A PROPOSED SOWT MODEL FOR TEACHING STRATEGIC ANALYSIS AND DEVELOPMENT

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ABSTRACT
This paper proposes a SOWT model for teaching strategic analysis and development. It offers an improvement over the traditional narrative form of SWOT analysis often found in current literature. It could be used at least in the strategic assessment stage of strategy formation. In addition to this model, this paper includes a number of suggested frameworks, which also represent workable tools that could be used on their own or in combination with other models.

INTRODUCTION

The SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) characterized early prescriptive models on strategy formation developed in the 1960s. More recently, Mintzberg (1994) distinguishes between strategic planning and strategic thinking. According to the author, planning is about analysis, about breaking down a goal or set of intentions into steps, formalizing those steps so that they can be implemented almost automatically, and articulating the anticipated results or consequences of each step. Strategic thinking is about synthesis. It involves intuition and creativity. The outcome is an integrated perspective of the enterprise, a not-too-precisely articulated vision of direction. Such strategies should be free to appear at any time and at any place in the organization, typically through messy processes of informal learning that can be carried out by people who are involved with the specific issues at hand at various levels. In line with Mintzberg's view, in this paper we consider learning as a key role in strategic development.

THE PROPOSED MODEL

Often threats to a firm's survival come from slow, gradual processes rather than from sudden events. Seeing the structures that influence behavior and events should enhance one's ability to influence reality. Senge (1990) introduces the concept of "metaiona" (i.e. shift of mind), and offers a number of mental models that could help avoid the fallacy of relying mainly on symptomatic signals for problem solving. Building on the author's idea of "systems thinking", this paper proposes a number of frameworks for teaching strategic decision making. They could be used as interactive tools for analyzing the strategic posture of a firm and for identifying areas of leverage for added stakeholders' value. They could also help in the search of the fundamental causes of problems. We use the notion of " metaiona" as the mindset for strategy development in a focused, adaptive, innovative, and managerial relatedness fashion. Particularly, we provide an improvement over the narrative form of the SWOT analysis often found in the current literature.

Annex 1 presents the SOWT wheel model, which involves five wheels representing respectively the strengths and opportunities on the left side [SO], the weaknesses and threats [WT] on the right side, and in the middle, the strategic actions that can be used to maximize the SO circles and minimize the WT circles. The critical part at the center of the SO wheels is the firm's area(s) of leverage. In normal circumstances, focusing on the strengths and opportunities should allow to minimize weaknesses and threats. This is why the small circle is adjacent to the SO circles. The likely shrinking effect on the threats and weaknesses is reflected in the decrease of the size of the WT circles. The initial dimension of each circle and the firm's main area(s) of

leverage can be determined based on quantitative and qualitative analyses of the firm's strategic posture. Adjustments in the relative size of each circle can be estimated for instance using percentage changes in performance measures such as market share, return on assets, unit cost, etc. The idea is to avoid a defensive approach, which focuses on threats and weaknesses and bears the risks of developing vicious circles of actions-reactions involving the firm and its competitors. However, some weaknesses and threats may never be eliminated because, as side effects, they may have to be included as inherent part of the process as a whole. Also, the model allows shifting the small circle to the right in particular cases, such as crisis situations.

Annex 2 shows the strategic posture of Bombardier Inc. as an example. We identify the Bombardier Manufacturing System [BMS] as the main area of leverage and the virtual corporation and expert systems as some major tools for maximizing the SO side.

