TOWARDS A PERFORMANCE MEASUREMENT SYSTEM TO CONTROL DISASTER RESPONSE

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Outline of presentation

- Context
- Resarch Statement and Research Methodology
- Literature review and problem statement
- Our proposition: Performance Measurement System
- Application Case: Humanitarian sector
- Conclusions

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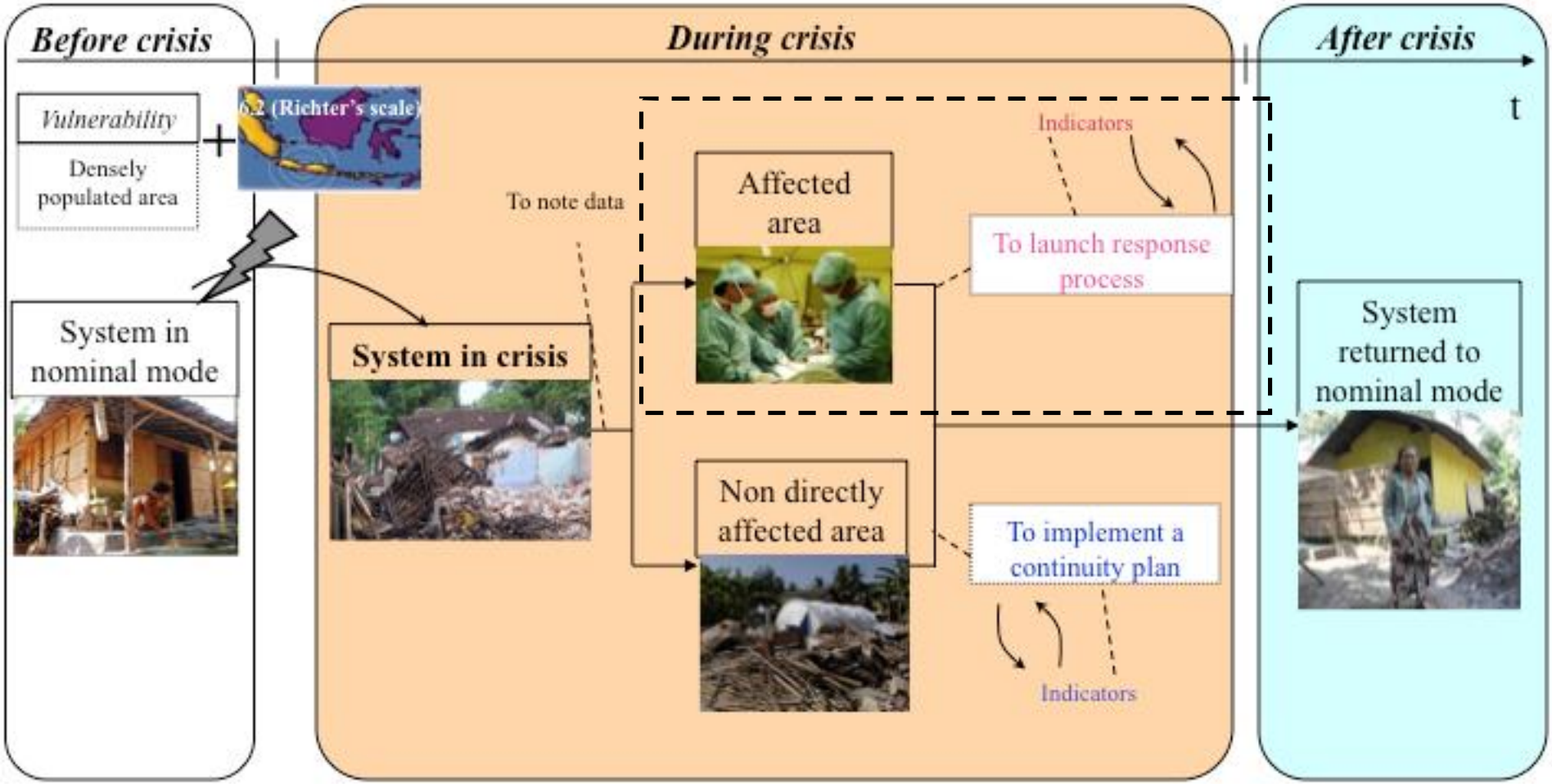
Research Work Context



