Mitigating the risks of the client in a military materials program

A DESCO Seminar

This seminar is addressed to you, purchaser or prescriber of weapons systems

CYBEL

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Sustainabilité, décarbonation, Finance verte

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Plan

From objective … to results

- Objective
- Actual and targeted risks identification and positioning
- Toolbox for risks reduction
- Results

- The objective of this seminar is to make you realize gains from risks reduction of a military equipment program, by :
  - ⇨ Risks identification
  - ⇨ Risks evaluation
  - ⇨ Actions definition for the necessary risk reduction
  - ⇨ Result checking

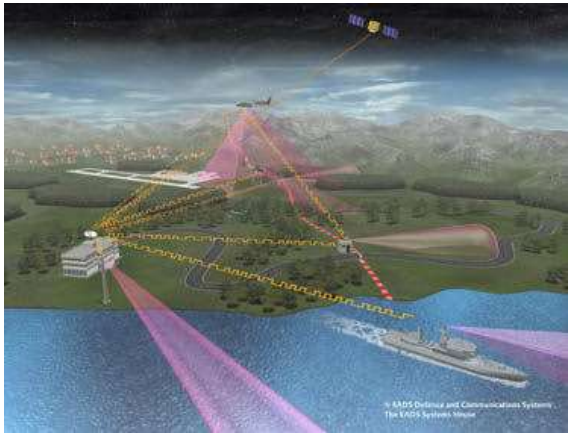
- At the end of the seminar, you will know how to:
  - Take a large « helicopter view » of the program and build a **risk profile**.
  - Position the risks from a more closely «helicopter view» and determine corresponding **stakes**.
  - Establish the targeted positioning of these risks and associate **stake reductions**.
  - Combine gap reduction between actual and targeted risks with the relevant know-how and tools.

Your objectives

- To be acquainted with the program's risks from an « helicopter view »
- To assess the potential costs of risks
- To estimate by how much these costs could be reduced and how.

Stakes

- Apprehend the possibilities for identifying drifts of the expected performances :
  - technical,
  - budgetary
  - and calendar,
- Reduce the corresponding risks
- And enhance the associated stakes.



- The risk's cost represents mostly up to ¼ budget of the programs.
- For very risky programs - due to "evolving" specifications, this evaluation can double or more considering the client exposure to such drifts as:
  - increased vulnerability to threats
  - political vagueness,
  - strategic resources losses,
  - non controllable parties game
  - …

Evaluations are specially driven in 4 main risks zones:

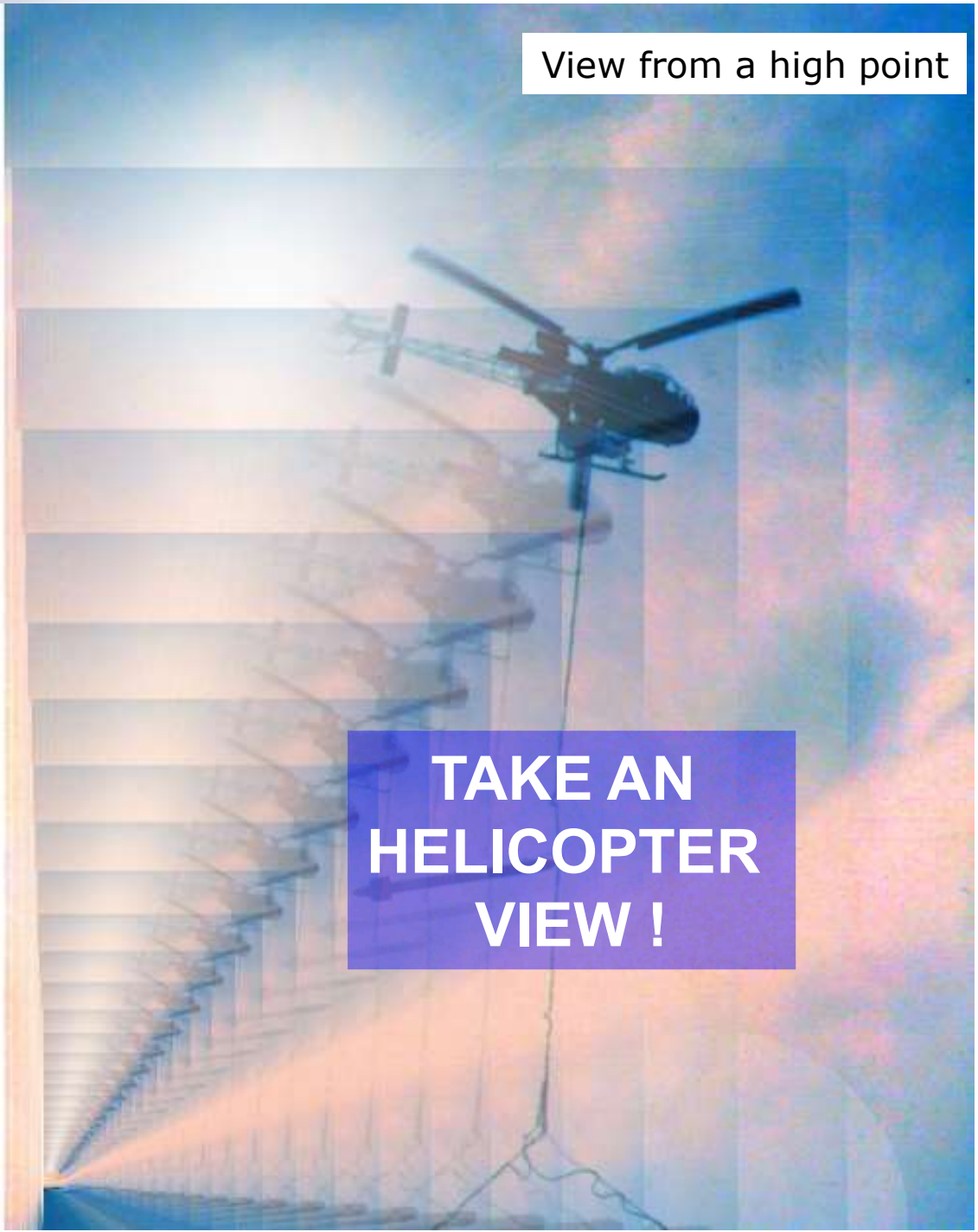
- Functional specifications
- Technical specifications
- Purchasing contract
- Qualification, execution follow-up, logistics

The analysis of the program profile enables you to identify 3 fields for your risk evaluation :

1. **Analyses** → **I**dentify your risks, their stakes and the means of reducing them

2. **Survey** → **L**ocate the risks “in germ” in order to prevent them

3. **Alarms** → **E**stablish the essential risks traceability in order to prevent their occurrence


View from a high point
TAKE AN HELICOPTER VIEW !

(Pages 4 to 16 from the learner book)

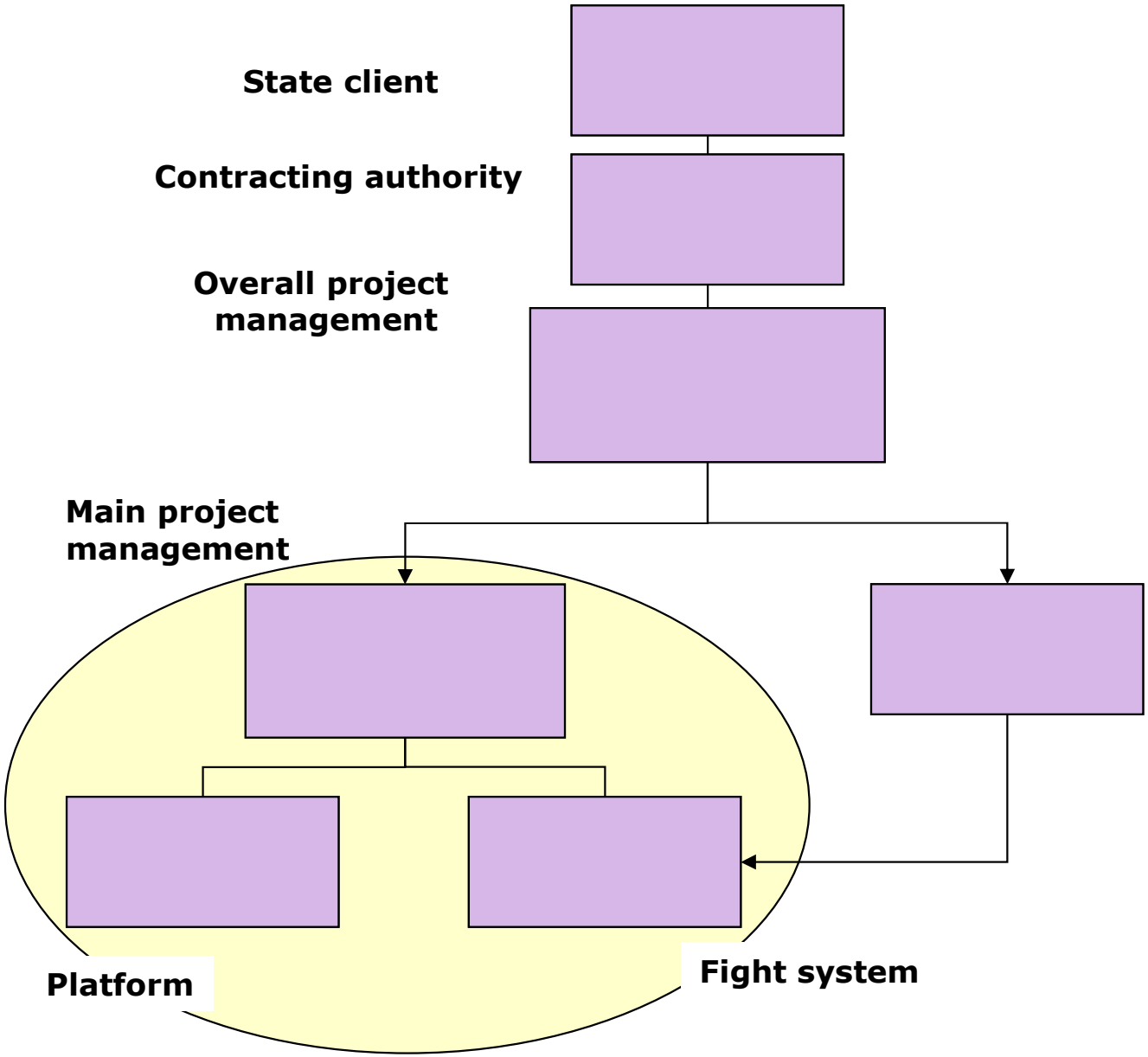
Parties identification

Client
Contracting authority (MOA)
Overall project manager (MOE)
Main project manager "Prime Contractor" (MOP)
Country vendor
Supervision organisation
A trusted third party
System manufacturers
Components manufacturers
System manufacturers 2nd level
Components manufacturers 2nd level

Parties identification

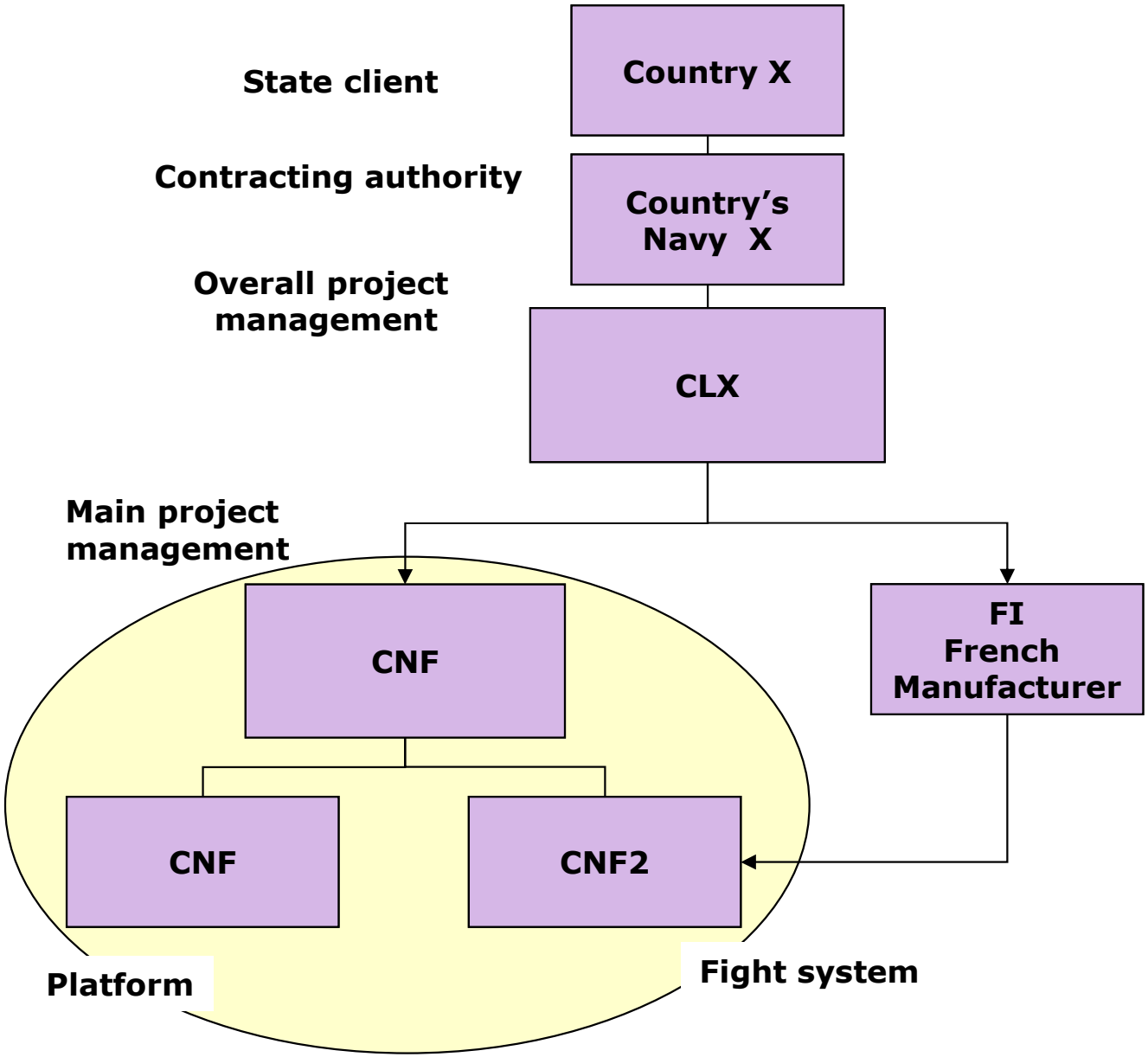
Client	Country X
Contracting authority (MOA)	Country's Navy X
Overall project manager (MOE)	CLX
Main project manager "Prime Contractor" (MOP)	CNF
Country vendor	France
Supervision organisation	?
A trusted third party	?
System manufacturers	2 French possible
Components manufacturers	2 French possible
System manufacturers 2nd level	Various and Contracting authority selection?
Components manufacturers 2nd level	Contracting authority selection ?

Links between Parties



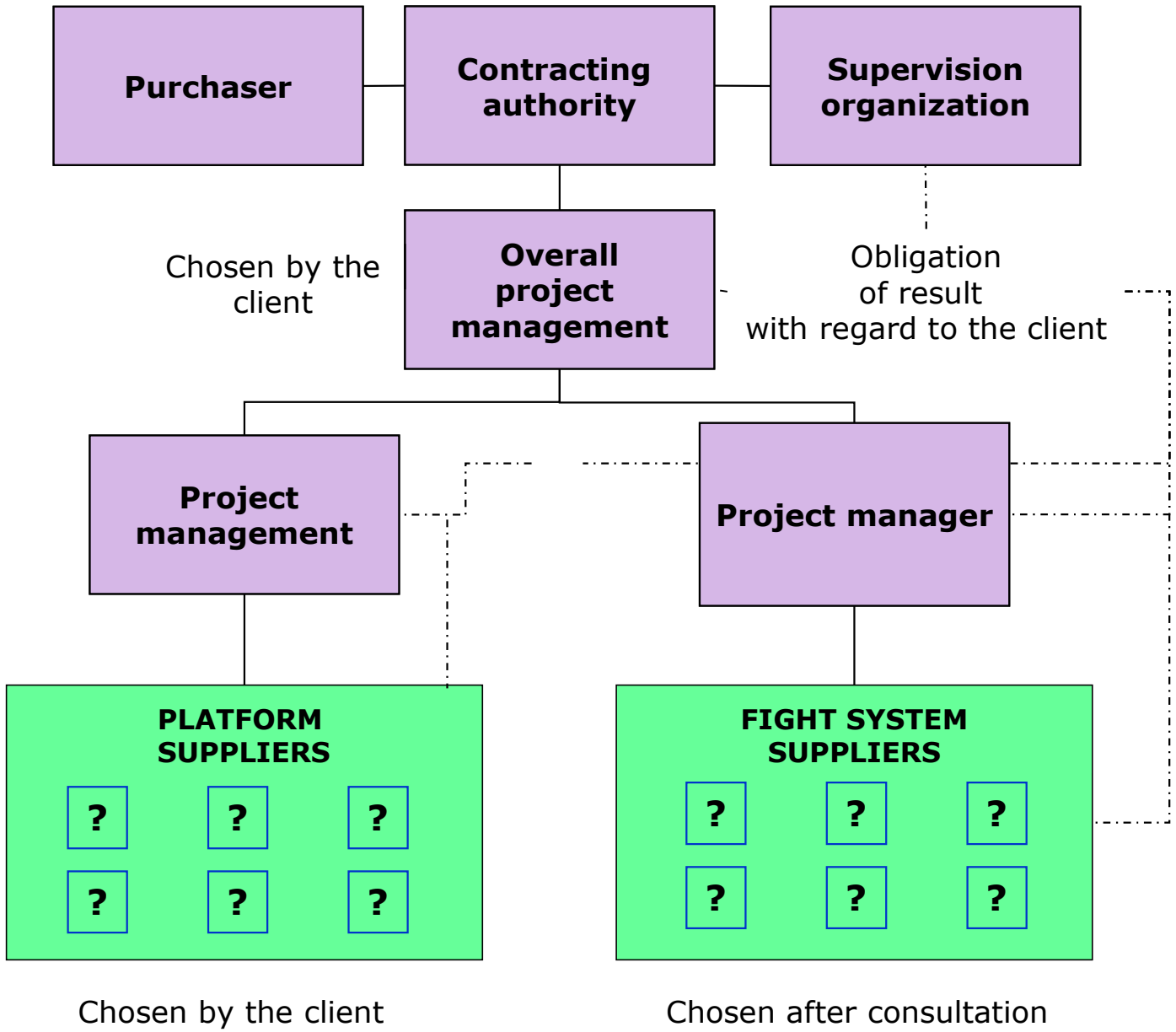
Relations complexity

Links between Parties



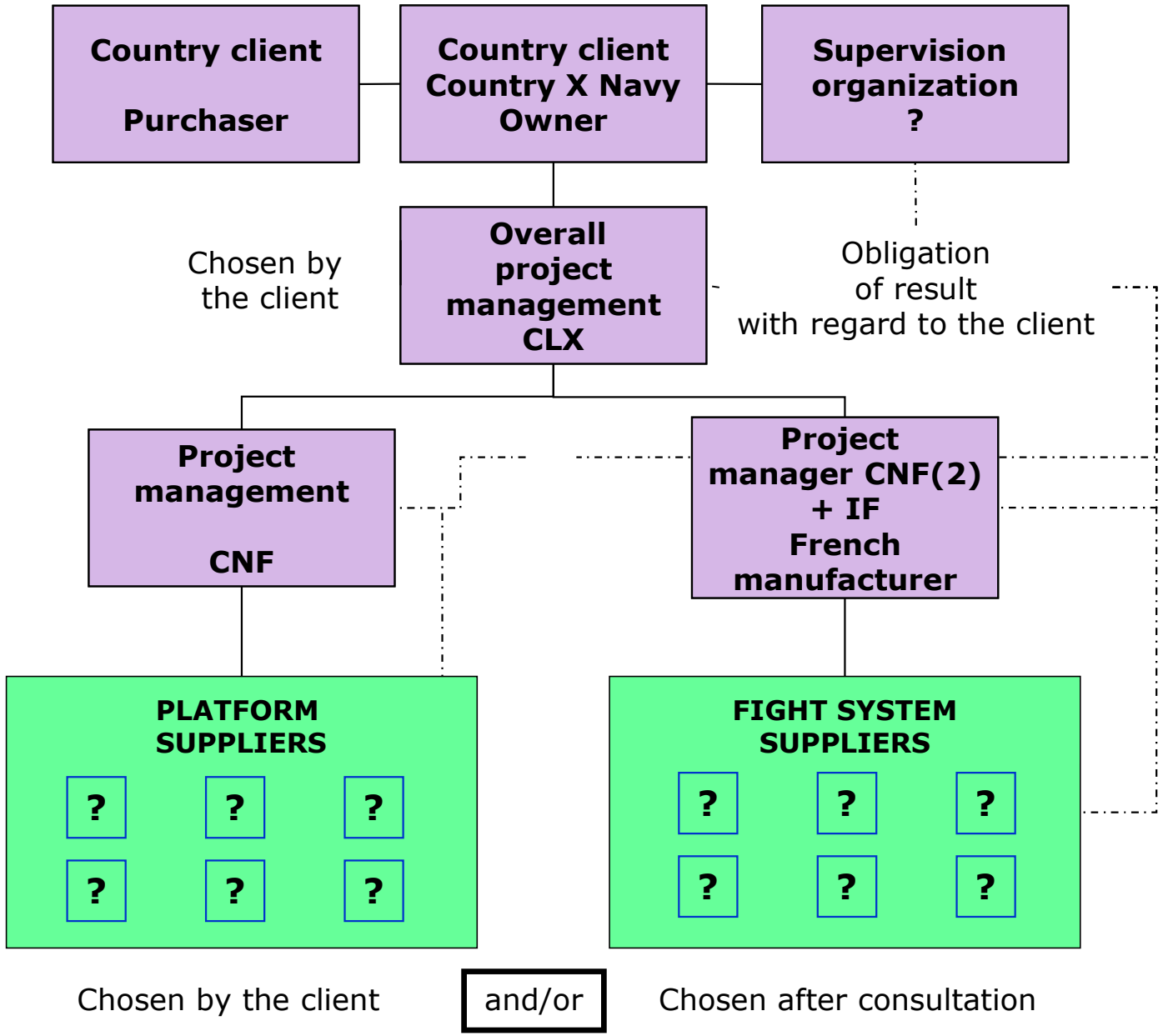
Relations complexity

Competencies areas



In case of problems it is hard to find responsibilities...

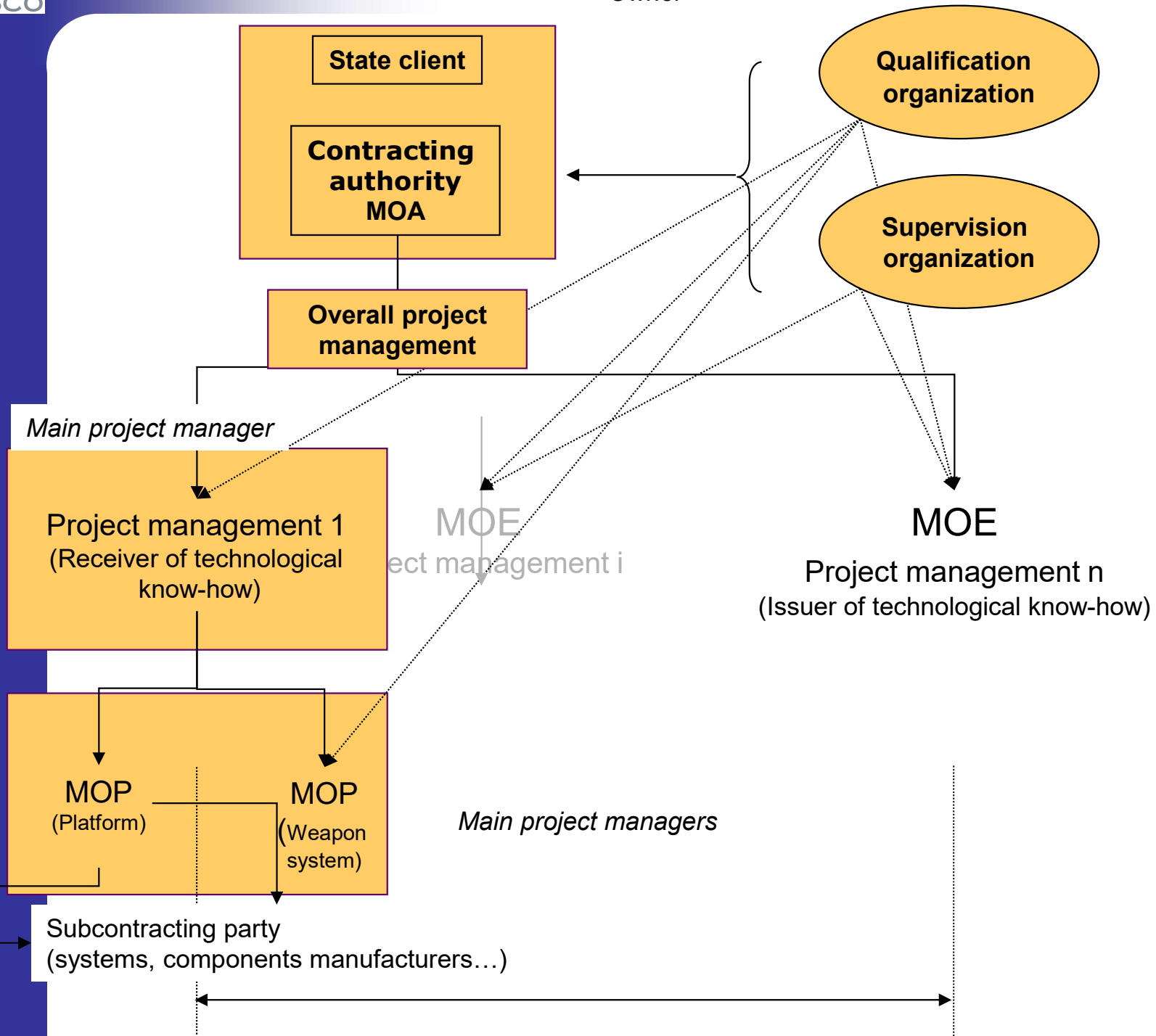
Competencies areas



In case of problems it is hard to find responsibilities...

Parties game

Owner



Parties game

Linked to the development

Le fil d'Ariane

Contracting authority

State client country X

Contracting authority MOA Country X Navy

Overall project managership CLX

Qualification organization

Supervision organization

Linked to the production

Main project manager

MOE - CNF

Project management 1

(Receiver of technological know-how)

MOE

ect management i

MOE

Project management n

(Issuer of technological know-how)

MOP

(Platform)

CNF1

MOP

(Weapon system)

CNF2

Main project managers

French Manufacturers FI

Subcontracting party

(systems, components manufacturers…)

If there is not a trusted third party between the issuer and the receiver of technologies risks of misunderstanding « go back up » to MOA and are not dealt with

Key Dates

	T0	T0+3	T0+6	T0+9	T0+12	T0+15	T0+18	T0+21	T0+24	T0+27	T0+30
Contract signature											
Definitive choice of combat system equipments											
Freeze of specifications											
Realization of two first frigates (1 in the country-seller, 1 in the country-client)											
Delivery of 2 following corvettes to the country X											
Delivery of 2 additional corvettes (option)											

	T0+33	T0+36	T0+40	T0+42	T0+45	T0+48	T0+52	T0+54	T0+57	T0+60	T0+64
Contract signature											
Definitive choice fight system equipments											
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	T0	T0+3	T0+6	T0+9	T0+12	T0+15	T0+18	T0+21	T0+24	T0+27	T0+30
Contract signature	✚										
Definitive choice of fight system equipments		✚									
Freeze of specifications					✚						
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Delivery of 2 following corvettes to the country X							✚				
Delivery of 2 additional corvettes (option)											✚

Examples of indicators to anticipate your risks on a program and establish a risk profile

- The program size.
- The importance of budget, calendar and technical stakes.
- The immaterial nature.
- The innovation.

- The autonomy.
- The very specific characteristic of engagements.
- The weak mutualism.
- The great complexity.

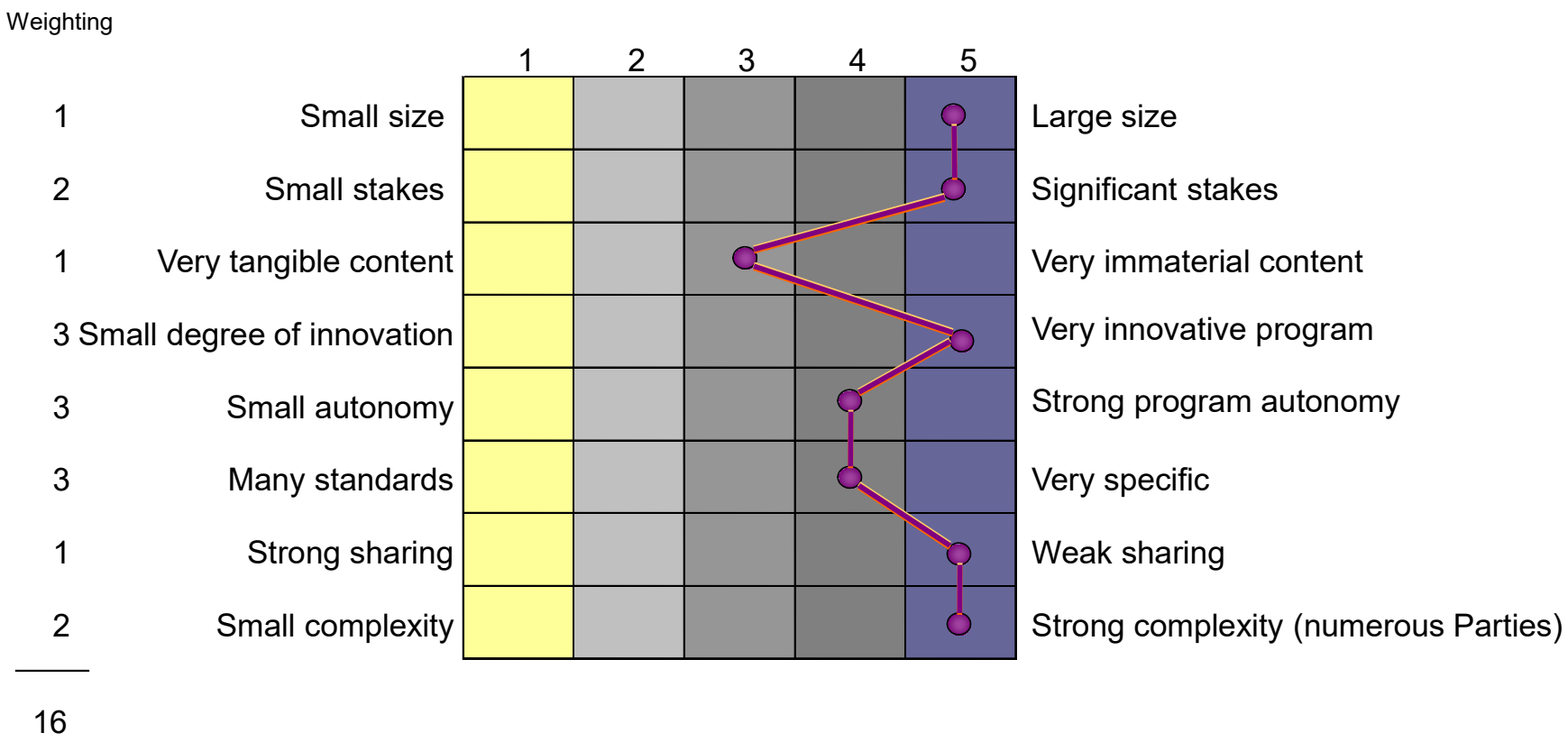
You should anticipate the risks of a program

- Establishing risks profiles allows you to perform overall diagnostics. It facilitates the awareness about the risks nature and stakes.

Helicopter view - Level 1

Weighting		1	2	3	4	5	
1	Small size						Large size
2	Small stakes						Significant stakes
1	Very tangible content						Very immaterial content
3	Small degree of innovation						Very innovative program
3	Small autonomy						Strong program autonomy
3	Many standards						Very specific
1	Strong sharing						Weak sharing
2	Small complexity						Strong complexity (numerous Parties)

Helicopter view – Level 1



Note 15 / 16 – Maximal risk
The program profile is very risky.

15 : Instance of the columns 4 or 5, weighted

The program risks

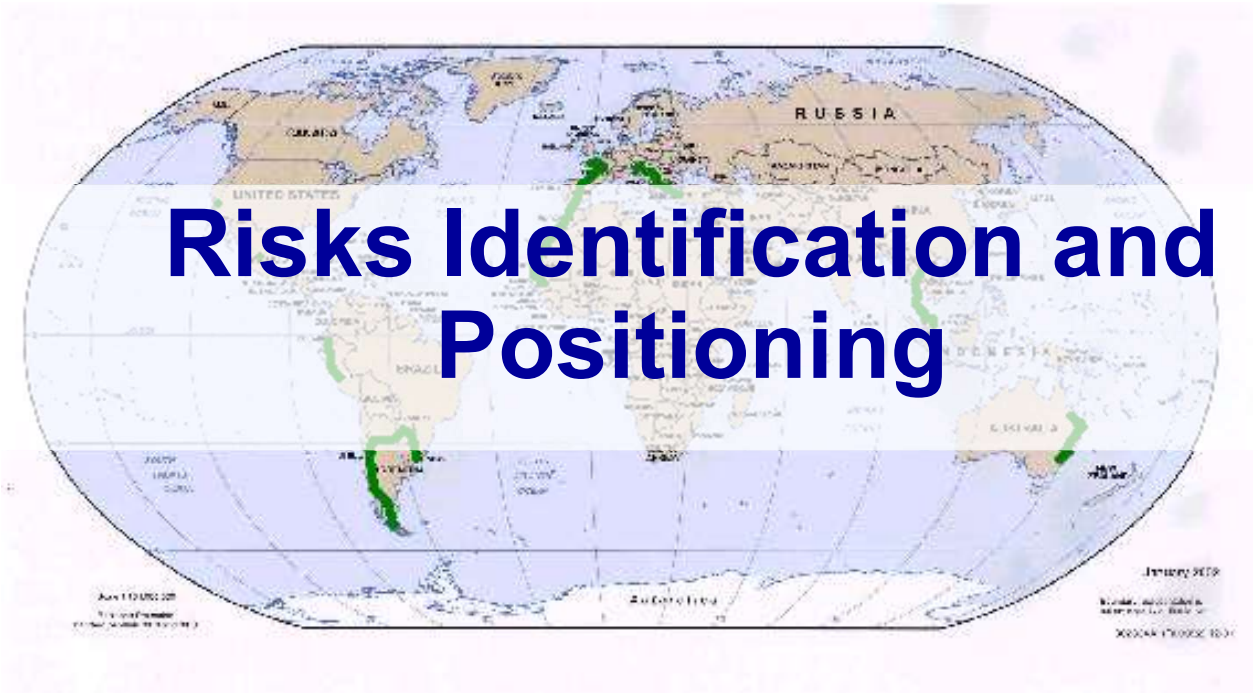
- «Possibilities that a program is not held in accordance with the forecasts of completion dates, costs and technical specifications -
- these variations compared to the forecasts are regarded as hardly acceptable, if not unacceptable».

