

-
- **DECISION PROCESS**
 - **ORGANIZATION ANALYSIS**
 - **TECHNOLOGY CLASSIFICATION**

Notes on decision process, organizational analysis, risk analysis–

Decision Process

Contents

- **Decision process**
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Notes on decision process, organizational analysis, risk analysis–

Decision Process

«What's the output of management activity?»

«**it's to take a decision.** Indeed without any decision activities wouldn't have any meaning».

«Is it easy to take a decision?»

«So and so! Look at next pages».

Notes on decision process, organizational analysis, risk analysis–

Decision Process

Let's start from what taking a decision means in an organizational context.

Organizational decision making is formally identified as the process of identifying and solving problems.

[R.L. Daft – Organization Theory & Design]



so, decision making is a process. Now, coming back to the question "Is it easy to take a decision?" when it is easy?

Of course when you know all inputs and you're confident about the outputs. But, **are all inputs and output fully defined on managerial processes?** Very often they aren't, so one should distinguish between:

- **Programmed decisions** → ... which are repetitive and well defined, and procedures exist for resolving the problems. They're well structured because criteria of performance are normally clear, good information are available about current performance, alternatives are easily specified etc.
- **Nonprogrammed decisions** → ... are novel and poorly defined, and no procedures exist for these problems. They are used when an organization has not seen a problem before and may not know how to respond.

[R.L. Daft – Organization Theory & Design]

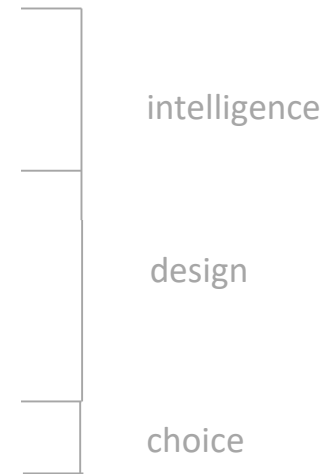
Notes on decision process, organizational analysis, risk analysis–

Decision Process

Programmed Decisions follows a process like the below one

- **define the problem**
- **identify the criteria**
- **weight the criteria**
- **generate alternatives**
- **rate each alternative on each criterion**
- **compute the optimal decision**

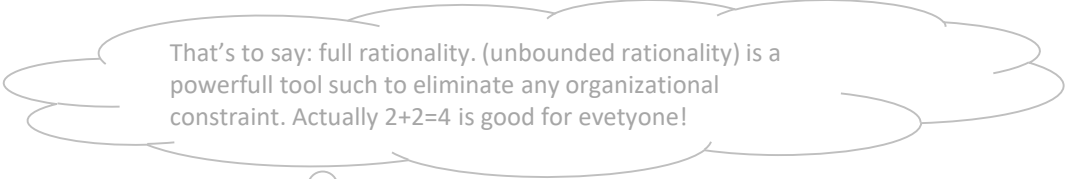
[M. H. Bazerman – Judgment in managerial decision making]



The whole process includes three phases, that's intelligence + design + choice, whose (rough) boundaries are showed by the drawing.

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Decision Process



That's to say: full rationality. (unbounded rationality) is a powerful tool such to eliminate any organizational constraint. Actually $2+2=4$ is good for everyone!

«An what about not **NonProgrammed Decisions**?»

«Of course, just because they're not programmable any sound process can be suggested. Indeed **the Bounded Rationality** (limited information, time, resources etc.) **must match the Organizational Constraints** (share perspective, corporate structure and culture etc.) **and at the same time the Personal Constraints** (that's the expectations of whom is in charge for decision).



In other words, the key word is to find

consensus

that's a research of a solution which is acceptable by the whole involved parts (at least the majority or the most influencing of them).

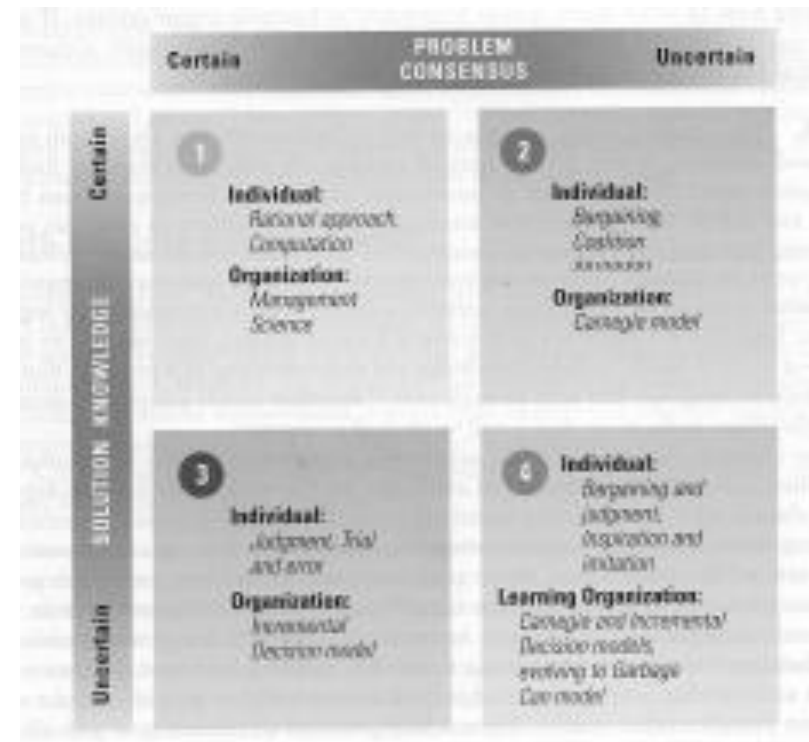


... in your opinion, which could be the most influencing parts?

Notes on decision process, organizational analysis, risk analysis–

Decision Process

- Anyway, taking into account that the phases mentioned for programmed decisions a priori are still applicable, **consensus must be related both to problem decision** (that's to the intelligence phase) **and to solution knowledge** (that's to design and choice phases).
- The drawing gives a description of the whole. Of course when both the problem consensus and the solution knowledge are certain (ref to box 1) we are in a programmed decision's case. In the other cases:
 - looking at the individual behaviour, things must be bargained (ref. to box 2) or showed (ref to box 3) or guessed (ref. to box 4),
 - while the organizational behaviour is showed by **Carnegie and Incremental Models**.