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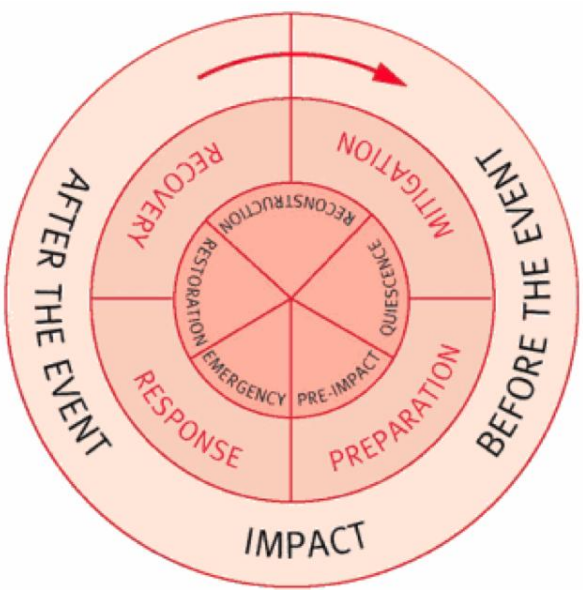
Research Work Context

- Definition of Crisis:
  - It is a *complex* and *dynamic* phenomenon, which constitutes a *threat* for the survival of an organization and its members, which gives *short time* to react, and which leads to an *adaptation* of the system *(Jacques and Gatot, 1996)*.

- Crisis Management Cycle *(Alexander, 2002)*:



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Research Statement

- Some Facts: Currently during crisis response
  - Actions are mainly based on actor's experience (but most of them are inexperimented);
  - There is a lack of visibility and anticipation capabilities;
  - There are difficulties in gathering and aggregating the information;
  - The performance of the response is not really evaluated (solely afterwards).

- A Need:
  - Crisis stakeholders need « tools » to assess performance of their response, « in real time », in order to improve it.

➔ In time of crisis stakeholders must have:

- to react quickly ➔In implementing a response process
  ➔So what are the business processes that have to be monitored?

- to react correctly ➔In assessing performance to control it
  ➔So what are performance components?

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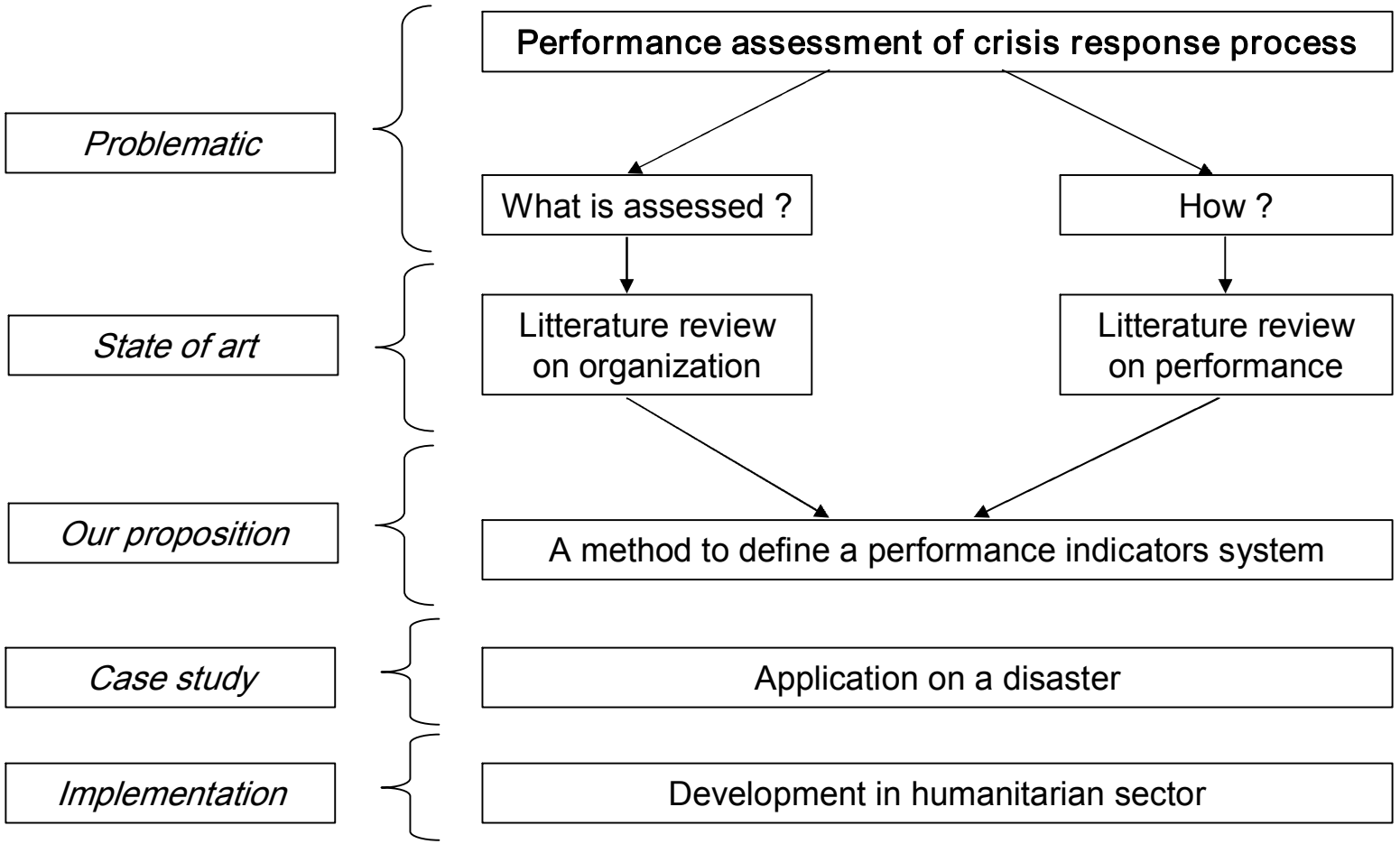
Research methodology



