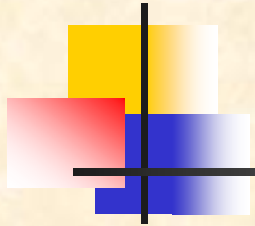


# San Diego PMA

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## **“Expertise in Using Experts: A Study of Manager-Expert Decision Behavior”**

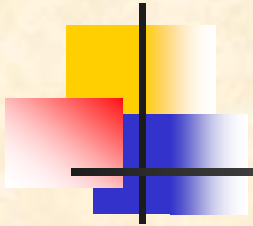
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## Effects of technology

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- Firms becoming more & more technologically intensive
- Technology is a major investment and a critical success variable
- As complexity grows, GM less & less able to keep abreast of the full breadth of technical knowledge underlying investment decisions

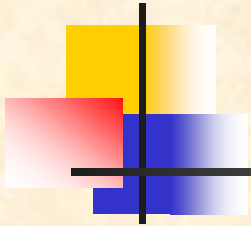


## A real-world problem

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As a result of the rapidly growing complexity of executive decisions:

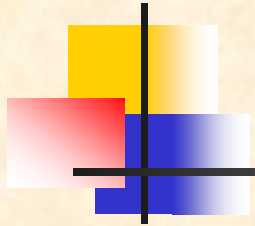
- Increasing reliance on supporting staffs and technologists for a wide range of specialized knowledge and skills not possessed by the executive
- Executives must develop the necessary skills to evaluate claims made by technologists



## The problem to be solved

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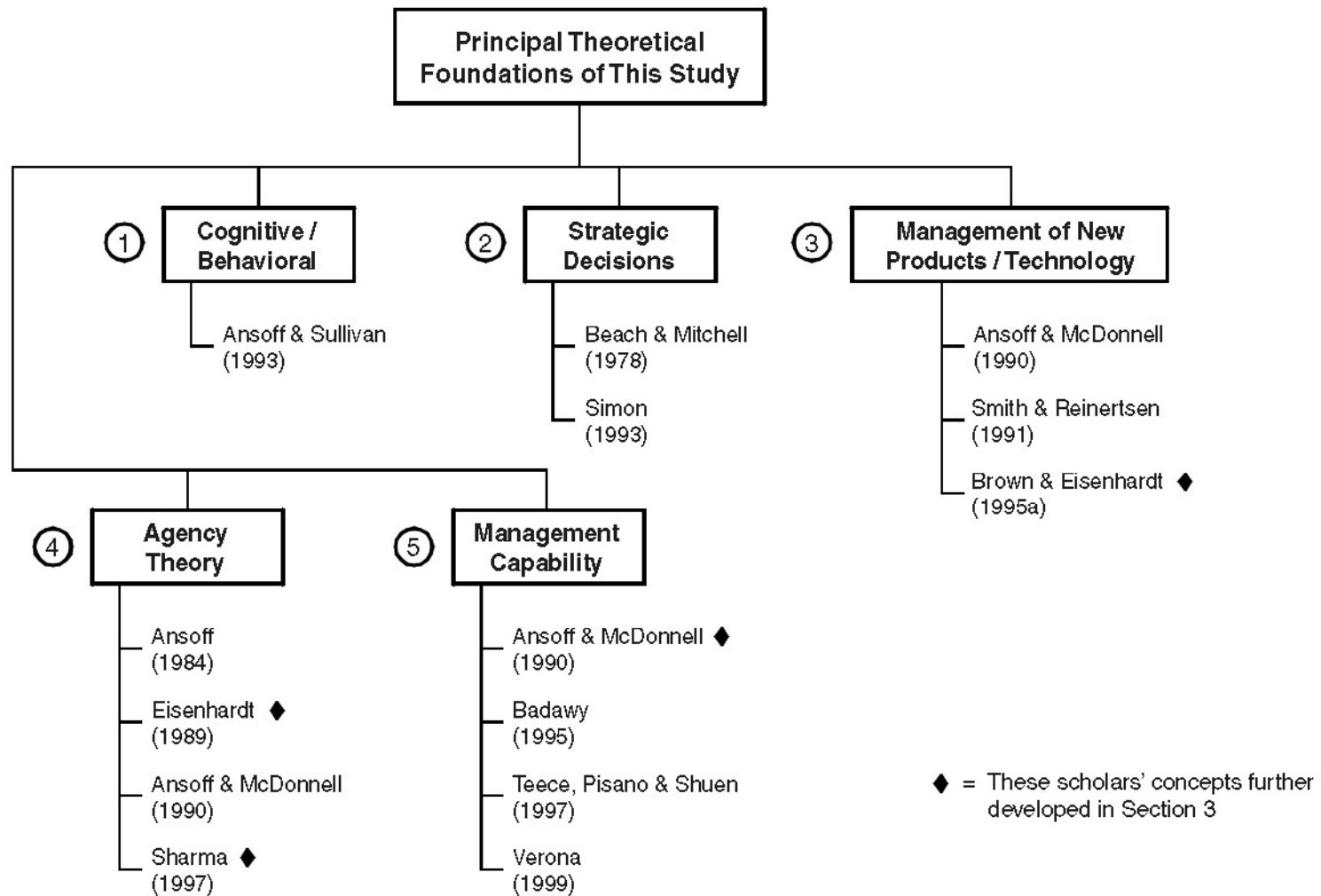
- Need to develop mgrs skills to evaluate the contribution of an expert w/o being able to understand contribution in detail
- Arises when more information is available than is understandable by the manager
- The manager has the power & responsibility, but not ability or knowledge, to satisfactorily evaluate the situation