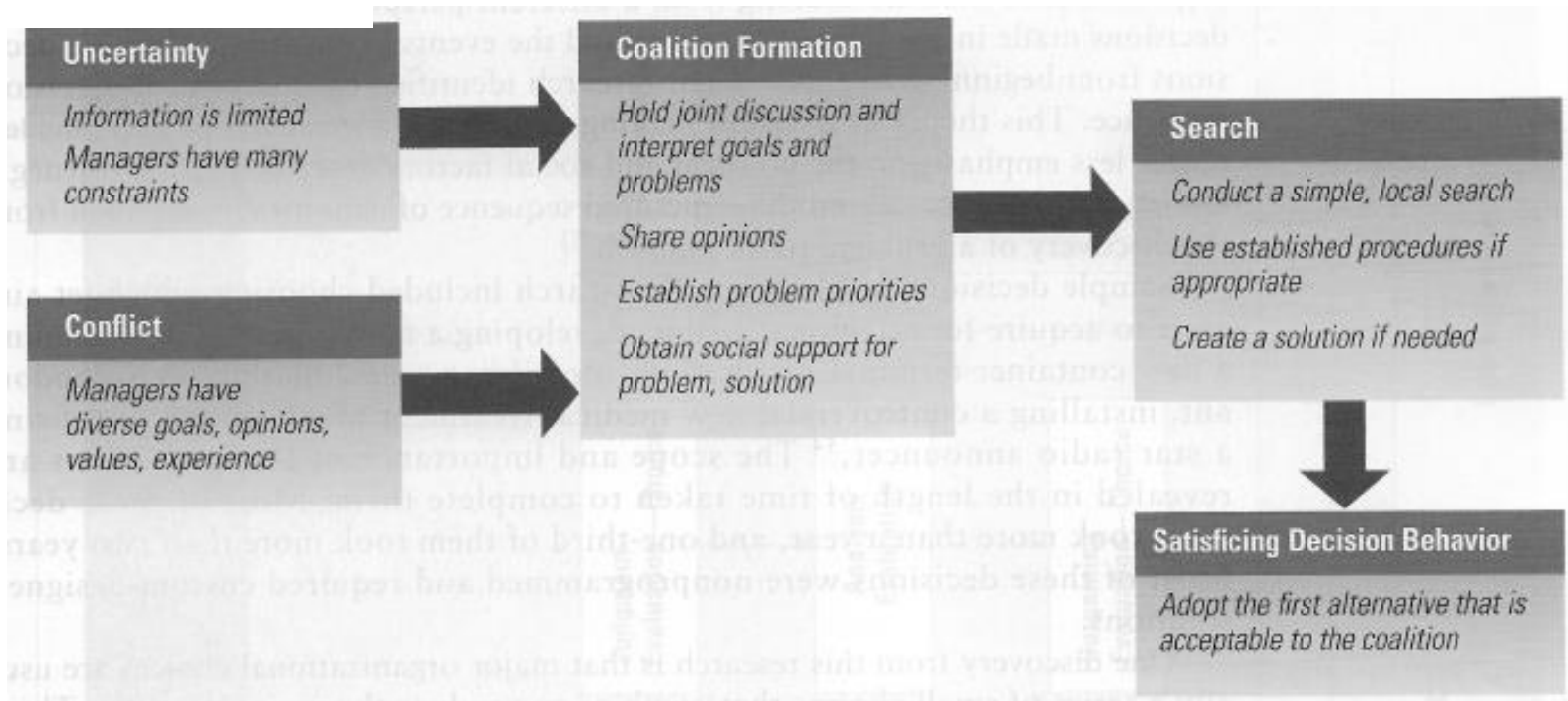


[R.L. Daft – Organization Theory & Design]

Notes on decision process, organizational analysis, risk analysis–

Decision Process

Carnegie Model



[R.L. Daft – Organization Theory & Design]

Carnegie model underlines management status both in uncertainty box ("managers have different constraints") and in conflict box («managers have diverse goals, opinions etc. »).

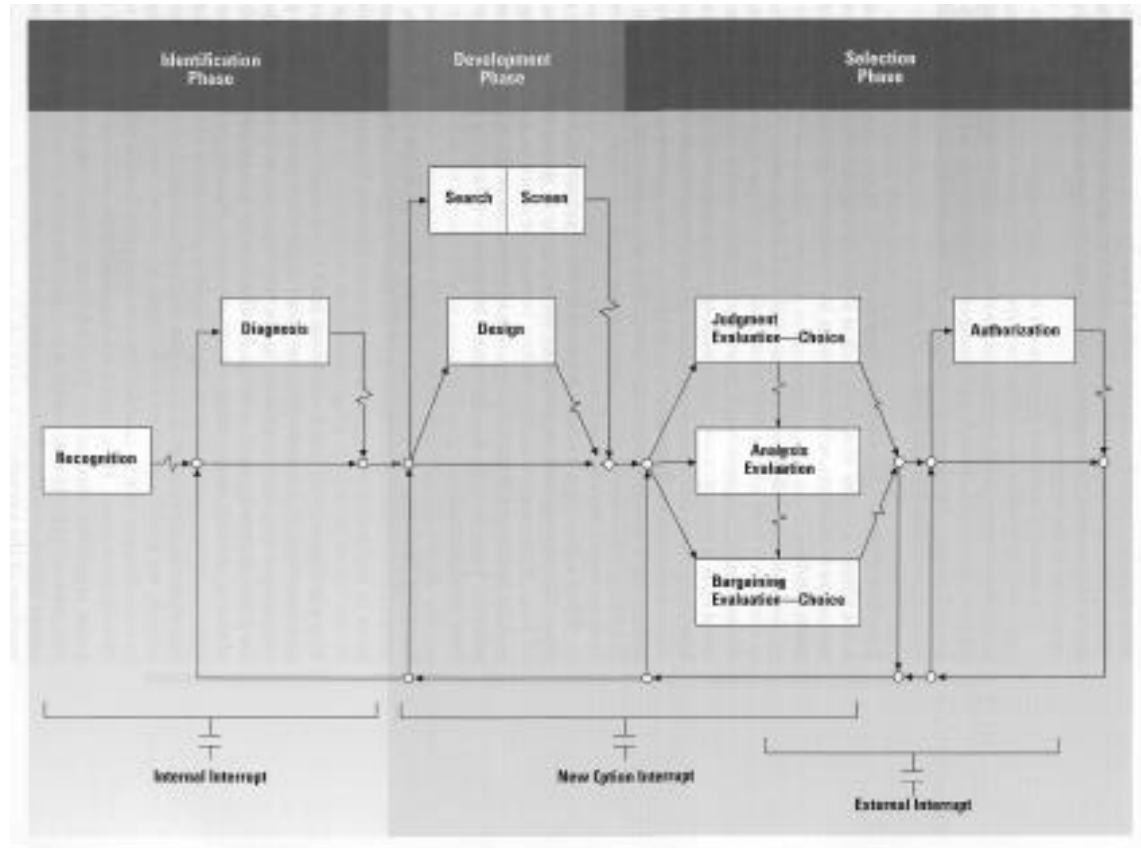
To note that «a solution is created if needed» and «adopt the alternative that is acceptable», which means that technical best solutions usually are not implemented. Is it wrong?

Notes on decision process, organizational analysis, risk analysis–

Decision Process

Incremental Decision Model

The Incremental Decision Model softens the matters of uncertainty and conflict sketched by Carnegie Model. Indeed the Incremental Decision Model gets back to the same phases of the programmed decisions and includes bargaining (that's the consensus achievement) in the selection phase.



[R.L. Daft – Organization Theory & Design]

Notes on decision process, organizational analysis, risk analysis–

Decision Process

On the right you can see a summary of decision models related to last decades.

It's to note that most recent one is «instantaneous decisions» that is related to the case of lackness both in problem definition and in solution knowledge.

1984

W. Carl Kester raises corporate awareness of real options by suggesting that managers think of investment opportunities as options on the company's future growth.

Daniel Isenberg explains that executives often combine rigorous planning with intuition when faced with a high degree of uncertainty.

1989

Howard Dresner introduces the term "business intelligence" to describe a set of methods that support sophisticated analytical decision making aimed at improving business performance.

1992

Max Bazerman and Margaret Neale connect behavioral decision research to negotiations in *Negotiating Rationally*.

1995

Anthony Greenwald develops the Implicit Association Test, meant to reveal unconscious attitudes or beliefs that can influence judgment.

1996

Web users start making buying decisions based on the buying decisions of people like themselves.

2005

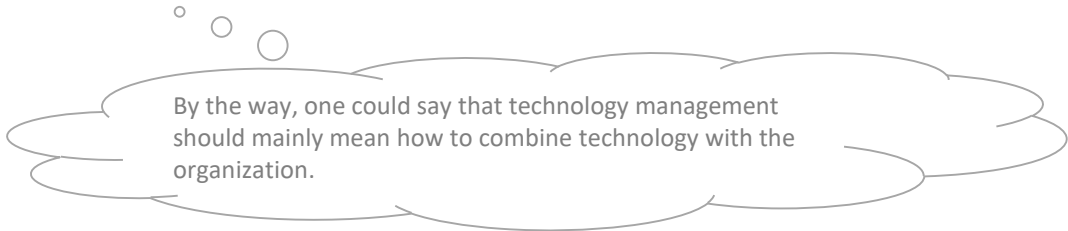
In *Blink*, Malcolm Gladwell explores the notion that our instantaneous decisions are sometimes better than those based on lengthy, rational analysis.