- The concept of **risk** corresponds to a gap considered unacceptable compared to what is being expected. This variation results from an hazard or an uncertainty.

- The concept of **hazard** means that the project parameters can fluctuate in a foreseeable bracket.

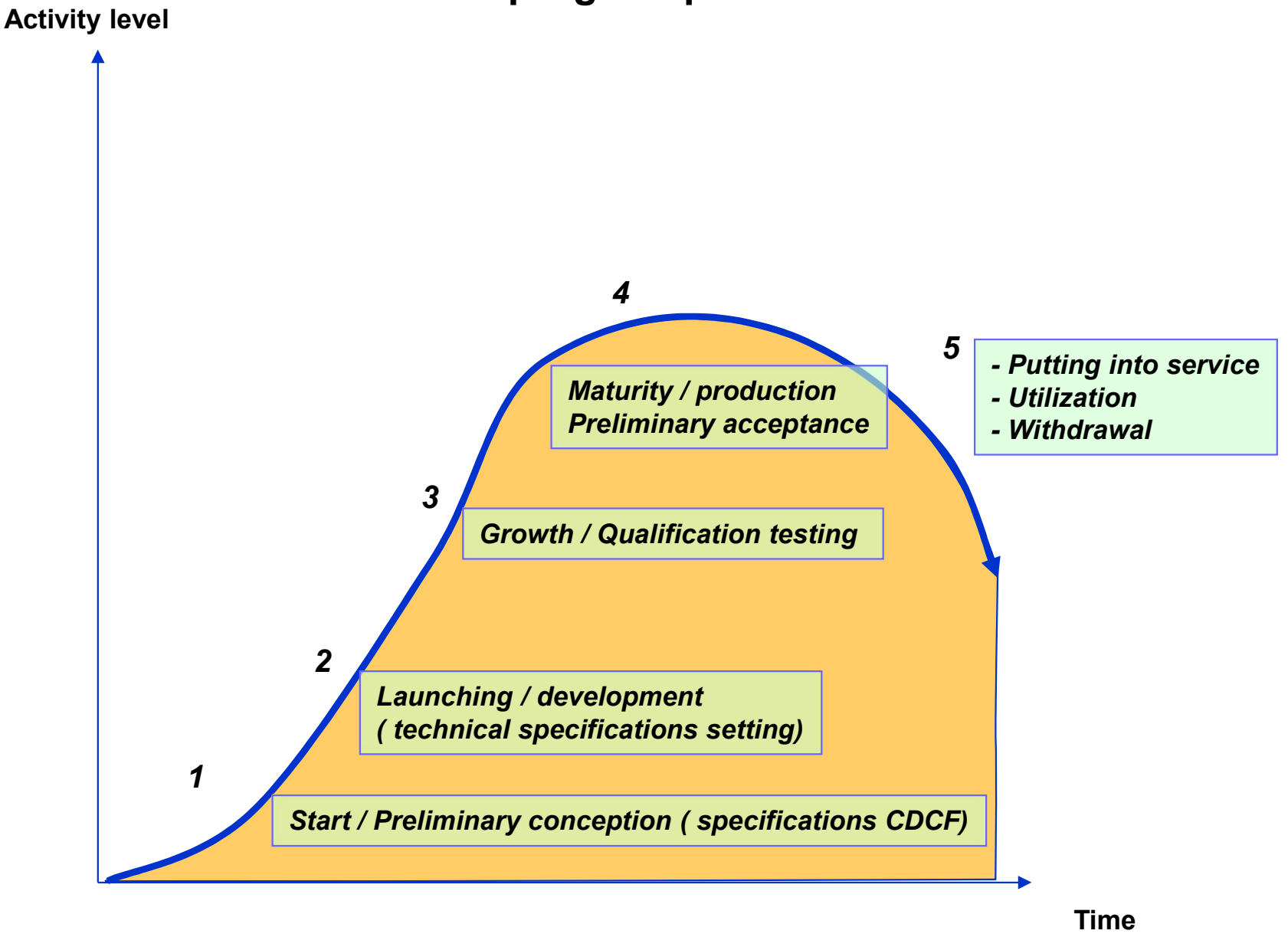
- The concept of **uncertainty**, contrarily to the concept of hazard, is not foreseeable. It is bothering only if it is focused on information which strongly affects the project.

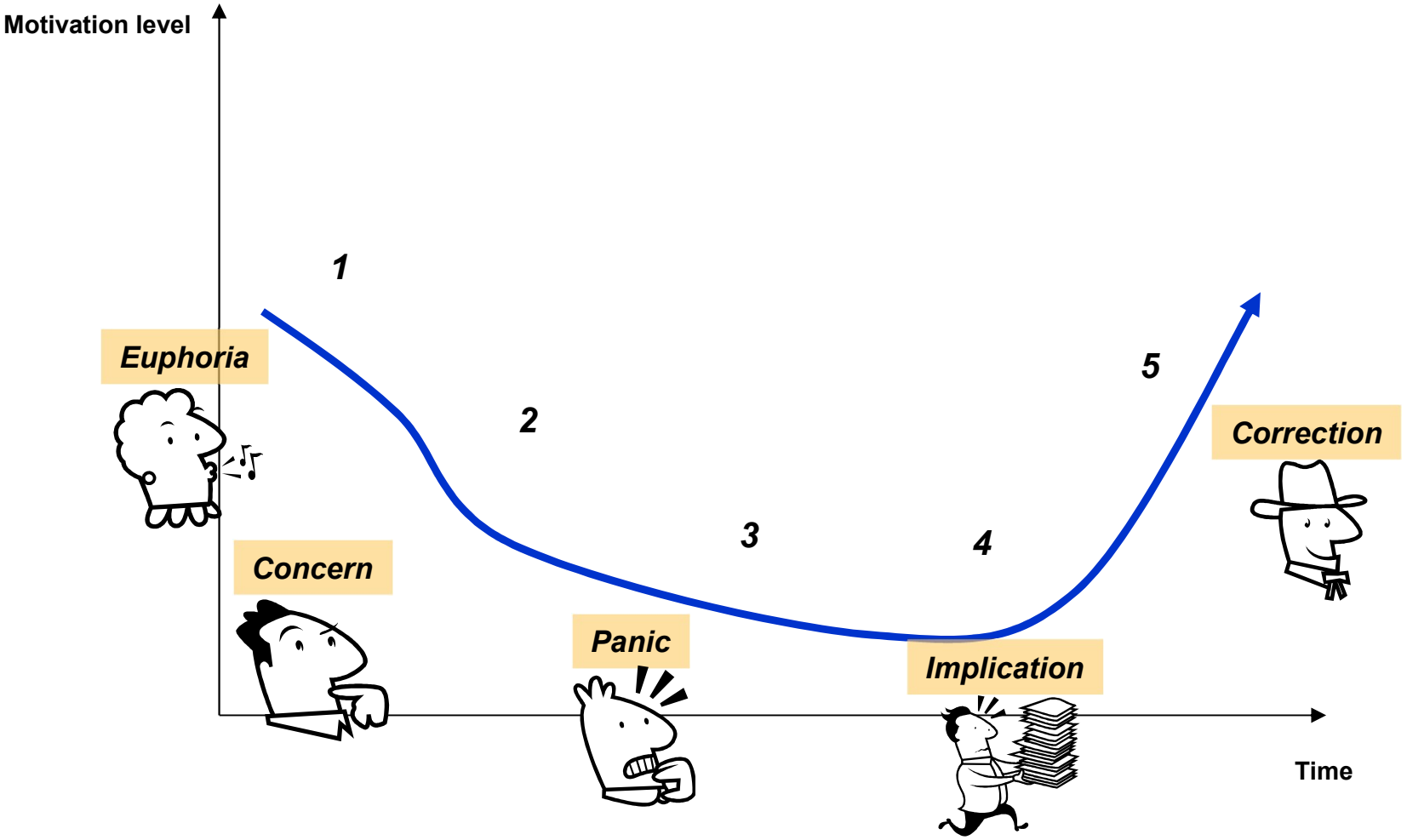
Risks Identification and Positioning



TAKE AN HELICOPTER VIEW ! (2)

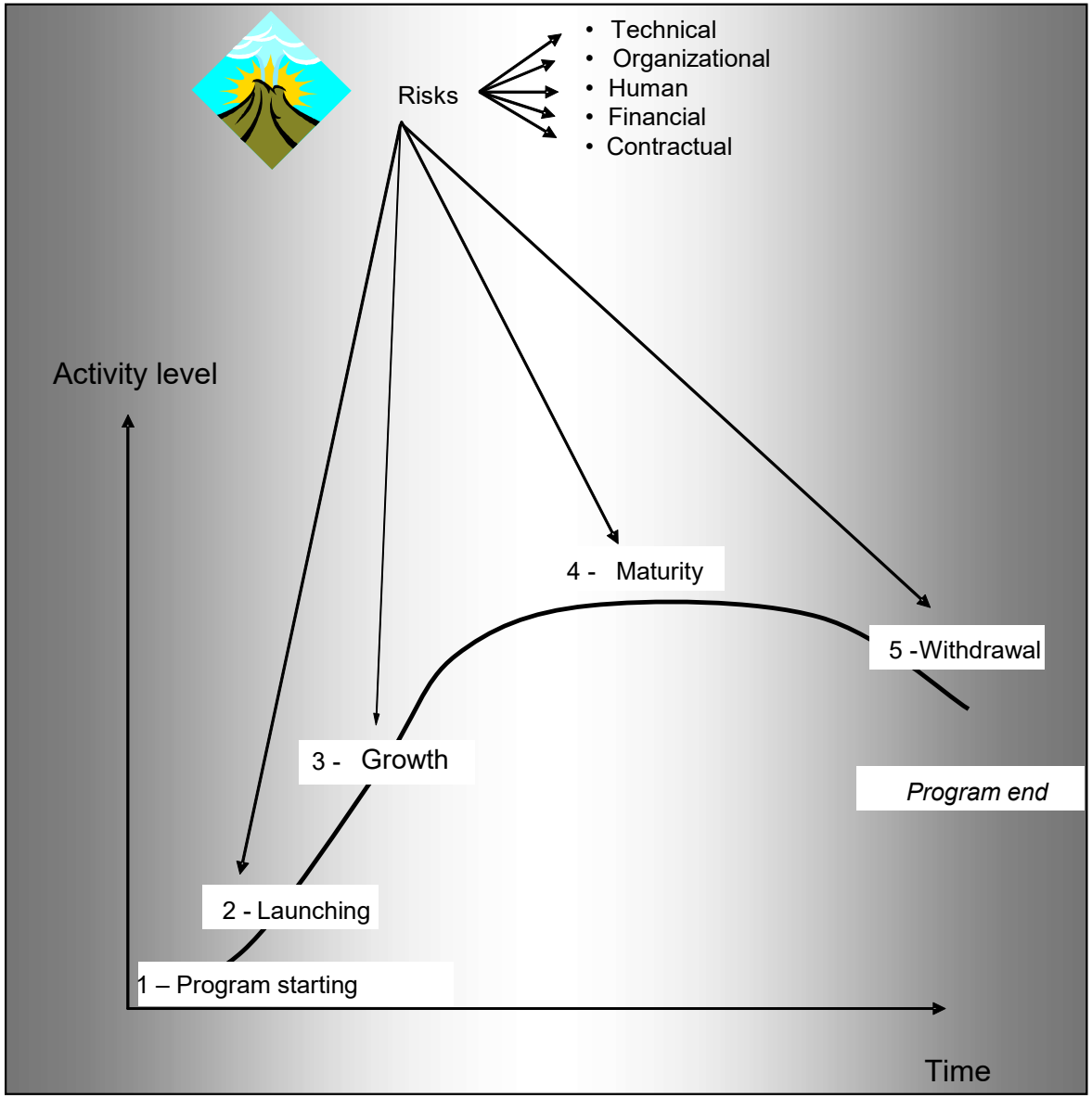
The 5 program phases





The level of motivation during these 5 phases is risk generating.
Motivation always decreases during the program progression, which can appear paradoxical, then grows very quickly

Risks reduction for the 5 involved resources is different according to the 5 program phases



Changes in involved resources and corresponding environments are “risks carriers”

A - Evolution of environment during the program

Risk level

EVOLUTION OF 5 ENVIRONMENTS	1	2	3
Human environment			
Environment of the contract			
Technological environment			
Organizational environment			
Financial environment			
Global note			

B - Evolution of resources during the program

Risk level

INTERNAL EVOLUTION 5 RESOURCES	1	2	3
Human			
Contractual			
Technological			
Organizational			
Financial			
Global note			

C - Resultant for risks reduction

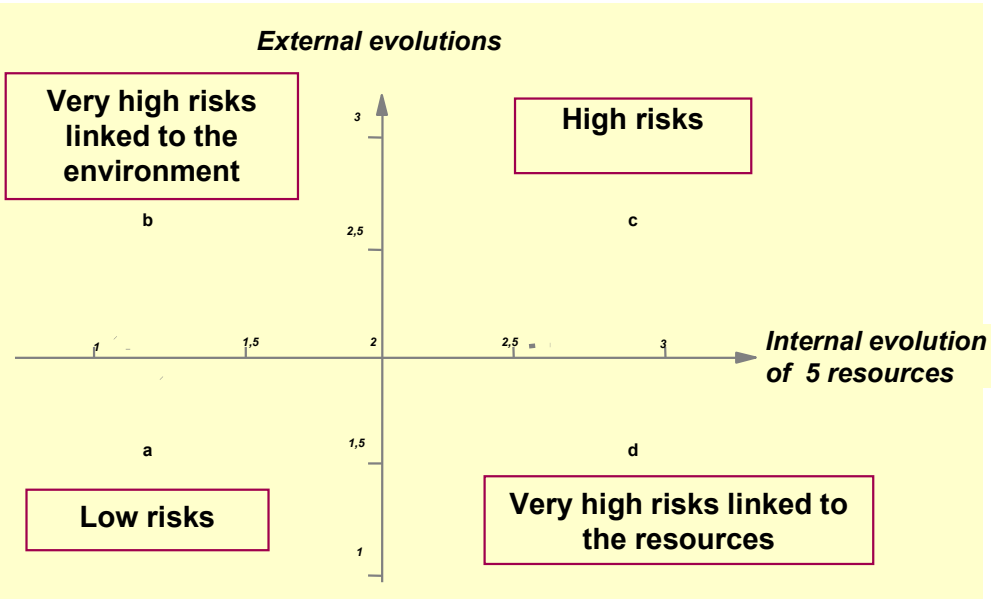
4 scenarios :

a – Low risks

b- Risks linked to the program environment

c- High risks (program is questioned)

d- Very high risks linked to the resources



Changes in involved resources and corresponding environments are “risks carriers”

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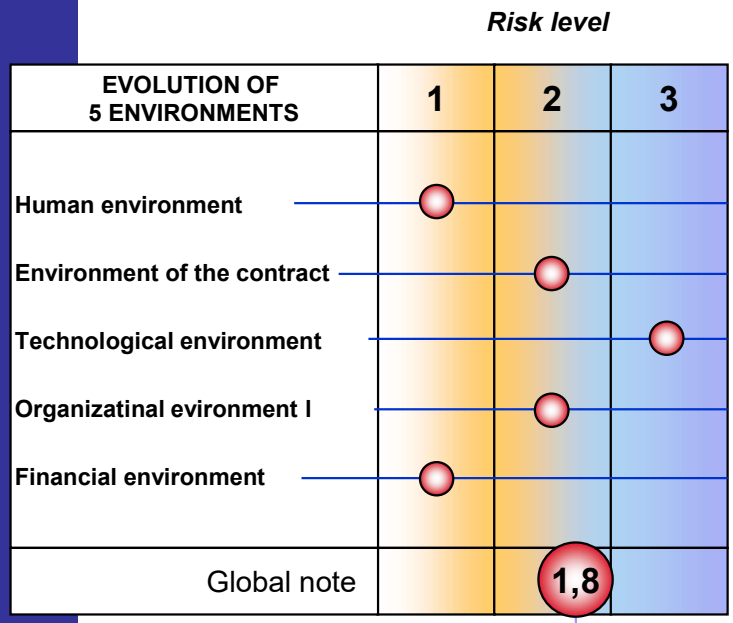
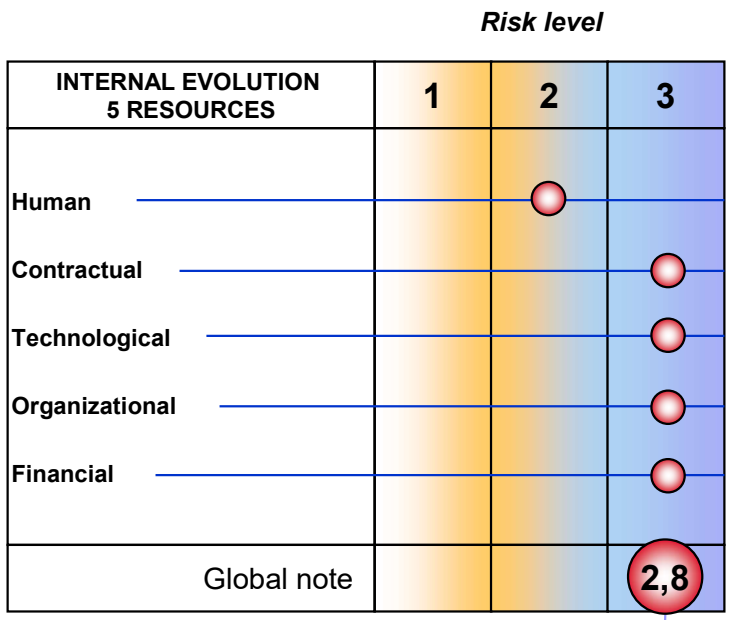


B - Evolution of resources during the program



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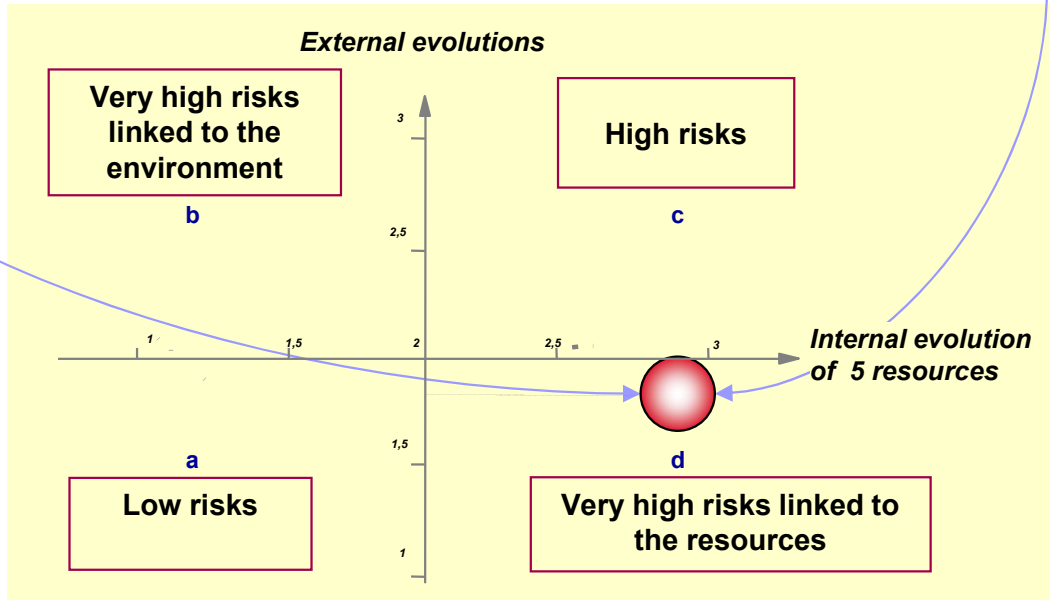


The program is very risky with regard to the engagement of "evolutionary" resources.
If the very innovating aspect of the weapon system should make the program divert, human resources of the customer would not be ready and the risk of technology transfer would put the program in DEAD END.

The « helicopter view » supposes a risk culture

- Admitted expertise
- Cumulative competencies
- Multilateral competencies
- Experience in risky situations

Average Risk probability in international programs for complex equipments

Major risks	Risk level
1 - Need modification	25%
2 - Programs modifications due to political decisions	15%
3 – A badly-written contract	15%
4 - The program is not coherent with the current organization	10%
5 – Follow up and qualifications are not controlled by a third party	10%
6 - Insufficient resources	5%
7 – Weak management	5%
8 - No overall view in order to anticipate problems	5%
9 – Logistic constraints are not integrated	5%
10 – Insufficient or under prepared competencies on the client side	5%
	100%

-95% of risks can be under control
(actions in qualification and monitoring of contracts development).
-5% are considered incompressible.

Examples of risks for the client for each of 5 resources involved in a program

Contractual resources	1 - Risks linked to the contract
Contractual resources	2 - Clients and suppliers risks, actors games (Clients/ States/ Suppliers)
Technological resources	3 - Problem of technology transfer and risks related to the manufacturer and the country-buyer
Contractual resources	4 - Risks of lack of control of engagements from the client point of view, from the supplier point of view, risks combined with critical resources, emerging risks
Financial resources	5 - Risks of unexpected overpricing
Financial resources	6 - Financial risks (insufficiently defined payment keys, uncertain financings definition of technical milestones which set off the financings, bad budgetary provisions)
Organizational resources	7 - Risks of configuration management, configuration variations and necessary audits in order to guarantee the integrity and the respect of engagements (configuration referential)
Organizational resources	8 - Logistic risks integrated to the contract
Technological resources	9 - Risks related to systems qualification, risks of robustness of technologies deployed in time, risks of obsolescence
Human resources	10 - Risk of non adapted competencies and/or not available on time
Technological resources	11 - Risks linked to the use of civil technology for a military program
Contract resources	12 - Risks of not meeting deadlines, and respecting costs, engagements

Example of an involved resource in a program

Program phase (1) : ***Start***

HR Risks (from 1 to 5 - 5 : very risky)

1 – Were the client's necessary competencies prepared?	
2 – Is the client staff training sufficient?	
3 – How to maintain the risk of competencies losses, once the program services provided?	
4 – Are there substitutable competencies for the client?	
5 – Are there innovating competencies?	
6 – Are the provided competencies very evolutionary?	
7 – Is competencies maintenance provided?	
8 – Is renewal of competencies forecasted?	
9 – Is teams creation planned by the client?	
10 – Has responsibilities allocation been planned?	
Average	

(1) : The 5 identified phases of a program are :

a. Start (phase 1)
b. Launching (phase 2)
c. Growth (phase 3)
d. Maturity (phase 4)
e. Withdrawal (phase 5)

Example of an involved resource in a program

Program phase (1) : ***Start***

HR Risks (from 1 to 5 - 5 : very risky)

1 – Were the client's necessary competencies prepared?	5
2 – Is the client staff training sufficient?	4
3 – How to maintain the risk of competencies losses, once the program services provided?	3
4 – Are there substitutable competencies for the client?	3
5 – Are there innovating competencies?	4
6 – Are the provided competencies very evolutionary?	4
7 – Is competencies maintenance provided?	3
8 – Is renewal of competencies forecasted?	4
9 – Is teams creation planned by the client?	2
10 – Has responsibilities allocation been planned?	3
Average	3,5

(1): The 5 identified phases of a program are :

a.Start (phase 1)
b.Launching (phase 2)
c.Growth (phase 3)
d.Maturity (phase 4)
e.Withdrawal (phase 5)

(Page 23 of the learner book)

Program phase (1) : ***Start***

Technological risks (from 1 to 5 - 5 : very risky)

1 - Evolutionary operations content	
2 - Some specificities depend on unknown external players	
3 - Some technologies are not controlled	
4 – Functional requirements are on an unprecedented level	
5 – Standards are vague	
6 – Complexity is badly controlled and/or is new	
7 – Technologies transferability is difficult	
8 - The expertise is insufficient	
9 - The new standards are not taken into account	
10 - Few research of specifications "on racks"	
Average	

Technological risks

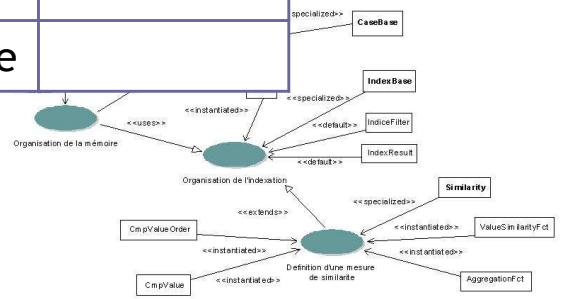
1 - Evolutionary operations content	5
2 - Some specificities depend on unknown external players	5
3 - Some technologies are not controlled	5
4 – Functional requirements are on an unprecedented level	4
5 – Standards are vague	4
6 – Complexity is badly controlled and/or is new	4
7 – Technologies transferability is difficult	4
8 - The expertise is insufficient	3
9 - The new standards are not taken into account	3
10 - Few research of specifications "on racks"	4
Average	4,1

(Page 24 of the learner book)

Program phase (1) : ***Start***

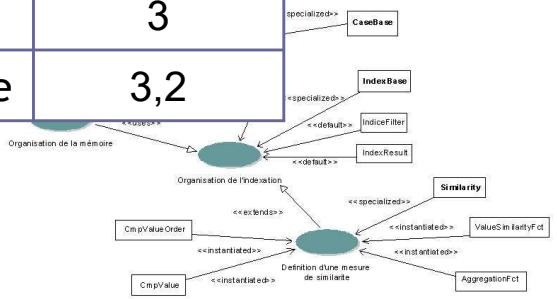
Organizational risks (from 1 to 5 - 5 : very risky)

1 – Priorities are not assessed	
2 – Simultaneous actions are conflicting	
3 – Critical deadlines are not identified	
4 – Means per activity are not used	
5 – Dissentions remain in the evaluation charge / duration	
6 – Dependence links are not specified	
7 – Deadlines are not taken in account	
8 - Engagements are insufficiently defined	
9 – The specifications are questioned	
10 – The qualification steps are not precise	
Average	



Organizational risks

1 – Priorities are not assessed	4
2 – Actions simultaneity generates conflicts	3
3 – Critical deadlines are not identified	2
4 – The per activity means are not used	2
5 – Dissentions remain in the evaluation charge / duration	3
6 – Dependence links are not specified	4
7 – Deadlines are not taken in account	2
8 - Engagements are insufficiently defined	5
9 – Specifications are questioned	4
10 – Imprecisions in the qualification steps	3
Average	3,2



(Page 25 of the learner book)

Program phase (1) : ***Start***

Financial risks (from 1 to 5 - 5 : very risky)

1 - Engagements are not enough well evaluated	
2 - Budgetary masses appear underestimated	
3 – Working capital is not envisaged	
4 - Somme activities are underestimated	
5 – Price evolutions are dubious	
6 - The terms of payment are not fixed	
7 – Evolutions of exchange rate are not covered	
8 - The supplying scales are very fluctuating	
9 – Labor costs are underestimated	
10 - Costs of access to critical technologies are underestimated	
Average	

Financial risks

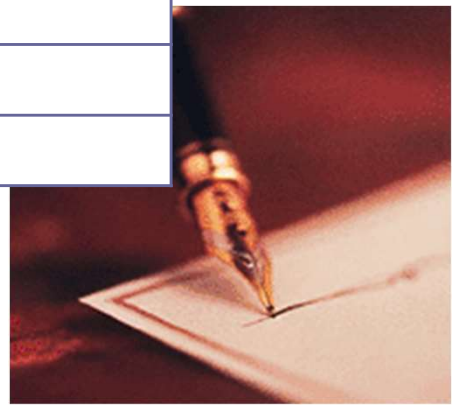
1 - Engagements are not enough well evaluated	4
2 - Budgetary masses appear underestimated	3
3 – Working capital is not envisaged	2
4 - Somme activities are underestimated	3
5 – Price evolutions are dubious	4
6 - The terms of payment are not fixed	1
7 – Evolutions of exchange rate are not covered	2
8 - The supplying scales are very fluctuating	1
9 – Labor costs are underestimated	1
10 - Costs of access to critical technologies are underestimated	4
Average	2,5

(Page 26 of the learner book)

Program phase (1) : ***Start***

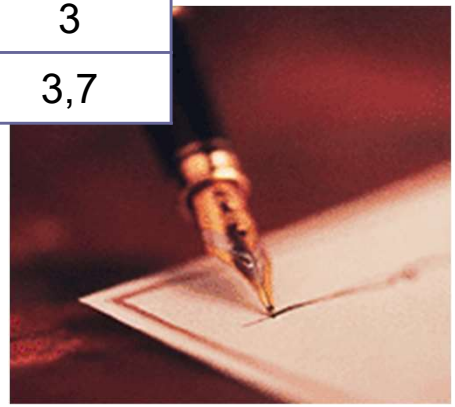
Contractual risks (from 1 to 5 - 5 : very risky)

1 - Needs analysis is incomplete	
2 - Functional definition is evolutionary	
3 - Specifications are not precise enough	
4 - Qualification steps are not sufficiently defined	
5 – Technological evolutions are not integrated	
6 - Dysfunctions resulting from the innovation integration are underestimated	
7 – Client's requirements are moving	
8 – Technologies are not robust enough	
9 – Threats have not been sufficiently evaluated	
10 – Logistics are not integrated	
Average	



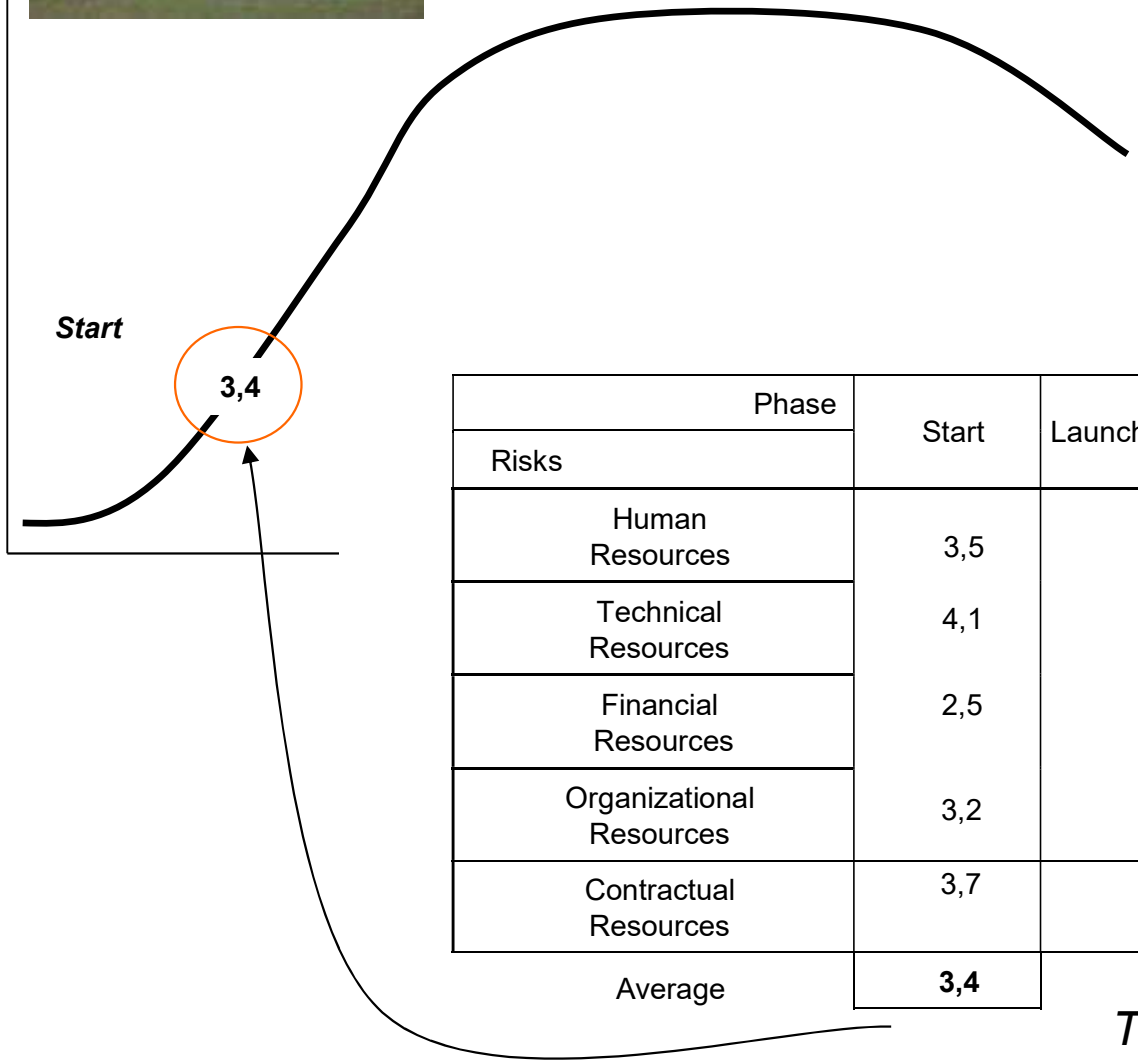
Contractual risks

1 - Needs analysis is incomplete	5
2 - Functional definition is evolutionary	4
3 - Specifications are not precise enough	5
4 - Qualification steps are not sufficiently defined	4
5 – Technological evolutions are not integrated	4
6 - Dysfunctions resulting from the innovation integration are underestimated	5
7 – Client's requirements are moving	3
8 – Technologies are not robust enough	2
9 – Threats have not been sufficiently evaluated	2
10 – Logistics are not integrated	3
Average	3,7



« Helicopter view »

Program phase : ***Start***



Phase / Risks	Start	Launching	Growth	Maturity	Withdrawal
Human Resources	3,5				
Technical Resources	4,1				
Financial Resources	2,5				
Organizational Resources	3,2				
Contractual Resources	3,7				
Average	**3,4**				