Bombardier Inc. is one of the largest manufacturing companies in Canada. It exercises its activities of conception, development, fabrication, and commercialization in the fields of transportation equipment, civil and military aerospace, defense, and motorized consumer products. The company also offers financial and real estate services as well as support, maintenance and training, and operations management services. Annex 3 presents a historical outline of the company. Based on Galbraith's (2001) "center of gravity theory", Bombardier's success would result mainly from its ability to remain close to its center of gravity while diversifying and evolving in various segments. According to the theory, the firm's success in implementing and managing diversification will depend on the degree to which it operates at the same center of gravity in a new industry. Annex 4 presents two frameworks, one summarizing the basics of the theory, the second showing a number of test results suggesting practical implications. Following are the basic assumptions underlying the theory: 1] firms learn different and important lessons at the initial stage (the center of gravity) of the vertical chain in which they began their operations; 2] lessons learned at this stage influence a firm's values, business lessons, management systems, succession path, organization, and mindsets; 3] different stages in the vertical chain represent different centers of gravity because they face different managerial problems and tasks. Laurent Beaudoin, Chairman and former CEO, says: "What does Bombardier do, essentially? It assembles metal parts. It welds. It uses professionals and trades that revolve around this key activity. If you look at it from this angle, you see that there isn't such a big difference between a rail car and an aircraft fuselage" (Bellavance ,1992). At the core of Bombardier's strategic posture is the Bombardier Manufacturing System [BMS]: "Engineering takes the aircraft and breaks it down into parts. Manufacturing takes the parts and assembles the aircraft. Engineering only knows the sequence in which the aircraft is assembled when it has all the drawings, but manufacturing can start with the parts and then get the sequence. They can start early, meet in the middle, and cut cycle time by half". (Bellavance ,1992). Bombardier succeeded in diversifying in various businesses while remaining close to its center of gravity without compromising its relentless metamorphosis. As a learning enterprise in a changing market environment, last year the firm even spun off its original core business, ski-doo manufacturing. The essence of its center of gravity still lies in the firm's BMS, but the form has evolved.

In Annex 5 we propose a framework suggesting the use of the Virtual Corporation [VC] for strategic alliances. We include a functional definition of a virtual corporation: a network of companies stripped to their core competencies using leadership, information technology, human resources, and the synergy from strategic alliances, partnerships, and teams, to create a Value Chain for customers and other stakeholders Added-Value. Using the VC is in line with one of the company's objective: a concomitant management of complexity and flexibility. However the caveats and risks of such an approach include: the difficulty of controlling the quality of partners-contractors; access control is difficult because of close-coupling of business partners that involves shared access to resources; conflict of interest among business partners; it is difficult for people to adjust; revolving door of personnel, which would not fit in the company's resource management philosophy. Annex 6 shows a summarized tasking document in the context of a VC.

Expert Systems [ES] could also be used as a main vehicle to exploit the company's technical know-how through the Bombardier Service Group [Annex 7]. This approach appears as a natural evolution in the company's move towards the downstream side of the value chain, getting closer to the customer by creating not only a Service Group but a Knowledge- and Service-Based Group with more explicit emphasis on the "Knowledge" content. Annex 8 shows a perspective of "Information-Knowledge as an Asset". The idea is using ES to capture and disseminate knowledge to assist in the company's decision making process in providing its support and maintenance services.

Following are some cost-benefits of expert systems: customers: enhanced satisfaction; product: lower cost [by capturing scarce and expensive expertise], quality [by consistent advice and reduction of error rate], responsiveness, reliability [includes important information that may otherwise be overlooked], conformance; participants: skills [accessibility to knowledge, personnel training], involvement, job satisfaction, security. But ES present some risks such as the following: Even for highly skilled experts, it is difficult to abstract good situational assessments; they may not be able to explain the line of reasoning. Users of ES have natural cognitive limits. The vocabulary used by experts for expressing facts or relations may not be understood by others. Knowledge transferred is subject to perceptual and judgmental biases. ES may not be able to arrive at a conclusion in some cases. Sometimes ES produce incorrect recommendations; some conclusions may be valid according to inference rules, but false in reality [ex. birds can fly, ostrich is a bird, therefore it can fly]. Except for problems that can be treated totally by ES, the user is ultimately responsible for the decision based on common sense and other sources of information. ES do not understand the data and the knowledge they are manipulating; this is why it is risky to trust ES to make decisions independently.

Finally, the Annexes 9 and 10 show respectively some perspectives about Corporate Effectiveness and Operational Efficiency.

The models and frameworks we propose in this paper can be easily adapted to particular situations. They allow interactive inputs from students in the traditional or virtual classroom. They also provide a basis for team learning. Their possible combination with other models, such as the GE and the REAL models, and their flexibility make them potential workable tools for creative thinking in strategic analysis and formation. The REAL model proposed by Hollander & al. (2000) uses the resources, events, agents and location as the main pillars of information system analysis and development. However, the models and frameworks imply the users' inputs and therefore a degree of involvement. Particularly, the SOWT wheel model requires that students prescribe real actions to make the wheels move in an effective manner, which is often a difficult task.