[abstract from L. Buchanan, A. O'Connell - "A brief history of decions making" – Harvard Business Review]

Notes on decision process, organizational analysis, risk analysis–

«What does it lack now?»

«In the decision processes we've just seen that decisions must match the organization's expectations, modifications of the organization have been mentioned several times talking on innovation. So **it lacks «how to get familiar with an organization»** ... that's how to analyze it; next pages are just about organizations' analysis and on how it can suit a technology's characteristics.



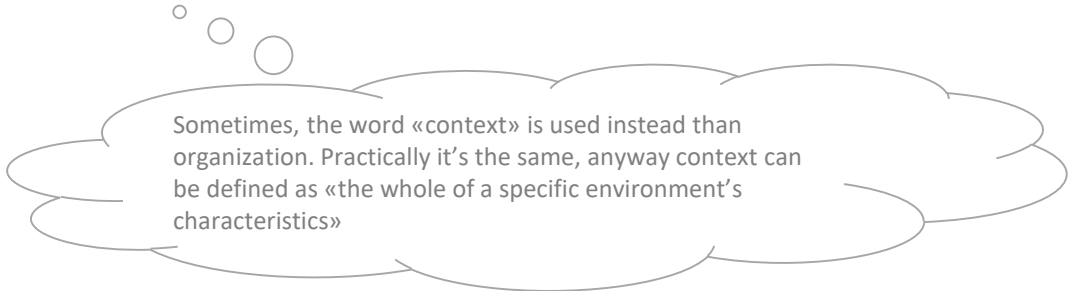
By the way, one could say that technology management should mainly mean how to combine technology with the organization.

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Organizational Analysis

Organizations are social entities that are goal-directed, designed as deliberately structured and coordinated activity systems, and are linked to the external environment.

[R.L. Daft – Organization Theory & Design]



Sometimes, the word «context» is used instead than organization. Practically it's the same, anyway context can be defined as «the whole of a specific environment's characteristics»

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Organizational Analysis

Organizations are social entities that are goal-directed, designed and deliberately structured and coordinated activity systems, and are linked to the external environment.



«So, taking the above definition what would you do in order to investigate on an organization?»

«I do guess that you'd deploy the definition's contents, then:

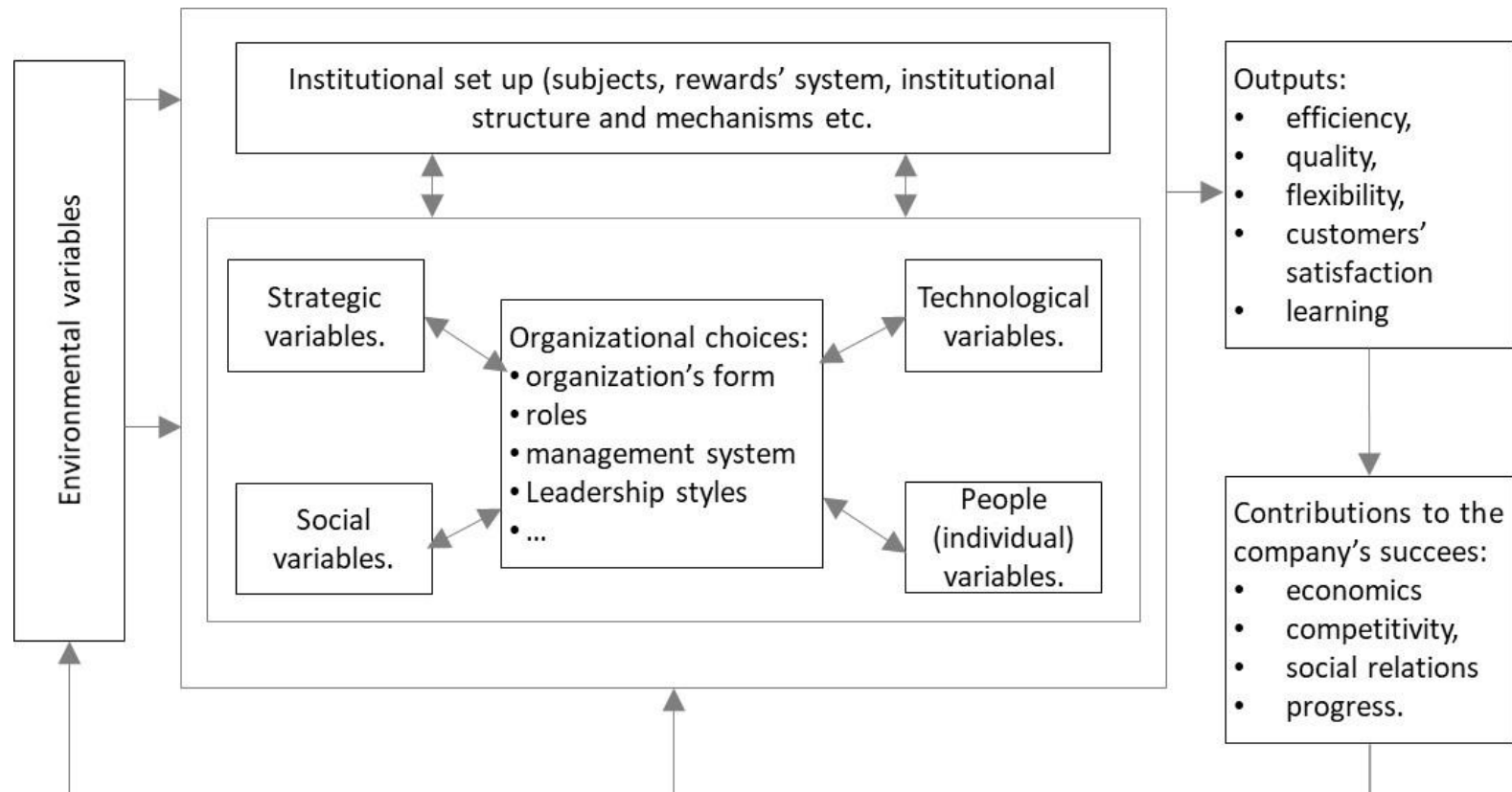
- being the organization a «social entity» you'd look at employees characteristics and at their relationships.
- «goal-directed», that means that there would be a strategy, which would work like a lighthouse for goals.
- «... coordinate activity system», about which it's quite natural to think at the technologies (manufacturing processes, IT Systems etc.) used by the company.
- on relations with external environment, one should analyze customers, suppliers, stakeholders in general etc.

By the way, about relationships inside the company: do you remember, in No Programmed Decisions, how much important they are in order to get consensus?

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Organizational Analysis

The following model sums up what in the previous page and is a **good tool for an organization's analysis** (see next page for legenda).



[abstract from G.F. Rebola – Manuale di organizzazione aziendale]

Notes on decision process, organizational analysis, risk analysis–

Organizational Analysis

- **Institutional structure:**
 - ✓ ... structure, powers and prerogatives of basic entities and roles.
 - ✓ ... it fixes basic rules which characterize the company's behaviour.
 - ✓ ... different institutional sets up between an master owned and a public company.
- **Strategic variables:** references and targets coming from a planning scheme related to the optimization of the opportunities and to the control of the threats which arise form the external and internal environments.
- **Technological variables:**
 - ✓ ... key variables affecting the operations and other operating activities. ...
 - ✓ ... attention to the ICT systems.
- **Individual variables:**
 - ✓ ... they characterize the employess: abilities and lacknesses, seniority, scholarity, personal disposition etc.
 - ✓ amenti e le motivazioni riguardo al lavoro, le attitudini relazionali, la capacità collaborativa.
- **Social variables**
 - ✓ ...tThey're related to the relationships among individuals and to the possible aggregations.
 - ✓ ... it's important to note that such aggregations can intervene between employees and the organization.