The risk level is high

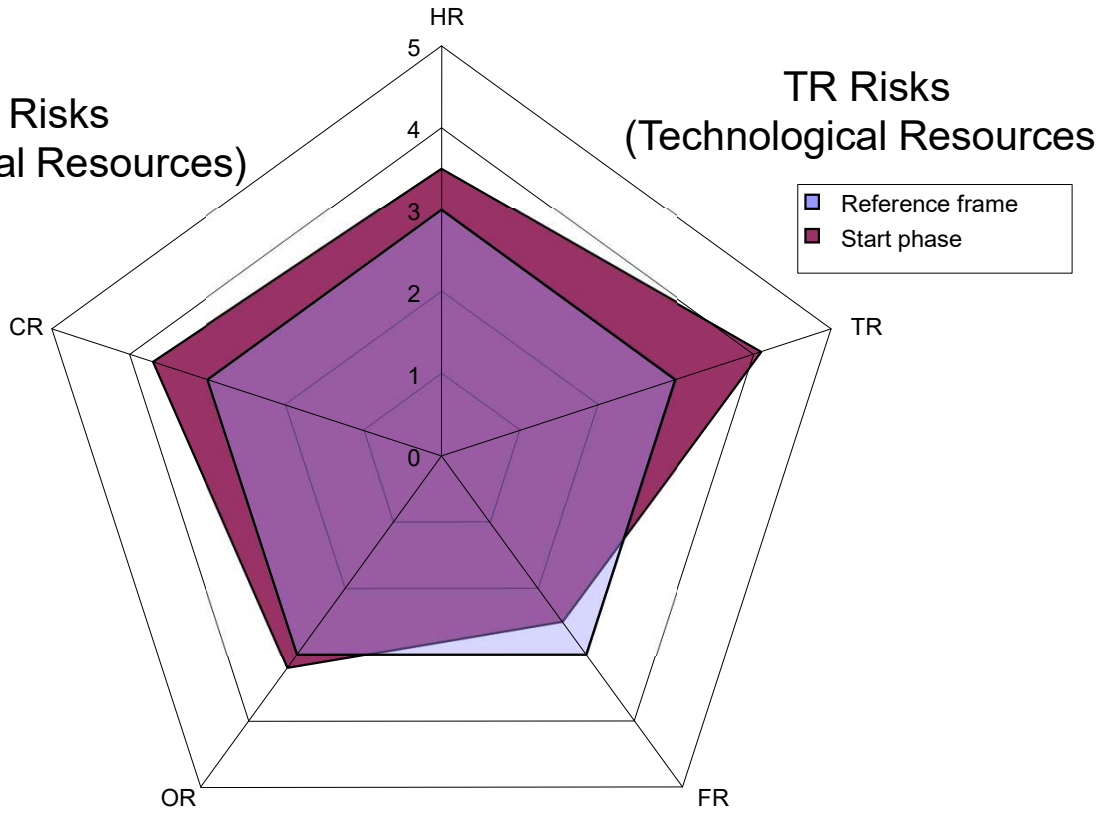
*Program phase : **Start***

HR Risks
(Human Resources)

Customer helicopter view

CR Risks
(Contractual Resources)

TR Risks
(Technological Resources)



OR Risks
(Organizational Resources)

FR Risks
(Financial Resources)

Major risks

1 - Technological

2 - Contractual

3 - Human

4 - Organizational

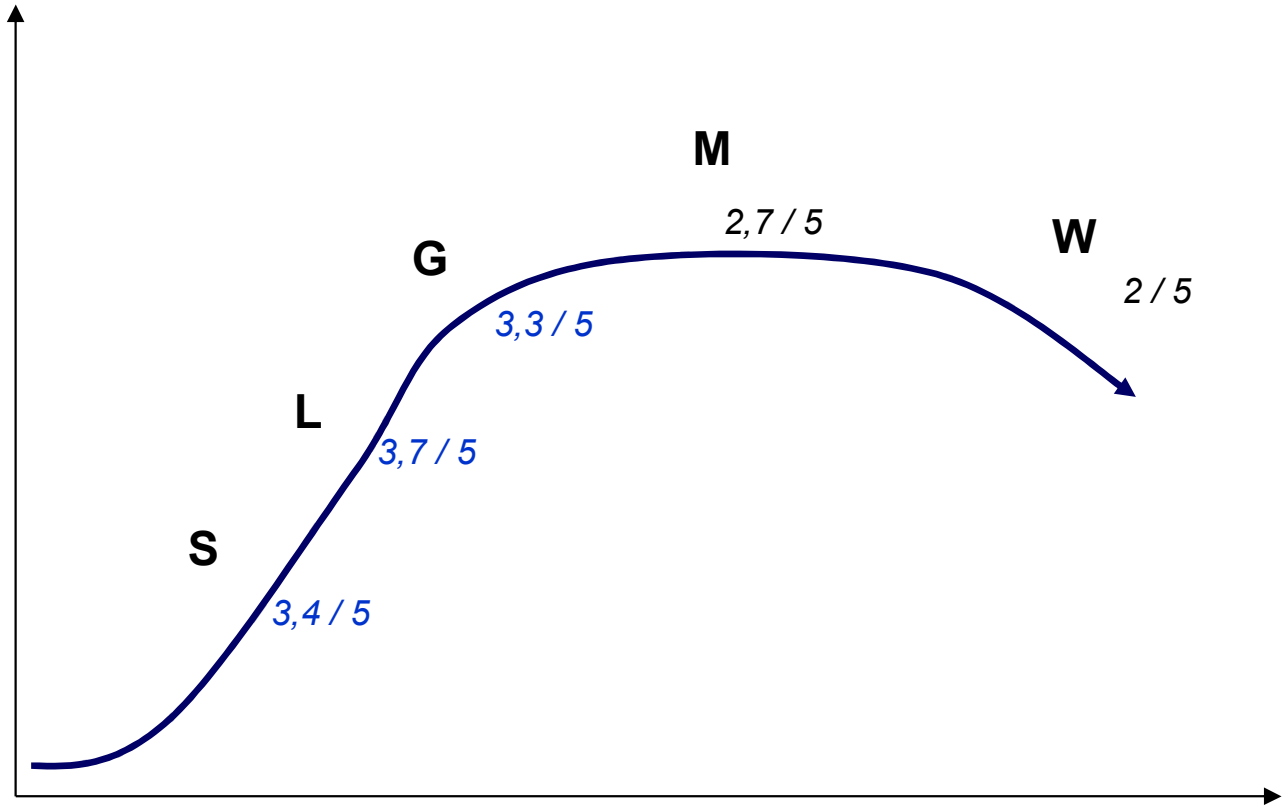
Risks Polygon
in the « Fil d'Ariane » program

5 resources risks :
(from 1 – not many risks to 5 – very risky)
According to the program positioning on the curve

Position / Risks	Start	Lauching	Growth	Maturity	Withadrawal
HR - Human resources	3,5	3,4	3,2	3,1	2,6
TR - Technological resources	4,1	3,8	3,6	2,8	2
FR - Financial resources	2,5	4,7	3,7	2,7	1,4
OR - Organizational resources	3,2	3	2,5	2	1,4
CR - Contractual resources	3,7	3,8	3,5	3,1	2,4
Appropriateness to needs					
Average	**3,4**	**3,7**	**3,3**	**2,7**	**2,0**

The risk is too high during start, launching and growth phases. It is liable to question the nature, the feasibility and the objective of the program.

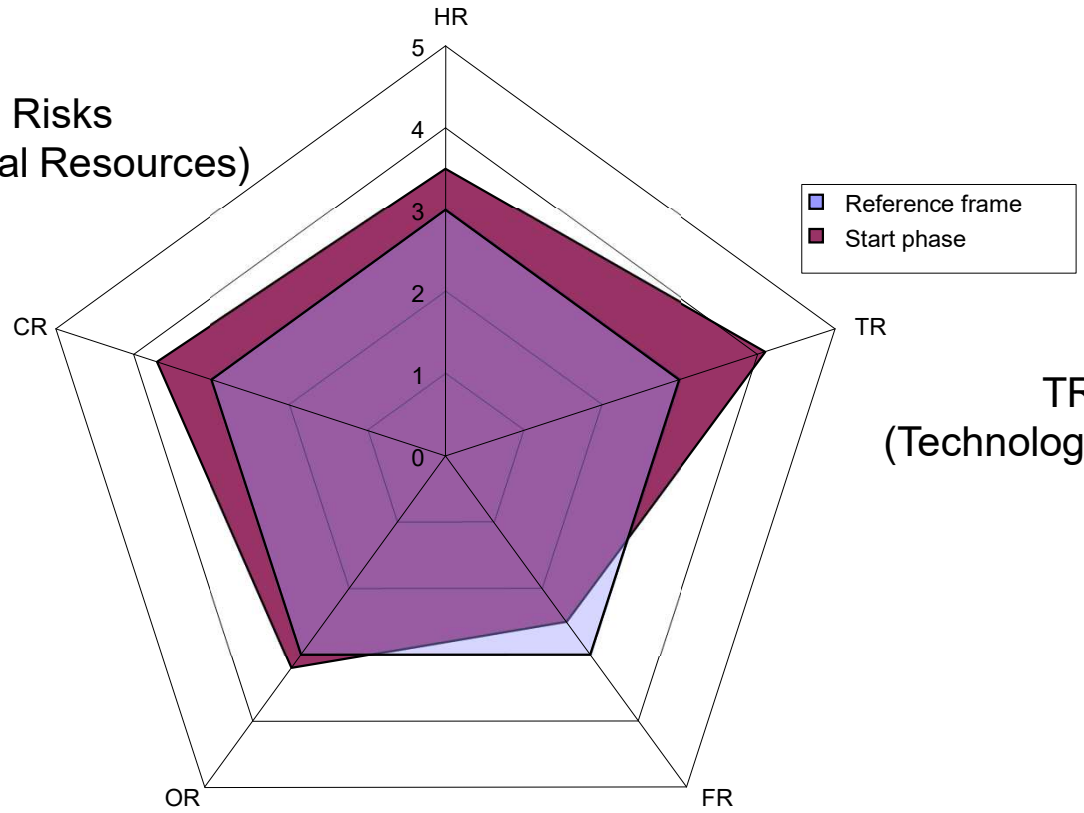
Position your program on the curve and identify the nature of risks associated with the 5 resources (from the client's point of view).



Risks are very high in the first 3 program phases: start, launching and growth

*Program phase : **Start***

HR Risks
(Human Resources)



CR Risks
(Contractual Resources)

TR Risks
(Technological Resources)

Risks RO
(Organizational Resources)

FR Risks
(Financial Resources)

Risks Polygon
in the program « Fil d'Ariane »

Major risks

1 - Technological

2 - Contractual

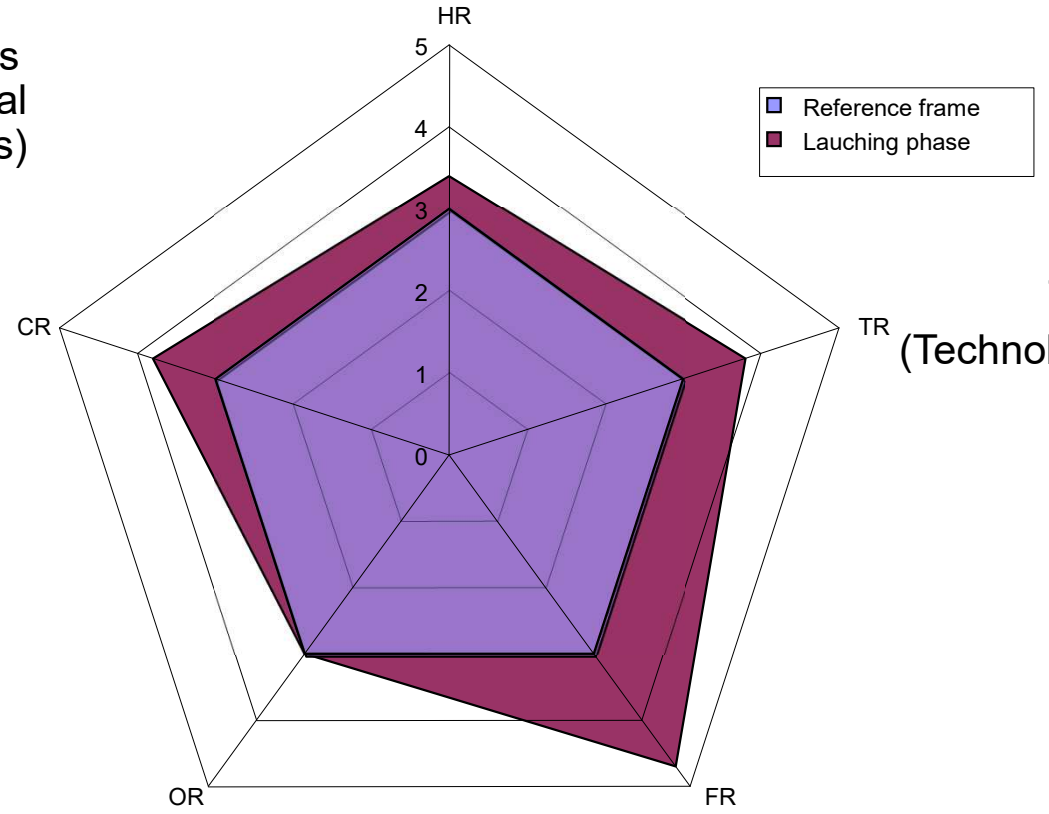
3 - Human

4 - Organizational

HR Risks
(Human Resources)

*Program phase : **Launching***

CR Risks
(Contractual
Resources)



TR Risks
(Technological Resources)

OR Risks
(Organizational
Resources)

FR Risks
(Financial
Resources)

Risks Polygon
in the program « Fil d'Ariane »

Major risks

1 – Financial

2 - Contractual

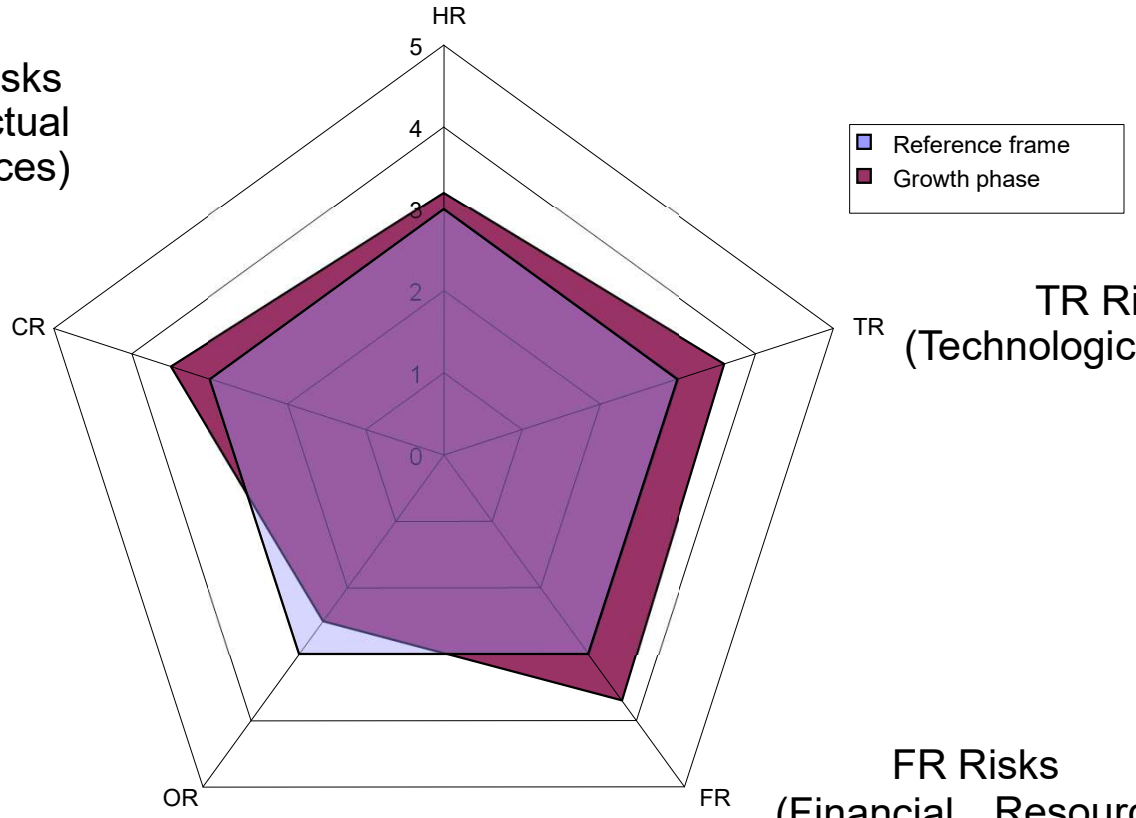
3 - Technological

4 - Human

HR Risks
(Humain Resources)

Program phase: ***Growth***

CR Risks
(Contractual
Resources)



TR Risks
(Technological Resources)

FR Risks
(Financial Resources)

OR Risks
(Organizational
Resources)

Major risks

1 – Financial

2 - Contractual

3 - Technological

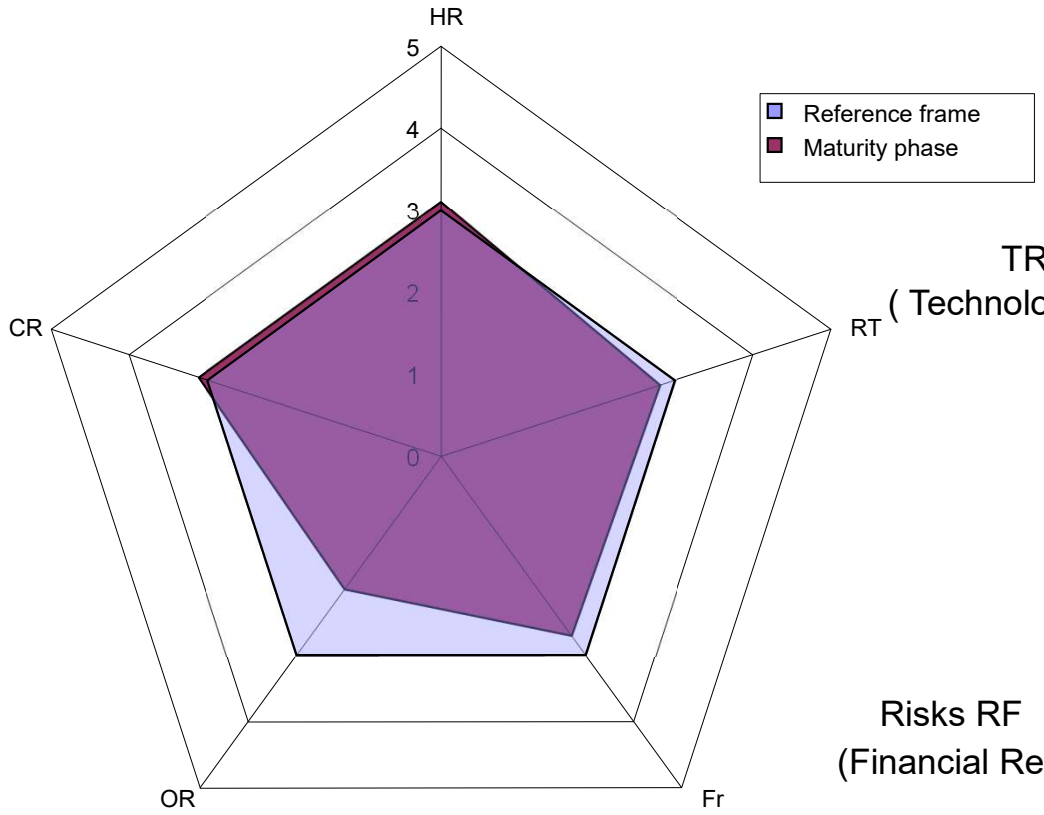
4 - Human

Risks Polygon
in the program « Fil d'Ariane »

Risks RH
(Human Resources)

Program phase: ***Maturity***

Risks RC
(Contractual
Resources)



TR Risks
(Technological Resources)

Risks RF
(Financial Resources)

OR Risks
(Organizational
Resources)

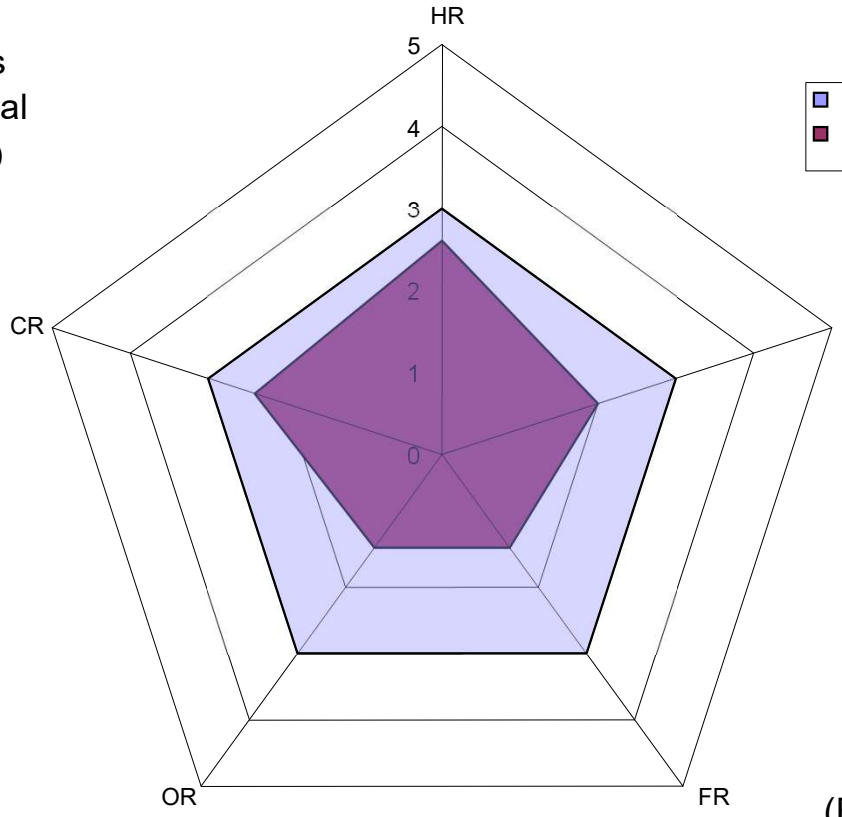
Risks Polygon
in the program « Fil d'Ariane »

Low Risks

HR Risks
(Human Resources)

Rpogram phase : ***Withdrawal***

CR Risks
(Contractual
Resources)



TR Risks
(Technological Resources)

FR Risks
(Financial Resources)

OR Risks
(Organizational
Resources)

Very low risks

Risks Polygon
in the program « Fil d'Ariane »

List of program's risks

Resource types ↓

	Nature of the risks	Program phases: Start	Lauching	Growth	maturity	Withdraw
RC	1. Contrat risks- Risks of disagreemnt between Prime contractor and Project managers	✚	✚	✚		
RC	2. Risks in players roles: Clients / States / Suppliers: relations between players are not steady, not enough defined	✚	✚			
RT	3. Risks in technology transfers : competencies are not ready till integration conditions are not settled	✚	✚			
RC	4. Risks of non control of engagements from the client point of view, risks associated with the critical resources of integration, emerging risks: engagements are not held. - Integrations systems/subsystems are to be defined	✚	✚	✚		
RF	5. Risks in increasing prices: such are the integration conditions that prices will not be sustainable		✚	✚		
RF	6. Financial risks (keys of payment insufficiently defined between actors, definition of the technical milestones on which depend financings, non-existent budgetary provisions)		✚	✚	✚	
RO	7. Risks of the configuration management, configuration variations and audits necessary to guarantee the integrity and respect of engagements (configuration reference frame) from the modifications which will not fail to be required in the process of integration.		✚	✚		
RO	8. Risks of logistics integrated in the contract, including innovating interface			✚	✚	✚
RT	9. Risks related to the systems qualification and role of the partner in the program running, specification risks (products "on the shelves"), risks of robustness of techniques displayed in time, risks of system obsolescence.		✚	✚	✚	
RH	10. Risk of non suitable competencies	✚	✚	✚	✚	
RT	11. Risks linked to the technologies duality (civil and military) present in the program: for instance: sturdiness of civil systems integration solutions?	✚	✚			
RC	12. Risks of not keeping of the deadlines, costs, budgetary engagements: the program is in a dead end - Too much innovative.	✚	✚			

Risks Characteristics

Seriousness

Will there be serious consequences with respect to the studied phase and involved resources?

- Very weak consequence
- Weak importance
- Average impact
- Significant consequence
- Very strong impact

Type of actions

Is a relevant and effective action easy to be set up?

- Very easy
- Rather easy
- Average easiness
- Rather difficult
- Very difficult

Probability

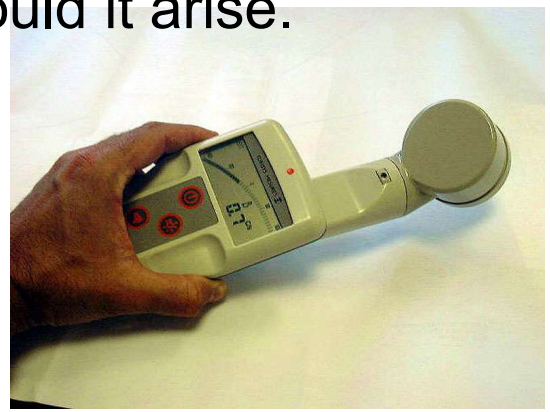
Does the risk have big chances to appear?

- Very exceptional
- Not much frequent
- Frequent
- Very frequent
- Always

For each characteristic, a five-level scale of qualitative measurements is specified. At each level, a note of increasing risk is put for :

- 0 to 10 for the Seriousness
- 0 to 1 for the probability
- from A to E for the type of action

- This quotation enables you to calculate the risk criticality which is defined here as the product of seriousness by probability and to work out the positioning of current risks and targets.
- Risks are then classified by order of decreasing criticality; priority risks are those which are most critical and those for which the risk reduction actions are the easiest to implement.
- For each risk, the expert associates a stake, which corresponds to the risk estimated value, should it arise.



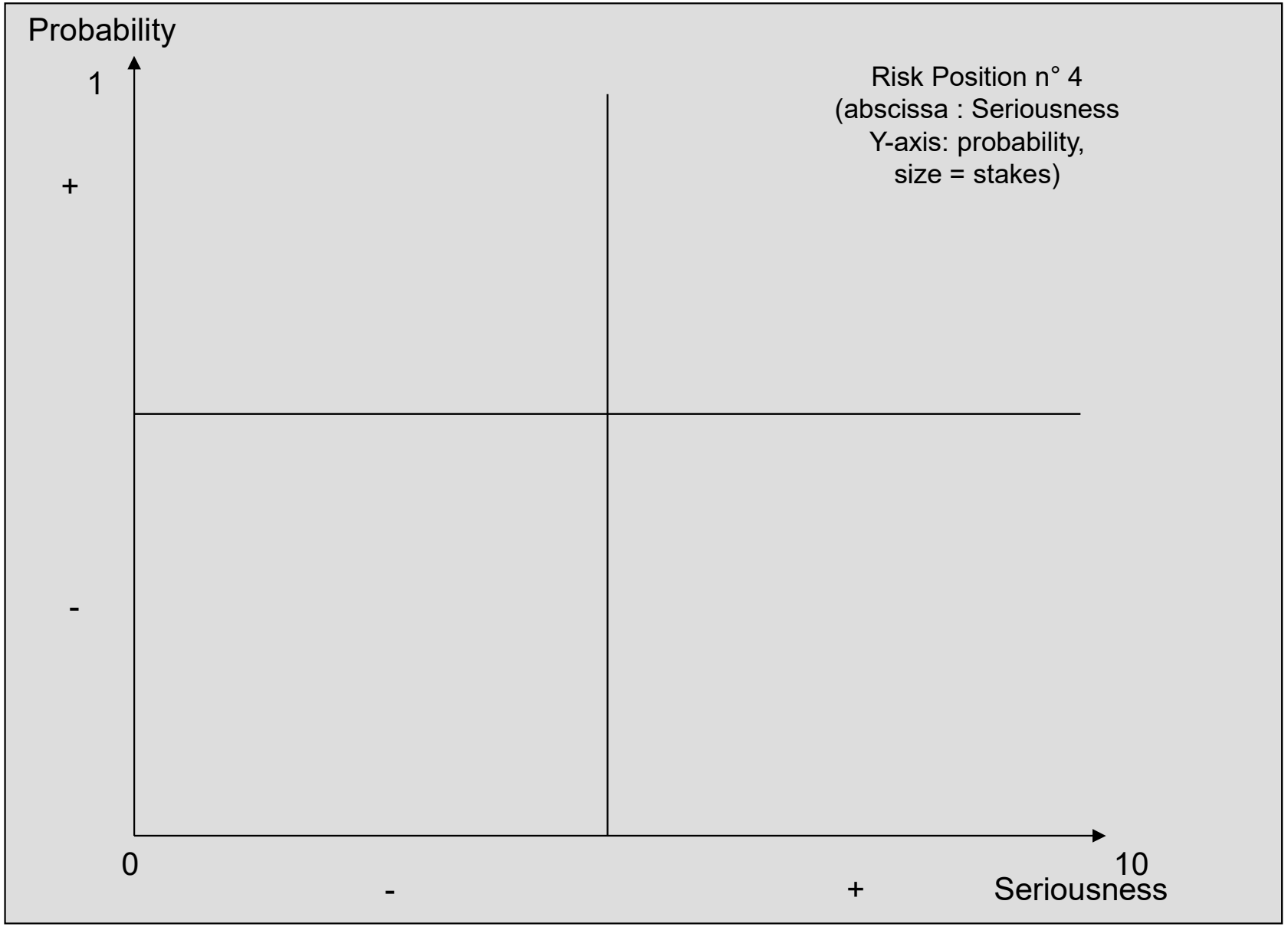
Risks liste "Fil d'Ariane" with respective stakes

	Nature of the risks	Program phases: Start	Lauching	Growth	maturity	Withdraw
RC	1. Contrat risks- Risks of disagreemnt between Prime contractor and Project managers	✚	✚	✚		
RC	2. Risks in players roles: Clients / States / Suppliers: relations between players are not steady, not enough defined	✚	✚			
RT	3. Risks in technology transfers : competencies are not ready till integration conditions are not settled	✚	✚			
RC	4. Risks of non control of engagements from the client point of view, risks associated with the critical resources of integration, emerging risks: engagements are not held. - Integrations systems/subsystems are to be defined	✚	✚	✚		
RF	5. Risks in increasing prices: such are the integration conditions that prices will not be sustainable		✚	✚		
RF	6. Financial risks (keys of payment insufficiently defined between actors, definition of the technical milestones on which depend financings, non-existent budgetary provisions)					
RO	7. Risks of the configuration management, configuration variations a… necessary to guarantee the integrity and respect of engage… reference frame) from the modifications which wi… process of integration.					
RO	8. Risks of logistics integrated …			✚	✚	✚
RT	9. Risks related to … the program running … of robustness of tec… science.		✚	✚	✚	
RH	10. …	✚	✚	✚	✚	
RT	11. … ologies duality (civil and military) present in the program: for in… ness of civil systems integration solutions?	✚	✚			
RC	12. Ris… of not keeping of the deadlines, costs, budgetary engagements: the program is in a dead end - Too much innovative.	✚	✚			

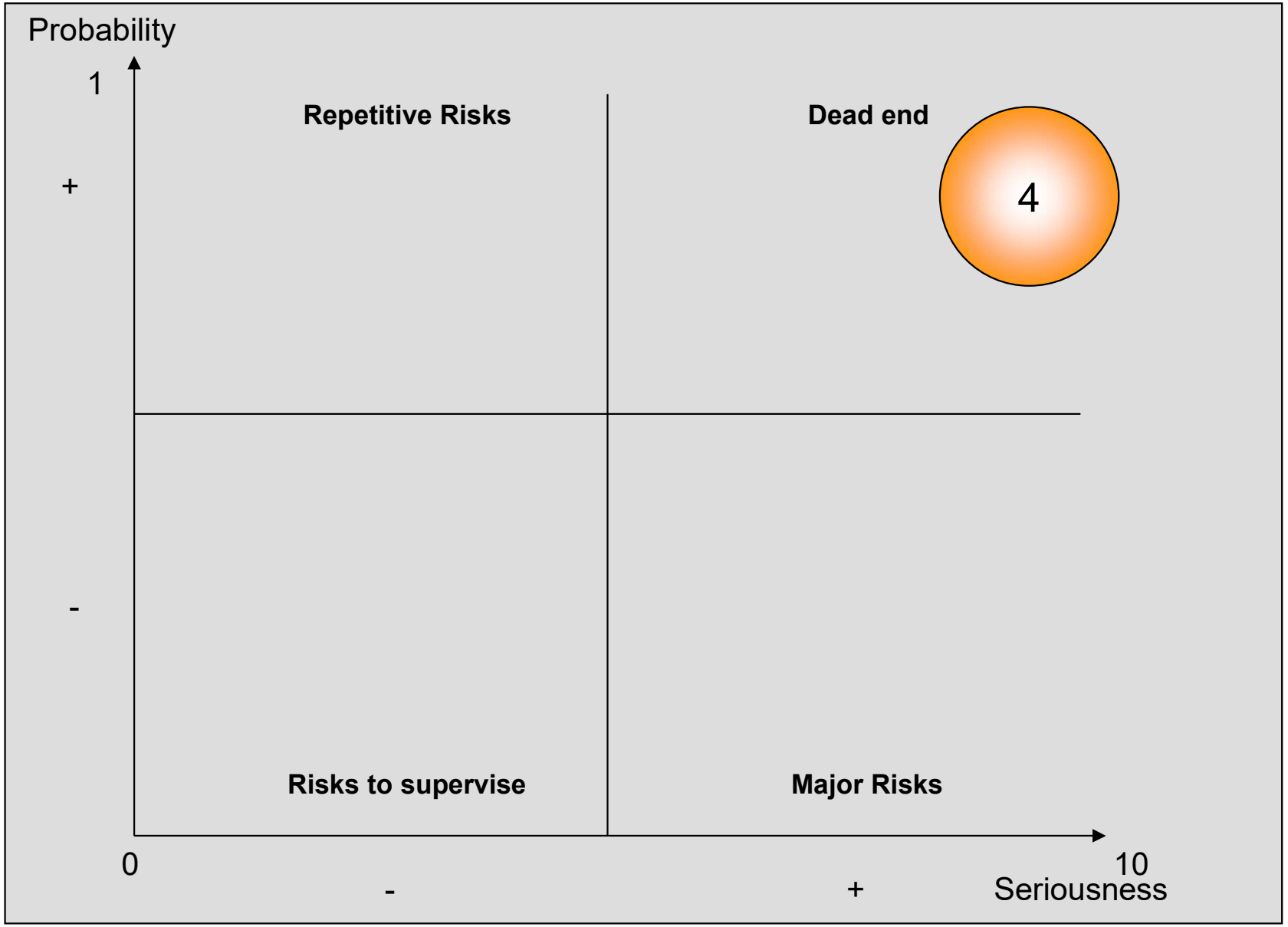
This positioning is established according to seriousness levels and risks probability, which are identified for the program.