# Theory development

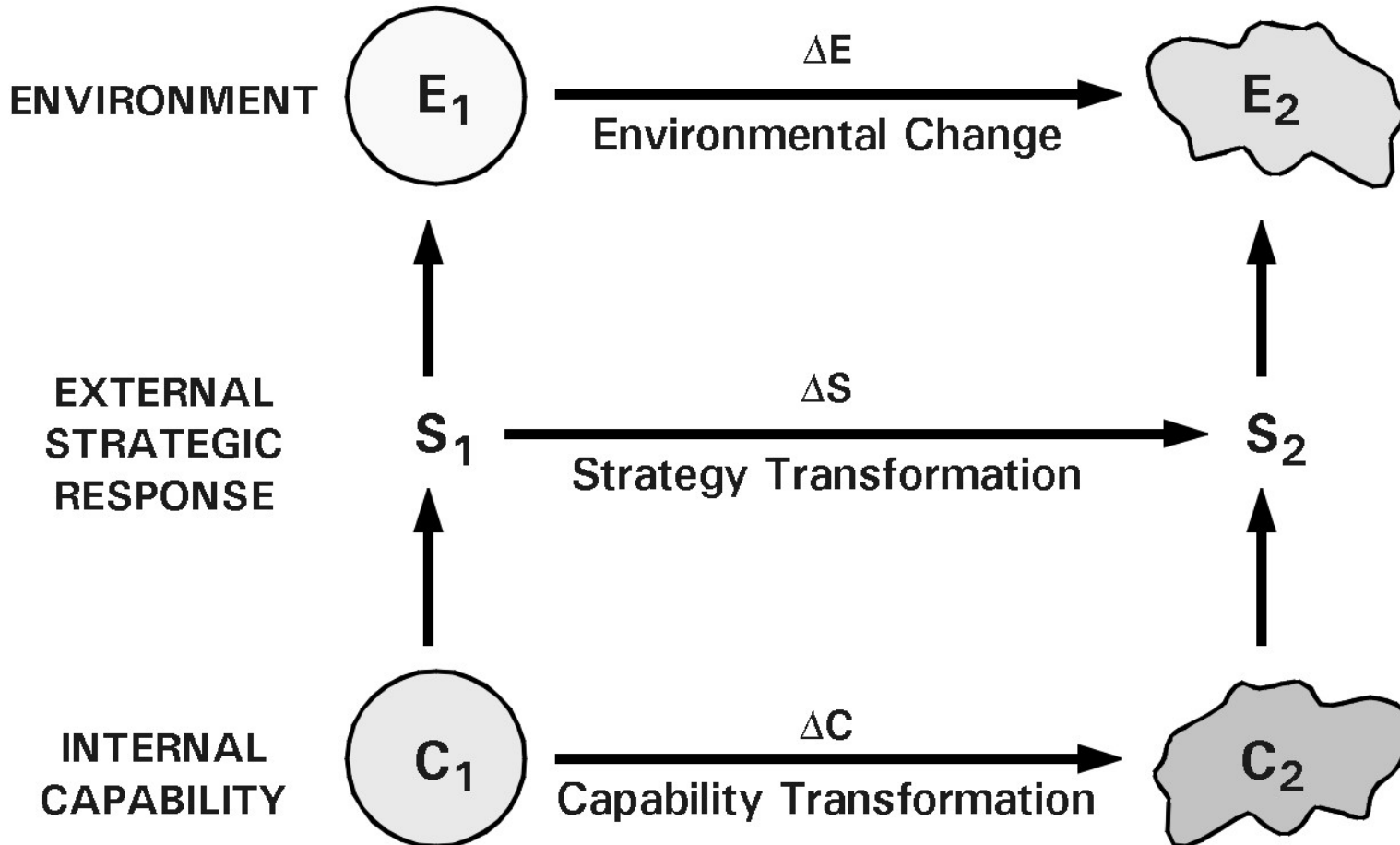
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- Turbulence scale
- Manager-expert relationship
- GM capability



**Figure 7**  
**Principal Theoretical Foundations of this Study**

# FIRM'S ADAPTATION TO ENVIRONMENT



<b>DISCONTINUITY</b>	<b>COMPLEXITY OF ENVIRONMENT</b>	National Economic	> +	Regional Technological	> +	Global Socio-Political
	<b>NOVELTY OF CHANGE</b>	None Slow	Incremental Slow	Incremental Fast	Discont. Familiar	Discont. Novel
<b>UNPREDICT-ABILITY</b>	<b>RAPIDITY OF CHANGE</b>	Zero	Slower Than Response	Comparable To Response	Faster Than Response	Surpriseful
	<b>VISIBILITY</b>	Total	Extrapolable	Predictable	Partially Predictable	Unpredictable
<b>INSTABILITY</b>	<b>FREQUENCY OF TURB. LEVEL SHIFTS</b>	Very Low	Low	Medium	High	Very High
<b>TURBULENCE SCALE</b>		<b>1</b> 	<b>2</b> 	<b>3</b> 	<b>4</b> 	<b>5</b> 



**Table 2**  
**Expert Versus Professional and Manager**

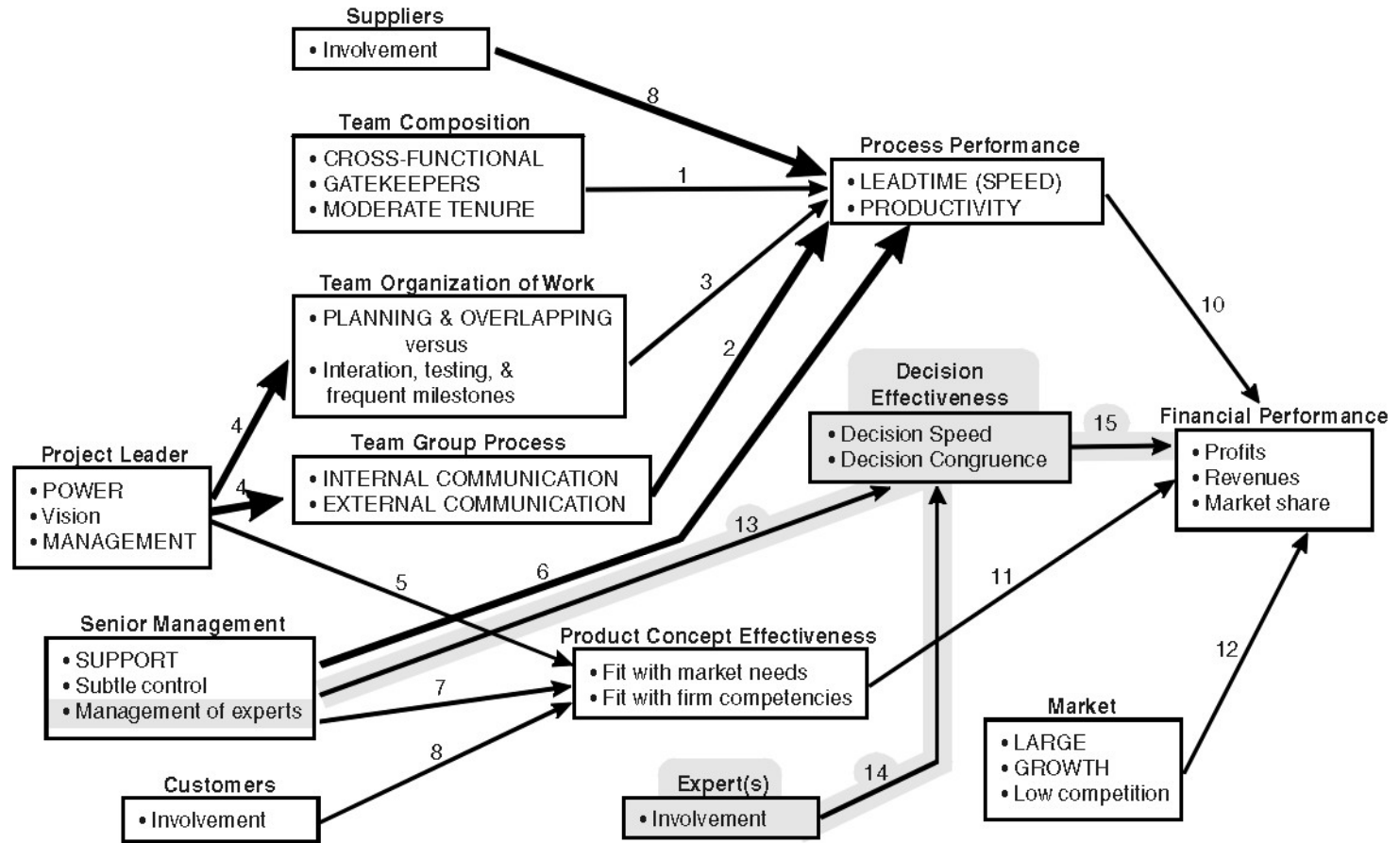
<b>Assumption</b>	<b>Manager—Expert</b>	<b>Principal—Professional<sup>1</sup></b>	<b>Owner—Manager<sup>2</sup></b>
<b>Coupling</b>	<b>Collaborator</b>	<b>Advisor</b>	<b>Informer</b>
Unit of analysis	Exchange between lay manager and expert agent	Exchange between lay principal and professional agent	Contract between principal and agent
Problem domain	Relationships in which the lay manager and the expert agent engage in a knowledge-intensive decision. The two parties have partly differing objectives/values <sup>3</sup> and semantics <sup>3</sup> .	Relationships in which the lay principal and professional agent engage in a knowledge-intensive task. The two parties have differing risk preferences and partly conflicting goals.	Relationships in which the principal and agent have partly differing goals and risk preferences.
Key idea	Manager-expert relationships should facilitate effective evaluation of expert's contribution by the manager without understanding the contribution in detail.	Principal-professional relationships should efficiently accommodate power asymmetry arising from knowledge gap in agent's favor.	Principal-agent relationships should reflect efficient organization of information and risk-bearing costs.
Human assumptions	Mixed motive (altruism & self-interest) Bounded rationality Social embeddedness Semi autonomy Risk aversion	Mixed motive (altruism & self-interest) Bounded rationality Social embeddedness	Self-interest Bounded rationality Individual autonomy Risk aversion
Organization assumptions	Partial objectives/values <sup>3</sup> conflict Efficiency as the effectiveness criterion Knowledge asymmetry <sup>3</sup> Co-production of service involving both manager and expert Contingent on capability <sup>3</sup>	Partial goal conflict Efficiency as the effectiveness criterion Knowledge asymmetry Co-production of service involving both principal and professional	Partial goal conflict Efficiency as the effectiveness criterion Information asymmetry Agent delegated the task by passive owner principal
Assumption about oversight	Corporate control Community of peers	Community of peers	Market (Corporate Control/Reputation)
Information assumptions	Incomplete market for esoteric knowledge—not a commodity.	Incomplete market for esoteric knowledge—not a commodity.	Information a purchasable commodity
Contracting problems	Agency (calibration and validity)	Agency (measurement and causality)	Agency (moral hazard and adverse selection)