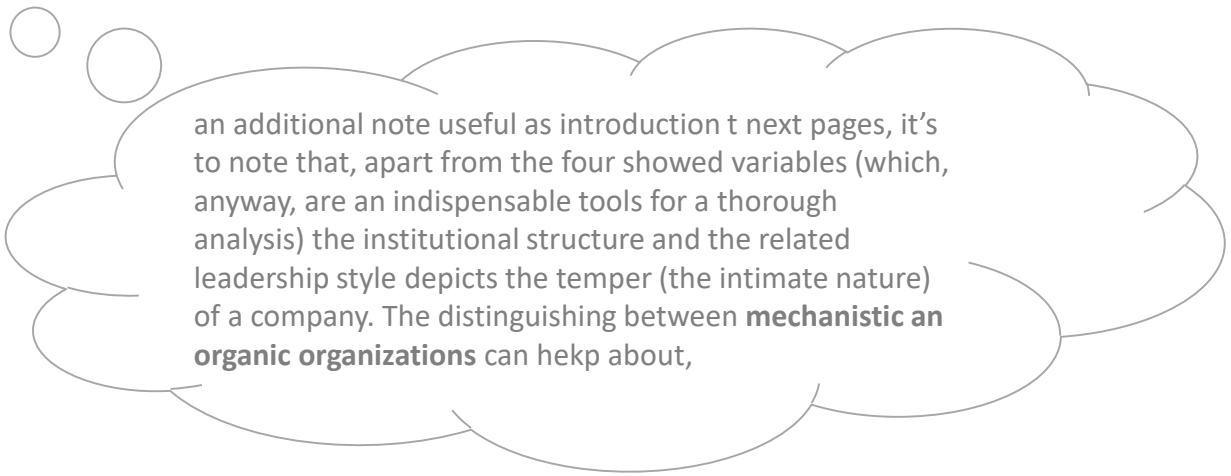
[*abstract* from: G.F. Rebora – Manuale di organizzazione aziendale]

Notes on decision process, organizational analysis, risk analysis–

Organizational Analysis

- **Organization choices:** obviously they take into account what detected by the four upmentioned variables:
 - ✓ ... Organizational structure: way to share activities and to implement the related ccoordination.
 - ✓ Operating mechanisms: suggestions which are usually adopted in order to assure the works of the different organizational entities match emerging expectations. consentire l'adattamento dell'operato di organi e ruoli alle esigenze della situazione.
- the organizational structure and the operating mechanisms give shape to the **organization scheme**, which lets to know the macro-structure (general organizational chart), the organizational units and the related roles and jobs (microstructure).
- the **leadership style** stands for the behaviour's model of the top management.

[*abstract* from: G.F. Reborà – Manuale di organizzazione aziendale]



an additional note useful as introduction t next pages, it's to note that, apart from the four showed variables (which, anyway, are an indispensable tools for a thorough analysis) the institutional structure and the related leadership style depicts the temper (the intimate nature) of a company. The distinguishing between **mechanistic an organic organizations** can hekp about,

Notes on decision process, organizational analysis, risk analysis–

Organizational Analysis

Taking what said about both the organizational choices, and on this mainly on operating mechanisms, and the leadership styles, an interesting classification of organizations differentiates «**mechanistic organizations**» by «**organic organizations**». The difference about is suitably told by the a machine's and evolution's paradigms, that's:

➤ **mechanistic organizations** 

they work like a machine, that's a system regulated by its-own mechanisms. In a mechanical organization such mechanisms are the operating mechanisms, that's procedures, instructions etc. As in a machine, the **strenghts** of a mechanistic organization are related to the good quality of the outputs ruled by the mechanisms and the **weaknesses** the poor ability to face news.

➤ **organic organizations** 

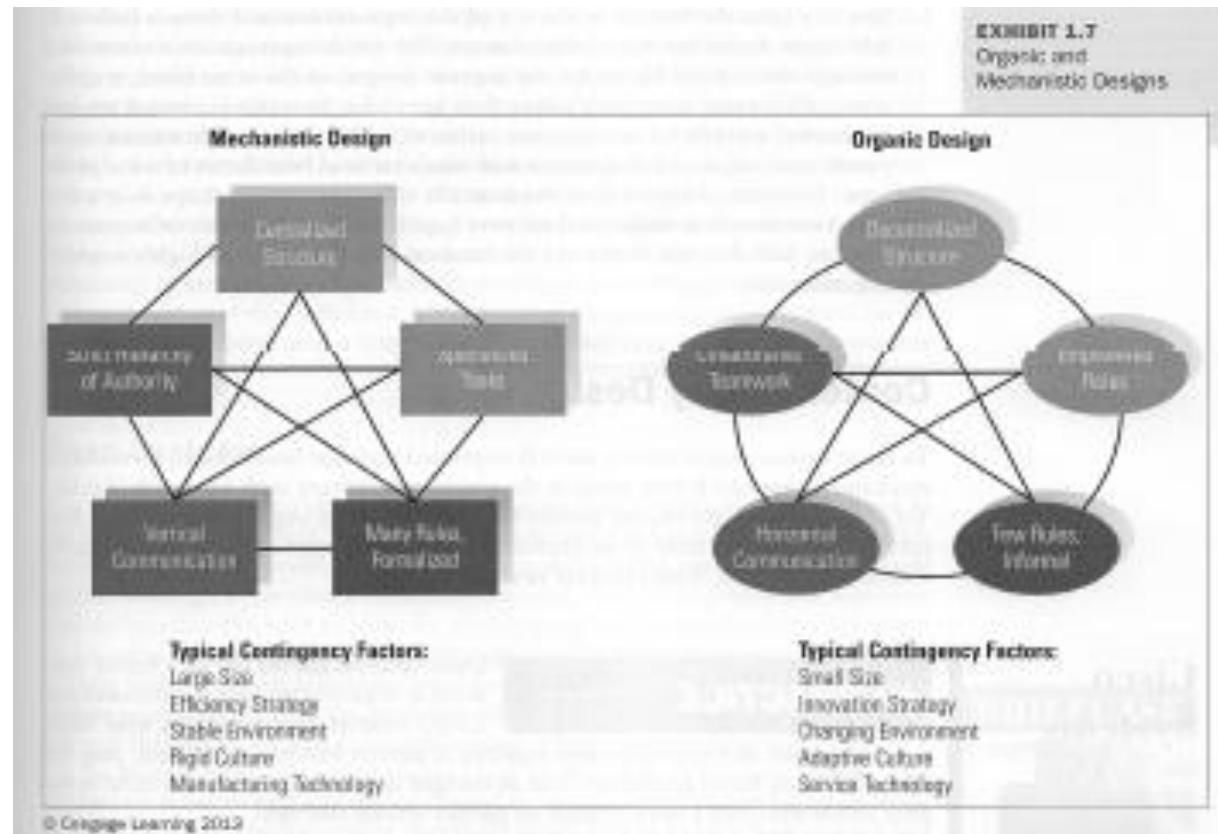
The word «organic» refers to the evolutionary theory, that's the ability of an organism to face environmental modifications. So, in a company's context, it means the skill on news' managing.

Notes on decision process, organizational analysis, risk analysis–

Organizational Analysis

Summing up the drawing, one could say that **communication** (as «the activity or process to express ideas and feelings or of giving people information») is:

- formal in mechanistic organizations – which show a strict hierarchy (so communication is top-down), specialized tasks whose carrying out is based on defined rules (procedure, instructions etc.).
- Informal in organic organizations where communication is based on targets's sharing, then on cooperation and on rules which can vary accordingly to the actors' interfacing.