CONCLUSION

This paper proposes a number of models and frameworks for teaching strategic decision making. The SOWT wheel model particularly offers an improvement over the narrative form of SWOT analysis often found in the current literature. The SOWT framework focuses on the strengths and opportunities and builds on the firm's main areas of leverage for strategic positioning. We also propose additional frameworks that could be used as interactive tools for teaching strategic decision making.

We use the example of Bombardier, a Canadian firm which succeeded in diversifying in a managerial relatedness fashion, evolving from the snowmobile manufacturing sector to transportation, and to the aerospace, while remaining close to its center of gravity. Bombardier's manufacturing system [BMS] is the main area of leverage for the firm's strategic positioning as it allows maximizing the transfer of technologies within its operating units.

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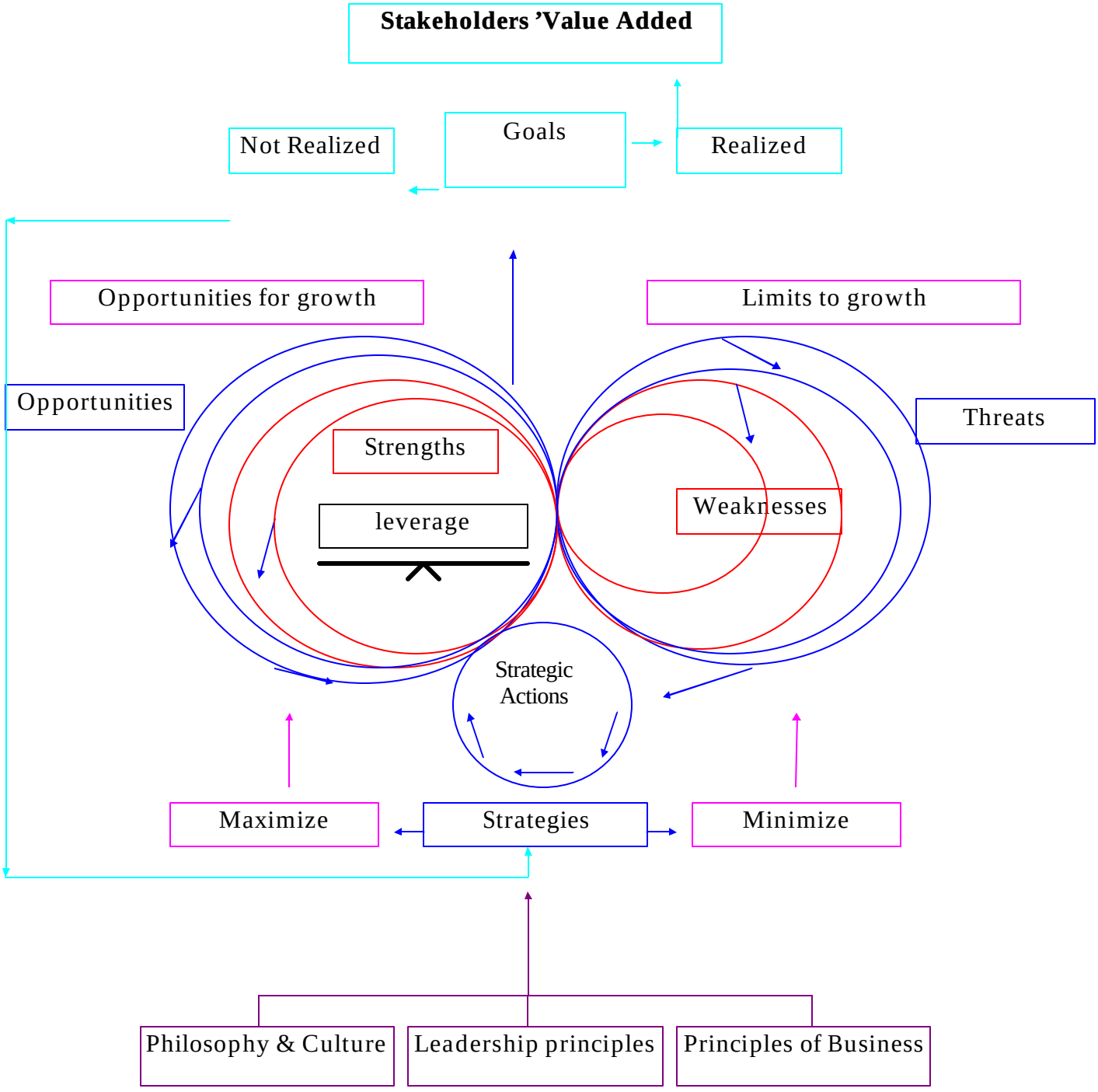
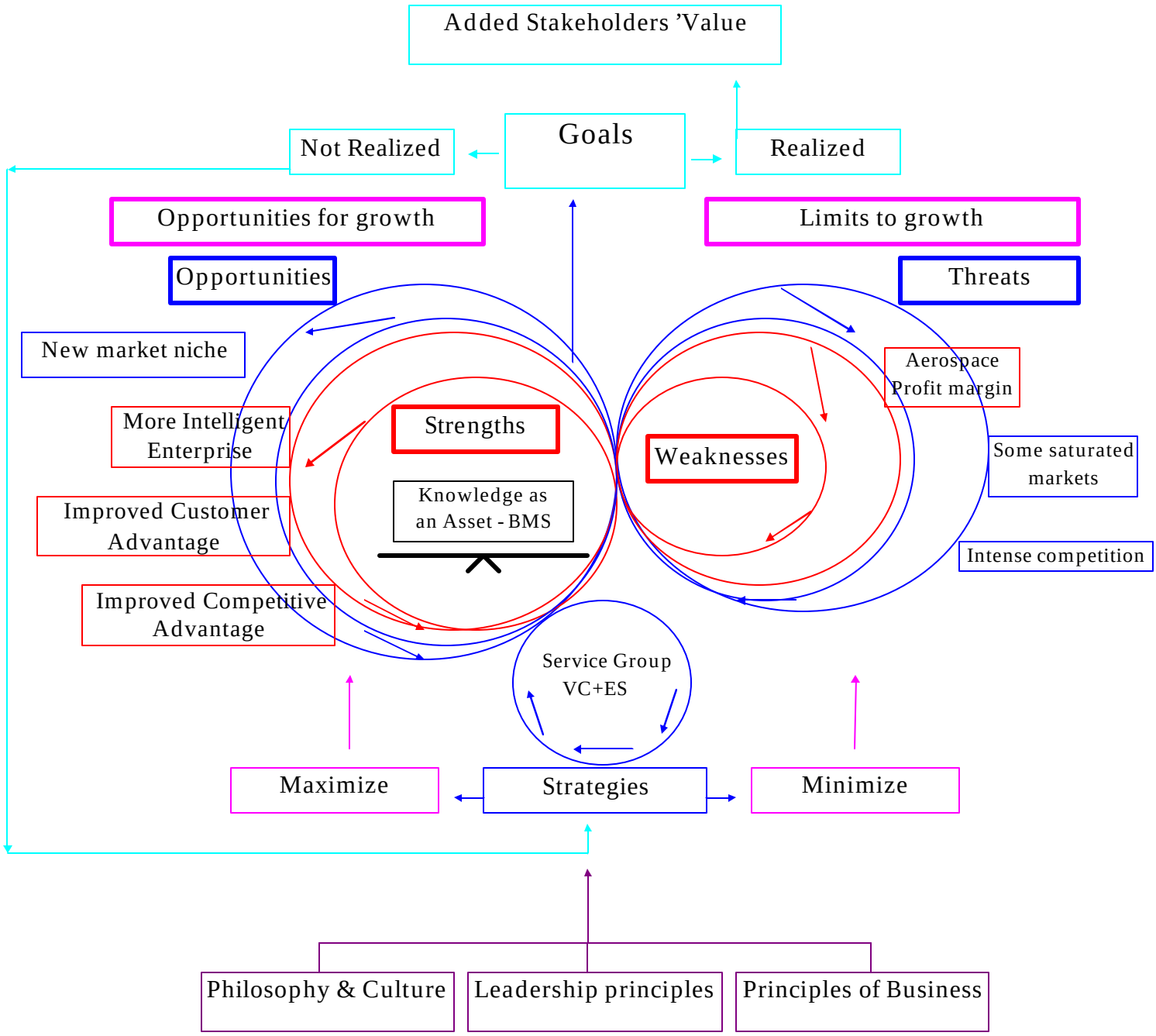
Note: In this paper we use the example of Bombardier with data mainly from the Annual Report of 1998. More recent data could alter the content of the suggested frameworks.