<sup>1</sup> Adapted from Sharma (1997: 774)

<sup>2</sup> Adapted from Eisenhardt (1989: 59)

<sup>3</sup> Adapted from Ansoff and McDonnell (1990: 174, 263)

 = New Theoretical Propositions

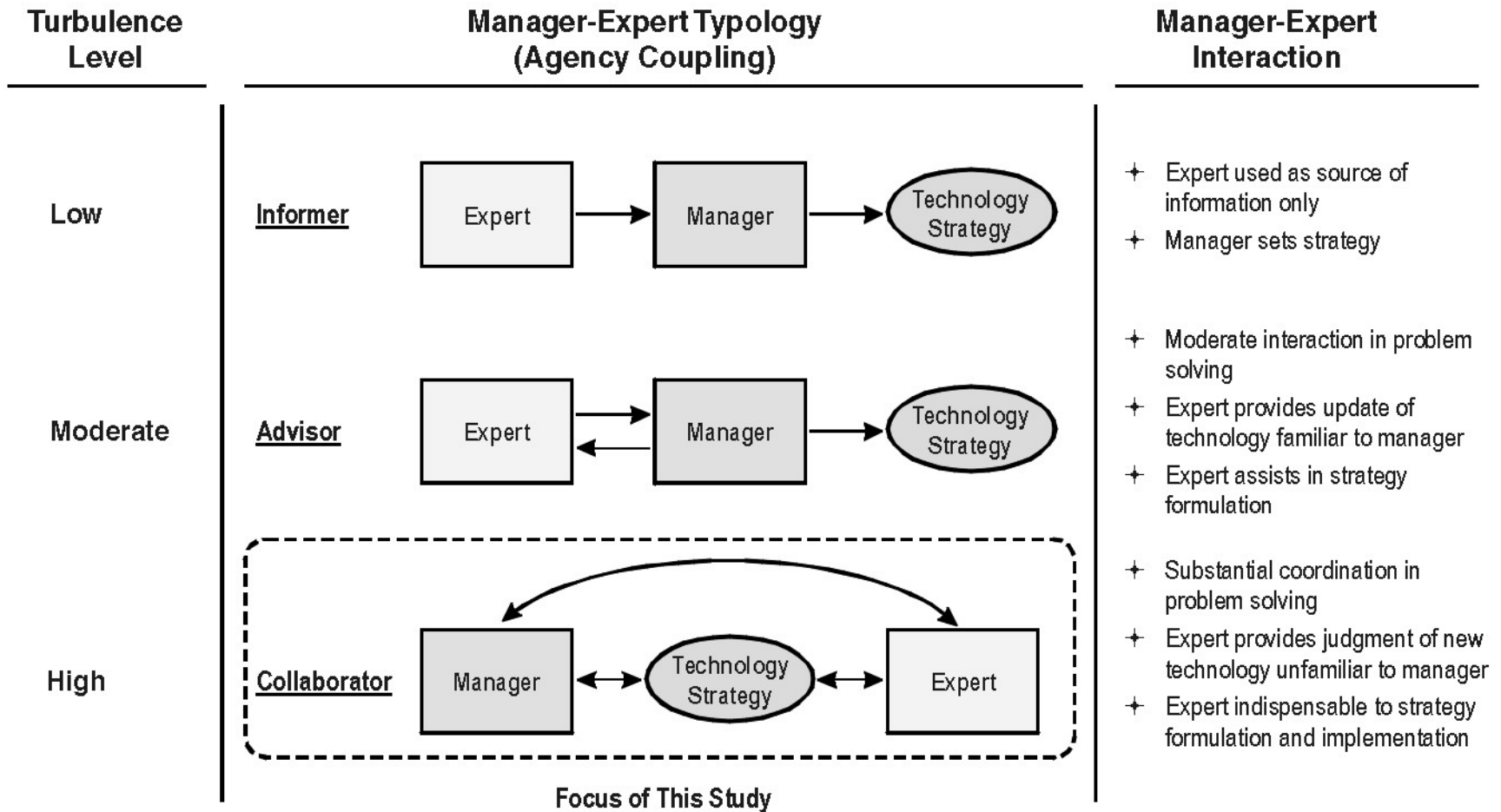


<sup>o</sup> Capital letters and thickened lines indicate robust findings.