[R.L. Daft – Organization Theory & Design]

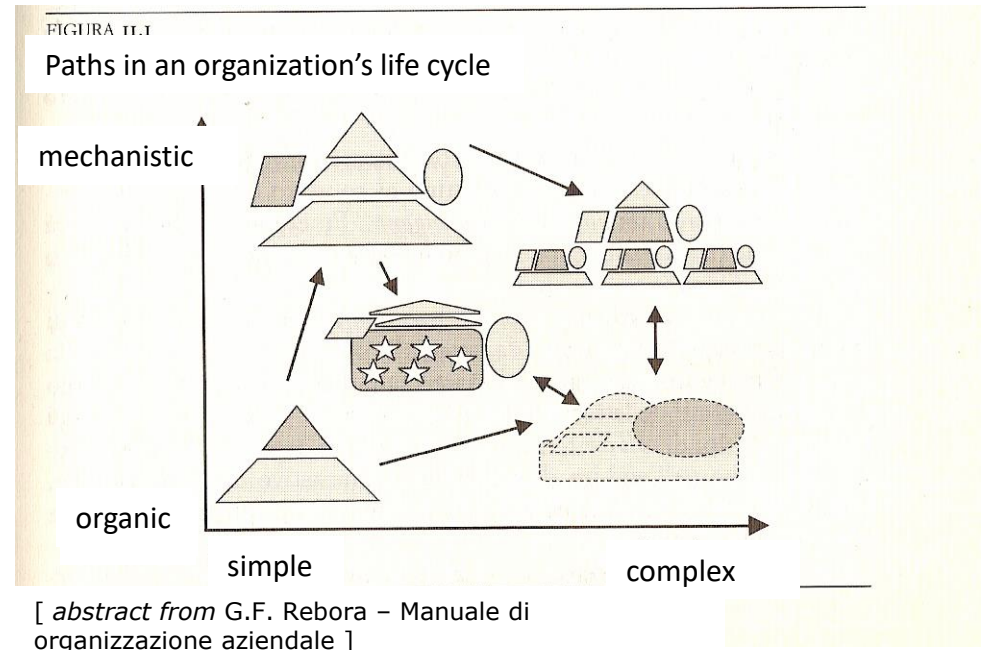
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Organizational Analysis

«Where does mechanistic and organic organizations' distinguishing come from?»

«It comes as need of the organizations themselves to afford complexity»

And what does complexity mean?»



Complexity: the state of being formed by many parts and difficult to understand.

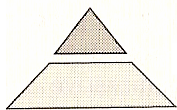
Simplicity: the the quality of being easy to understand or use.

The simplicity-complexity dimension is linked to the environmental complexity. It reflects the heterogeneity, that's the number and diversity of external factors that are such to impact on the organization. In a complex context several different external variables factors can affect and influence an organization.

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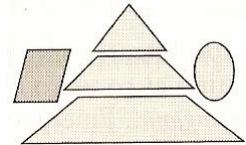
Organizational Analysis

... Previous page legenda.



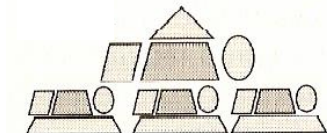
base organizational structure

- *base organizational structure (of the entrepreneur one) /imprenditoriale.* The key element is authority (authoritative, paternalistic typical of «small companies' masters»);



mechanistic centralized

- *mechanistic centralized.* Which are characterized by tecnostructures whose role is the issuing of rules (procedures, instructions etc.) such to standardize operating processes.



mechanistic decentralized

- *managerial decentralized:* it's still mechanistic but tecnostructures are delegated to the single organizational entities, that's in order to customize rules and optimize outputs (for instance: divisional organization).



innovative form

- *innovative:* it's an organic organization. Tecnostructures are still present, but focus is on reciprocal adaptation's processes and on learning culture.



professional form

- *professional:* tecnostructures practically disappear, key factors are professional roles and the spread of self-governement's and self-determination's culture.

[abstract from G.F. Rebola – Manuale di organizzazione aziendale]

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Organizational Analysis

«Intricacy» is another suitable word which give the meaning of complexity. Just about intricacy/complexity next chapter will be on modularity, that is an important tool for complexity's solution.

KEY DRIVER CATEGORI	<i>Product/ Technological Intricacy</i>	<ul style="list-style-type: none"> • heterogeneous demands • raising product complexity • new technologies 	<ul style="list-style-type: none"> • non synchronized supply chain planning & control systems • incompatible IT systems 	<ul style="list-style-type: none"> • technological innovations • changing resource requirements • technological customer demands
	<i>Organizational Aspects</i>	<ul style="list-style-type: none"> • process-related deficits • structural deficits 	<ul style="list-style-type: none"> • different strategies • non harmonized decisions & actions • supply chain bottlenecks • information gaps • non-harmonized processes • supplier & customer reliability 	<ul style="list-style-type: none"> • development of business environment • provisions of law • globalization • shortened product lifecycles
	<i>Uncertainty</i>	<ul style="list-style-type: none"> • subjective estimations • changing skill requirements 	<ul style="list-style-type: none"> • demand amplification (bullwhip) • parallel interactions • non synchronized decisions & acting 	<ul style="list-style-type: none"> • general uncertainty of future development • economic trends • decreasing accuracy of forecast
		<i>Internal Organization</i>	<i>Supplier-Customer Interface</i>	<i>Dynamic Environment</i>
ORIGIN				

Becker – Development of an Approach for Analyzing Supply Chain Complexity – Hamburg University]

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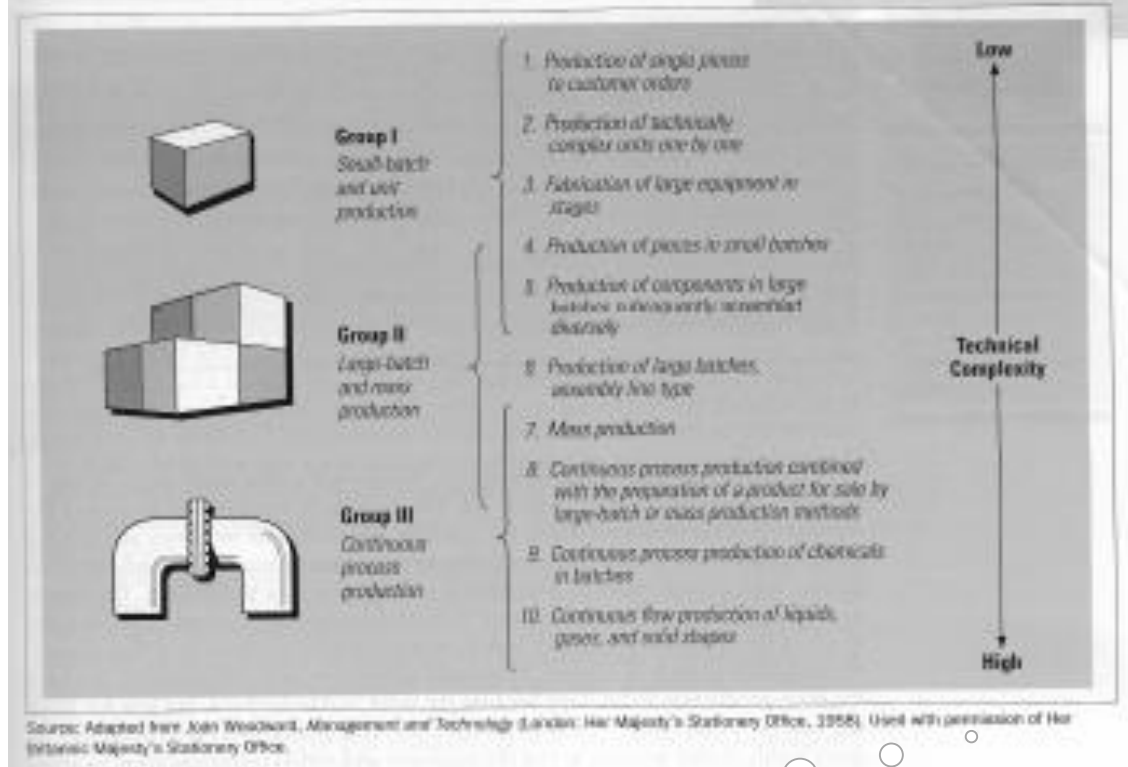
Organizational Analysis

«Ok, but where does complexity come from?»