Annex 1 The SOWT model



Annex 2 – SOWT
The case of Bombardier


Added Stakeholders 'Value
Goals
Not Realized
Realized
Opportunities for growth
Limits to growth
Opportunities
Threats
New market niche
More Intelligent Enterprise
Improved Customer Advantage
Improved Competitive Advantage
Strengths
Knowledge as an Asset - BMS
Weaknesses
Aerospace Profit margin
Some saturated markets
Intense competition
Service Group VC+ES
Maximize
Strategies
Minimize
Philosophy & Culture
Leadership principles
Principles of Business

Annex 3 - Bombardier Inc. - Historical Strategic Profile

Level	Focus	Actions
Vocational or Spiritual	Mission	To be the leader in all the markets in which it operates
	Goals	Excellence in design, manufacturing, and marketing in all its fields of business
	Objectives	Short-T.: Focus on innovation, balance complexity & flexibility, improve aerospace returns
Psycho-motor	Philosophy	Foster: innovation, motivation, commitment, entrepreneurship, continuity
	Leadership	Strongly evidenced by Laurent Beaudouin, Chairman, CEO.
Intellect [Technology]	Learning:	Snowmobiles → Trains → Airplanes >>>
	Teaching:	>>>>>>>>>>>>>>>>>>>>>>>>
		Product-related services: maintenance & O M
		Financial services
Physical	Value chain activities [BMS]	Historical Center of gravity: assemble parts → Implemented in 1975 → transferred in
		Related diversification: same center of gravity
		Linked diversification: different center of gravity
Social or relational	Risk sharing	Suppliers: strategic alliances Production: partners, acquisitions for synergy Finance: initial cost sharing Marketing: *Flex Jet*, *fractional ownership solution*
		Galbraith's
Past Strategic Pattern		Natural complements
	Snowmobiles to trains: out of necessity: deteriorating market, + opportunity [Mtl. Metro]	Trains to Aerospace: opportunity : Canadair in difficulty
	Long-term: [emergent] Inside-out strategy creation	Diversification & Growth based on : 1] mastering technologies [focus on R&D, and transfer of technologies] 2] the firm's capacity to occupy a leading position in its specialties
Current strategic posture	No more acquisitions in view. Company considers itself to be well positioned.	
	Current focus: 1] market penetration 2] growth from within - exploit BMS competitive advantage. 3] in particular, improvement of aerospace returns through BMS . Already in place with observed benefits	

A two-dimensional typology of diversification strategies

		Managerial Relatedness Corporate Level	
		Low	High
Product Relatedness Business Level	High	2. Product	1. Focused
	Low	4. Unfocused	3.Managerial

Strategies

1. ***Focused relatedness***: choosing strategies that are highly related on both product & managerial dimensions.
2. ***Product relatedness***: entering businesses that share resources, technology, or market similarities, usually within the same broadly defined industry, but at different vertical stages.
3. ***Managerial relatedness***: entering different industries but at the same vertical stages of the industry value-added chain**.**
4. ***Unfocused diversification***: diversify into different industries at different vertical stages.

Test Results

Association with Firm Performance

	Excluding interaction		Independent test
	Managerial relatedness	Product relatedness	Prod.×Man. relatedness
Forest	S - P	S - P	S - P
Oil	N	S - N	S - N
Diversified	S - (P)	S - (N)	Not clear because of opposite signs

	Including interaction		
	Managerial relatedness	Product relatedness	Prod.×Man. relatedness
Forest	Signs unstable because high degree of Multicollinearity		I
Oil			I
Diversified			I

S = significant results | I = insignificant results | P = positive | N = negative

ANNEX 5 - THE VIRTUAL CORPORATION

A FUNCTIONAL DEFINITION

A network of companies stripped to their core competencies

Using

Leadership

- Host organization = strong center of gravity, a superintegrator.
- Identify core competencies
- Highly committed organization.: chose partners
  ..before opportunities arise
  ..worthy of trust
  ..compatible at various levels: business objectives, cultural, organizational, technical.
- Clear expectations