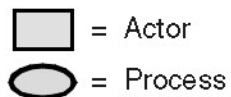
<sup>1</sup> Adapted from Brown and Eisenhardt (1995a: 346).

= New Theoretical Propositions

**Figure 10**  
**Factors Affecting the Success of Product-development Projects<sup>o1</sup>**



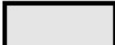
1 Adapted from Ansoff and McDonnell (1990: 185).



**Figure 11**  
**Manager-Expert Typology<sup>1</sup>**

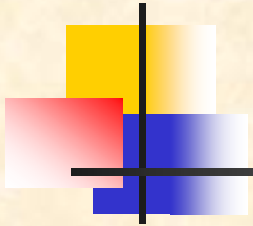
**Table 5**  
**General Management Capability (Composite)<sup>1</sup>**

Attributes	Manager / Expert	Organization
Climate (will to respond)	Success Mentality (Attitudes) <sup>2</sup>	Foster Success
Competence (ability to respond)	Technical Competence (Knowledge Skills) <sup>2</sup>	Calibrate Expert
		Manage Knowledge
	Influence Competence (Interpersonal Skills) <sup>2</sup>	Manage Risk
Capacity (volume of response)	Personal	Organizational

 = New theoretical propositions

<sup>1</sup> Adapted from Ansoff and McDonnell (1990:263)

<sup>2</sup> Adapted from Badawy (1995:29)



# Global and research models

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- Global models
- Research domain
- Research model

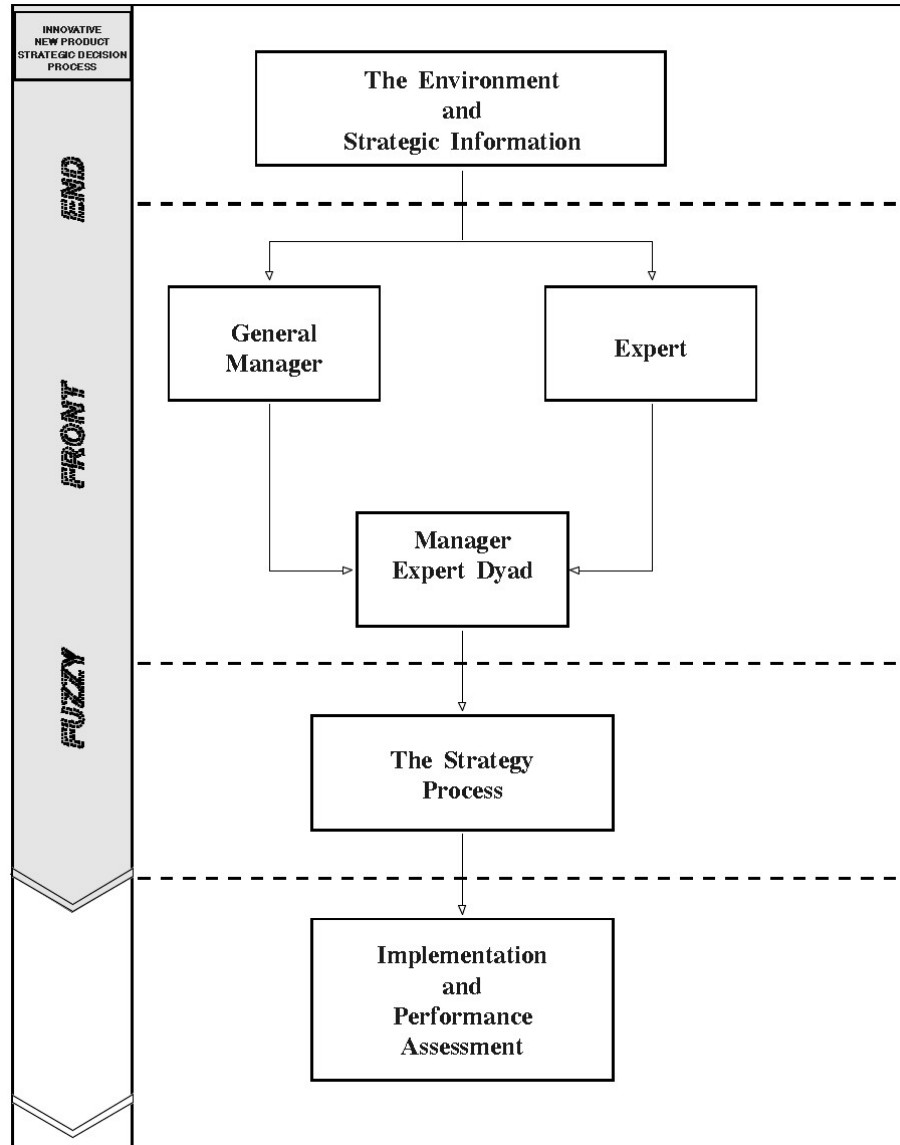


Figure 1

**Global Model (Block): Manager-Expert Strategic Behavior  
For New Product / Technology Decision In  
Technology-based, Turbulent Environments**