«It comes from everything. For instance «globalization» implies wider potential markets with different clients and so different expectations and cultures, so (for instance) the request of an higher flexibility and shorter lead-time and time-to-market; one could face different laws' systems etc.. **Complexity can come from new technologies devoted to increase both efficiency and effectiveness** etc.»

[R.L. Daft – Organization Theory & Design]

EXHIBIT 7.3
Woodward's Classification of 100 British Firms According to Their Systems of Production



please don't forget that a «new technology» could be not new any more for an organization (which could have been implemented it for long time) and new for another.

Notes on decision process, organizational analysis, risk analysis–

Organizational Analysis ... and Technology Classification

So, taking into account that our core is (new) technology management, how could we classify specific technologies? The matter of technology classification arises.

There are three main variables which classify a technology:

- **Analyzability:** a dimension of technology in which work can be reduced to mechanical steps and participants can follow an objective computational procedure to solve problems.
- **Variety:** in terms of tasks, the frequency unexpected and novel events that occur in the conversion process.
- **Intedipendence:** the extent to which departments depend on each other for resources or materials to accomplish their tasks.

[R.L. Daft – Organization Theory & Design]



So, given the above definitions what type of organizations should suit high or low analizability or high or low variety etc.? ... The answer is easy!


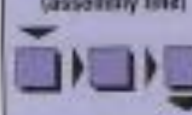

Notes on decision process, organizational analysis, risk analysis–

Organizational Analysis ... and Technology Classification

As additional information: the model for classification of technology in the three showed dimensions (analyzability, variety, interdependence) is Perrow's model.

EXHIBIT 7.11
Thompson's Classification of Interdependence and Management Implications

Just to clarify **indertependen**
ce meaning,
that's pooled,
sequantial and
reciprocal
types.

Form of Interdependence	Demands on Horizontal Communication, Decision Making	Type of Coordination Required	Priority for Locating Units Close Together
Pooled (bank)  Client	Low communication	Standardization, rules, procedures Divisional structure	Low
Sequential (assembly line)  Client	Median communication	Plans, schedules, feedback Task forces	Median
Reciprocal (hospital)  Client	High communication	Mutual adjustment, relational coordination, teamwork Horizontal structure	High

[R.L. Daft – Organization Theory & Design]

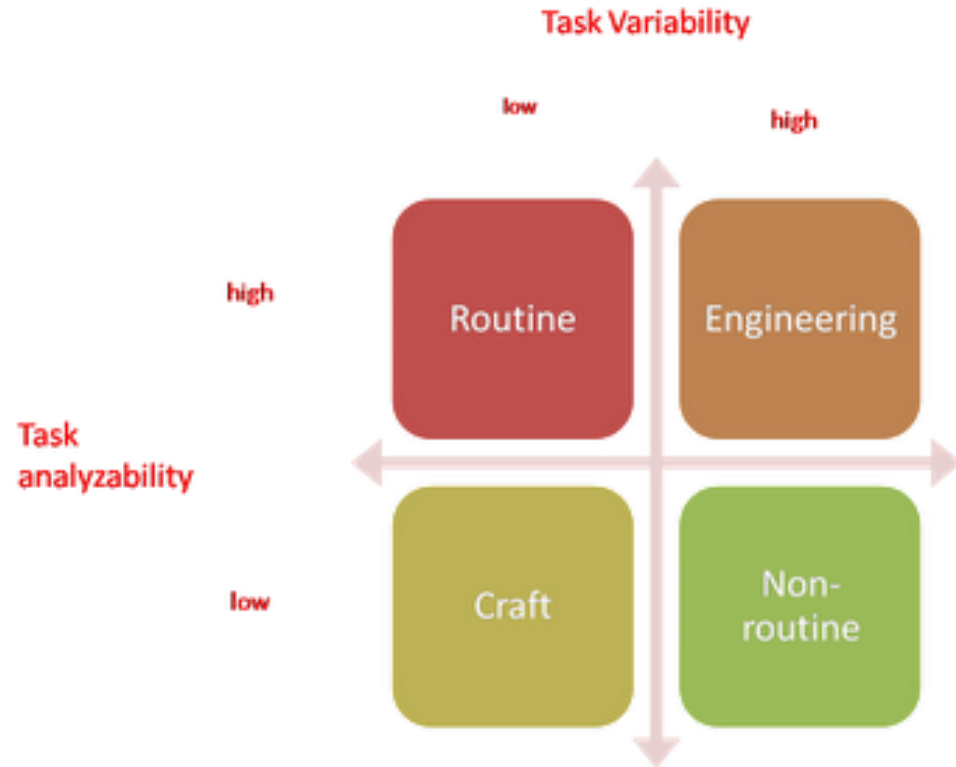
... and then, on next two pages, to **link analyzability and variety to mechanistic and organic types of organization**

Notes on decision process, organizational analysis, risk analysis–

Organizational Analysis ... and Technology Classification

Indeed, the answer is given by the drawing:

- where the routine content (that's repetition of the same activity) is higher the most suitable organization is mechanistic.
- viceversa for non-routine one, that's non-routine requires organic organization.



Based on Perrow(1967)

[www.somanagement.com]

Notes on decision process, organizational analysis, risk analysis–

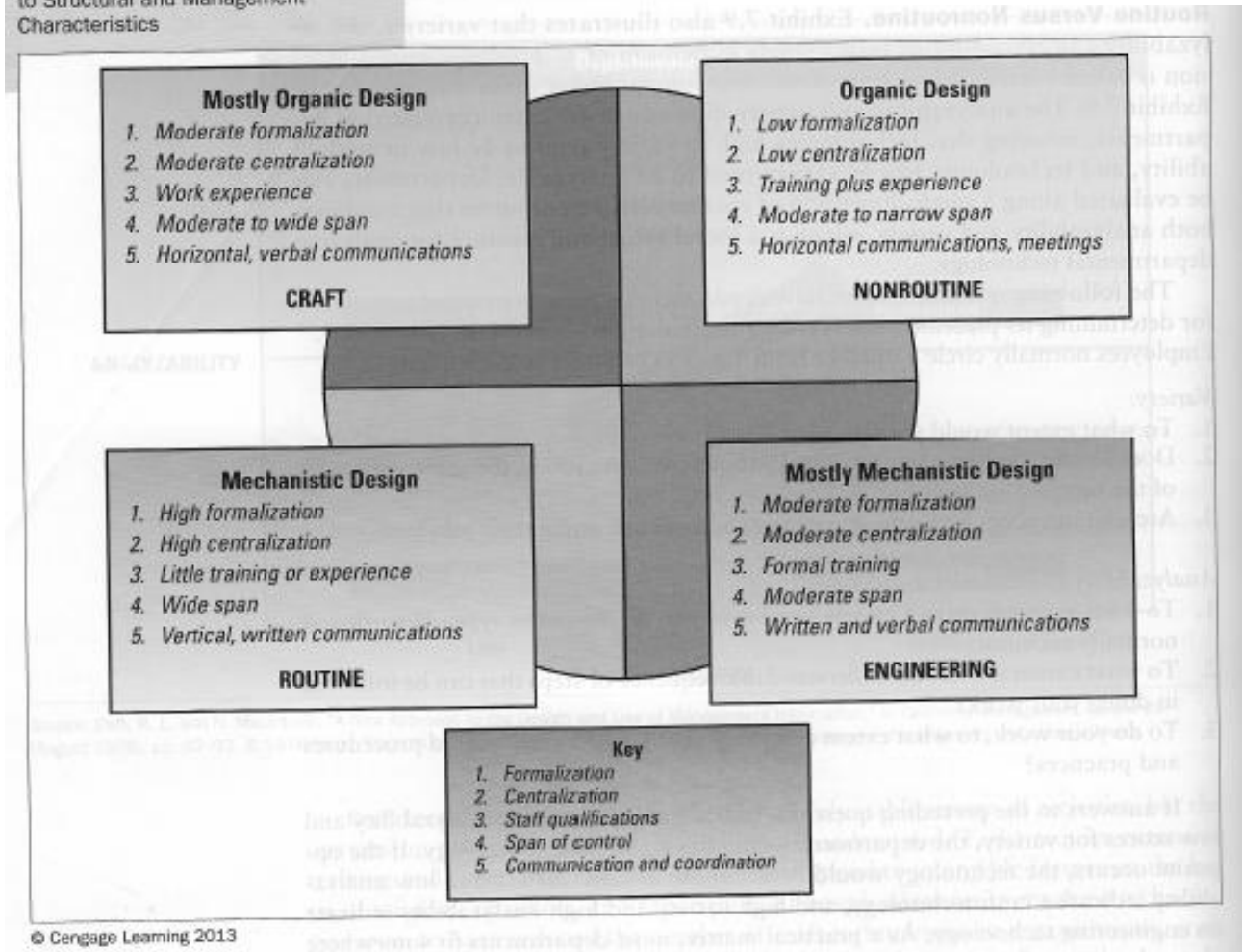
Organizational Analysis ... and Technology Classification