List of risks classified in decreasing criticity order

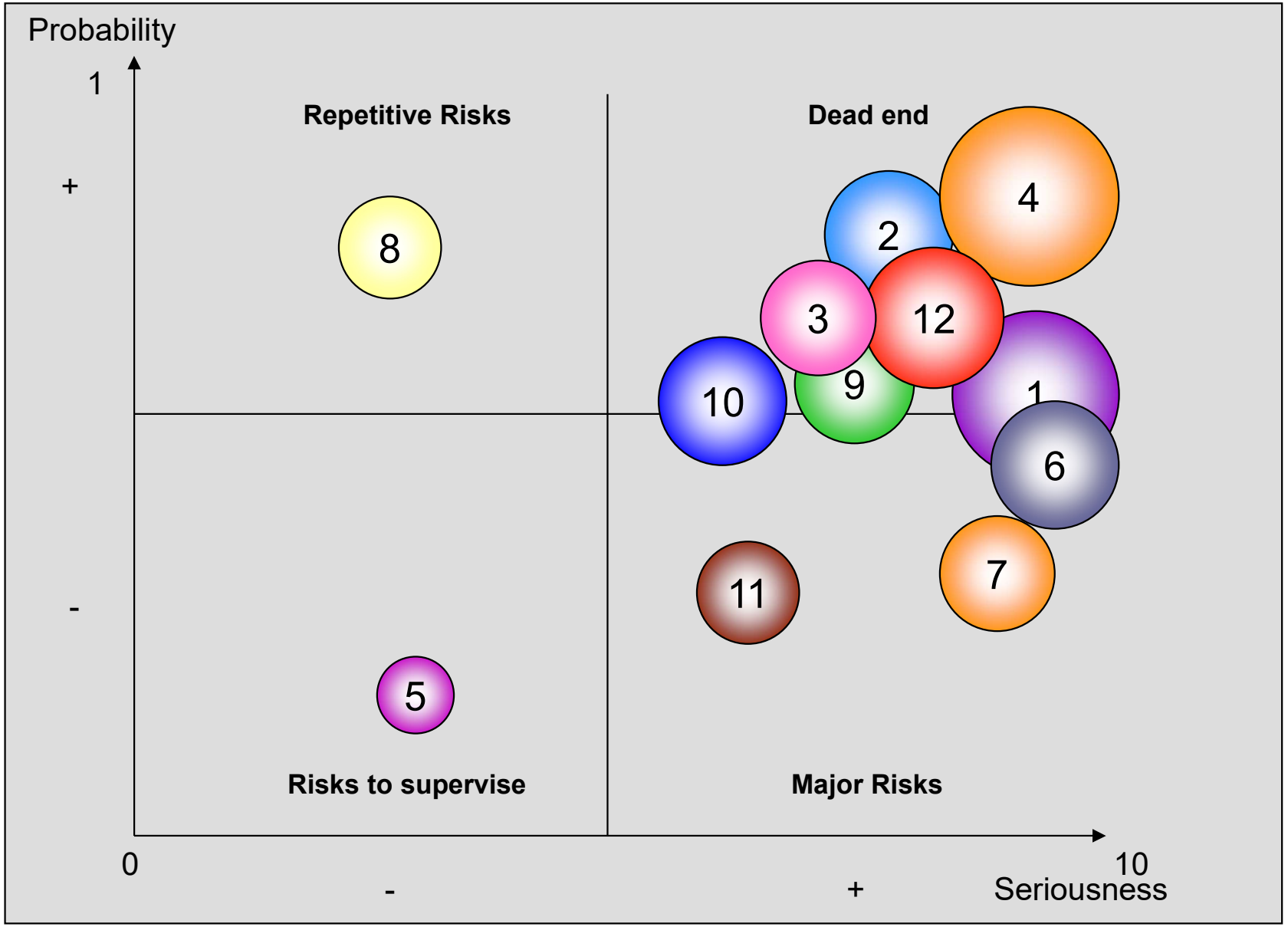
Nature of the risks	Seriousness	Probability	Critical G x F	Type of actions	
4. Risks of non control of engagements from the client point of view, risks associated with the critical resources of integration, emerging risks: engagements are not held. - Integrations systems/subsystems are to be defined	9	0,9	8	E	
2. Risks in players roles: Clients / States / Suppliers: relations between players are not steady, not enough defined	8	0,8	6	E	
12. Risks of not keeping of the deadlines, costs, budgetary engagements: the program is in a dead end - Too much innovative.	8	0,7	6	C	Priority
1. Contrat risks- Risks of disagreemnt between Prime contractor and Project managers	9	0,5	5	D	
3. Risks in technology transfers : competencies are not ready till integration conditions are not settled	7	0,6	4	C	
6. Financial risks (keys of payment insufficiently defined between actors, definition of the technical milestones on which depend financings, non-existent budgetary provisions)	9	0,4	4	B	
9. Risks related to the systems qualification and role of the partner in the program running, specification risks (products "on the shelves"), risks of robustness of techniques displayed in time, risks of system obsolescence.	7	0,5	4	B	
10. Risk of non suitable competencies	6	0,5	3	B	
7. Risks of the configuration management, configuration variations and audits necessary to guarantee the integrity and respect of engagements (configuration reference frame) from the modifications which will not fail to be required in the process of	9	0,3	3	C	
8. Risks of logistics integrated in the contract, including innovating interface	3	0,8	2	C	
11. Risks linked to the technologies duality (civil and military) present in the program: for instance: sturdiness of civil systems integration solutions?	6	0,3	2	D	
5. Risks in increasing prices: such are the integration conditions that prices will not be sustainable	4	0,2	1	C	
			46		



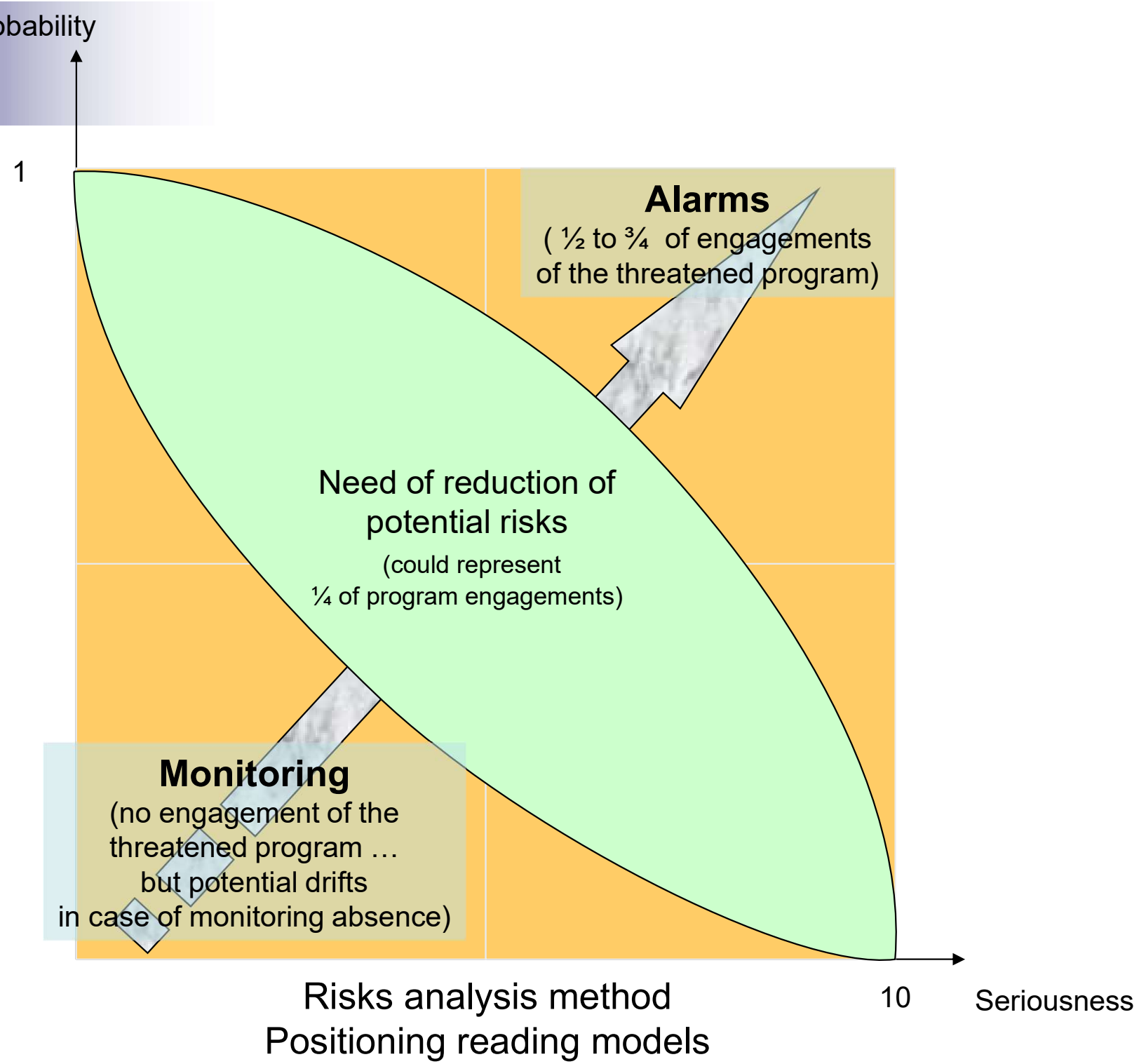
Risk Positioning



Risk Positioning



Risk Positioning



Risks analysis method
Positioning reading models

12 actions

What has been done :

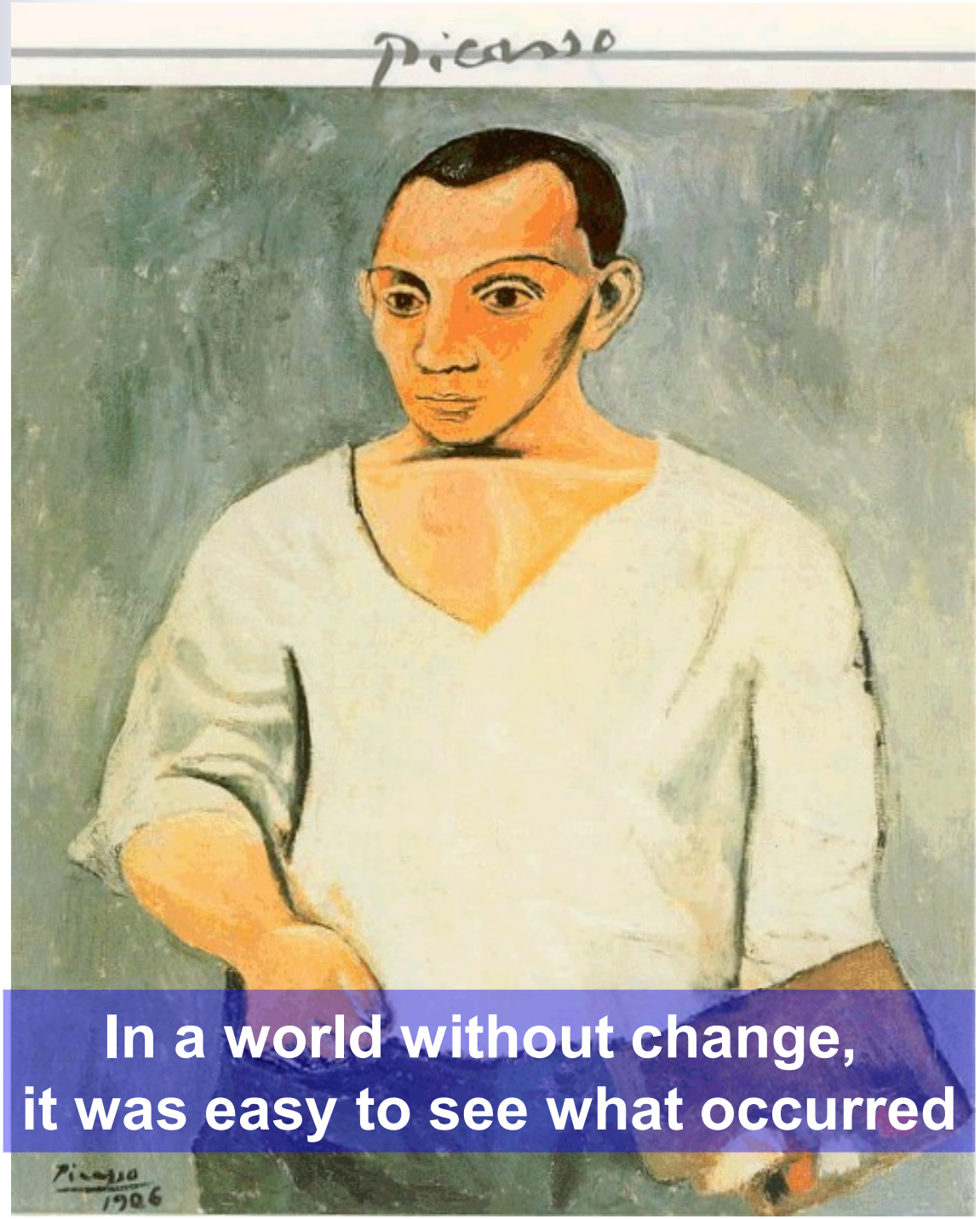
1. Establish the **risks list** (Helicopter view, their stakes and positioning)
2. **Grade the risks attached to** the 5 resources involved in the 5 phases of the program life, according to their degree of emergency (hierarchical basis)
3. **Identify the priorities** related to potential risks, phase by phase, stake by stake
4. **Establish the actual positioning**

What remains to be done :

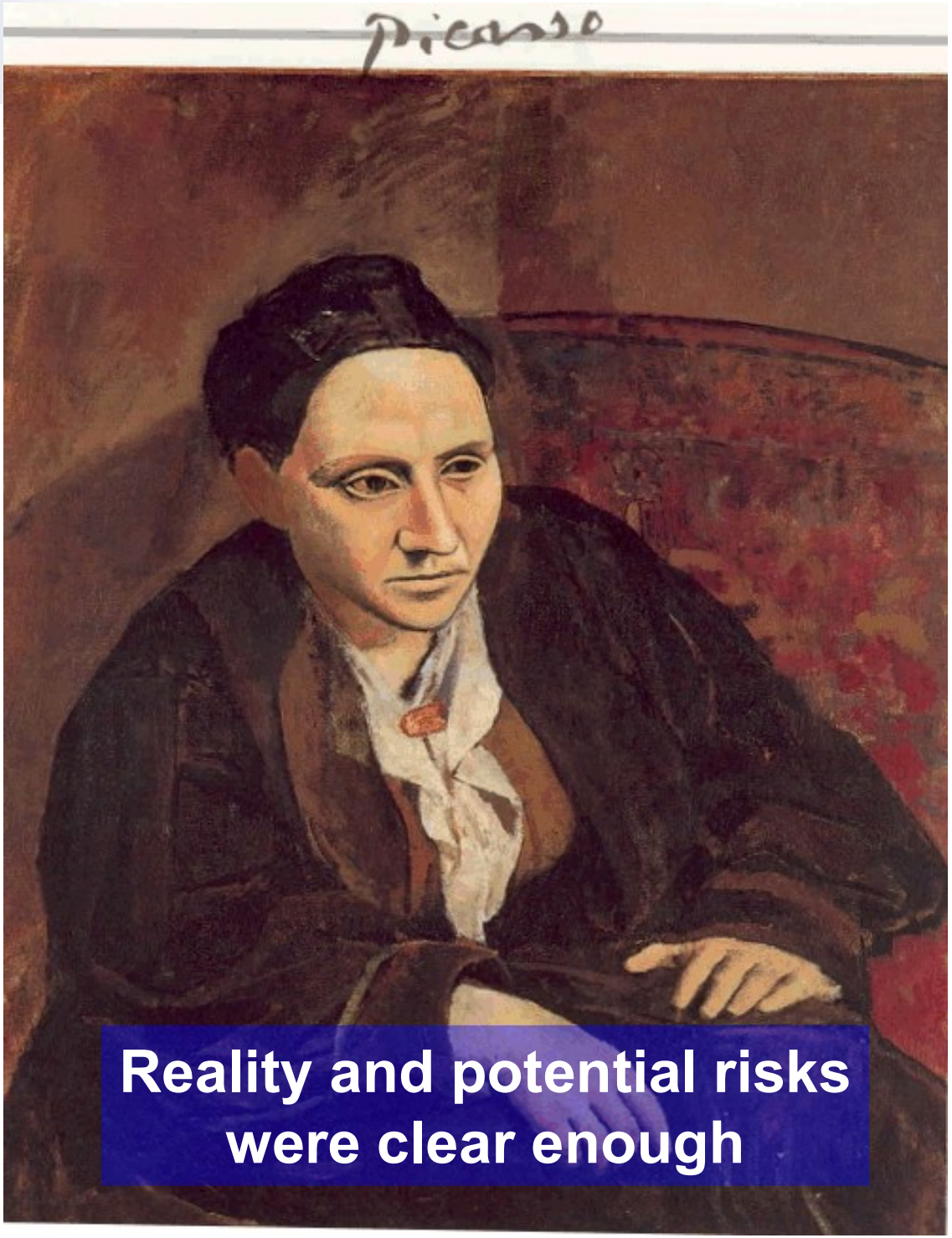
5. **Define the target**
6. Make the **choices concerning the resources allocation**, phase by phase, to reach the targets.
7. **Reduce the risks corresponding** to each of the 5 resources, by employing the accurate know-how and tools

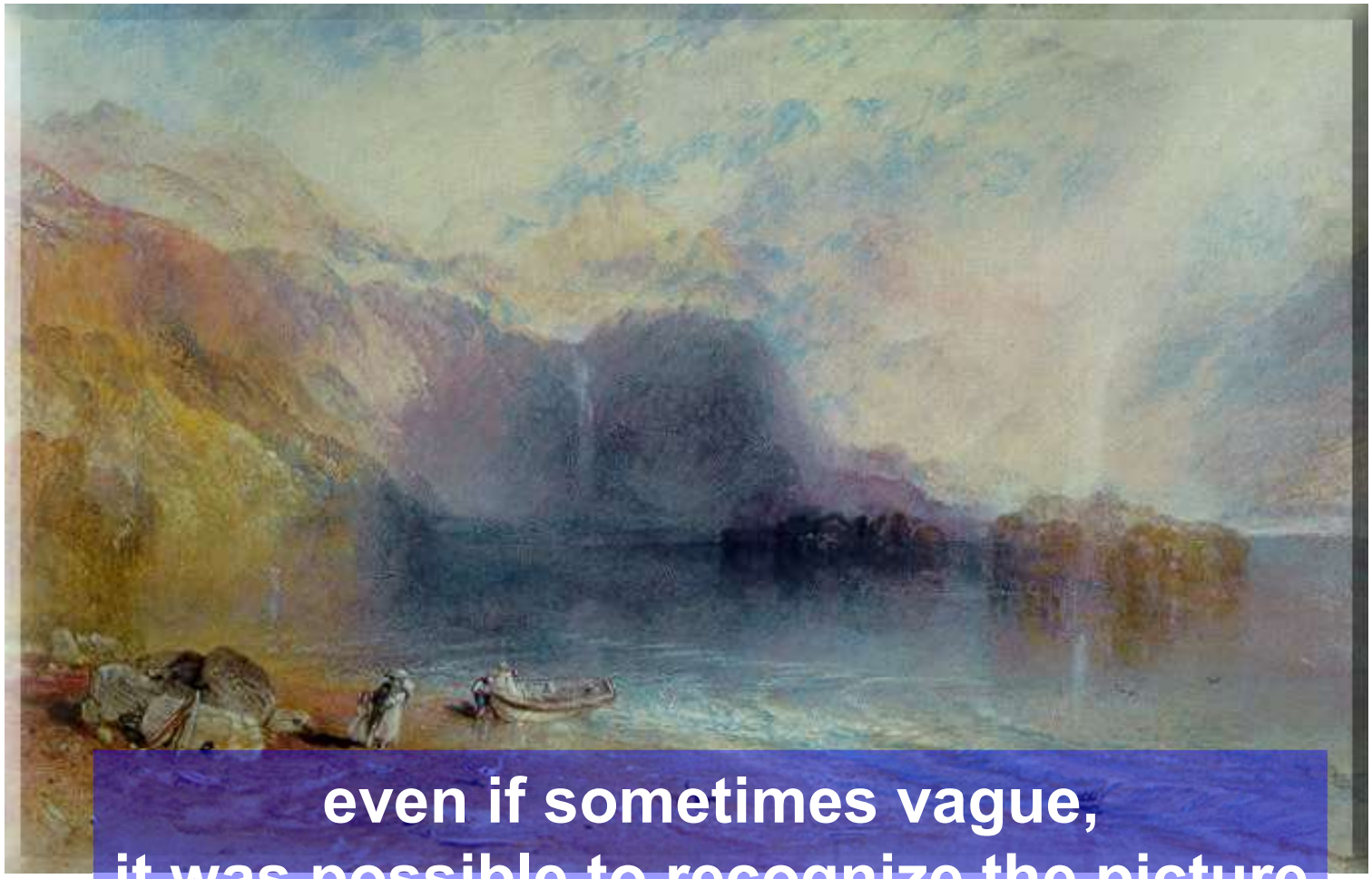
12 actions

8. **Control risk reduction** and establish indicators for monitoring, analysis and warning
9. **Update the risk positioning** to control their reduction
10. **Identify the new stakes** of the new positioning, under monitoring
11. **Regulate the risk reduction procedures** which are taken according the positioning evolution (alarms, risks in seeds, change…)
12. **Implement the experience feedback** necessary for the monitoring

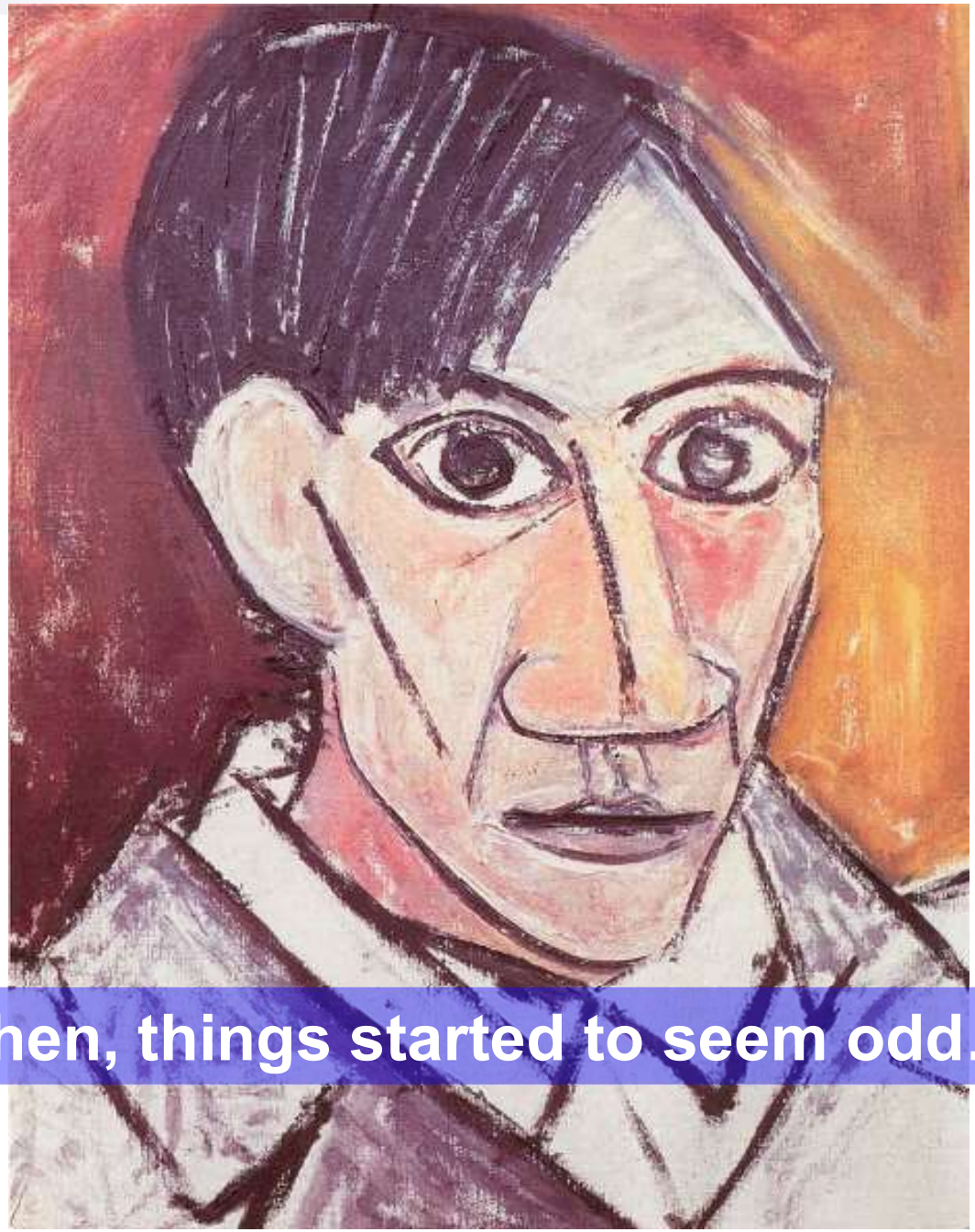


In a world without change,
it was easy to see what occurred

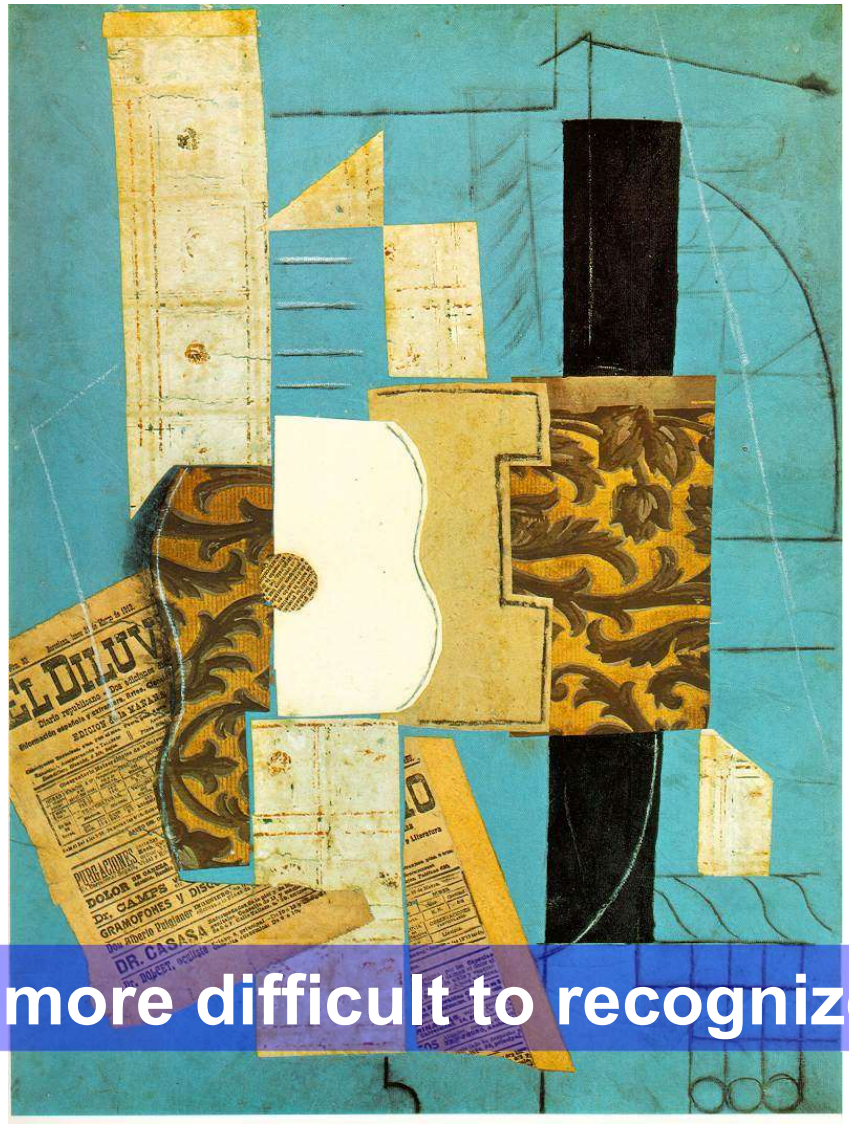

Picasso
Reality and potential risks were clear enough



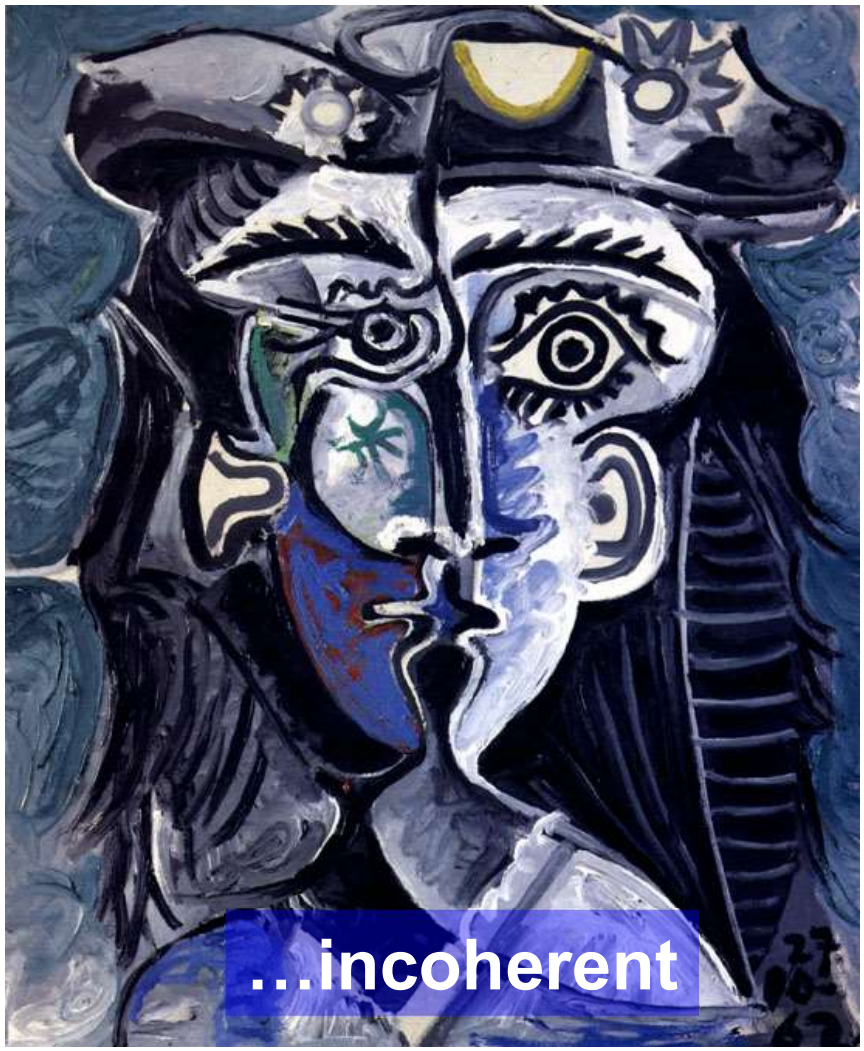
even if sometimes vague,
it was possible to recognize the picture