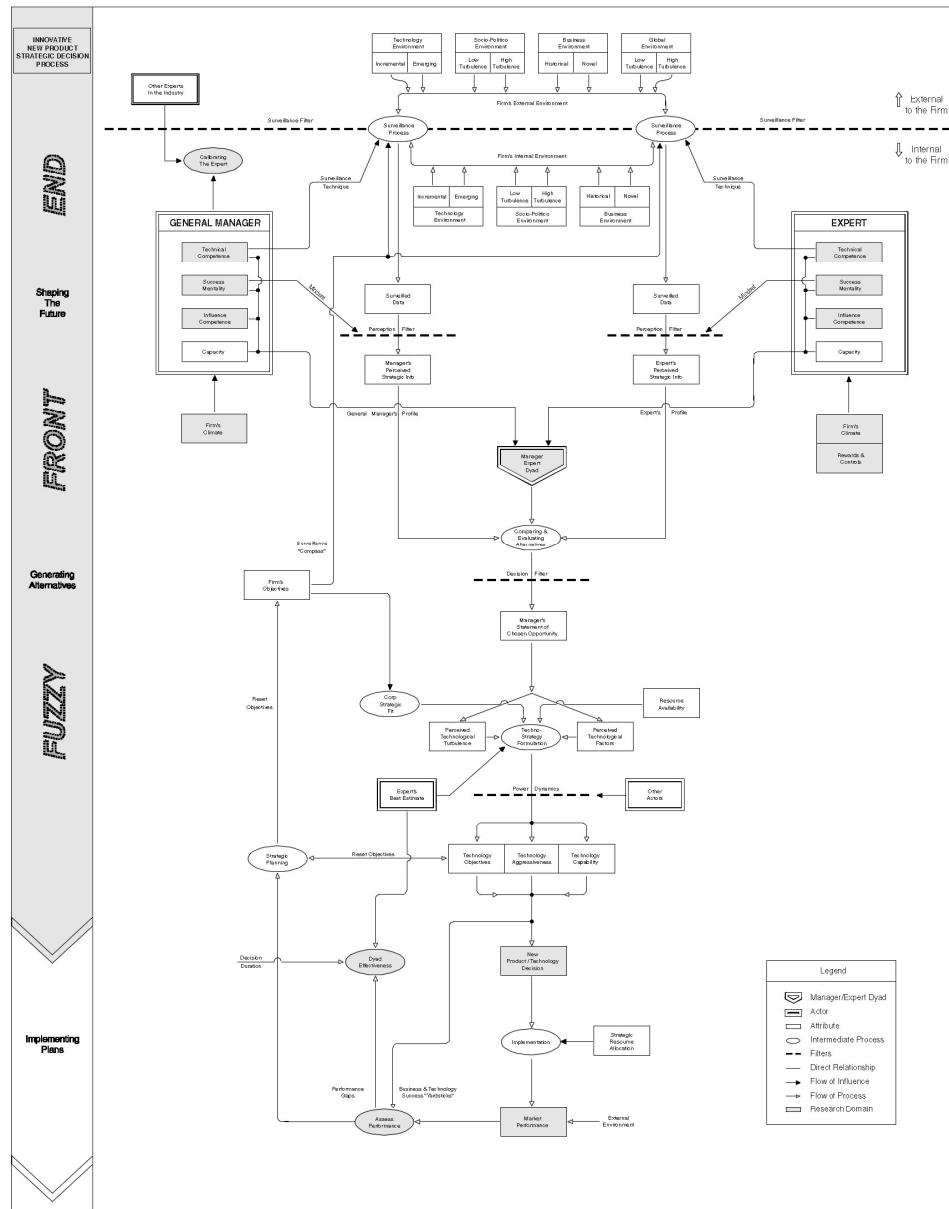
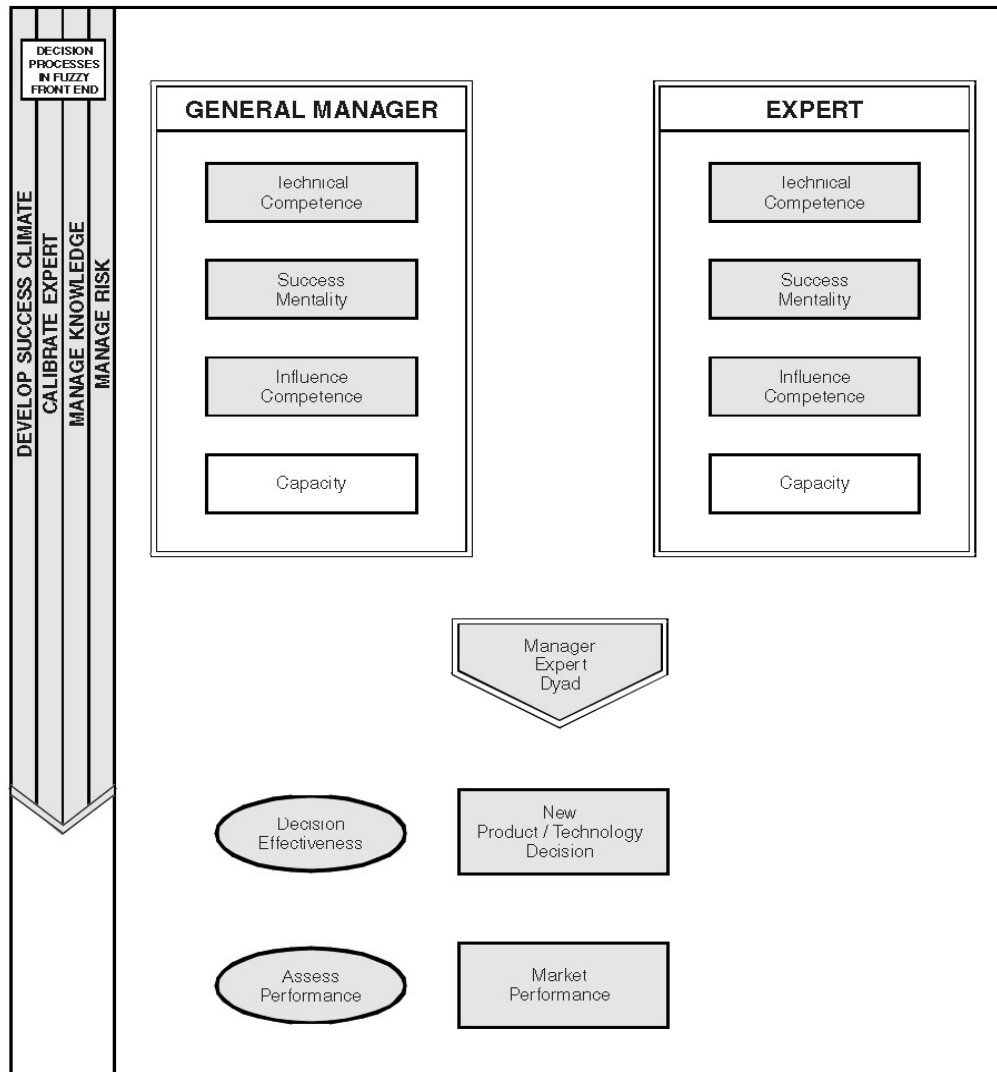


