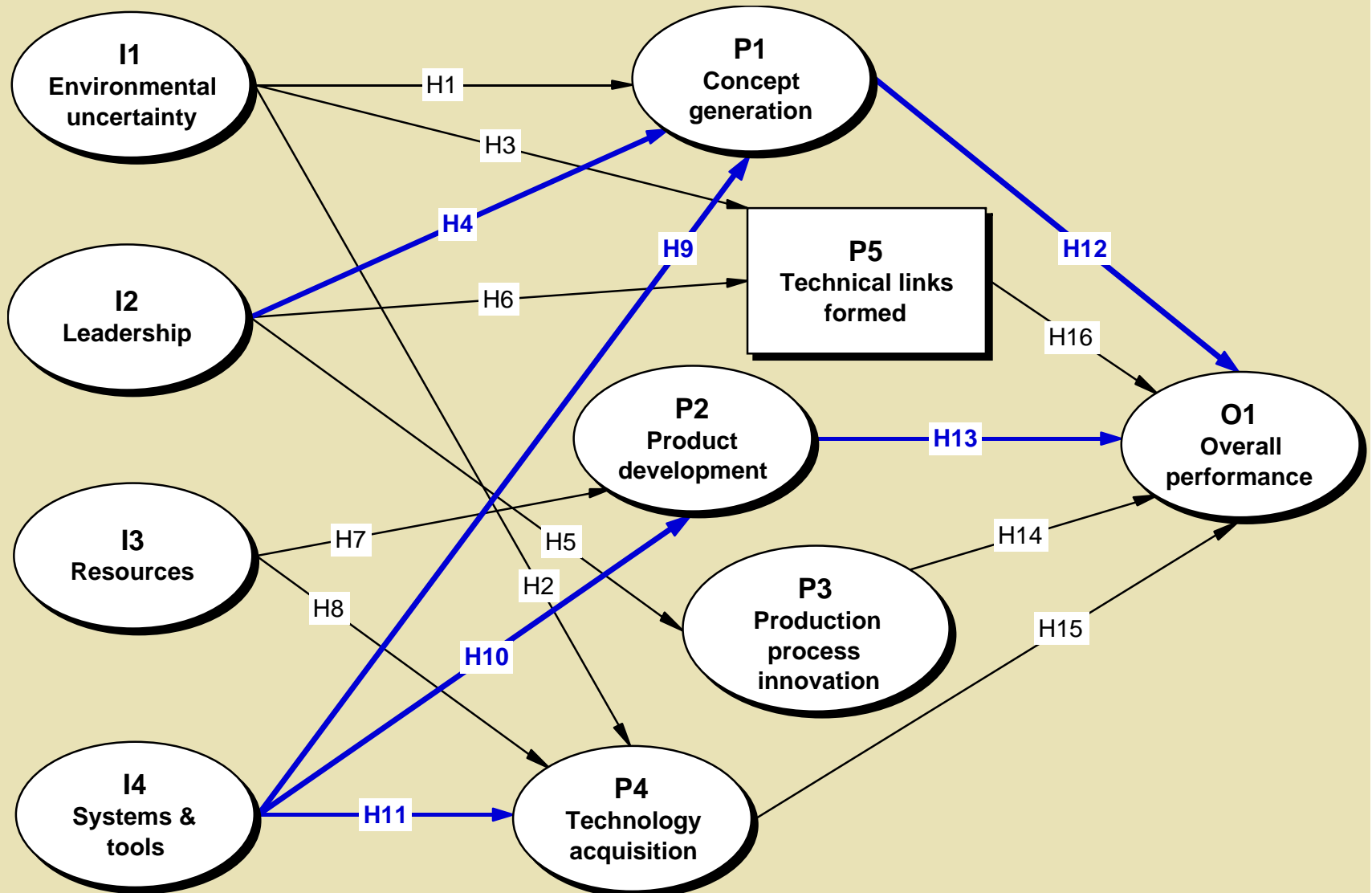
Formulating technology strategy

1. Systematically monitoring trends in existing and future technologies
2. Assessing competitors' technological capabilities
3. Relating technology to business objectives

Selection, generation and sourcing of technology

1. Choosing sources of technologies (R&D, licensing, partnering, external alliances)
2. Corporate procedure for selecting R&D projects

Preliminary results



Preliminary results

Thank you for your attention!