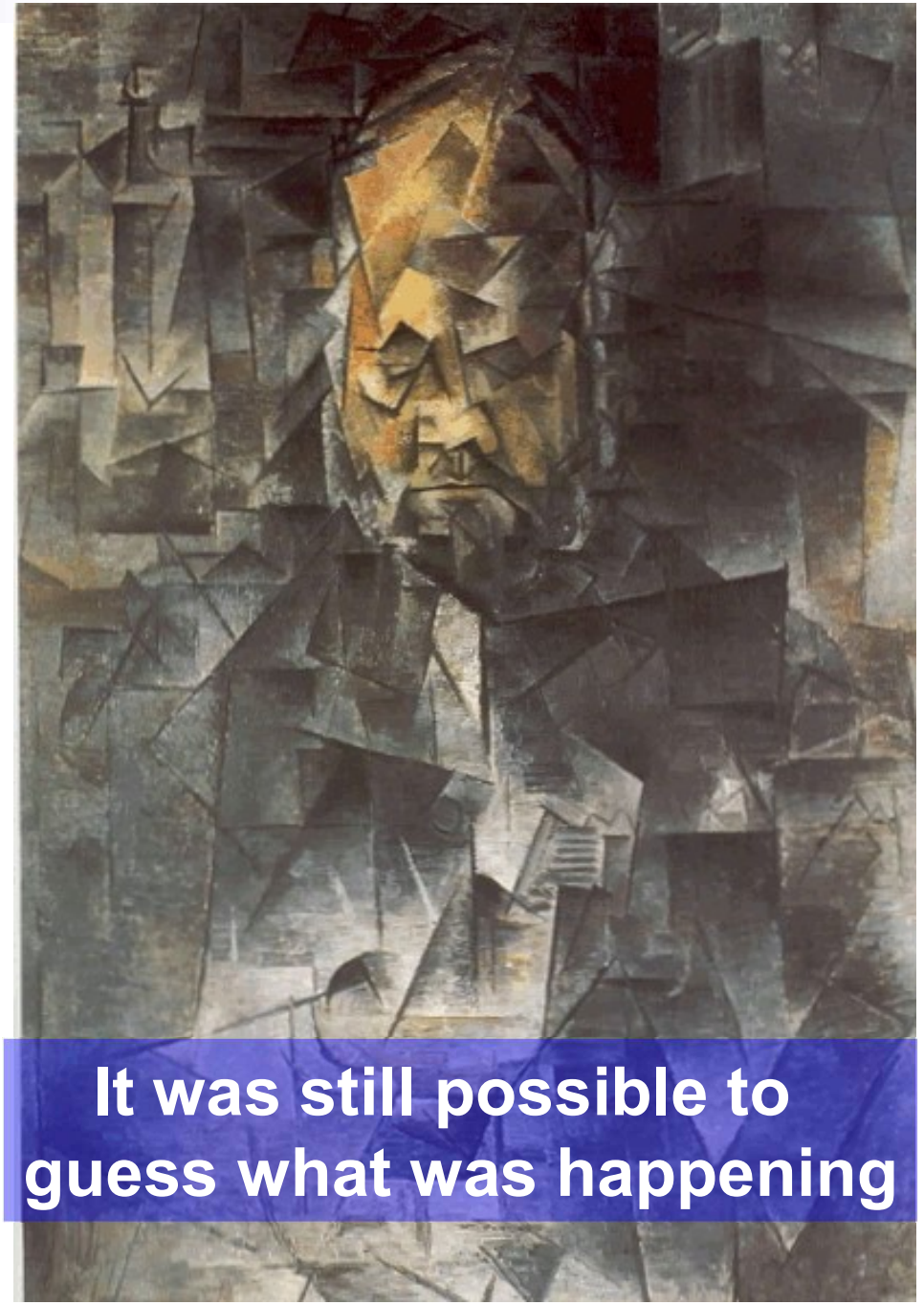


Then, things started to seem odd…

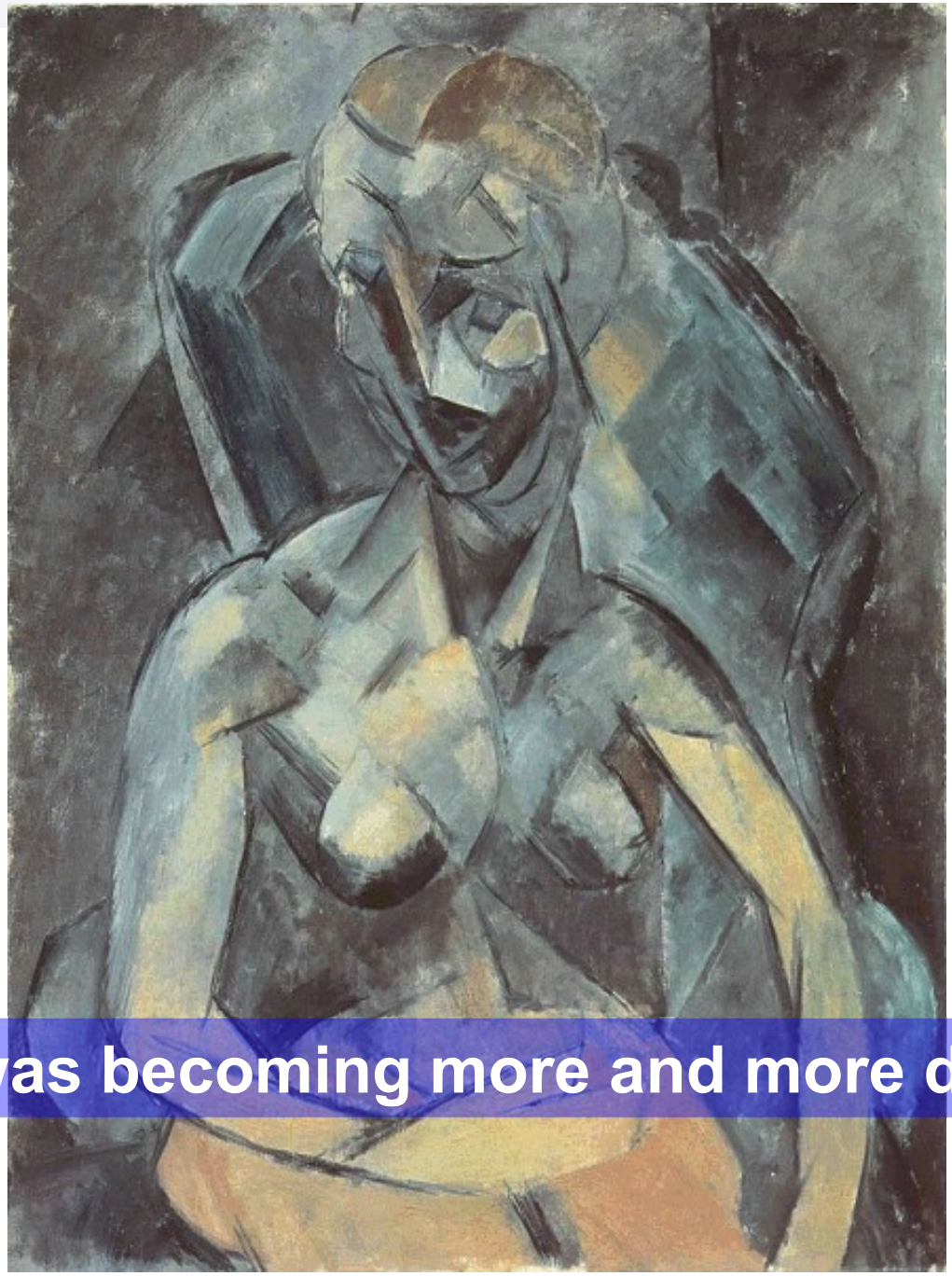


…more difficult to recognize…


…incoherent

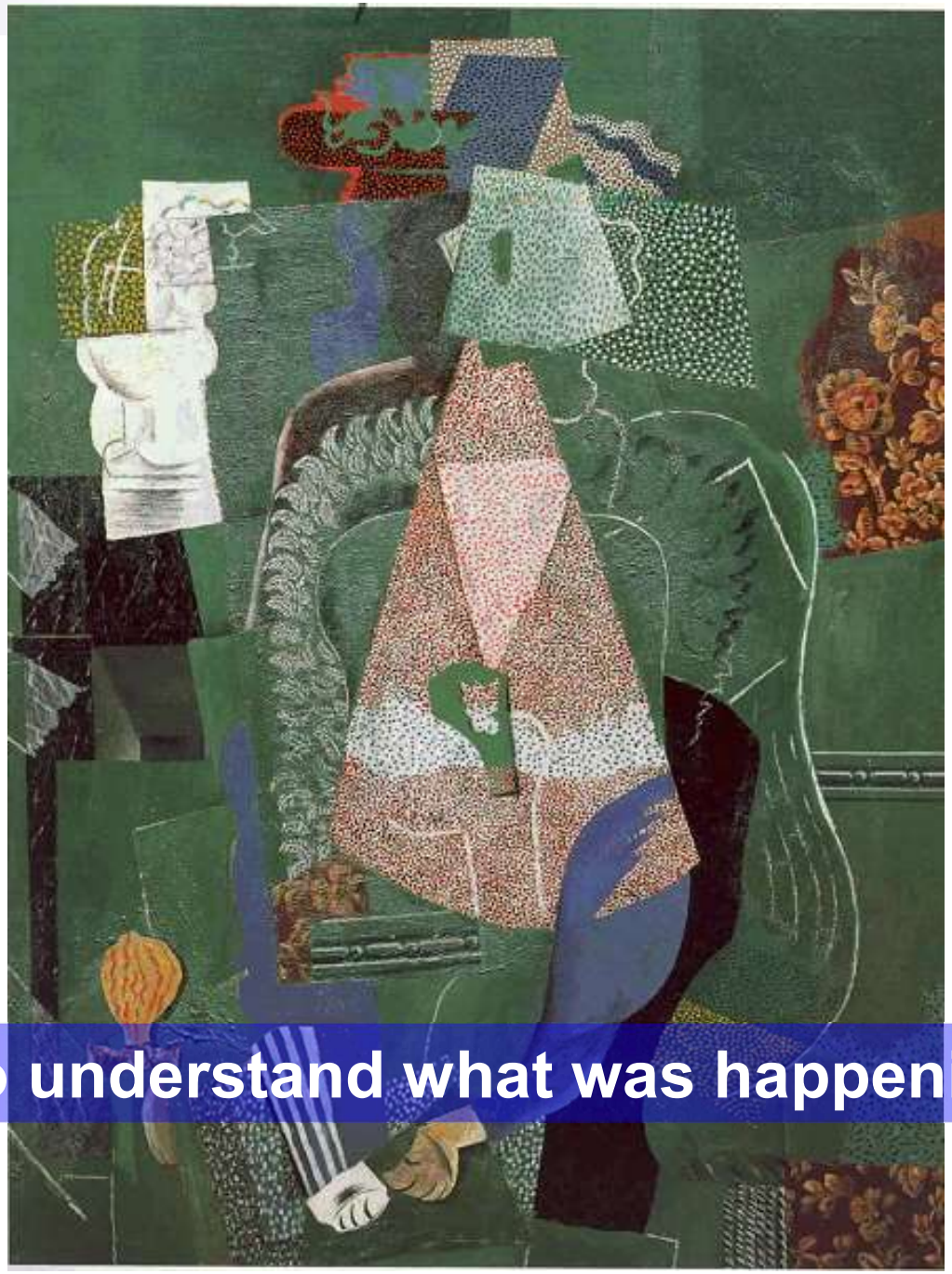


It was still possible to guess what was happening



but it was becoming more and more difficult…

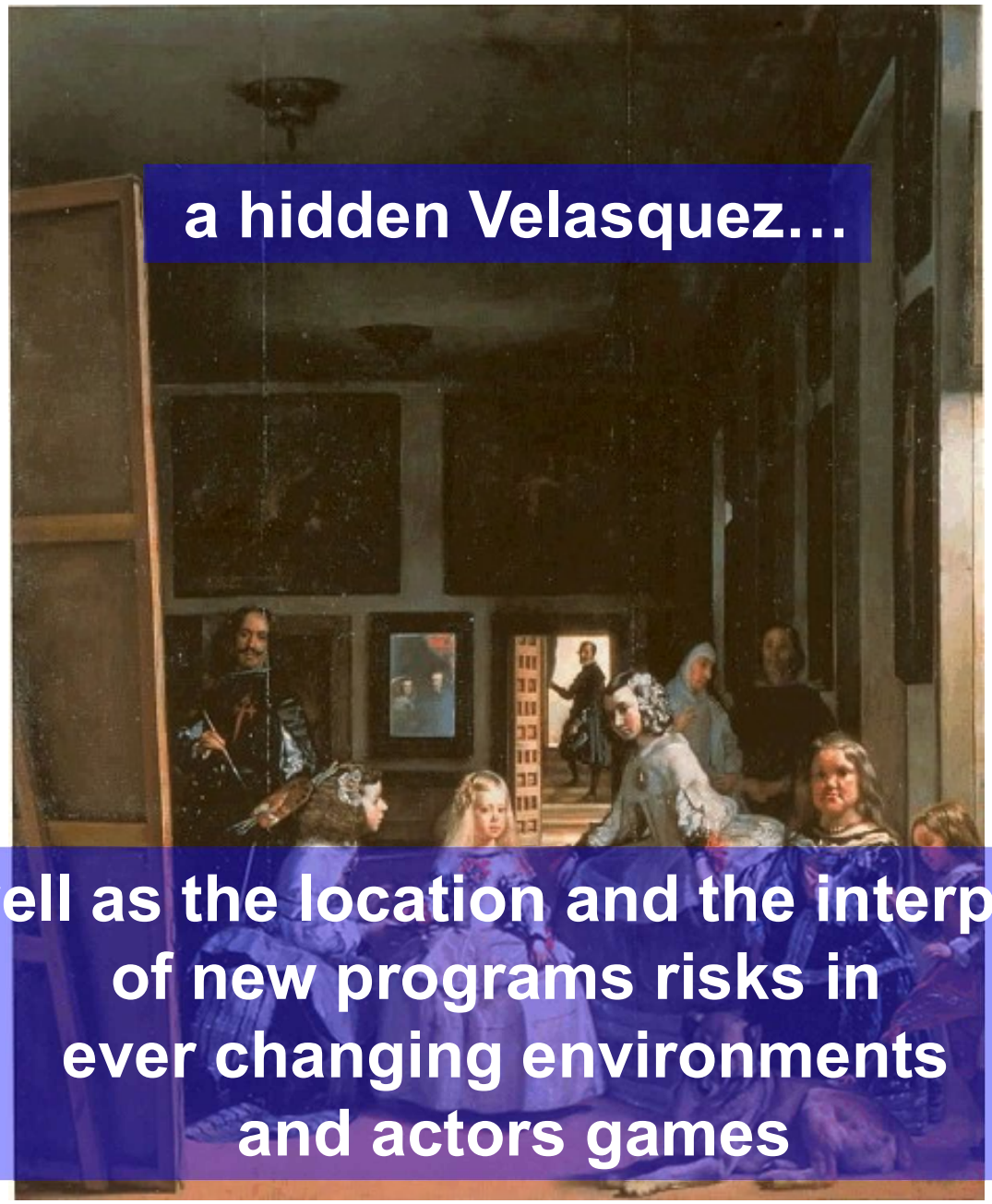
and finally, it became impossible…



…to understand what was happening…

…using an usual look on things


to guess under a Picasso….



a hidden Velasquez…

80% of risks known by experience…

…as well as the location and the interpretation of new programs risks in ever changing environments and actors games

…20% of new risks

To reduce a risk is :

- To remove it
- To prevent it as soon as possible
- To protect against it
- To divide it for control
- To transfer it « by contract »
- To warn
- To modify the specifications upstream
- To follow it with the client
- To redeploy the resources
- To improve and control stakes.

It is a culture made of real-life case experience, approaches and tools.

The risk management in an international risk expert

For an international expert in risks, the culture of risk is made up individually: this culture is contingent with the situations. For a good risk management it is necessary to be prepared, to know to treat on a hierarchical basis and anticipate, to have "**long range headlights**", according to the program speed, to be acquainted with necessary expertise and to be able to mobilize it.

The expert's role:

- To know how to transmit the risk culture and to set up the corresponding procedures.
- To recognize the right to make a mistake and to do controlled corrections.
- To identify the risk reduction system.
- To have the overall forecast, the vision and the sensitivity (locally and generally).
- To know how to highlight the stakes.
- Permanently apprehend and validate information, environment, players...

The risk management in a international industrial group

In this group, the risk reduction management is a competencie which consists in the know-how to take proportional risks so that the project can support them.

The role of the expert:

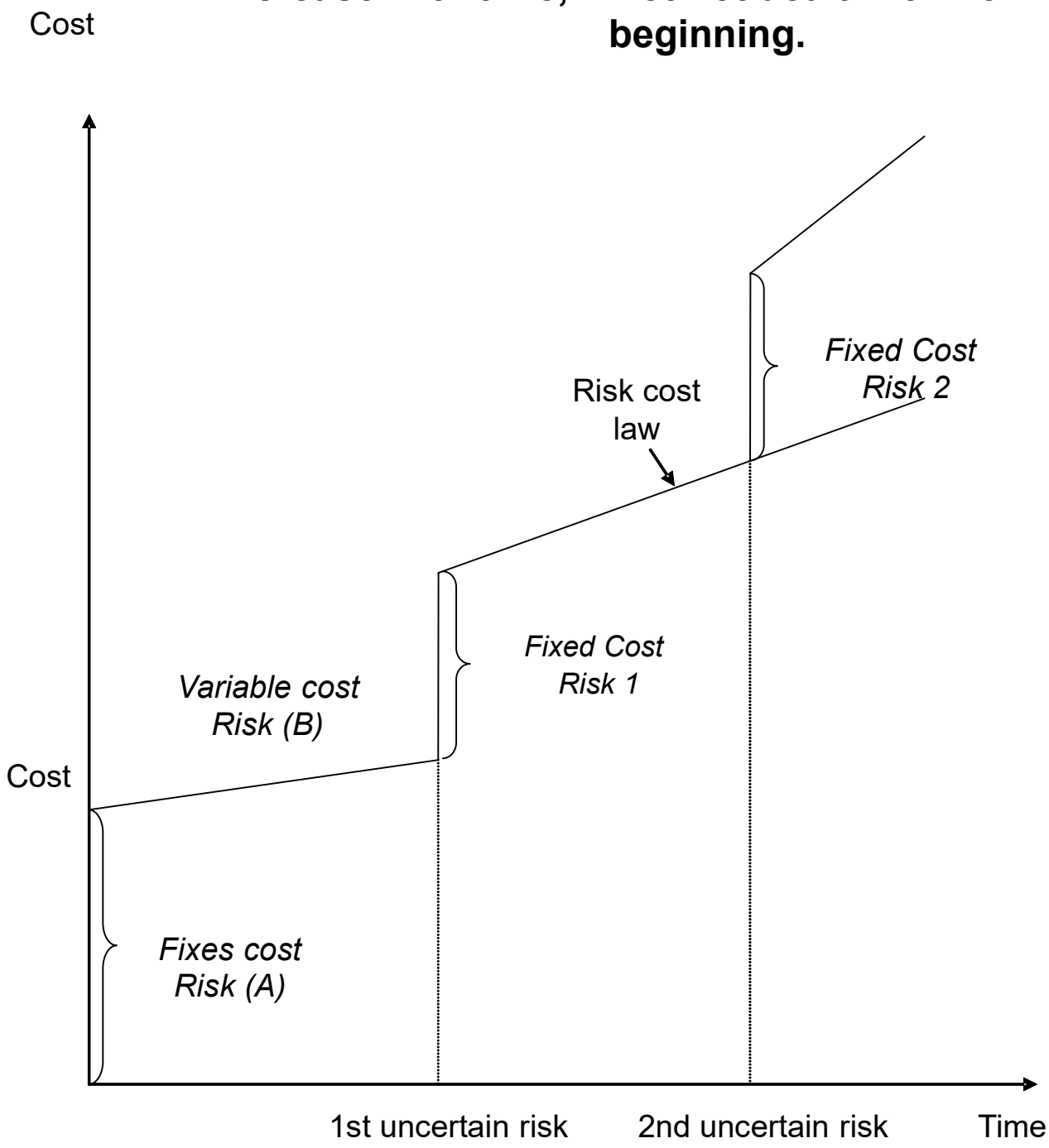
- Is the program capable of adaptation?
- Get right to the bottom by gathering and formulating the good questions.
- Limit usual risks, that are just to be identified (20% of the costs drifts, owing to their repetition).
- Have the **risk culture** (real-life case...), to be concrete.
- Be a good "multifunction" communicator (know to speak with the HRD, the financier, the industrialist...)
- Seek not only there where is light
- Be pedagogue to question, sensitize, warn
- Reexamine the risks even if they do not change, their consequences can change in the project life course.

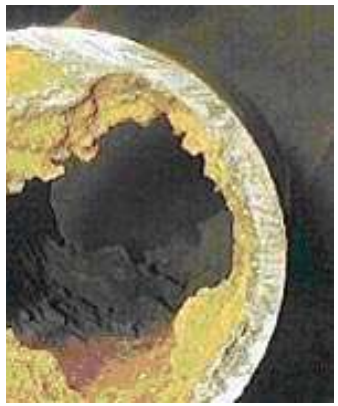
Pro-active risk management for an manufacturer « project manager »

The program produces perceived quality for the client, taking the risk to engage his resources.

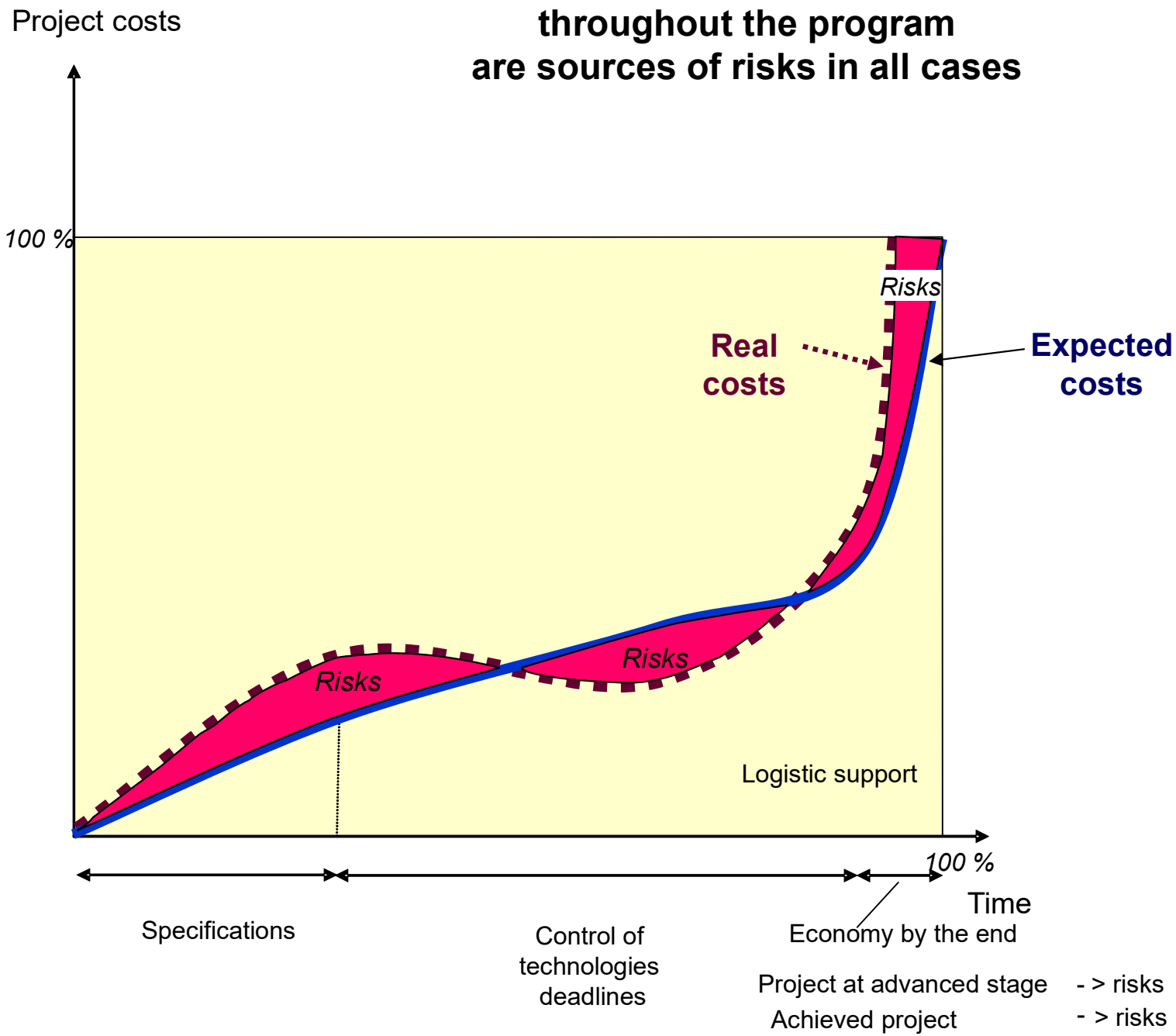
- Identified and permanent risks (supplies quality...)
- Identified and evolutionary risks (specifications on racks...)
- risks not identified in advance (uncertain...)

Fixed and variables unit costs of non managed risks increase with time, if not not dealt with from the very beginning.

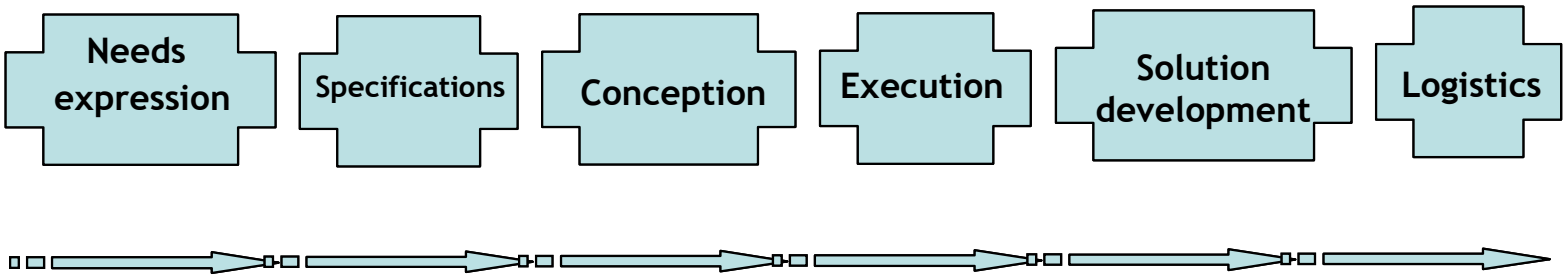




Variations between real and expected costs throughout the program are sources of risks in all cases



The competencies implemented by the client in order to evaluate his risks wich are different throughout the 6 program stages



6 stages of the value flows logic client / supplier
6 stages where risks have decreasing stakes
6 stages correspond to 6 seriousness levels for the client
6 competencies fields have to be mastered by the client
6 fields require specific tools

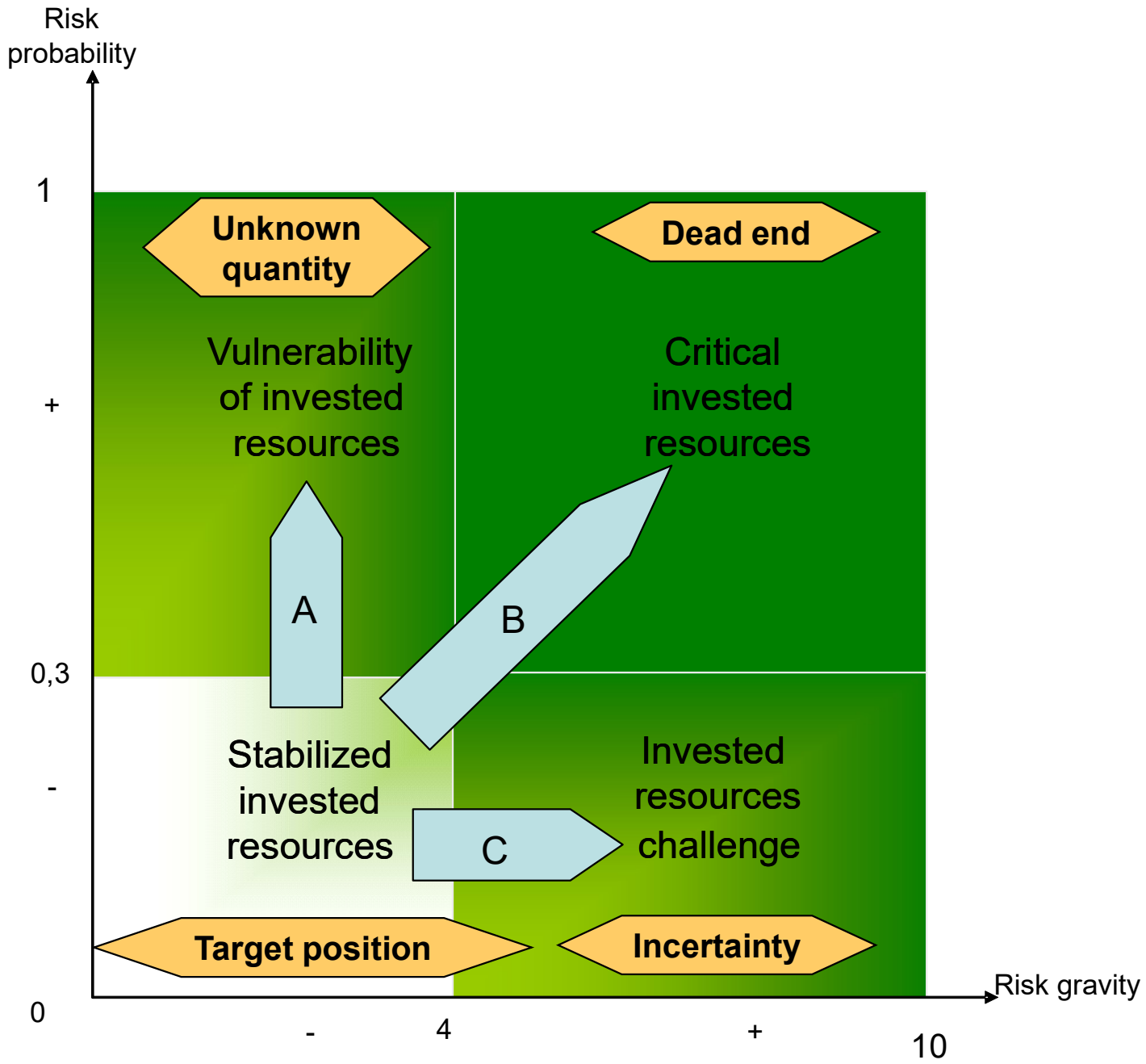
4/5 of the client risks are reduced by actions which are decided during the 3 first stages
The logistic phase is often underestimated

« THERE IS NO FAVOURABLE
WIND FOR SOMEONE
WHO DOES NOT KNOW WHERE HE IS SAILING"

Seneca

Fix the targeted risks levels

Risks positioning

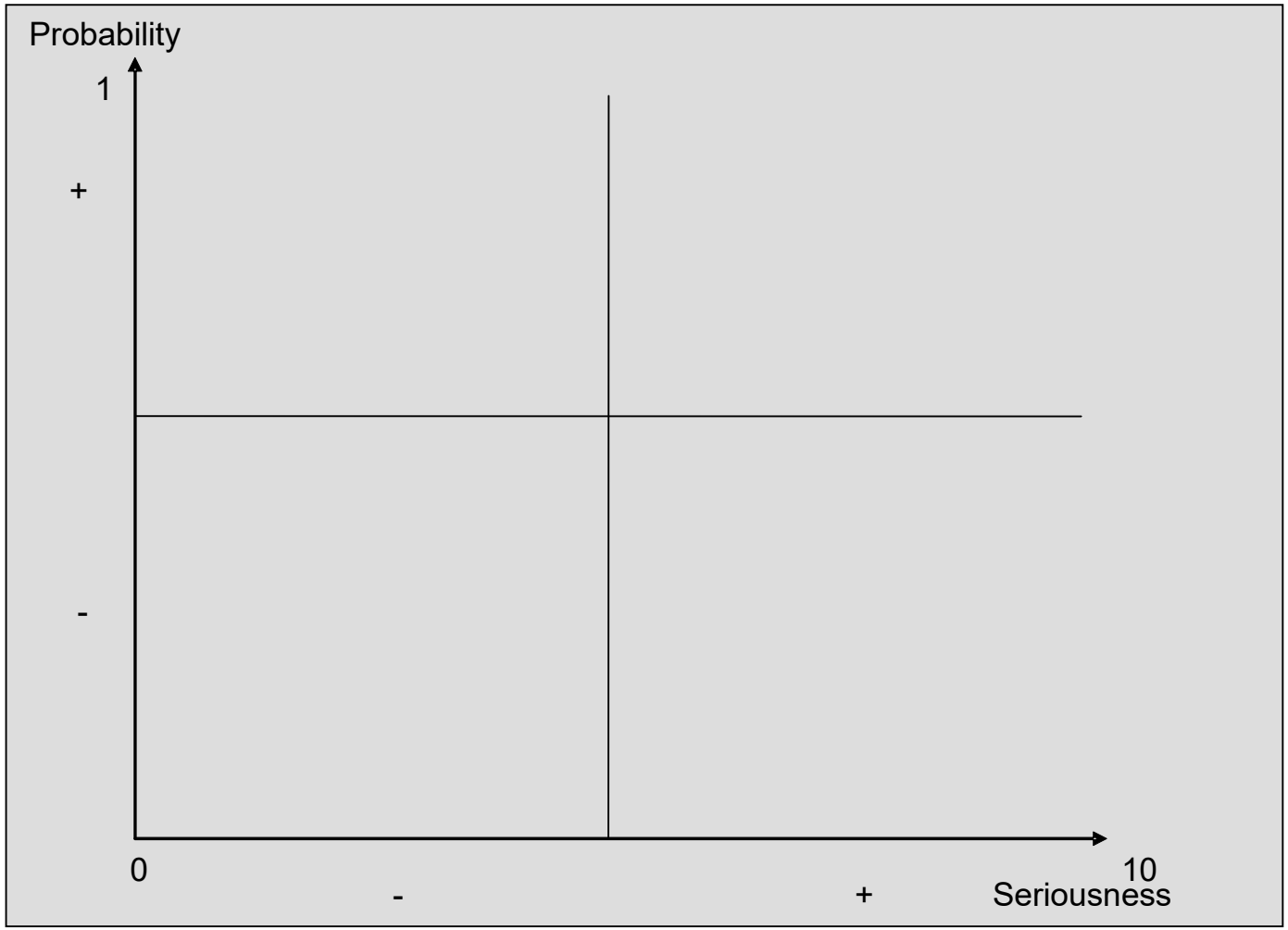


Target positioning (« Fil d'Ariane »)

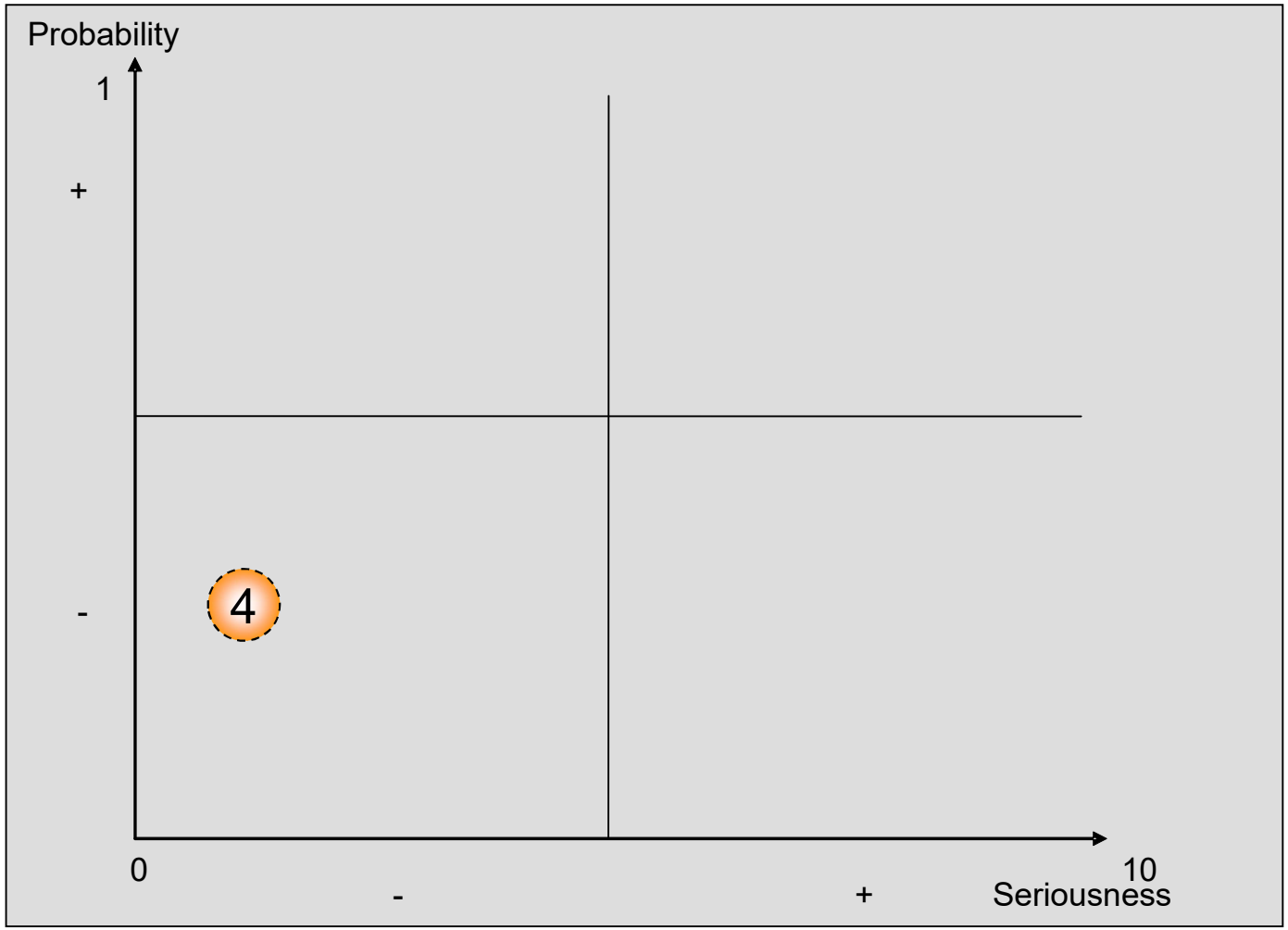
Position the risk n°4 as a target

Nature of the risks	Seriousness		Probability		Critical G x F		Stakes (1)	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target
4. Risks of non control of engagements from the client point of view, risks associated with the critical resources of integration, emerging risks: engagements are not held. - Integrations systems/subsystems are to be defined	9	1	0,9	0,4	8		0,20	
2. Risks in players roles: Clients / States / Suppliers: relations between players are not steady, not enough defined	8		0,8		6		0,05	
12. Risks of not keeping of the deadlines, costs, budgetary engagements: the program is in a dead end - Too much innovative.	8		0,7		6		0,10	
1. Contrat risks- Risks of disagreemnt between Prime contractor and Project managers	9		0,5		5		0,05	
3. Risks in technology transfers : competencies are not ready till integration conditions are not settled	7		0,6		4		0,08	
6. Financial risks (keys of payment insufficiently defined between actors, definition of the technical milestones on which depend financings, non-existent budgetary provisions)	9		0,4		4		0,15	
9. Risks related to the systems qualification and role of the partner in the program running, specification risks (products "on the shelves"), risks of robustness of techniques displayed in time, risks of system obsolescence.	7		0,5		4		0,15	
10. Risk of non suitable competencies	6		0,5		3		0,05	
7. Risks of the configuration management, configuration variations and audits necessary to guarantee the integrity and respect of engagements (configuration reference frame) from the modifications which will not fail to be required in the	9		0,3		3		0,10	
8. Risks of logistics integrated in the contract, including innovating interface	3		0,8		2		0,10	
11. Risks linked to the technologies duality (civil and military) present in the program: for instance: sturdiness of civil systems integration solutions?	6		0,3		2		0,05	
5. Risks in increasing prices: such are the integration conditions that prices will not be sustainable	4		0,2		1		0,03	