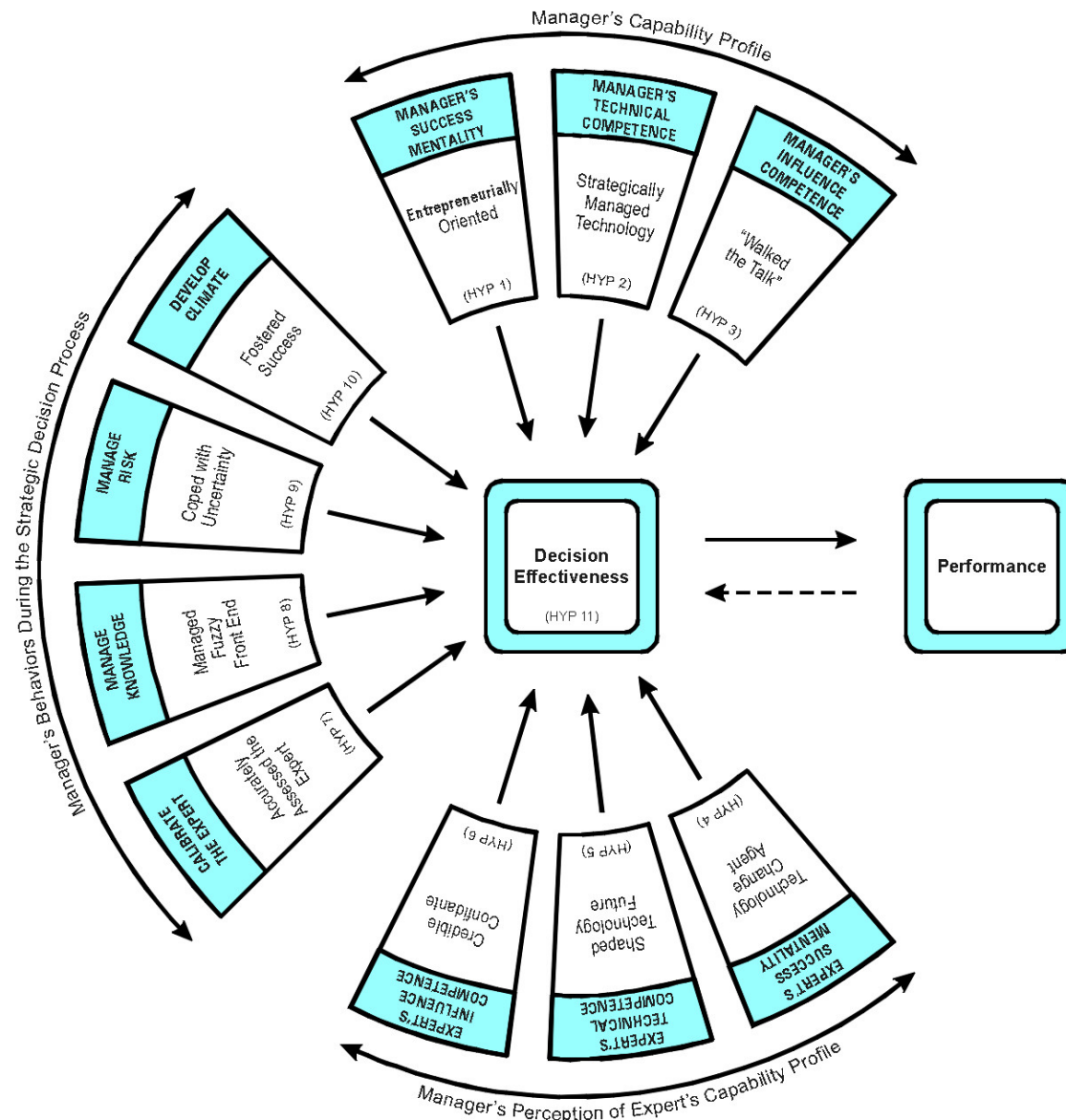
Figure 18

Global Model (Detail): Manager-Expert Strategic Behavior For New Product / Technology Decision In Technology-based, Turbulent Environments



**Figure 8**  
**Domain of the Research Model**





**Research Model**

**Table 6**

**The Management of Experts: Predicted Manager's Behavior Profile During the Strategic Decision Process Leading to Successful Performance**

<b>COMPONENT PROFILE</b>	<b>MANAGER'S SUCCESS MENTALITY</b>	<b>MANAGER'S TECHNICAL COMPETENCE</b>	<b>MANAGER'S INFLUENCE COMPETENCE</b>
<p><b>MOST SUCCESSFUL</b></p>	<p><i>Entrepreneurially Oriented</i></p> <ul style="list-style-type: none"> <li>• Entrepreneurially oriented toward novel technology strategies</li> <li>• Comfortable with complexity</li> <li>• Tolerant of ambiguity</li> <li>• Practiced mental simulation on decision alternatives</li> </ul>	<p><i>Strategically Managed Technology</i></p> <ul style="list-style-type: none"> <li>• Sought relevant knowledge ("savviness") of emerging technologies</li> <li>• Exhibited a high "absorptive capacity" for technology</li> <li>• Maintained basic expertise in technology being managed</li> <li>• Used intuition that was derived from technology experience</li> </ul>	<p><i>"Walked the Talk"</i></p> <ul style="list-style-type: none"> <li>• Exhibited a high degree of credibility</li> <li>• Inspired a shared vision of success</li> <li>• Utilized a participative (hands-on) style of leadership</li> <li>• Had a high level of "cross disciplinary" dialog skills</li> </ul>

**Table 7**

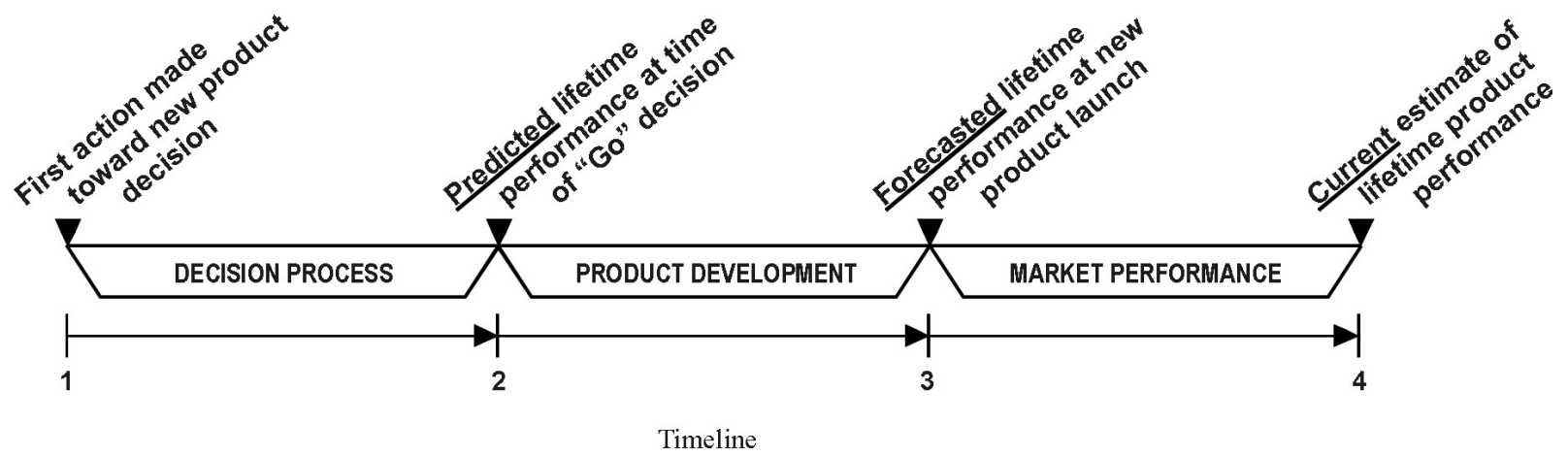
**The Management of Experts: Predicted Manager's  
Perception of Expert's Behavior Profile  
During the Strategic Decision Process  
Leading to Successful Performance**