Information Technology

- A virtual environment & architecture including: E-Mail, EDI, Videoconferencing, networked CAD/CAM, virtual LAN services, groupware...
- Virtual Offices: where people do work::
  - telecommuting
  - office in a box
- Virtual meetings

Human Resources

- Foster empowerment & entrepreneurship
- Staff/members must feel connected & valued for their contribution
- Relationships based on trust & respect
- Use cultural diligence
- Organization system alignment with shared goals
- Provide for feeback.
- Adapt rewards & compensation

And the synergy from strategic alliances, partnerships, & teams

To create a Value Chain → **For** → **Customers Added-Value** → **All Stakeholders Added-Value**

- Supported by a strategic value-added business process
- With a Market Orientation
- Giving substance to available information

- Greater customer focus
- Higher customer responsiveness
- Improved quality

- Increased cost ratio: VC/FC=> increased financial flexibility
- Improved cycle time, productivity
- Competitive advantage
- Increased profit opportunities & stock value

Annex 6 - Virtual Corporation Tasking Document

Process

Phases

Initiation

Development

Operation & Maintenance

Implementation

An iterative and interactive process

Time frame: five years

Product [output]

A network of companies stripped to their core competencies, using:

- Leadership
- IT
- Human resources
- synergy from alliances, partnership, teams

resulting in Customer & all Stakeholders' Added - Value

Participants

- Bombardier as Host Corp.
- Customers & stakeholders
- Strategic planning dept.
- IT specialists
- Legal advisers
- other: system builder,tool builder, support staff, vendors...

Information [input]:

- Knowledge from ES and real experts[BMS]

Technology

- IT platform with supporting IT building blocks [same as those included in ES supporting building blocks
- Emphasis on Communication software:
  interface: for communicating with user, obtaining new facts from user or from external databases
- Communications should allow easily and real time feedback from customers [inside or outside].

Assuring coordination

Grandmont-Gariboldi

Annex 7 - Bombardier - Expert Systems

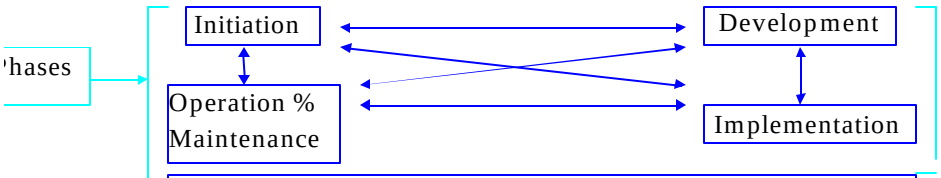
Product:
Timely Decision

→

Customer-Centered Advantage

Customer
User of decision inside / outside the Organization

Process



An iterative and interactive process

Time frame: five years

Product [output]

- expert knowledge in a specific area is available
- decision made in a guided [by rules or frames], controlled [making sure the steps are followed], complete [making sure all predetermined criteria are applied], timely [expertise available at any time], and convenient manner
- all the benefits of this type of decision: ex. improved efficiency & effectiveness
- most ES provide explanation of decision

Participants

ovider of knowledge:
pert [**Manufacturing Unit**]

owledge engineer for
velopment and
intenance of ES

er of ES: expert, ES builder,
rvice Group as consultant
adviser, **customer**..

Information [input]:

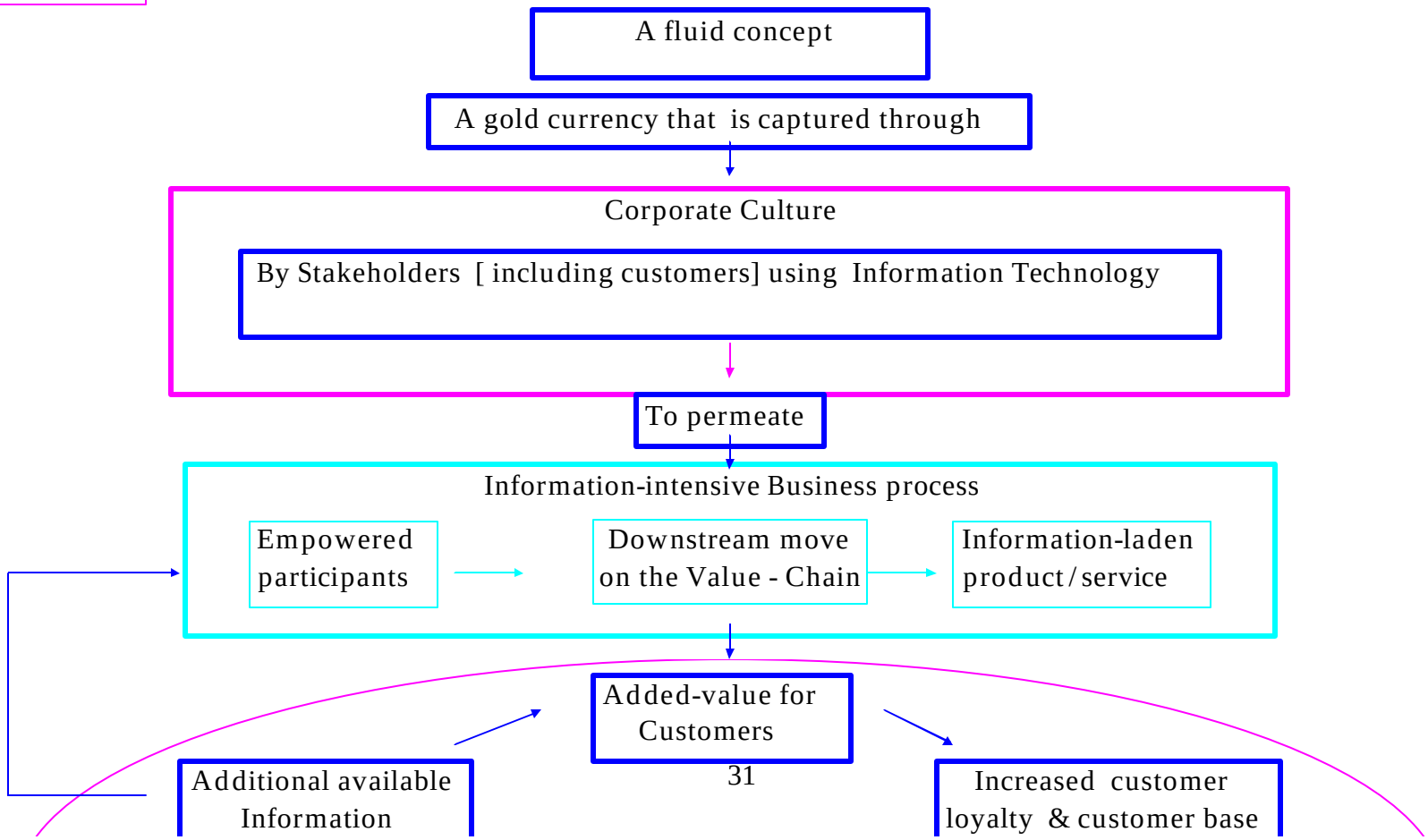
- database that includes: facts [what is known about the domain area or situation: BMS] obtained from other databases, [including CAD / CAM] by interaction with user, or by inference rules
- knowledge base: rules

Technology

- inference engine: uses rules and database to "infer",i.e. pattern matching according to predetermined path of independent criteria.
- explanation module:
I] explains how the reference engine drew specific conclusions
2] or why the system is asking a