Position the risk target n° 4



Position the risk target n° 4

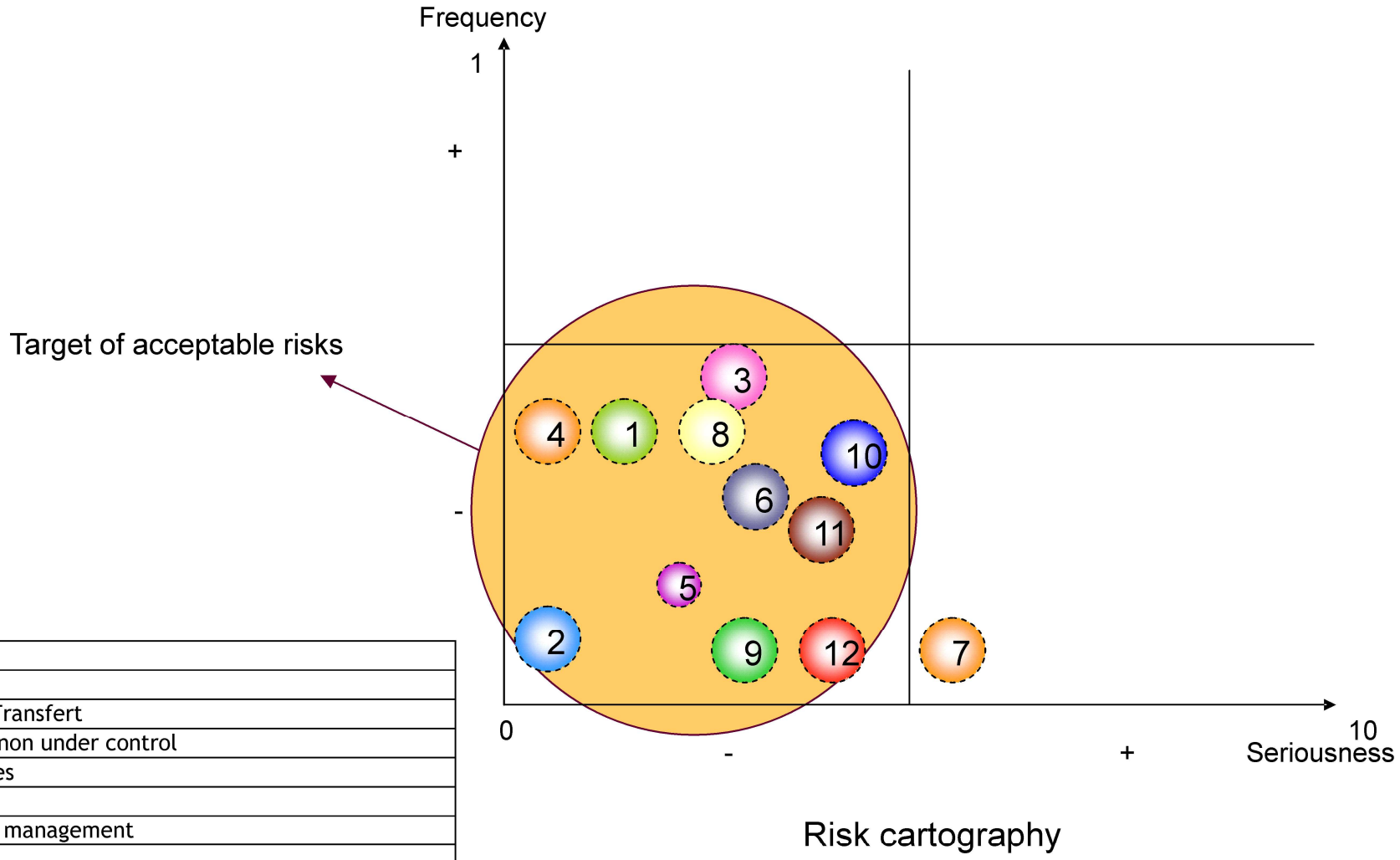


Target positioning (Case « Fil d'Ariane »)

Nature of the risks	Seriousness		Probability		Critical G x F		Stakes (1)	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target
4. Risks of non control of engagements from the client point of view, risks associated with the critical resources of integration, emerging risks: engagements are not held. - Integrations systems/subsystems are to be defined	9	1	0,9	0,4	8	0	0,20	0,010
2. Risks in players roles: Clients / States / Suppliers: relations between players are not steady, not enough defined	8	1	0,8	0,1	6	0	0,05	0,003
12. Risks of not keeping of the deadlines, costs, budgetary engagements: the program is in a dead end - Too much innovative.	8	4	0,7	0,1	6			
1. Contrat risks- Risks of disagreemnt between Prime contractor and Project managers	9							
3. Risks in technology transfers : competencies are not ready till conditions are not settled								
6. Financial risks (keys of [illegible] of the [illegible]					4	1	0,15	0,003
[illegible] program [illegible] risks of robustness of [illegible] system obsolescence.	7	3	0,5	0,1	4	0	0,15	0,003
[illegible] suitable competencies	6	4	0,5	0,4	3	2	0,05	0,004
7. Risks of the configuration management, configuration variations and audits necessary to guarantee the integrity and respect of engagements (configuration reference frame) from the modifications which will not fail to be required in the	9	6	0,3	0,1	3	1	0,10	0,004
8. Risks of logistics integrated in the contract, including innovating interface	3	3	0,8	0,4	2	1	0,10	0,002
11. Risks linked to the technologies duality (civil and military) present in the program: for instance: sturdiness of civil systems integration solutions?	6	4	0,3	0,3	2	1	0,05	0,001
5. Risks in increasing prices: such are the integration conditions that prices will not be sustainable	4	3	0,2	0,2	1	1	0,03	0,001

The expert fixes the acceptable levels for the target risks and related stakes

Target positioning (« Fil d'Ariane »)

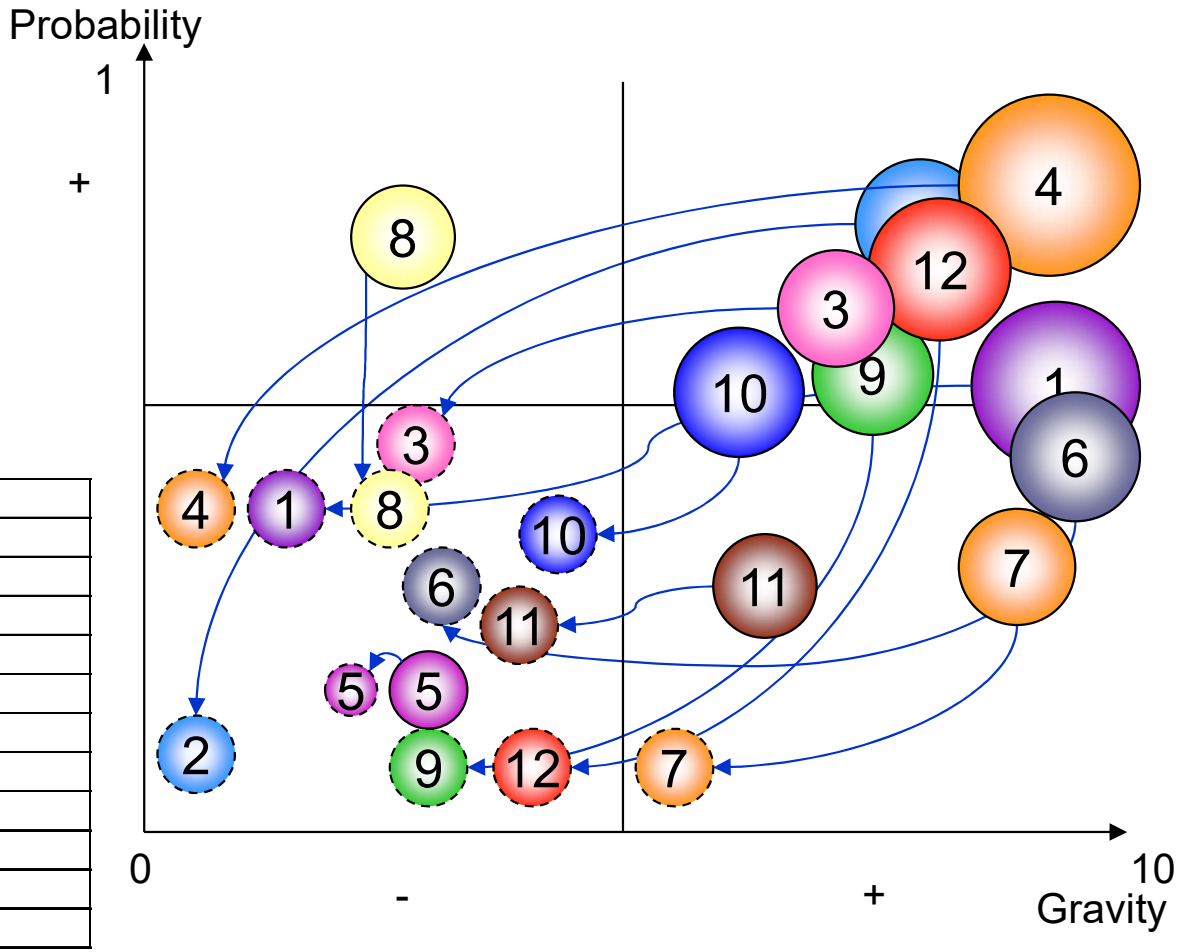


Risk cartography

1. Contract
2. Players game
3. Technologie Transfert
4. Engagements non under control
5. Prices slippages
6, Financial risks
7. Configuration management
8. Supply chain
9. Systems qualification
10. GFX (Government Furnished X….)
11. Technologies duality
12. Costs increased and dead lines missed

Variation between actual positioning and target positioning
(« Fil d'Ariane »)

1. Contract
2. Players game
3. Technologie Transfert
4. Engagements non under control
5. Prices slippages
6, Financial risks
7. Configuration management
8. Supply chain
9. Systems qualification
10. GFX (Government Furnished X….)
11. Technologies duality
12. Costs increased and dead lines missed



Risks positioning

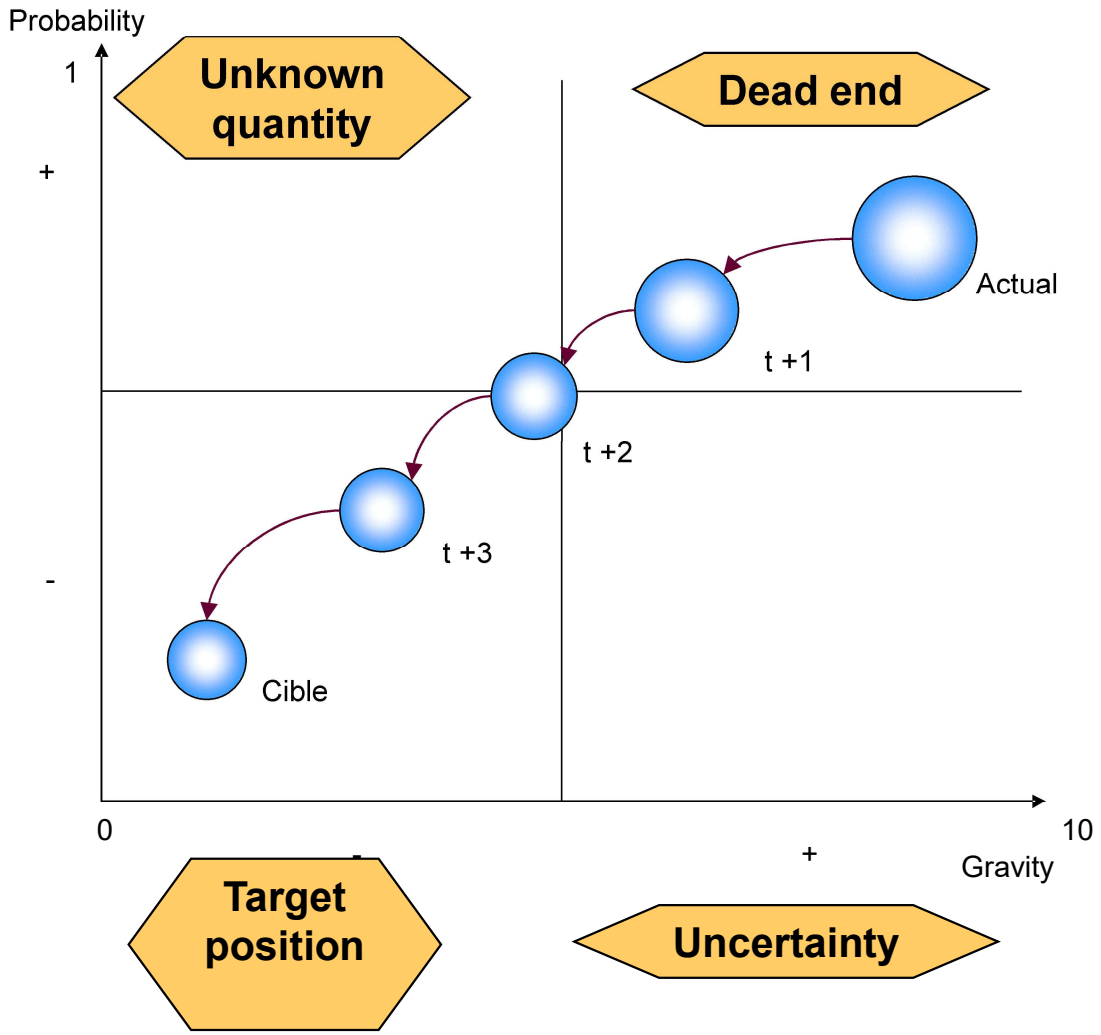
Stakes monitoring
(Case « fil d'Ariane »)

Nature of the risks	Seriousness		Probability		Critical G x F		Stakes (1)		Enjeux valorisés		Écarts	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actuel	Cible	Valorisés	%
4. Risks of non control of engagements from the client point of view, risks associated with the critical resources of integration, emerging risks: engagements are not held. - Integrations systems/subsystems are to be defined	9	1	0,9	0,4	8	0	0,20	0,010				,19
2. Risks in players roles: Clients / States / Suppliers: relations between players are not steady, not enough defined	8	1	0,8									05
12. Risks of not keeping of the deadlines, costs, budgetary engagements: the program is in a dead end - Too much innovative.												0,10
1. Contrat risks- Risks of disagreemnt bet… managers										1 500 000 €	73 500 000 €	0,05
3 …							0,08	0,002	112 500 000 €	2 250 000 €	110 250 000 €	0,07
		4	0,4	0,3	4	1	0,15	0,003	225 000 000 €	4 500 000 €	220 500 000 €	0,15
… of the partner in the program (products "on the shelves"), risks of robustness of … displayed in time, risks of system obsolescence.	7	3	0,5	0,1	4	0	0,15	0,003	225 000 000 €	4 500 000 €	220 500 000 €	0,15
10. Risk of non suitable competencies	6	4	0,5	0,4	3	2	0,05	0,004	75 000 000 €	6 000 000 €	69 000 000 €	0,05
7. Risks of the configuration management, configuration variations and audits necessary to guarantee the integrity and respect of engagements (configuration reference frame) from the modifications which will not fail to be required in the	9	6	0,3	0,1	3	1	0,10	0,004	150 000 000 €	6 000 000 €	144 000 000 €	0,10
8. Risks of logistics integrated in the contract, including innovating interface	3	3	0,8	0,4	2	1	0,10	0,002	150 000 000 €	3 000 000 €	147 000 000 €	0,10
11. Risks linked to the technologies duality (civil and military) present in the program: for instance: sturdiness of civil systems integration solutions?	6	4	0,3	0,3	2	1	0,05	0,001	75 000 000 €	1 500 000 €	73 500 000 €	0,05
5. Risks in increasing prices: such are the integration conditions that prices will not be sustainable	4	3	0,2	0,2	1	1	0,03	0,001	37 500 000 €	750 000 €	36 750 000 €	0,02
(1) : % of the contrat (1,5 MM €)					46	10			1 650 000 000 €	57 000 000 €		

Going though the actual situation to the target situation, the valorization of the risk stakes is divided by 3

The 12 risks are not independant from each other

Dashboard



This stakes improvement is the subject of a dashboard which follows the risk reduction

Basic dashboard combined with risks and stakes monitoring (« Fil d'Ariane »)

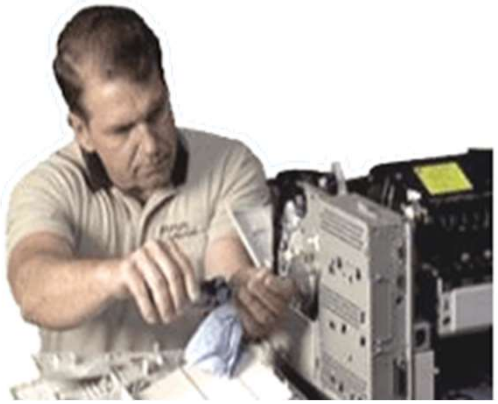
	Serioousness								Frequency							
	Actual	T+12 Nominal	T+12 estimated	T+24 Nominal	T+24 estimated	T+36 Nominal	T+36 estimated	target	Actual	T+12 Nominal	T+12 estimated	T+24 Nominal	T+24 estimated	T+36 Nominal	T+36 estimated	target
1. Contrat risks- Risks of disagreemnt between Prime contractor and Project managers	9	7	9					2	5	5	5					4
2. Risks in players roles: Clients / States / Suppliers: relations between players are not steady, not enough defined	8	6	6	5		3		1	8	6	6	5		3		1
3. Risks in technology transfers : competencies are not ready till integration conditions are not settled	7	6	6	5		4		3	6	6	6	5		5		4
4. Risks of non control of engagements from the client point of view, risks associated with the critical resources of integration, emerging risks: engagements are not held. - Integrations systems/subsystems are to be defined	9	7	7	5		3		1	9	8	8	7		5		4
5. Risks in increasing prices: such are the integration conditions that prices will not be sustainable	4	4	4	4		3		3	2	2	2	2		2		2
6. Financial risks (keys of payment insufficiently defined between actors, definition of the technical milestones on which depend financings, non-existent budgetary provisions)	9	8	8	7		5		4	4	4	4	4		3		3
7. Risks of the configuration management, configuration variations and audits necessary to guarantee the integrity and respect of engagements (configuration reference frame) from the modifications which will not fail to be required in the process of integration.	9	8	8	6				6								
8. Risks of logistics integrated in the contract, including innovating interface	3	3									9	6		5		4
9. Risks related to the systems qualification and role of the partner in t… running, specification risks (products "on the … techniques displayed in time …						4		3	5	4	4	3		2		1
10. …	6	6	6	5		5		4	5	5	5	5		4		4
11. … for ir …	6	6	6	5		5		4	3	3	3	3		3		3
12. R … is in a dead end - Too much innovative.	8	7	7	6		5		4	7	6	6	4		3		1

Phase by phase, the risks positioning can generates warnings

The dashboard table is set up at the various stages (each column of the table).
It shows the change from the current positioning to target positioning
and allows the risk reduction supervision, throughout the program development.
Risk level of 1 - absence of risk with 10 - very risky - Alarm starting from level 5

Competencies and toolbox of risks reduction

The difference between the current position of each risk and its target position is reduced using competencies and risk treatment tools.
Those are combined with the program development phases.



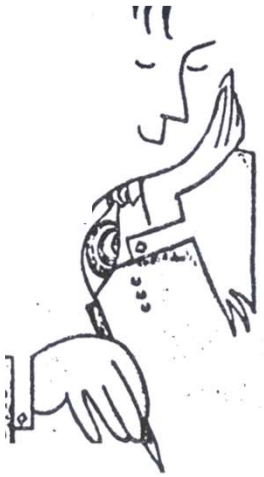
Studies drew it

Project manager asked for it

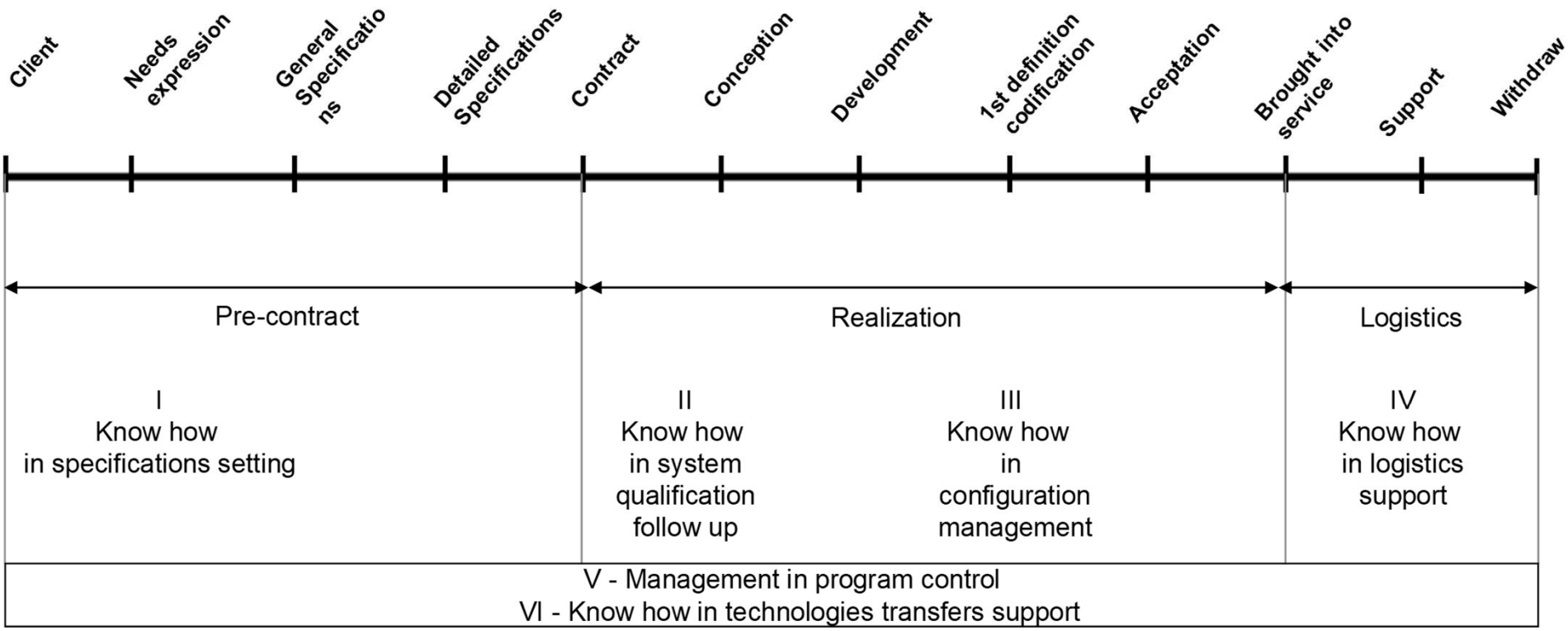
Commercial task sold it

Plant made it

Workers installed it



The inventoried and positioned risks relate to all phases of the military equipment program development (cycle). Know-how and tools are combined with in order to reduce the risks.



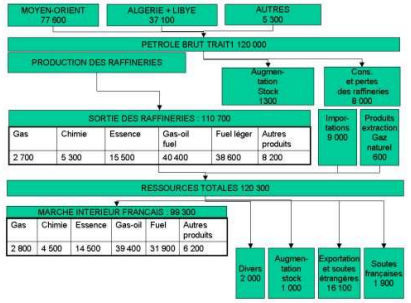
Risks reduction tools are combined with each first phase of the process (I with IV).
Control tools of the correct running of the program are combined with the whole of the program value chain (V)
A little more specific tools are combined with the programs including of the technology transfers (VI).

The tools and know-how of risk solution concern :

1. SYSTEM DESCRIPTION
2. QUANTITATIVE ANALYSIS
3. QUALITATIVE ANALYSIS
4. CHOICE AND EVALUATION
5. CREATIVITY
6. METHODOLOGY

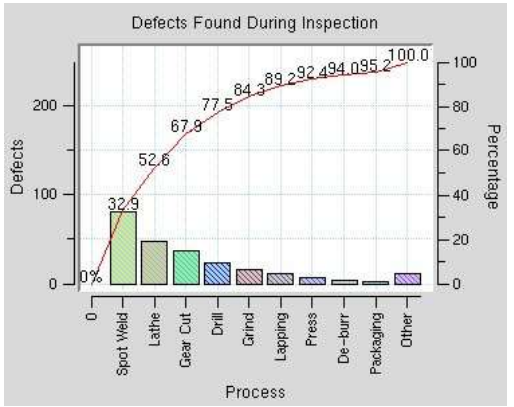
Tools examples

SYSTEM DESCRIPTION TOOLS	1. **Circulation diagram**
	2. **Rheogram**
	3. **Planning PERT**
	4. **GANTT chart**
	5. **Flowchart**
	6. **System ins and outs**



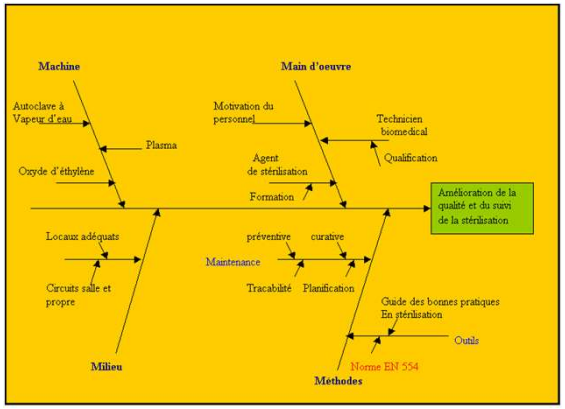
Tools examples

QUANTITATIVE ANALYSIS	1. **ABC Method**
	2. **Pareto chart**
	3. **Categorization**
	4. **Checking sheets**
	5. **Statistic study of one variable**
	6. **Normal distribution**
	7. **Random sampling**
	8. **Statistic study of several variables**
	9. **Linear regression**
	10. **Model and data validation**
	11. **Confidence interval**
	12. **Normality test**
	13. **Control chart**



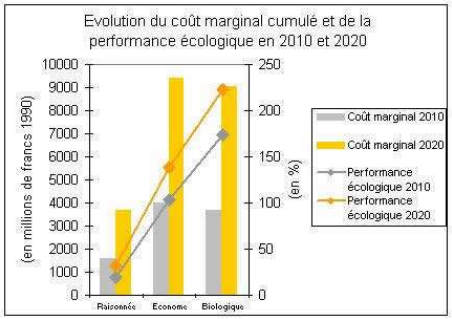
Tools examples

QUALITATIVE ANALYSIS TOOLS	1. **Proposal flow chart**
	2. **Process chart**
	3. **QQOQCP**
	4. **Discovery stamp**
	5. **Relevance tree**
	6. **Diagram cause-effect**
	7. **Listing « Is - Is not »**



Tools examples

CHOICE AND EVALUATION TOOLS	1. **Decision table**
	2. **Decision tree**
	3. **Notation axes**
	4. **Compatibility matrix**
	5. **Analysis of cost effectiveness**
	6. **Synergy O.M.F.F**
	7. **Listing « Variable constraints "**
	8. **Advantages – Disadvantages**
	9. **Multi - criteria choice**

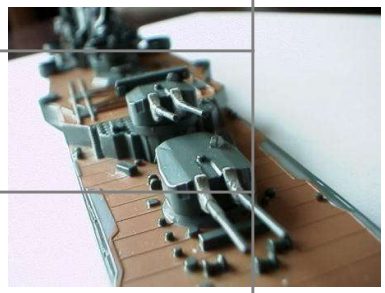


Tools examples

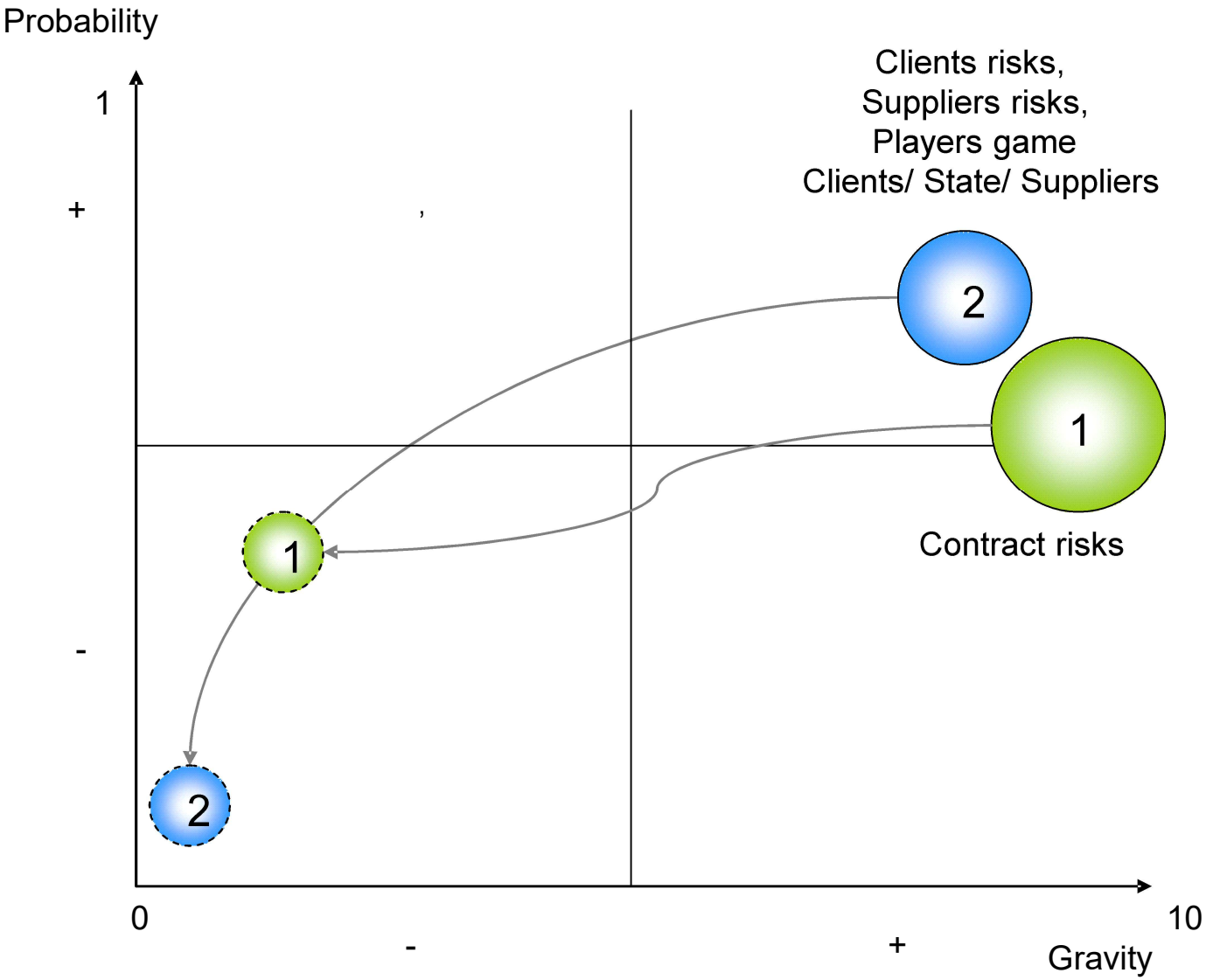
CREATIVITY TOOLS	**1. Point of view bombardment**
	2. Brain-Storming
	3. Semantic analysis
	4. Role play
	5. Regressive futurology
METHODOLOGY TOOLS	**6. Experimental method**
	7. Method of scenarios
	8. Simulation
	9. Cross impacts
	10. MRP (Material Requirements Planning)
	11.CRP (Component Requirements Planning)
	12. ILS (Integrated Logistics System)

Example of competencies which contribute to reduce the risk linked to the specifications realization

I Specializations realization know-how	Tool type
1. Assistance to the expression of the operational need (exploration of the threat…)	**System description Choice and evaluation Creativity**
2. Comprehension methodologies of the client operational specifications	**Fil d'Ariane Players game risk**
3. Methodologies for technical specifications setting up according to DGA standards, corresponding to the operational specifications and adapted to the manufacturers specificity.	
4. Methodologies for development and operating monitoring considering the specifications fixing the engagements	
5. Adaptation methodologies of the specifications suggested by the industrialist to the contract operational needs.	
6. Supportive methodologies to the customer in the expression of his operational needs specifications.	
	Fil d'Ariane Contract risks



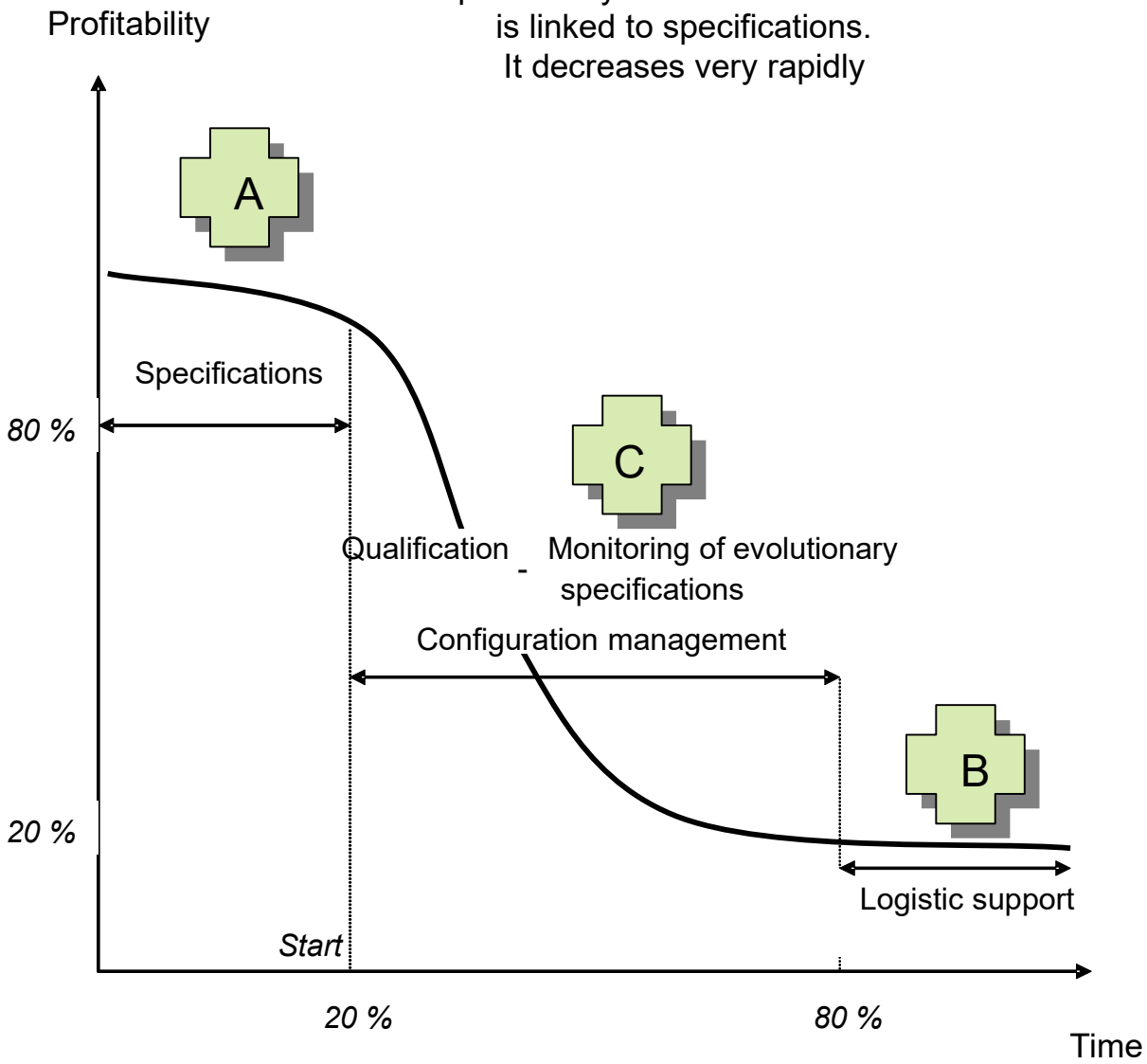
I – Use of competencies of the specifications realization in order to reach the targeted positions