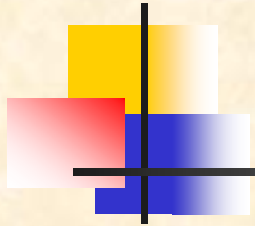
<b>COMPONENT PROFILE</b>	<b>EXPERT'S SUCCESS MENTALITY</b>	<b>EXPERT'S TECHNICAL COMPETENCE</b>	<b>EXPERT'S INFLUENCE COMPETENCE</b>
<p><b>MOST SUCCESSFUL</b></p>	<p><i>Technology Change Agent</i></p> <ul style="list-style-type: none"> <li>• Embraced technological change</li> <li>• Utilized a high degree of analogic reasoning</li> <li>• Creative problem solver</li> <li>• Knew what he didn't know (i.e. limits of expertise)</li> </ul>	<p><i>Shaped Technology Future</i></p> <ul style="list-style-type: none"> <li>• Maintained up-to-date domain knowledge of emerging technologies</li> <li>• Closely involved in the development of the firm's technology strategy</li> <li>• Able to accurately assess technically relevant from irrelevant</li> <li>• Maintained professional relationships with other technology experts</li> </ul>	<p><i>Credible Confidante</i></p> <ul style="list-style-type: none"> <li>• Cultivated a superior professional reputation</li> <li>• Skilled educator of technological complexity</li> <li>• Balanced loyalty to firm with loyalty to the profession</li> <li>• Demonstrated a high degree of tenacity ("stick-to-itiveness")</li> </ul>

Table 8

The Management of Experts: Predicted Manager's Behaviors During the Strategic Decision Process Leading to Successful Performance

PROCESS PROFILE	CALIBRATE THE EXPERT	MANAGE KNOWLEDGE	MANAGE RISK	DEVELOP CLIMATE
<b>MOST SUCCESSFUL</b>	<p><i>Accurately Assessed the Expert</i></p> <ul style="list-style-type: none"> <li>• Developed intuitive sense regarding expert's capabilities ("intuitive auditor")</li> <li>• Used trial assignments ("tacit testing") to assess reliability of expert</li> <li>• Attuned to context of task assignments (determine fit of the expert)</li> <li>• Sensitive to norms and aspirations of expert</li> </ul>	<p><i>Managed the Fuzzy Front End</i></p> <ul style="list-style-type: none"> <li>• Solicited disparate perspectives from other technologists</li> <li>• Demanded real-time information ("learning-on-the-fly")</li> <li>• Ensured a rational (apolitical) process</li> <li>• Played "provocateur" to stimulate creative cognitive conflict</li> </ul>	<p><i>Coped with Uncertainty</i></p> <ul style="list-style-type: none"> <li>• Ensured the problem was clearly defined</li> <li>• Promoted really new products but implemented incrementally</li> <li>• Actively used effortful thought (reflection) to assess judgment bias</li> <li>• Probed for evidence to determine where expert may be in error</li> </ul>	<p><i>Fostered Success</i></p> <ul style="list-style-type: none"> <li>• Encouraged a culture of collaboration</li> <li>• Fostered a high sense of trust</li> <li>• Rewarded creative contributions</li> <li>• Actively promoted a sense of urgency</li> </ul>

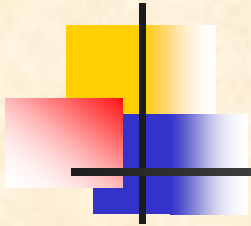




## Key questions

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1. What are the pertinent skills, behaviors and perceptions that positively influence the management of an expert in making fast, effective strategic decisions?
2. Does utilizing these skills for managing experts result in an increase in performance?



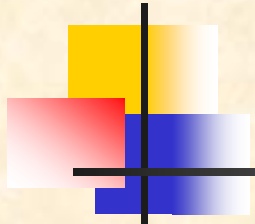
## Screening criterion

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- restricted to top managers who collaborated with an expert in making a strategic decision
- the strategic decision involved the introduction of a new product, service or technology
- the new product was on the market less than five years
- the new product was introduced long enough for manager to judge its performance with 80+ percent certainty as to its ultimate lifetime success or failure
- participants limited to those competing in discontinuous environments (i.e., T.L.  $\geq$  3.0)

<b>Organizational or Personal Source</b>	<b>Transmission Method</b>	<b># Who Responded (or # of Items Mailed)</b>	<b># of Survey Participants</b>
<b>UCSD CONNECT</b>	<b>Newsletter</b>	<b>8</b>	<b>4</b>
<b>UCSD Executive Education Program</b>	<b>Email notice to program graduates</b>	<b>36</b>	<b>18</b>
<b>San Diego Software Industry Council</b>	<b>Email notice to members</b>	<b>12</b>	<b>8</b>
<b>UCSD New Product Course Exploratory Committee</b>	<b>Email letter to attendees</b>	<b>10</b>	<b>4</b>
<b>San Diego Product Management Association</b>	<b>Email notice to members</b>	<b>17</b>	<b>13</b>
<b>Other Product Management Associations<sup>1</sup></b>	<b>Email notice to members</b>	<b>11</b>	<b>10</b>
<b>San Diego-Orange FAST 50 High Tech/Software Firms<sup>2</sup></b>	<b>Direct mail</b>	<b>80</b>	<b>3</b>
<b>New Product Development Consultant Mailing List<sup>3</sup></b>	<b>Direct mail</b>	<b>239</b>	<b>15</b>
<b>Professional Direct Referrals</b>	<b>Email or letter</b>	<b>43</b>	<b>23</b>
<b>Total Survey Participants =</b>			<b>98</b>