Assuring coordination

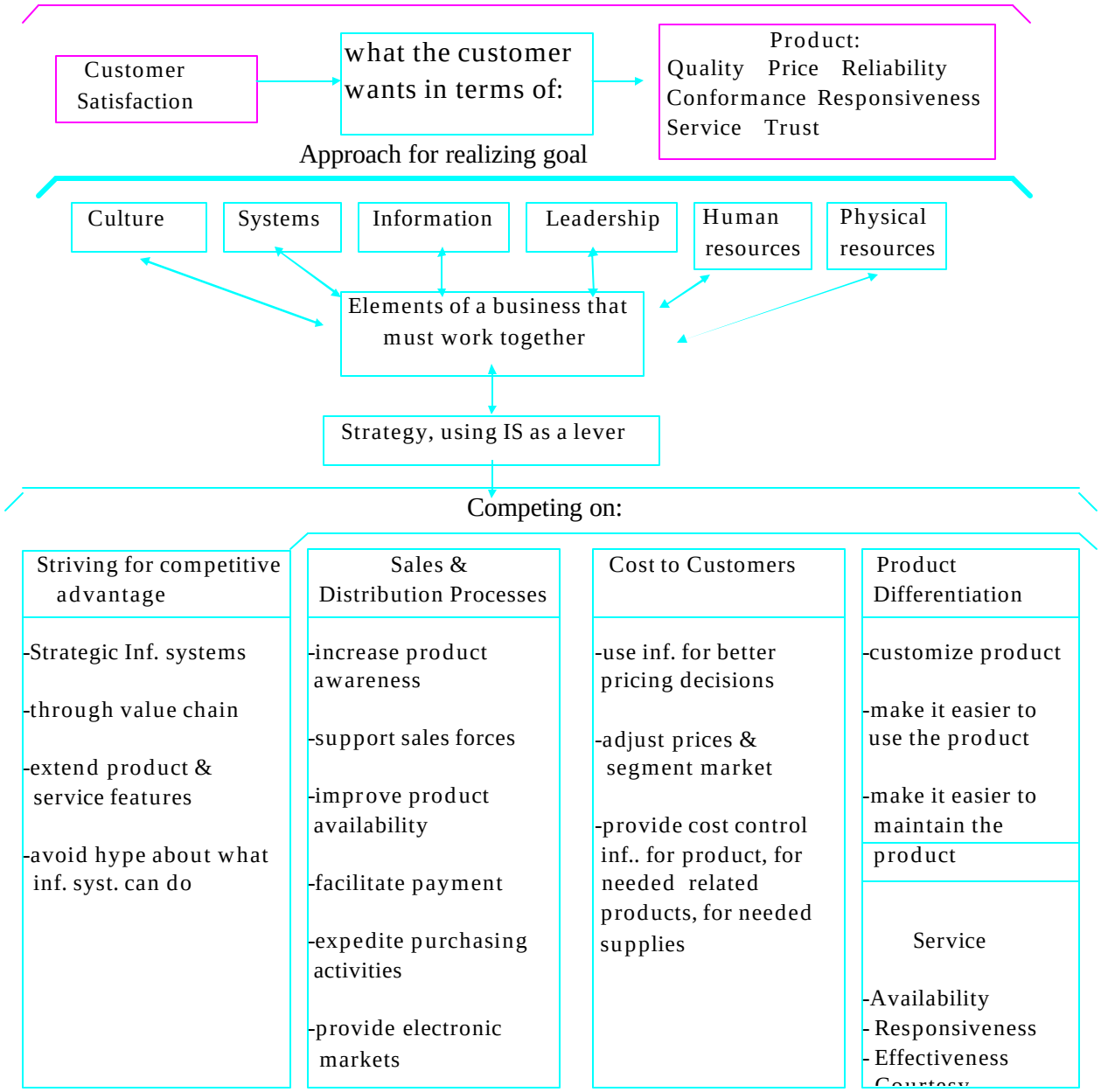
ANNEX 8 - INFORMATION - KNOWLEDGE AS AN ASSET



Annex 9 - Corporate Effectiveness

It concerns External Corporate Goal:

It is related to producing:



Annex 10 - *Operational Efficiency*

It concerns Performance Within the Business Process

It involves Performance Criteria, such as:

Capacity	Consistency	Cycle Time
Productivity	Flexibility	Security

Approaches for improving efficiency using IS

Empowering people by providing:

-Information

-Tools

-Training

-Use Ergonomics

Supporting Management Roles:

-Interpersonal: by personal & organizational communications

-Informational: by availability of inf., helping analyze it and communicate it

-Decisional: provide inf. for decision making & help explain decision

- Inf. Sys. should be Flexible

Eliminate waste :

-Unproductive use of time

-Unnecessary paper

-Unnecessary work steps & delays

-Unnecessary variations in procedures & systems

-Counterproductive incentives

-Reuse work

Integrate across functions & organizations by:

-Linking customers & Customers through EDI

-Supporting organizational planning processes

-Collaborating in product design

-Computer-integrated manufacturing

Automate work::

-Customer interface

-Design work

-Manufacturing

Structure work to promote best practices:

-Minimize record keeping, data handling, office work

-Support appropriate work flow

-Permit work to occur wherever & whenever it should be done