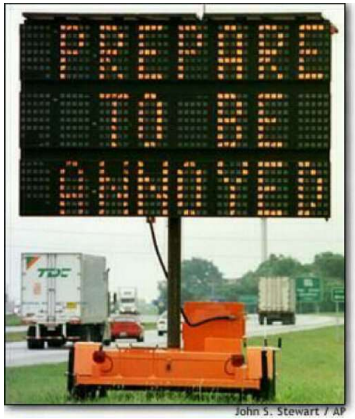


Risks cartography

Competencies and toolbox of risk reduction: pilot-contract – Specifications realization know-how

The profitability of risk reduction actions is linked to specifications.
It decreases very rapidly

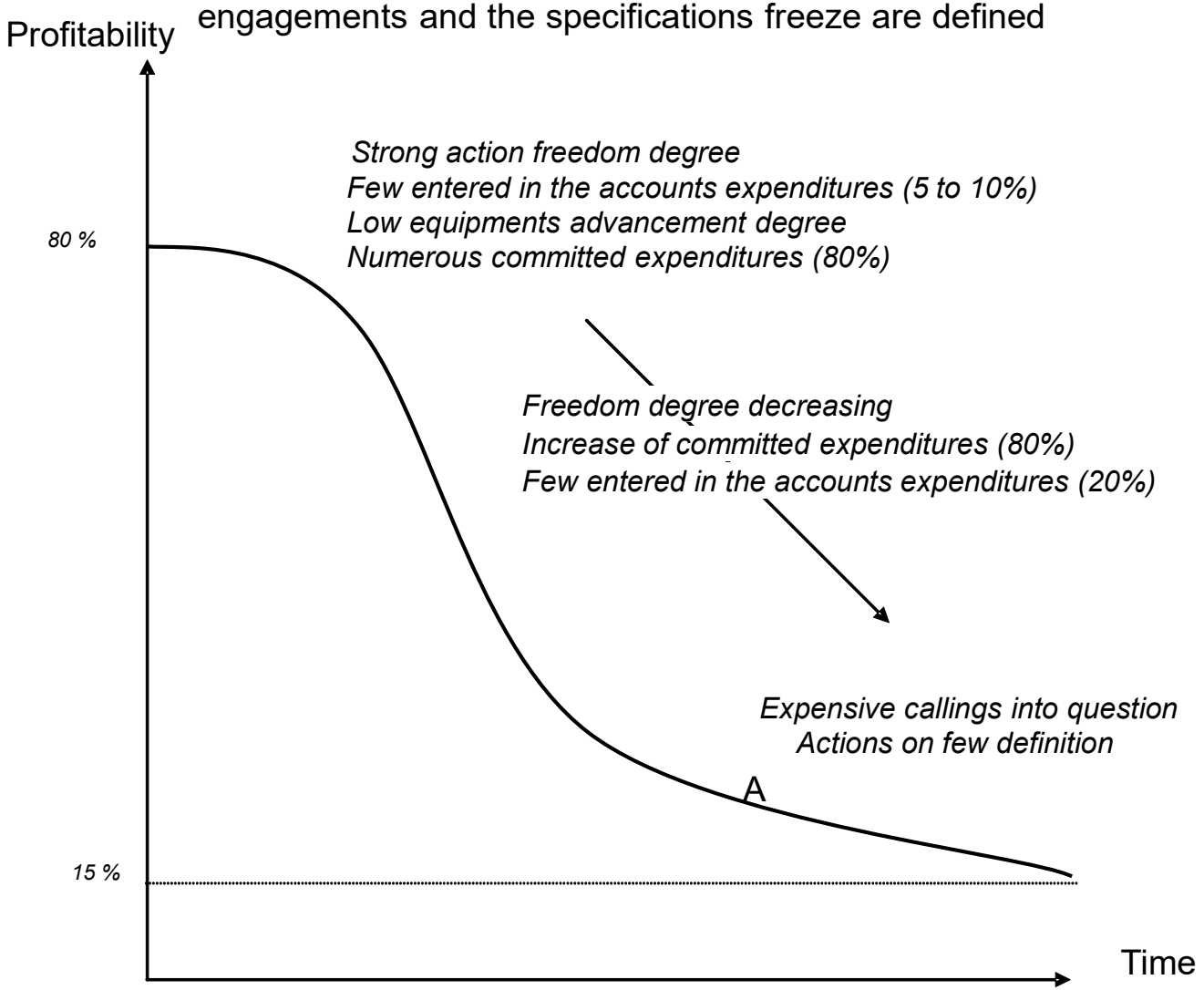




A : Zone of specification risk subsequently lead to costs drifts
« Very profitable » risk reduction actions
B : Zone of optimization risk actions involving too many resources according to their profitability - The risk reduction is obtained by running the supply chain
C : Zone of evolutionary specifications risk

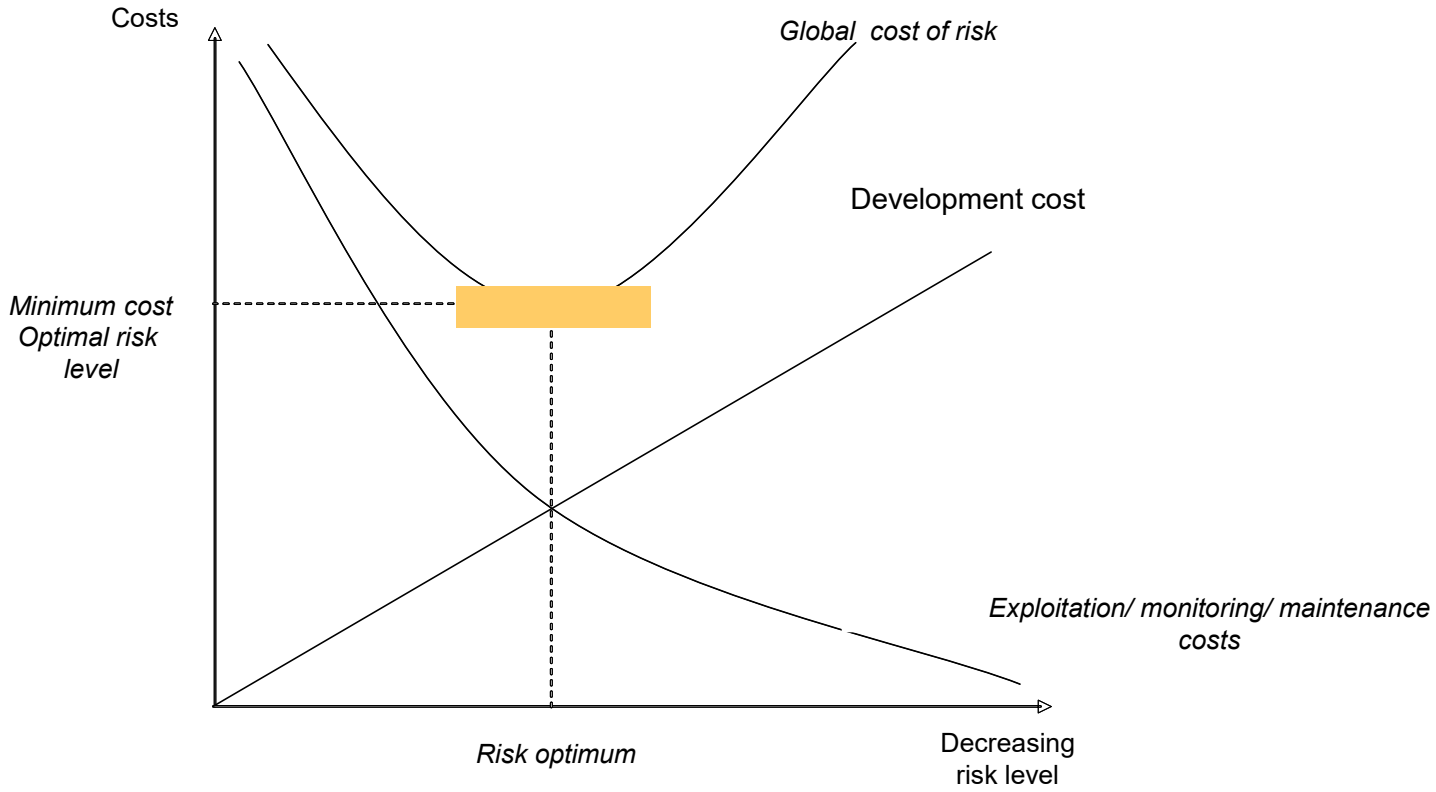
competencies and toolbox of risk reduction: pilot-contract - Specifications realization know-how

The risk reduction profitability is decided as soon as engagements and the specifications freeze are defined



Profitability evaluation of risk reduction actions according to the program progress

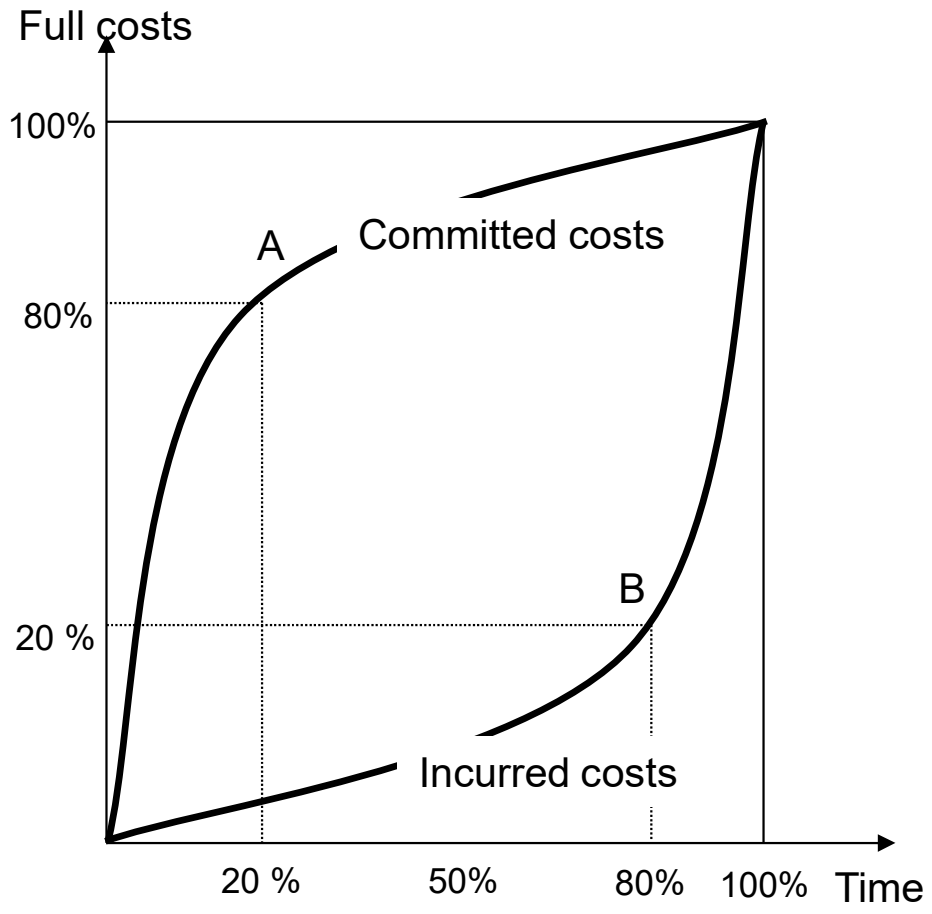
competencies and toolbox of risk reduction: pilot-contract – Specifications realization know-how



The higher the provided development costs, the weaker exploitation and monitoring costs.
The plan of risks reduction arbitrates between these 2 costs with an « optimum zone »

competencies and toolbox for risk reduction: pilot-contract – Specifications realization know-how

The incurred and involved costs induce a risks reduction during 20% of time involving 80% of expenditure, when the number of freedom degrees is maximum.



A : 80% of committed costs and 20% of project progression
B : 20% of committed costs and 80% of project progression

The evolutions of risks which must be reduced in the programs lead to concentrate on the needs expression and on designing adapted solutions

The 5 phases of military equipment export programs	Risks to control	Risks to control cumulated	Risks remaining to reduce	Stakes		
				Costs	Deadlines	Specifications
A – Need expression	50	50	50			
B - Design of adapted solutions	25	75	25			
C –Technical developments	12	87	13			
D – Process preparation	6	93	7			
E – Final qualification	3	96	4			

The parts A & B account for 75% of cumulated risks to master at the time of specifications

Example of competencies « qualification monitoring »

	Tools type
II – Know-how of system qualification monitoring	**Quantitative analysis Choice and evaluation Methodology**
1. Methodologies of variations piloting compared to the contractual specification reference frame, to the developments of technologies combined with these specifications and with the experience accumulated by the monitoring operator.	
2. Synthesis and scenarios of actors game in order to reduce time variations, to guarantee the client satisfaction with services appreciated as being in conformity with specifications, translating its operational needs	**Fil d'Ariane**
3. To ensure satisfaction by reducing the importance of modifications made in the initial offer technical specifications and to maintain the independence of the State and the credibility of its representative in the good execution of the contract.	

competencies and toolbox of risks reduction: realization phase – Know-how of the system qualification monitoring

Reduce the integration risks A, B, C & D stage by stage (cost reduction for clients)

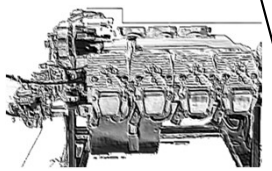
Risks D

System in its environment real simulations

Risks C

Risks B

Risks A

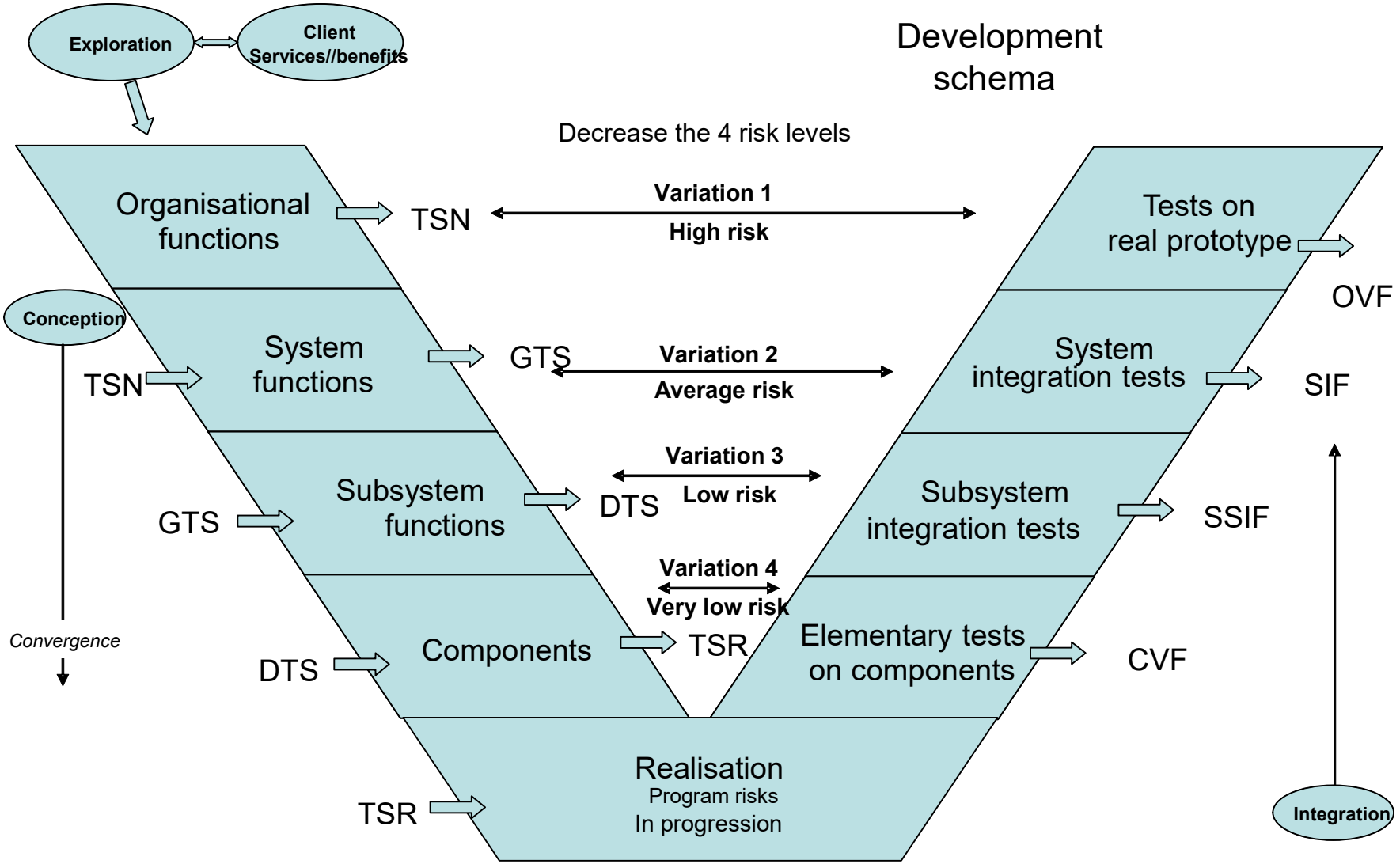


Unit components

System apart environment

System in its environment simulated requests

competencies and toolbox of risks reduction: realization phase - Know-how of the system qualification monitoring



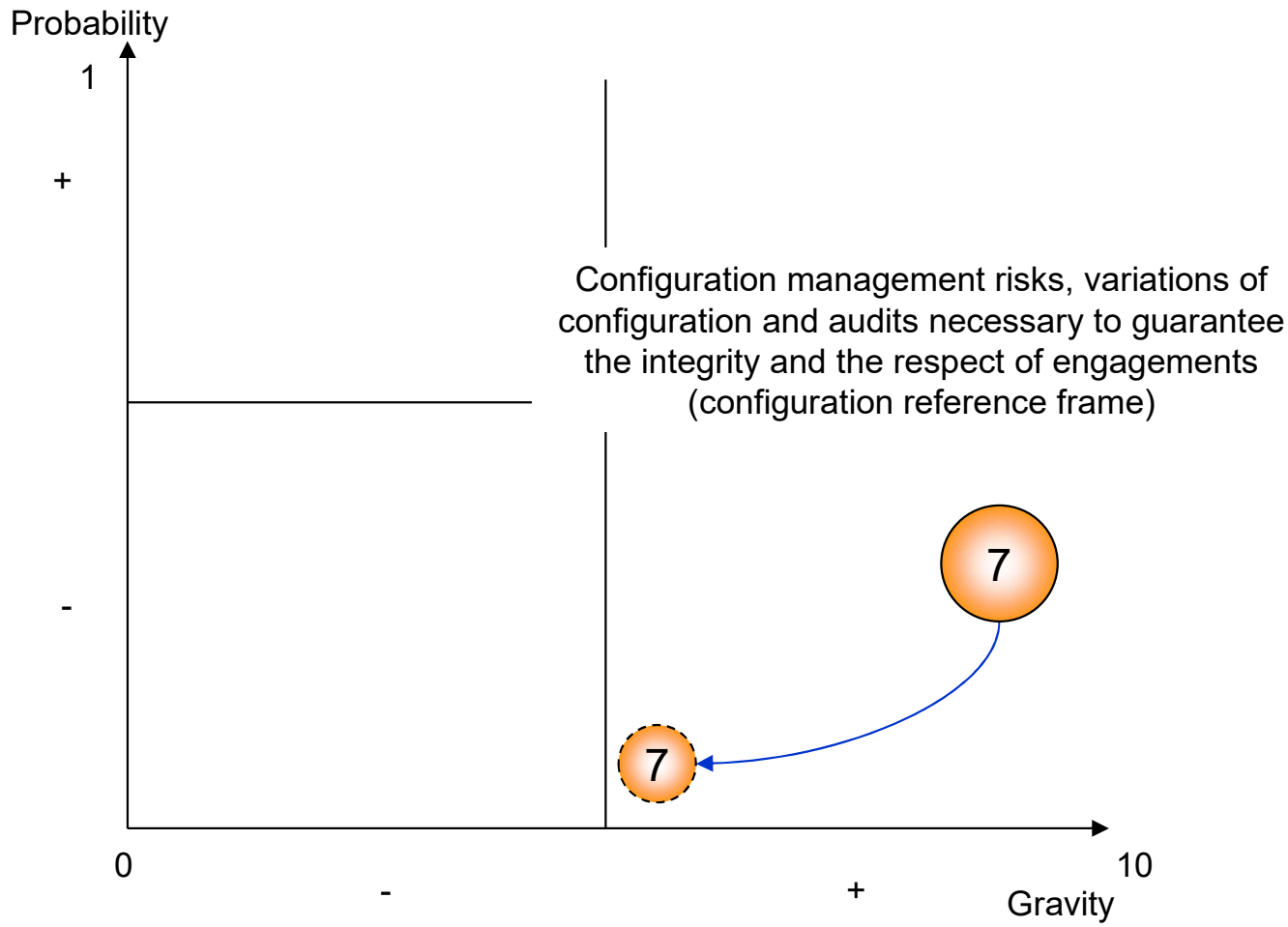
TSN = Technical specifications of needs
GTS = General technical specifications
DTS = Detailed technical specifications
TSR = Technical specifications of realisation

OVF = Organisational validation file
SIF = System integration file
SSIF = Subsystem integration file
CVF = Component validation file

The client should look after a good application of the Approach in «V »

Example of competencies "configuration management monitoring »

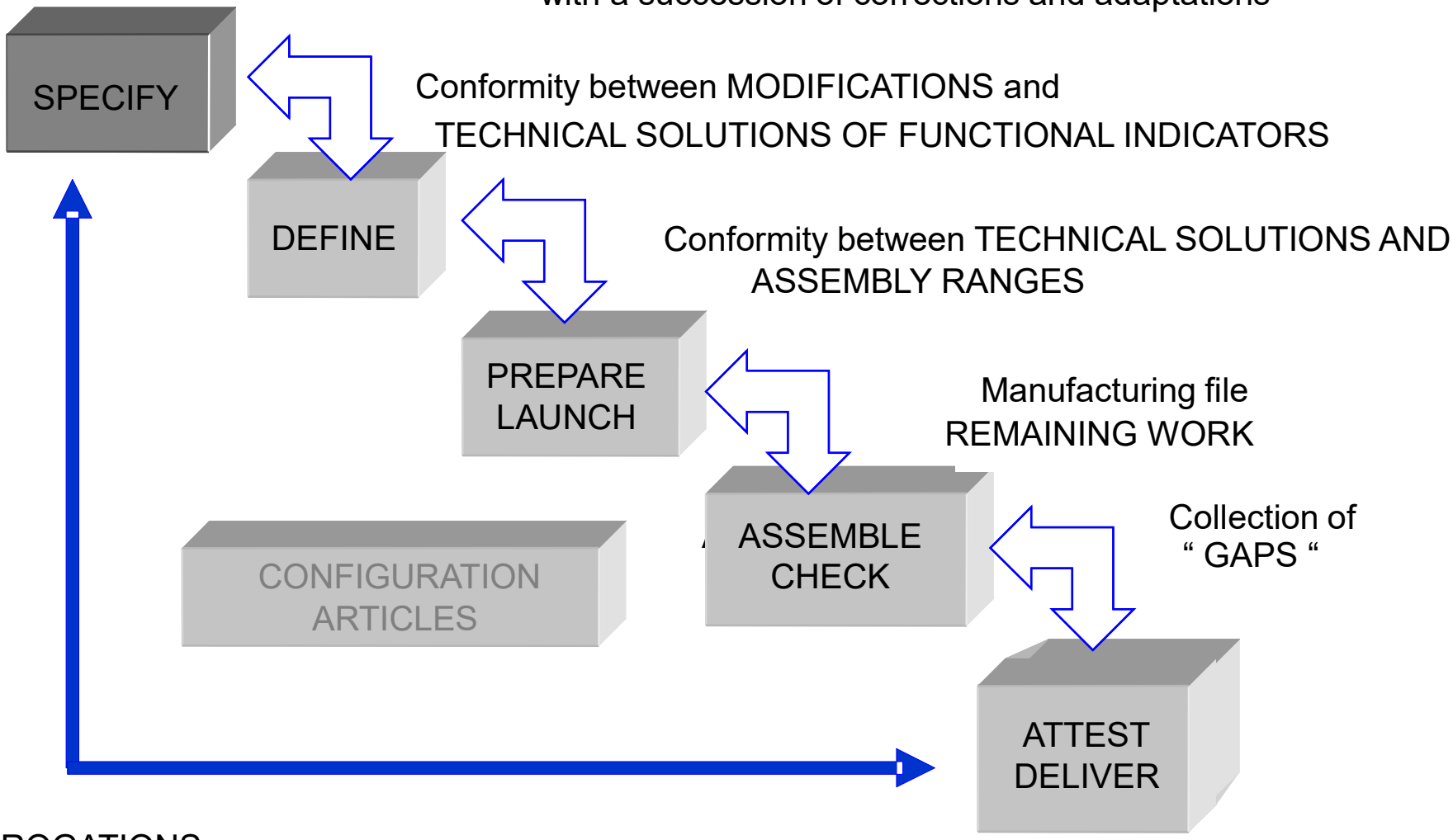
	Tools type
III - Configuration management know-how - to reduce risks and make the programs safe (configuration conformity levels according to client requirements)	**Quantitative analysis Methodology**
1. Identification of configuration value chains which are object of military equipment export contracts / programs	
2. Support methodologies for the customer in the monitoring of modification problems of the program progression	**Fil d'Ariane**
3. Methods of accompaniment methodologies, of variation control and monitoring, conformity control	
4. Modification management and initial reference frame	**Fil d'Ariane**
5. Risks incurred by configuration modifications in the contract progression (software configurations in particular)	
6. Partner role in the programs running in order to accompany and guarantee that what is delivered is in conformity with engagements (the delivered product is not in conformity with the market product…)	
7. Calendar, technical and budgetary preventive role / Dashboards	**Fil d'Ariane**
8. Anticipation of engagements to take and of evaluations of technical risks	



Risks position

Competencies and toolbox of risk reduction : realization phase – Configuration management know-how

Constituent set of the configuration risk management which changes during the program life
with a succession of corrections and adaptations



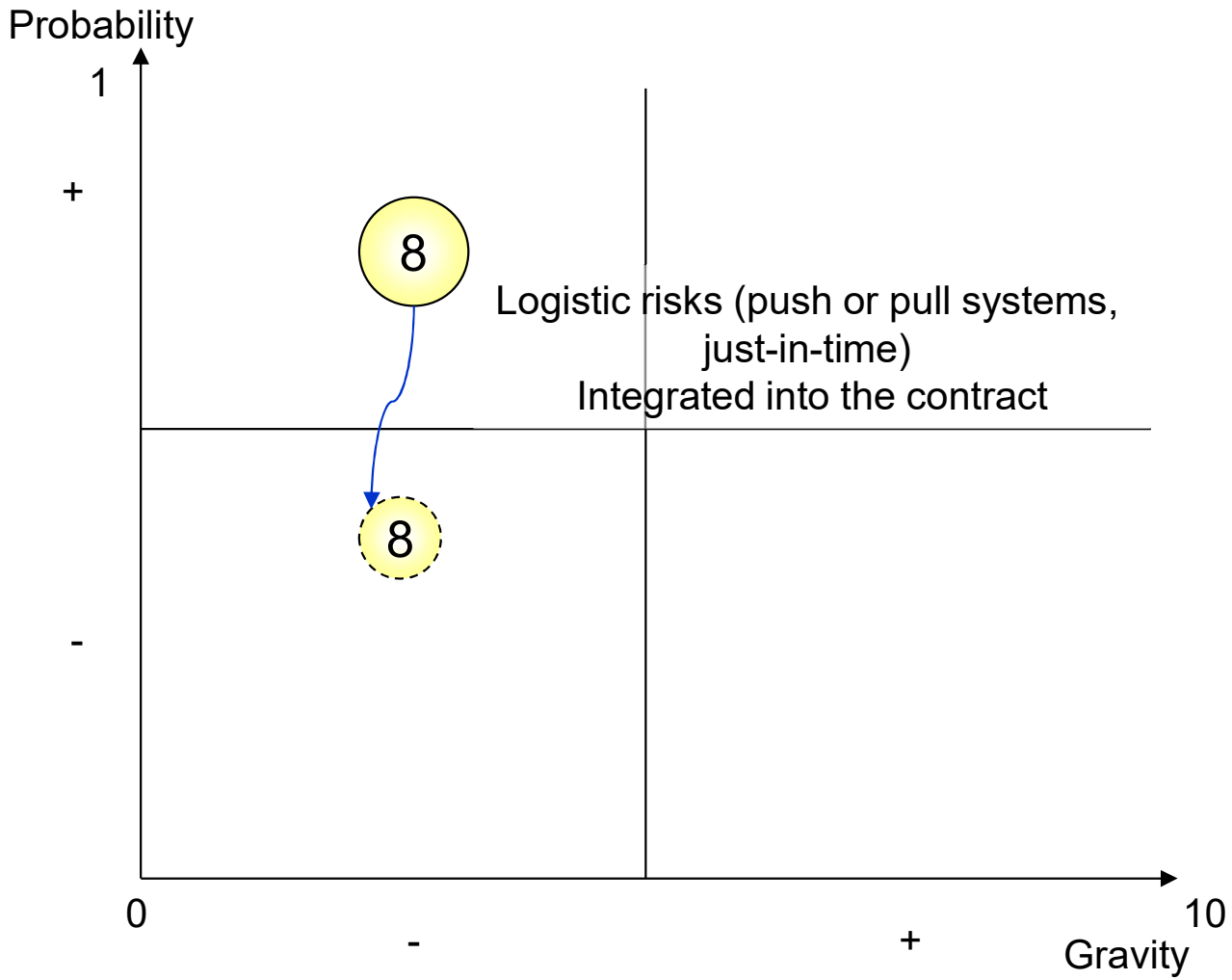
DEROGATIONS

Conformity certificate

The client asserts that the Configuration management is well organized by the project manager

Example of logistic competencies

IV - Logistic accompaniment for the program's safety	Tools types
1. Identification of the supply chain and its sensitive elements (ensured support three years after the development, obsolescence of technologies, product life by the client, supplying system). The equipment life is 30 years; some suppliers may disappear.	**ILS**
2. Risks analysis and reduction at the various stages: average ground; bench-test; replacements; consumable; reparable and ingredients; technical documentation (use and maintenance); infrastructure needs; technical aid: restocking; repair; periodic plan of maintenance; technical and operational trainings in support.	
3. Risks incurred by the non control of flows, integrated logistic system, support system.	**Fil d'Ariane**
4. Reduction of the waiting period between needs expression and order, obsolescence of contents coming in support to the programs, checking of the existence of logistic budgets by the client, maintenance of competencies.	