In addition to previous page.

EXHIBIT 7.10

Relationship of Department Technology to Structural and Management Characteristics

[R.L. Daft – Organization Theory & Design]



Notes on decision process, organizational analysis, risk analysis–

Risk Analysis

«That's all?»

«More or less, indeed let's consider that treated topics are just notes, so things could (and in application, «must») be deepened. Anyway, do you remember that any organization faces the external context? Now, apart the typical factors showed by Porter model, there are several others related, so a **risk analysis** should be carried out».

«So, how could we approach the matter?»

«Right, as a first approach I would say that three topics should be considered:

- first a wide view on risks' triggers. For instance, what would happen if an off-shore catastrophe (like a flood, an earthquake or a war) would interrupt the supply of raw material necessary for your technology?
- then, what risks could come by project management?

Notes on decision process, organizational analysis, risk analysis–

Risk Analysis

... However, first of all let's have a definition of risk and of project as well.

➤ risk

... some people like to distinguish between risk and uncertainty. The distinction is usually that risk is taken to have quantifiable attributes, whereas uncertainty does not. ... Using this logic, the actual risk to be carried was quantified as follow:

$$\text{Risk} = \text{Probability of event} \times \text{Magnitude of loss/gain}$$

➤ project

✓ “... an endeavour in which human, material and financial resources are organised in a novel way, to undertake a unique scope of work of given specification, within constraints of cost and time, so as to achieve unitary, beneficial change, through the delivery of quantified and quantitative objectives.”

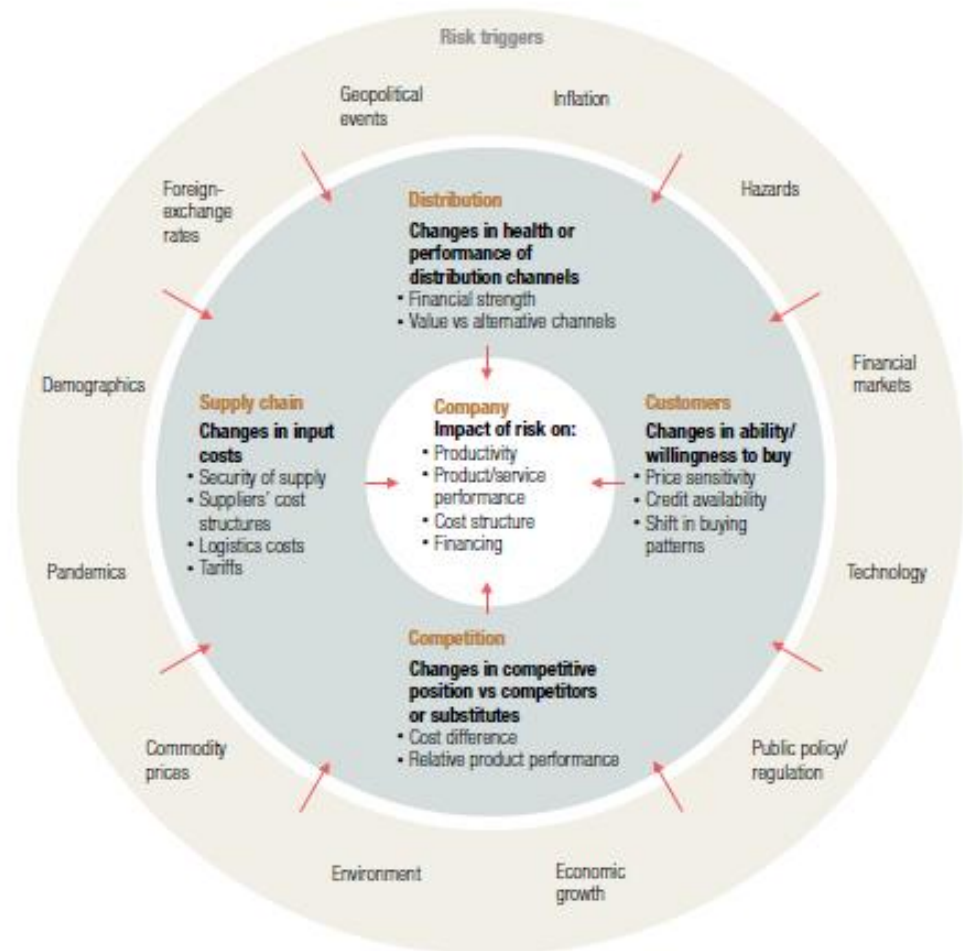
[C. Chapman, S, Ward – Project risk management]

Notes on decision process, organizational analysis, risk analysis–

Risk Analysis

Exhibit 1
Cascading risks

In a very preliminary way: apart from typical business issues, one should infer on several «world-wide» factors that could act as risk's triggers.



[H. Lamar, M. Peggler – Risks: seeing around the corner – HBR 2010]

Notes on decision process, organizational analysis, risk analysis–

Risk Analysis

... by the way, new technology are recognized as risks triggers, at least because experiences about are limited.

Table 1.1 A list of major categories of sources of risk

SOURCE	EXAMPLE
Client/government/ regulatory agencies	Bureaucratic delays, changes in local regulations
Funding/fiscal	Changes in government funding policy, liaison between several funders
Definition of project	Change in project scope
Project organization	Authority of project manager, involvement of outside bodies
Design	Adequacy to meet need, realism of design programme
Local conditions	Local customs, weather windows
Permanent plant supply	Degree of novelty, damage/loss during transportation
Construction contractors	Experience, financial stability
Construction materials	Excessive wastage, reliability of quality
Construction labour	Industrial relations, multiracial labour force
Construction plant	Resale value, spares availability
Logistics	Remoteness, access to site
Estimating data	Relevance to specific project availability
Inflation	
Exchange rates	
<i>Force majeure</i>	

Source: Hayes *et al.* (1986), p. 12.

[J. Raftery – Risk analysis]

Notes on decision process, organizational analysis, risk analysis–

Risk Analysis

5)

Anyway, how should the risks' management process be configured?

Generally speaking it should include three main steps:

- risk identification,
- risk analysis,
- risk response.