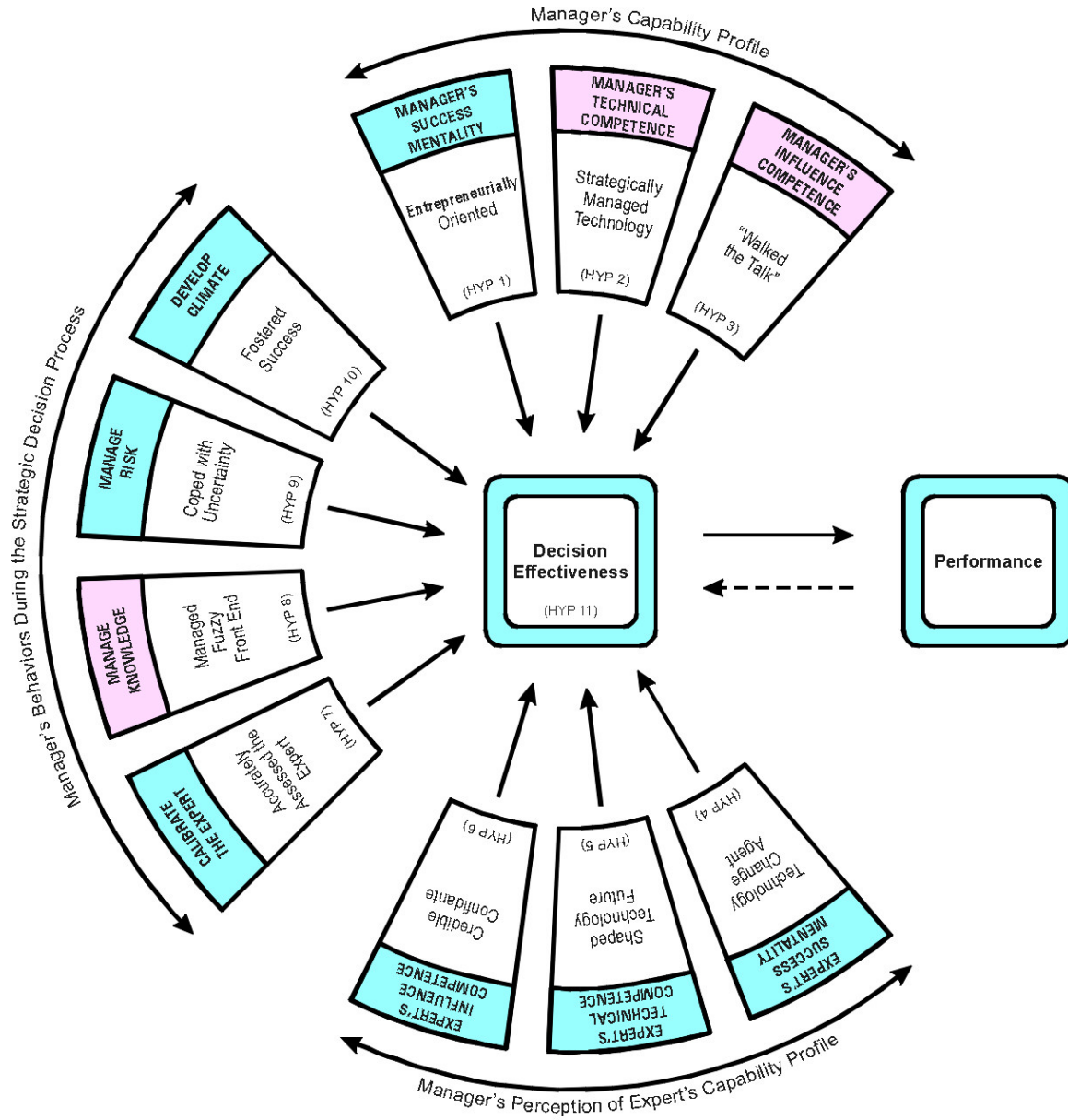




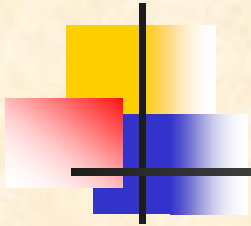
# “Expertise in using experts”

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**Findings**



**Research Model**



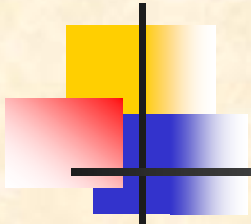
# Conclusions supported

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## Managers who:

- ✓ Are entrepreneurially oriented
- ✓ accurately assess (calibrate) the expert
- ✓ manage risk in collaborating with an expert
- ✓ foster a climate of success

tend to have more effective strategic new product decisions  
with better overall performance



# Conclusions supported

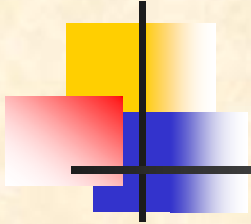
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## Experts\* who:

- ✓ think as a technology change agent
- ✓ actively direct the firm's technology future
- ✓ are a credible confidante

when working collaboratively with the manager tend to result in more effective strategic new product decisions with better overall performance

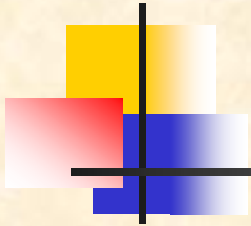
(\* - as perceived by the manager)



## Conclusions supported

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***More effective strategic new product decisions tend to result in better overall performance***



## Conclusions suggested

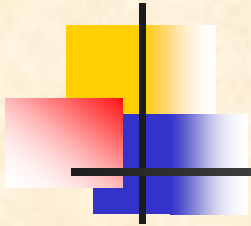
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- ◆ **Environmental Turbulence Level:**

Managers collaborating with an expert in higher ( $\geq 3.0$ ) T.L.s tend to have more effective strategic new product decisions and better overall performance than those operating in lower ( $< 3.0$ ) T.L.s

- ◆ **Decision Speed:**

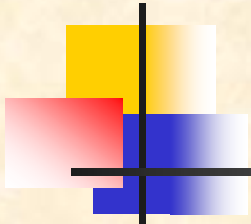
Faster is better - managers collaborating with an expert to make fast ( $\leq 6$  mo) new product decisions tend to have more effective decisions and better overall performance than slow ( $> 6$  mo) decision-makers



## Conclusions suggested

---

- ◆ Time saved in the “fuzzy front end” increases performance
- ◆ In environmental turbulence levels of 3.0 and above, the relationship between the manager and expert tends to be one of a collaborator (versus informer or advisor)
- ◆ Product performance is linear vs. non-linear (i.e., no N-L indication by scatterplot, or Ln, log,  $x^2$  curve fit)



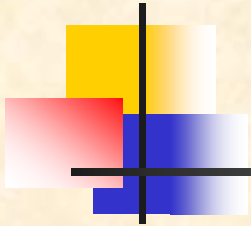
# Conclusions suggested

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Possible remedies suggested for some common biases that may distort data perceived by both the manager and the expert:

1. **Overconfidence Bias**: Relates to an overestimation of certainty regarding current information, leading to an overestimation of the accuracy of predictions
2. **Confirmatory Bias**: Seeking out information that supports one's existing instinct or point of view, while avoiding information that contradicts it
3. **Framing Bias**: Framing problems in terms of one's beliefs and prejudices, and predisposing oneself to see these problems in certain ways, reality notwithstanding
4. **Conservatism Bias**: When providing an estimate in an uncertain situation, people tend to conservatively adjust their predicted outcome to increase the likelihood that their prediction will be a valid solution



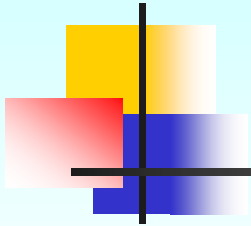


# Contributions to management practice

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## Manager needs to:

- ✓ Be less of a technologist and more of a manager
- ✓ Ensure that he accurately calibrates the expert, and matches the expert to the task
- ✓ Recognize the risk inherent in his reliance on the expert and manage his vulnerability
- ✓ Establish a climate of success that will let the expert perform to his full creative and professional potential
- ✓ Be aware of skills/techniques to attenuate judgment bias (e.g., overconfidence, confirmatory, conservatism and framing biases)



## Questions?

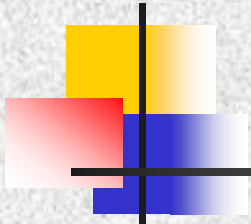


“The most important thing in science is not so much to obtain new facts, as to discover new ways of thinking about them.”

- Sir William Bragg -

“As for the search for truth, I know from my own painful searching, with its many blind alleys, how hard it is to take a reliable step, be it ever so small, toward the understanding of that which is truly significant.”

- Albert Einstein -



# Thank you!!

---

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