Risks cartography

competencies and toolbox of risks reduction: Realization phase – Logistic accompaniment know-how

Example: Risks of supplying drift in the supply chain concerning the organizational resource

If 10 components are designed to fill the progressing of program.
The presence of these 10 components, necessary simultaneously, lead to increase the stocks by reducing the safety

Component Level	Probability of stock before break		Probability of stock after break	Probability of availability simultaneous
•A	100		0,9	
•B	200		0,9	$0,90^2 = 0,81$
•C	100		0,9	$0,90^3 = 0,72$
•D	300	↗ 400	0,9	
•E	200	300	0,9	
•F	150	200	0,9	
•G	200	400	0,9	
•H	150	↗↗ 500	0,9	
•I	200	600	0,9	
•J	100	↗↗↗ 600	0,9	$0,90^{10} = 0,3$

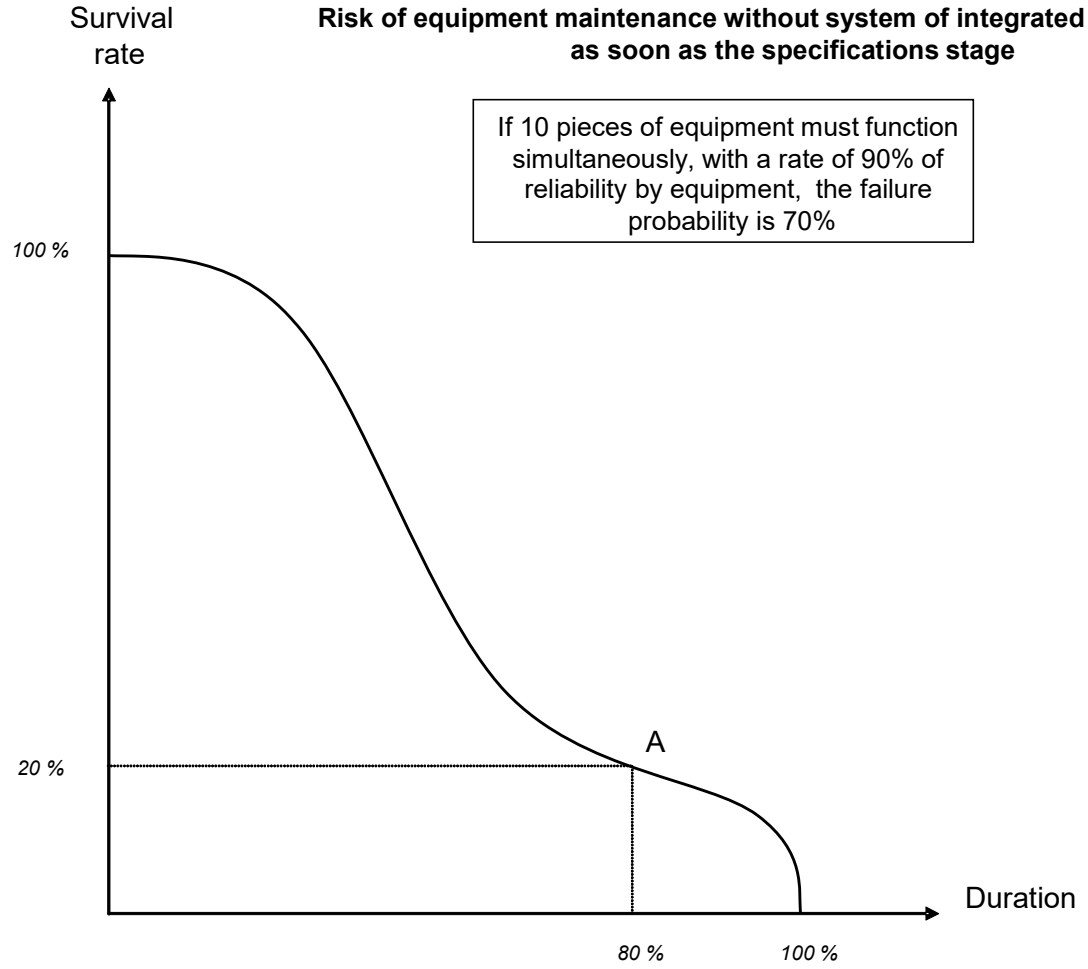
•->In 7 cases from 10, inventory shortage

This risk being present in all programs, it is essential to consider to set up an integrated logistic system (ILS –NATO) as early as the specifications stage

competencies and toolbox of risks reduction: Realization phase – Logistic accompaniment know-how

Risk of equipment maintenance without system of integrated maintenance, as soon as the specifications stage

If 10 pieces of equipment must function simultaneously, with a rate of 90% of reliability by equipment, the failure probability is 70%



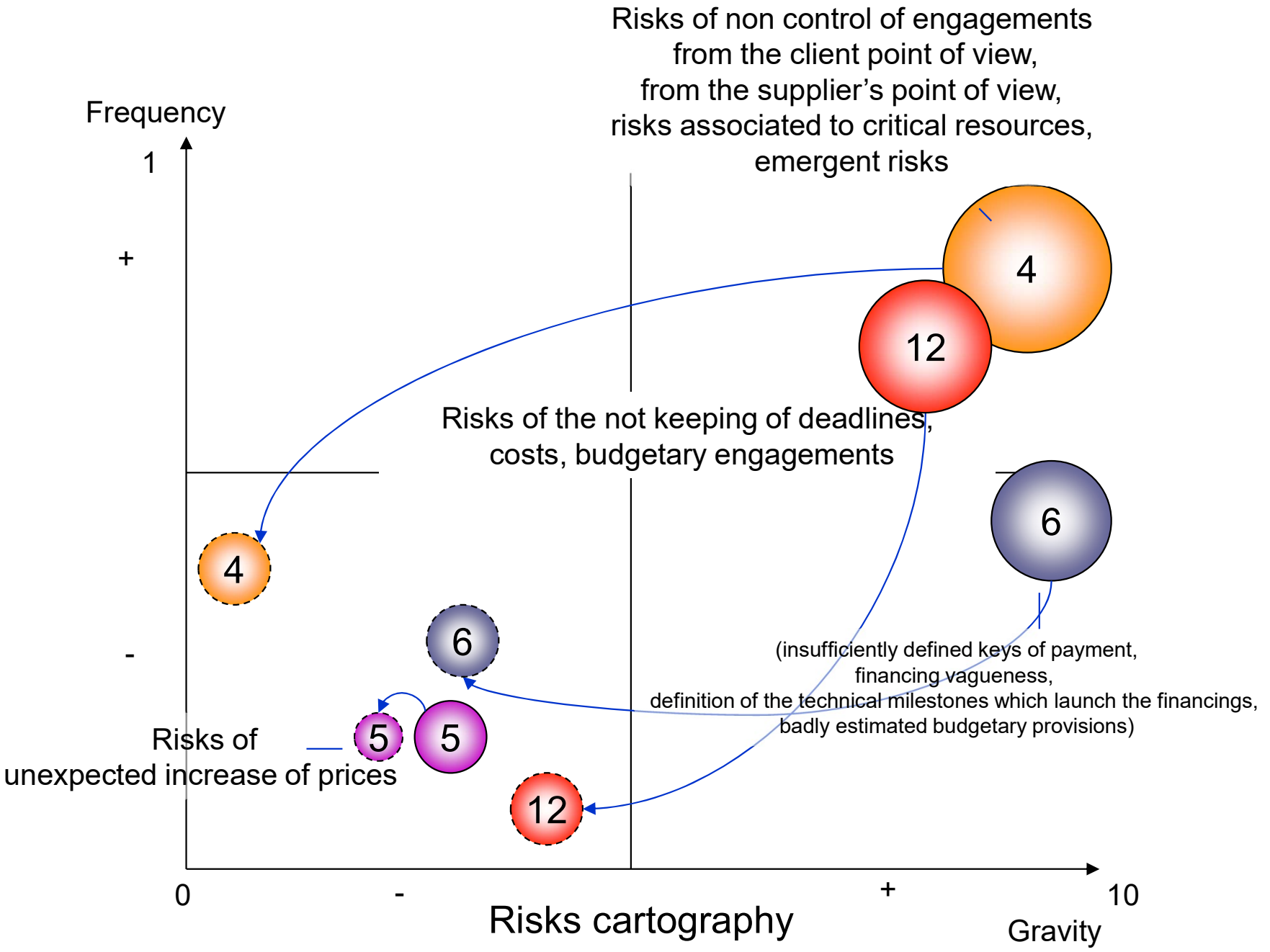
Risk reduction factors:

- Identify data of preventive maintenance (point A) for equipment replacement
- Identify durations of preventive maintenance of various equipments in the same system
- Modify the specifications
- Get the life curves
- Identify the effects of innovation and technological ruptures

Example of the competencies involved in the program control

	Tools type
V -Program control know-how -- reduce the risks, make the programs and identify the stakes for the client	**Choice and evaluation Methodology**
1. Tools for scheduling, the marking out control and operations accompaniment (by the transfer)	**Fil d'Ariane**
2. Monitoring of technical, budgetary and calendar risks, related to the client and the industrial supplier	
3. Alarms dashboard -- Mastery of the technical, budgetary and calendar variations.	

V – Know-how of the program control



competencies and tool box of the risks reduction: realization phase – Program control know-how

Plan of control according to the project advancement
The know-how of control reduces 95% of the controllable risks

Phases	End at the earliest J_0 : Start	% Existing risks	Controlled risks	Know-how of control	Tools for control
Specifications	J_0 + 3 months	50%	50%		
Conception	J_0 + 5 months	25%	75%		
Development	J_0 + 8 months	13%	87%		
Preparation	J_0 + 10 months	7%	93%		
Execution	J_0 + 12 months	4%	96%		

Objectives achieved by the marking out monitoring (System PERT...)

The residual risk remains on this level (4 to 5%) if the program control is integrated after the emission of specifications.

competencies and tool box of the risks reduction: realization phase – Program control know-how

The client ascertains the know-how of the program control and its application

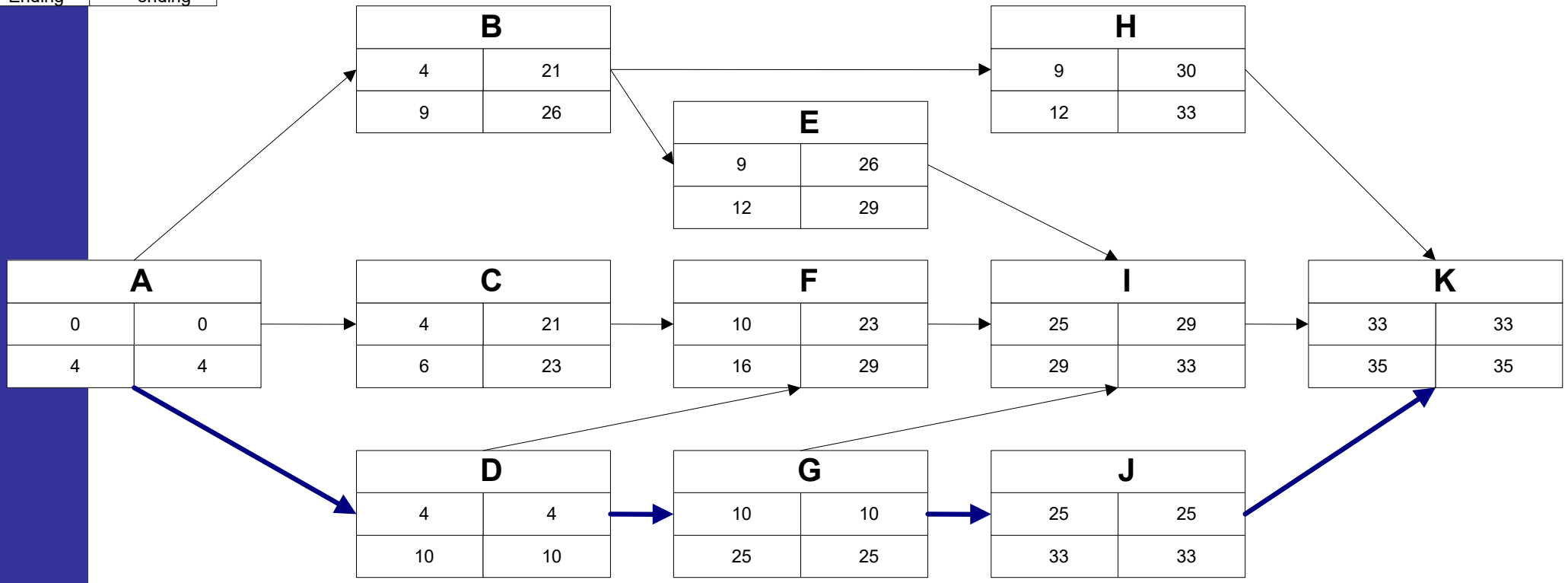
Calendar, budgetary and technical controls
from the program centralized scheduling

Example of a military equipment program involving 15 activities :

	Activities	Immediate antecedent	Resources		
			Duration	Budget	Equipment
A	Threat analysis	-	4		
B	Functional analysis	A	5		
C	Specifications / contract structure	A	2		
D	Technical specifications / Equipment choice	A	6		
E	Detailed specifications / Specifications freeze	B	3		
F	Launching of activities of the corvette configuration	C, D	6		
G	Configuration implementation and equipment assembly	D	15		
H	Qualification	B	3		
I	Logistic system	E, F, G	4		
J	Recurring purchases	G	8		
K	Final reception	H, I, J	2		

competencies and tool box for risks reduction: Realization phase – Program control know-how

Activity name	
Earliest beginning	Latest beginning
Earliest Ending	Latest ending

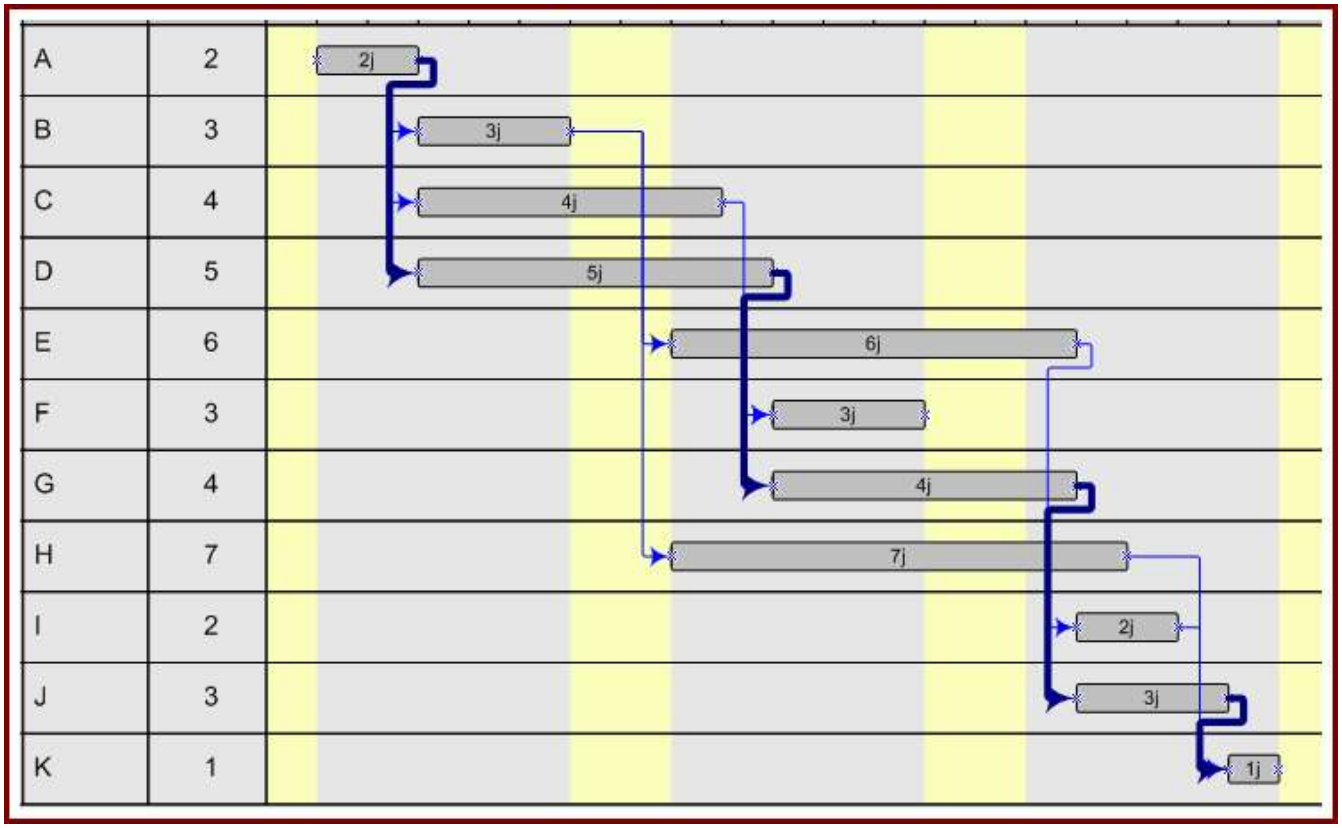


Total Margin for F :23 - 10 = 13
Free margin for F :25 - 23= 2
→ : Critical path

Competencies and tool box of the risks reduction: realization phase – Program control know-how :

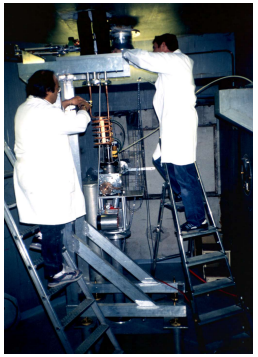
Control of the right tools application (PERT-Gantt for example)

For risk controlling, the program is presented on a diagram



Example of competencies « Support for technologies transfers »

	Type of tools
VI –Supportive know-how for technologies transfers	**Choice and evaluation Creativity Methodology**
1. Transfer value chain (example BOT : *Built Operating Transfer)*	
2. Codification, knowledge dissemination, control of the acquisition and knowledge operational implementation	**Fil d'Ariane**
3. Monitoring of competencies assets	**Fil d'Ariane**



competencies and toolbox of risks reduction : realization phase – Supportive know-how for technologies transfers

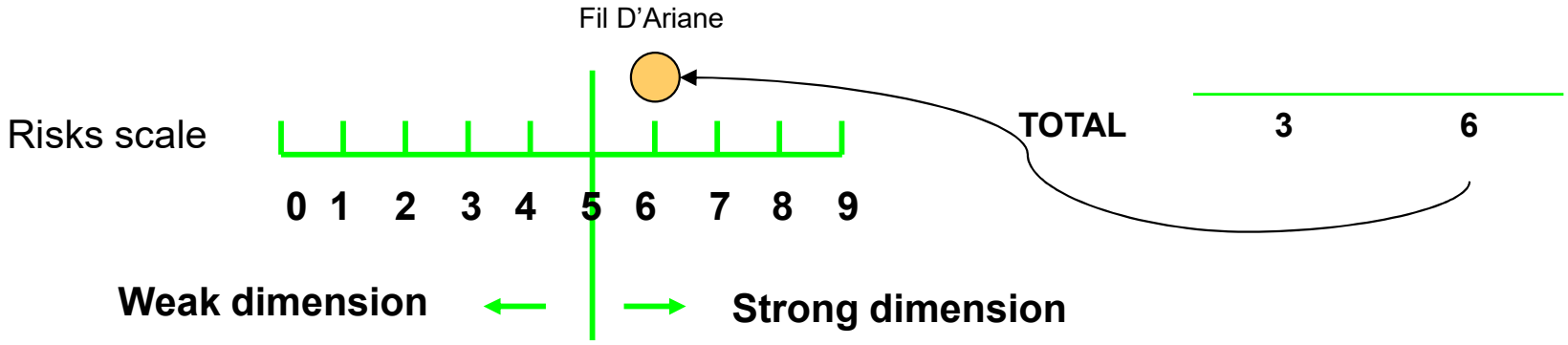
3 technology transfer stakes

- ☞ **ECONOMICAL**
- ☞ **ORGANIZATIONAL**
- ☞ **POLITICAL** (actors game)

… therefore numerous related risks

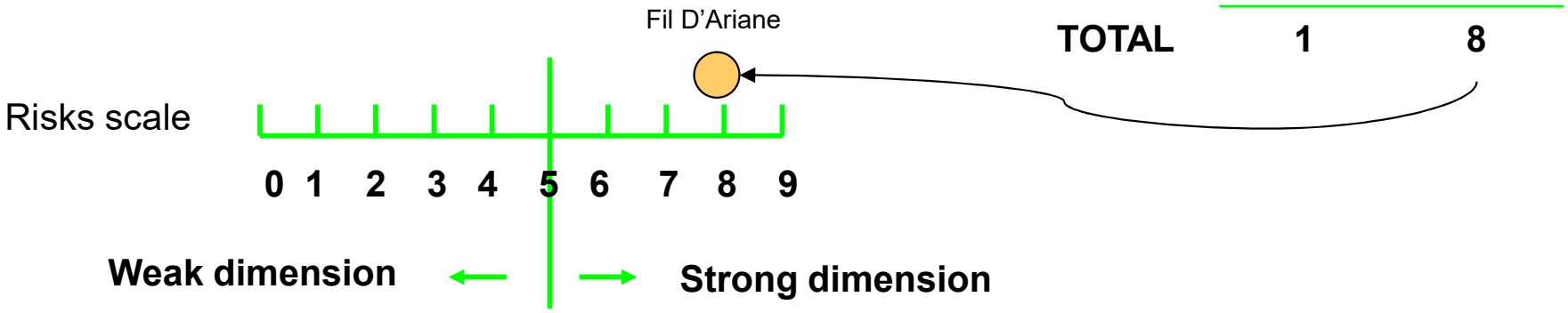
Economical component of the technologies transfer risk « Fil d'Ariane »

	YES (risks)	NO
Is the mission clearly defined?	0	1
Are the objectives clearly defined?	0	1
Is a search for balance between players carrying out ?	0	1
Is there a systematic mode of information collection about economical, political and social environment?	0	1
Is a systematic analysis of players capacities and competencies carrying out? In technical, activity level and in financial terms	0	1
Does a search for competencies complementarities exist ?	0	1
Are the necessary means systematically identified and evaluated?	1	0
Are the action priorities fixed?	1	0
Do the action plans with assignment of persons in charge and the forecasts of results and times exist?	1	0
TOTAL	**3**	**6**



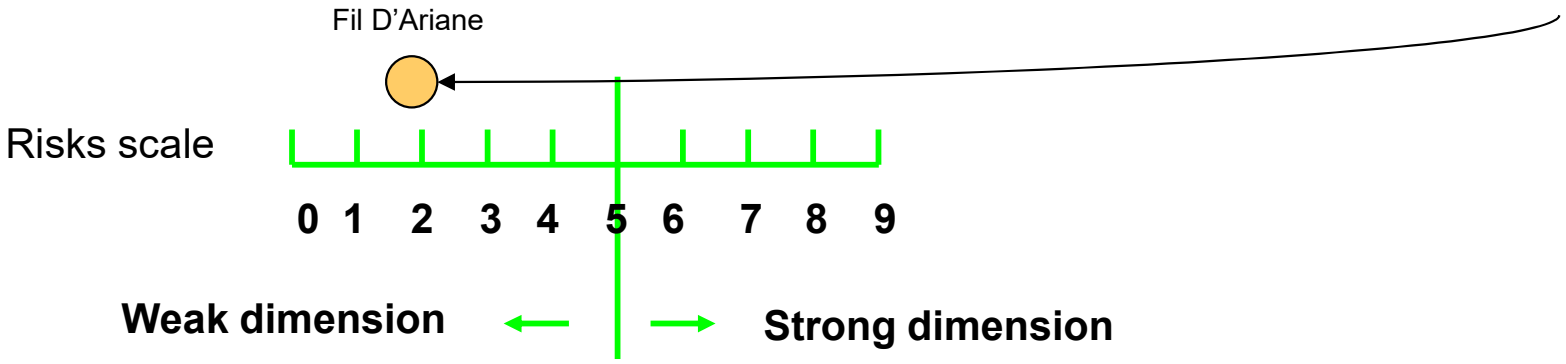
Organizational component of the technologies transfer risk « Fil d'Ariane »

Questions	YES (risks)	NO (risks)
Does a clearly definite structure to implement exist?	0	1
Does a clear and distributed information system exist?	0	1
Do rules, procedures, policies, programs exist?	0	1
Do coordination means exist?	1	0
Does an action monitoring system exist?	0	1
Does a results control system exist?	0	1
Does a persons in charge evaluation system exist?	0	1
Does a system of adjustment in case of not keeping (the expected performances) exist?	0	1
Do one or some systems of adaptation to environment changes exist?	0	1
TOTAL	1	8

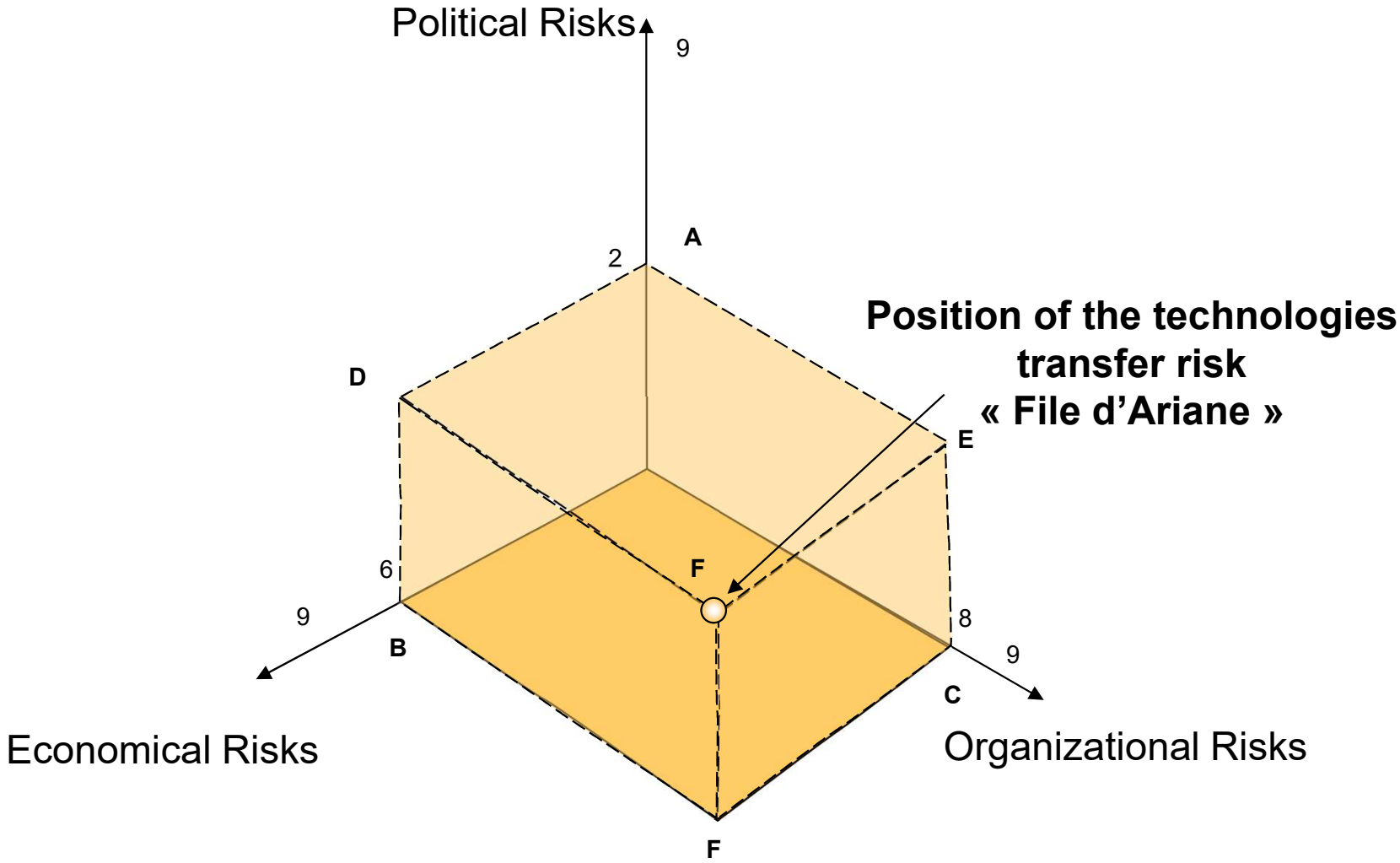


Political component (players game) of the technologies transfer risk « Fil d'Ariane »

Questions	YES	NO (risks)
Are the internal players identified?	1	0
Are the external players identified?	1	0
Are the actors' objectives known?	1	0
Is the players' strategy known?	1	0
Has the players' action impact been anticipated?	0	1
Have the innovations been identified?	1	0
Have the opponents been identified?	1	0
Has the actors' reaction to the implementation been anticipated?	1	0
Have response strategies to the players' reaction been envisaged?	0	1
TOTAL	7	2



« Fil d'Ariane »
Technologies
transfer Risk



Position of the technologies transfer risk « File d'Ariane »

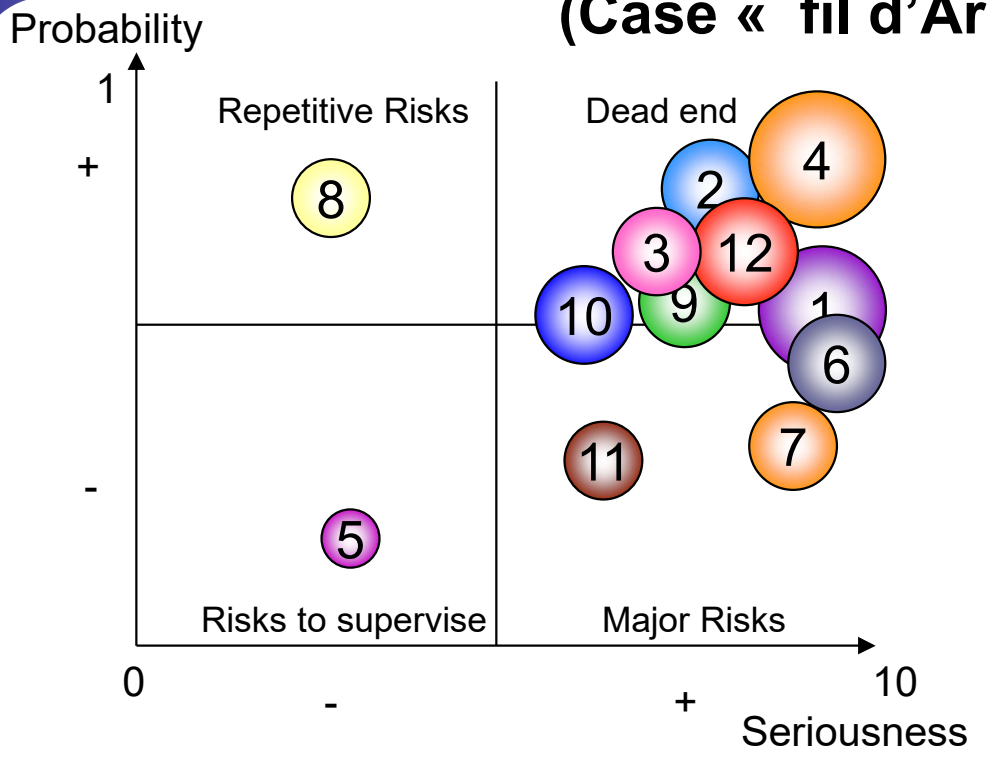
The technologies transfer risk « Fil d'Ariane » is the one of «short-sightedness». Economical and organizational risks are too important.

Technologies transfer risks

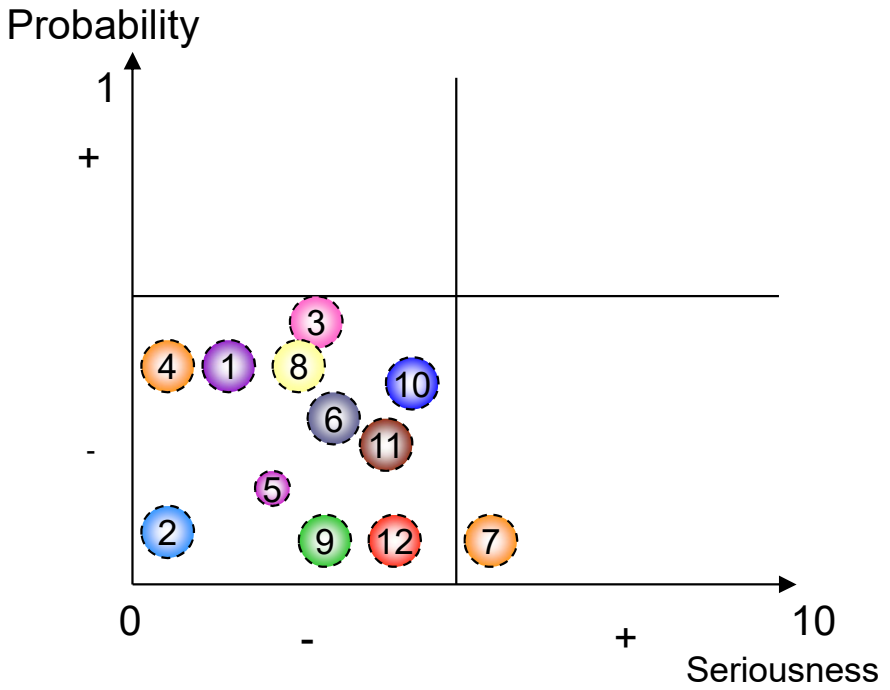
	Position du risque de transfert	Conséquences sur le transfert de technologies
A	Risque de coalition imprévisible (dimension politique seule)	• Stratégies conjoncturelles • Accent sur la seule tactique • Groupe ad hoc. Organisation peu structurée • Rapports de force entre acteurs • Objectifs des acteurs privilégiés au détriment de l'objectif global
B	Risque d'un système trop rationnel (dimension économique seule)	• Conceptions idéales mais irréalistes • Forte cohérence interne • Mise en œuvre négligée • Parfaite rationalité dans l'analyse et les choix proposés • Hypothèse de l'existence d'un acteur
	Risque	
	(dimension politique et économique combinées)	• Désaccord entre les acteurs • Absence d'infrastructure organisationnelle permettant une mise en œuvre coordonnée et cohérente de la décision • Aller-retour permanent entre la politique et l'économique. Instabilité stratégique
E	Risques de dérives de coûts (dimensions politique et organisationnelle combinées)	• Pas d'unité de direction de programme • Objectifs personnels des acteurs dominants • Mise en œuvre contrariée par les normes et les règles organisationnelles • Risque de blocage des acteurs
F	Risque de myopie (dimensions économique et organisationnelle combinées)	• Stratégie économique mise en œuvre efficacement • Contradiction entre démarche rationnelle et aspirations des acteurs • Accent sur le formel, l'analytique, le rationnel • Système stable mais inadapté
G	Risque d'impasse (absence des dimensions politiques, économiques, organisationnelles)	• Cohérence de programme • Désorganisation totale • Action ou réaction cohérente impossible • Immobilisme absolu

Short-sightedness risks – Vagueness in the programme of technologies transfer linked to the economical and organisational risks

Risks Positioning (Case « fil d'Ariane »)



Identified Risks and Risks Under control



Gains for the client
(Cas fil d'Ariane)

Probabilité

Nature of the risks	Seriousness		Probability		Critical G x F		Stakes (1)		Enjeux valorisés		Écarts	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actuel	Cible	Valorisés	%
1. Contrat risks- Risks of disagreemnt between Prime contractor and Project managers	9	2	0,5	0,4	5	1	0,05	0,001	75 000 000 €	1 500 000 €	73 500 000 €	0,05
2. Risks in players roles: Clients / States / Suppliers: relations between players are not steady, not enough defined	8	1	0,8	0,1	6	0	0,05	0,003	75 000 000 €	4 500 000 €	70 500 000 €	0,05
3. Risks in technology transfers : competencies are not ready till integration conditions are not settled	7	3	0,8	0,4	4	1	0,08	0,002	112 500 000 €	2 250 000 €	110 250 000 €	0,07
4. Risks of non control of engagements from the client point of view, risks associated with the critical resources of integration, emerging risks: engagements are not held. - Integrations systems/subsystems are to be defined	9	1	0,9	0,4	8	0	0,20	0,010	300 000 000 €	15 000 000 €	285 000 000 €	0,19
5. Risks in increasing prices: such are the integration conditions that prices will not be sustainable	3	3	0,2	0,2	1	1	0,03	0,001	37 500 000 €	750 000 €	36 750 000 €	0,02
6. Financial risks (keys of payment insufficiently defined between actors, definition of the technical milestones on which depend financings, non-existent budgetary provisions)	9	4	0,4	0,3	4	1	0,15	0,003	225 000 000 €	4 500 000 €	220 500 000 €	0,15
7. Risks of the configuration management, configuration variations and audits necessary to guarantee the integrity and respect of engagements (configuration reference frame) from the modifications which will be fair to be required in the process of integration.	9	6	0,3	0,1	3	1	0,10	0,004	150 000 000 €	6 000 000 €	144 000 000 €	0,10
8. Risks of logistics integrated in the contract, including innovating interface	3	3	0,8	0,4	2	1	0,10	0,002	150 000 000 €	3 000 000 €	147 000 000 €	0,10
9. Risks related to the systems qualification and role of the partner in the program running, specification risks (products "on the shelves"), risks of robustness of techniques displayed in time, risks of system obsolescence.	7	3	0,5	0,1	4	0	0,15	0,003	225 000 000 €	4 500 000 €	220 500 000 €	0,15
10. Risk of non suitable competencies	6	4	0,5	0,4	3	2	0,05	0,004	75 000 000 €	6 000 000 €	69 000 000 €	0,05
11. Risks linked to the technologies duality (civil and military) present in the program: for instance: sturdiness of civil systems integration solutions?	6	4	0,3	0,3	2	1	0,05	0,001	75 000 000 €	1 500 000 €	73 500 000 €	0,05
12. Risks of not keeping of the deadlines, costs, budgetary engagements: the program is in a dead end - Too much innovative.	8	4	0,7	0,1	6	0	0,10	0,005	150 000 000 €	7 500 000 €	142 500 000 €	0,10
(1) : % of the contrat (1,5 MM €)					46	10			1 650 000 000 €	57 000 000 €		

Stakes divided by 3

Stake Risk level of the program, to be reduced — A

Risks levels which cannot be reduced, to be monitored — B

Planning-Gap

Risks Reduction
Passing from the program global critical index of 465 to a target index of 96

Reduction of the stakes value
A - B

- The trustee third party has experience, competencies and the necessary tools for reduction of the identified risks. He:
  - Reduces the number of the transactions between purchasers and vendors
  - Identifies the risks of which he has experience
  - Facilitate the negotiations of risks reduction between players
  - Appears as referee
  - Diminishes the complexity
  - "Ensures" the risks and analyzes the conditions of their reduction
  - Establishes the alarm monitoring system, the dashboard

- Spot the risks and their stakes
  - Put them under control
    - Reduce the stakes

- … to become experienced clients !

- Thank you for your participation