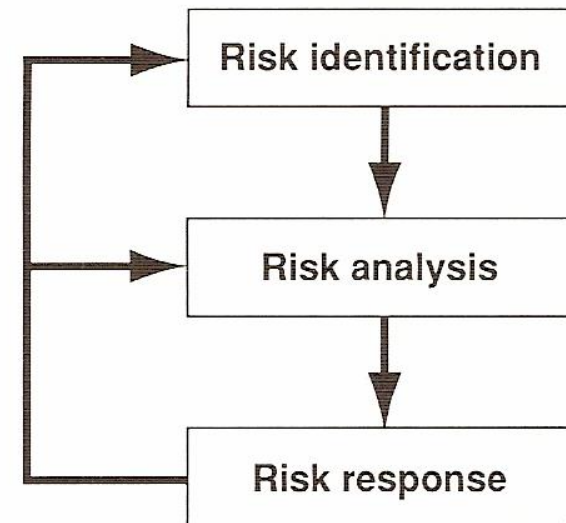


Figure 1.10 Risk management

[J. Raftery – Risk analysis]

That said (and besides the risks range mentioned in the previous page) **about risk identification** one should considered:

- the «integrity of the management system»,
- the suitability of the project management

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Risk Analysis

6)

As «integrity of the management system» we mean the effectiveness and completeness of the whole of operational and all managerial activities (like audits,, reporting etc.) and tools (like instructions, procedures etc,)

MANAGEMENT
Efficiency Measurement

CONTROL
Assessment Methods

DESIGN, OPERATION and MECHANICAL INTEGRITY
Basics requirements



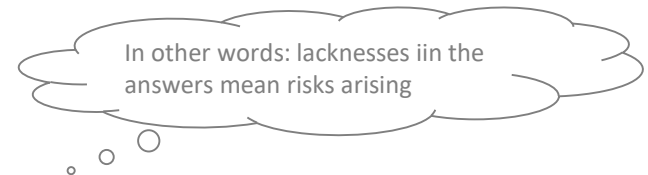
Fig- 1 Technological Risks Management Principles

[D.Duval, J.P. Zundel – technological risks management principles – SPE International Proceedings]

The showed picture is mainly referred ti environmental and safety risks. Anyway, by an apt interperetation it can be applied to general risks analysis as well.

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Risk Analysis



With concern to project management, the related risks can be identified by the answers related to each of the following «W» (sixW methodology).

1. *who* who are the parties ultimately involved ? (parties)
2. *why* what do the parties want to achieve ? (motives)
3. *what* what is it the parties are interested in ? (design)
4. *whichway* how is it to be done ? (activities)
5. *wherewithal* what resources are required ? (resources)
6. *when* when does it have to be done ? (timetable)

[C. Chapman, S, Ward – Project risk management]

Anyway, of course two further comments.

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Risk Analysis

First comment is about the **sequence** and the **iterativity** showed by the graph

The sequence should be self-explaining (of course before the «whichway», that's how to carry out the project, one must define the expectations, that's the «who, «why» and «what».

About the iterativity it's to note that it's a characteristic of any project: indeed as soon as the experience increases (or that more reliable data are got) some of the previous thoughts could be revised.

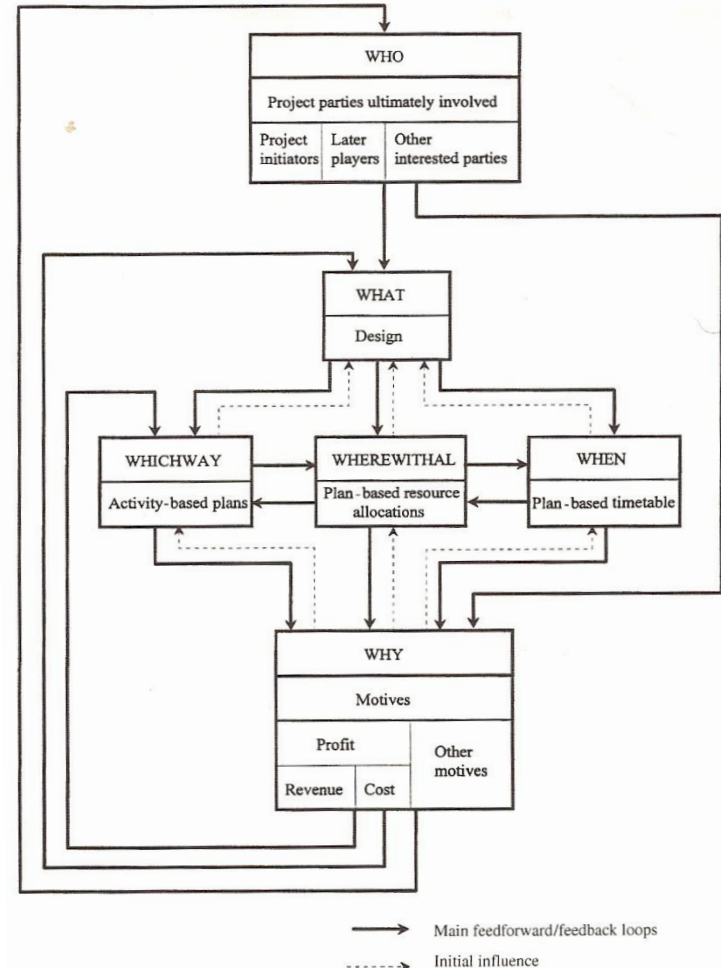


Figure 1.1 The six Ws.

[C. Chapman, S, Ward – Project risk management]

Notes on decision process, organizational analysis, risk analysis–

Risk Analysis

Second comment is related to the project life cycle: of course the «w» are related to each life-cycle stage: indeed during the conception and selection the most important w will be whichway, wherewithal etc.

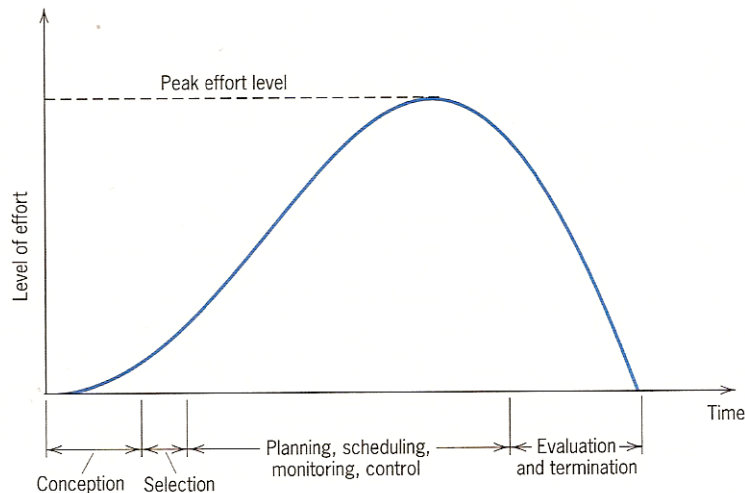


Figure 1-4 Time distribution of project effort.

[J.R. Meredith, S.J. Mantel – Project management]

Table 2.1 Phases, stages and steps in the project life cycle.

Phases	Stages	Steps
Conceptualisation	Conceive	Trigger event Concept capture Clarification of purpose Concept elaboration Concept evaluation
Planning	Design	Basic design Development of performance criteria Design development Design evaluation
	Plan	Base plan Development of targets and milestones Plan development Plan evaluation
	Allocate	Base design and plan detail Development of allocation criteria Allocation development Allocation evaluation
Execution	Execute	Coordinate and control Monitor progress Modification of targets and milestones Allocation modification Control evaluation
Termination	Deliver	Basic deliverable verification Deliverable modification Modification of performance criteria Deliver evaluation
	Review	Basic review Review development Review evaluation
	Support	Basic maintenance and liability perception Development of support criteria Support perception development Support evaluation

[C. Chapman, S, Ward – Project risk management]