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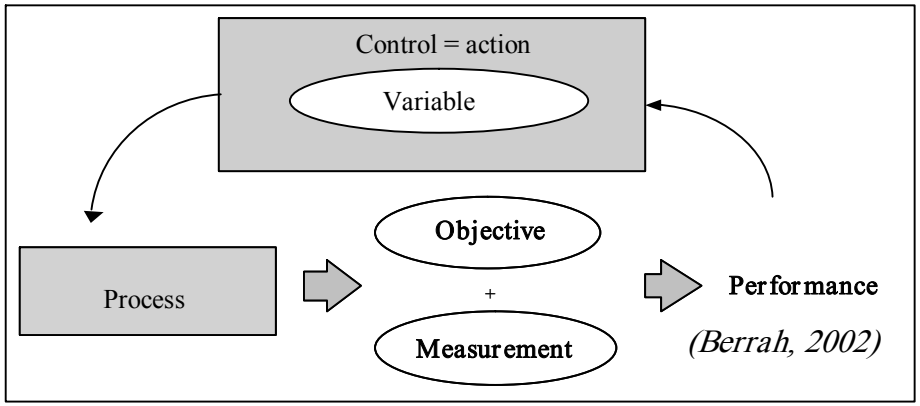
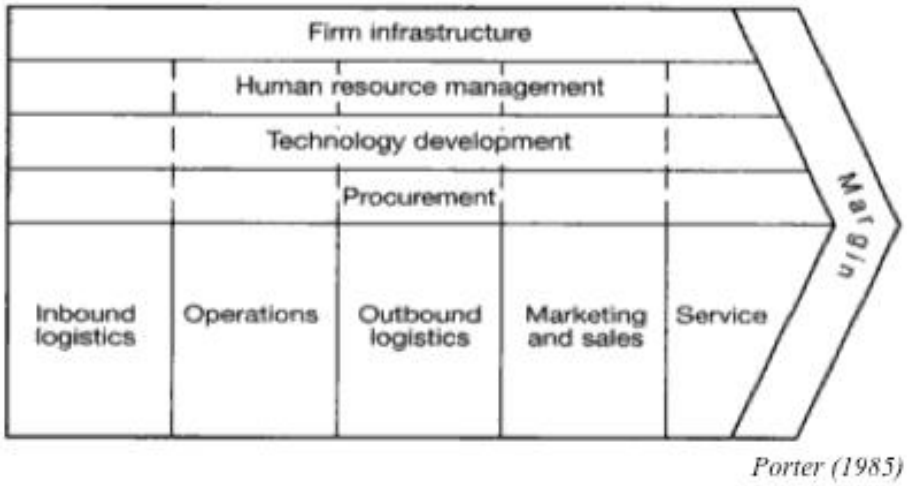
Literature review and problem statement: indicator and performance

- Indicator:
  - information that can help an actor to lead action towards the realization of an objective or can permit to evaluate the result of it *(Lorino, 2003)*.
- Performance Measurement:
  - Reflection of the real state of the system, given by indicators *(Gunasekaran and Balent, 2007).*
- Performance Assessment:
  - An interpretation of the measurement
- Performance components:
  - Effectiveness; efficiency; responsiveness; relevance
- Scorecards:
  - A limited group of KPIs to support decision

- To remember:
  - Performance → Business Process
  - Business Process → KPIs
  - KPIs → Interpretation

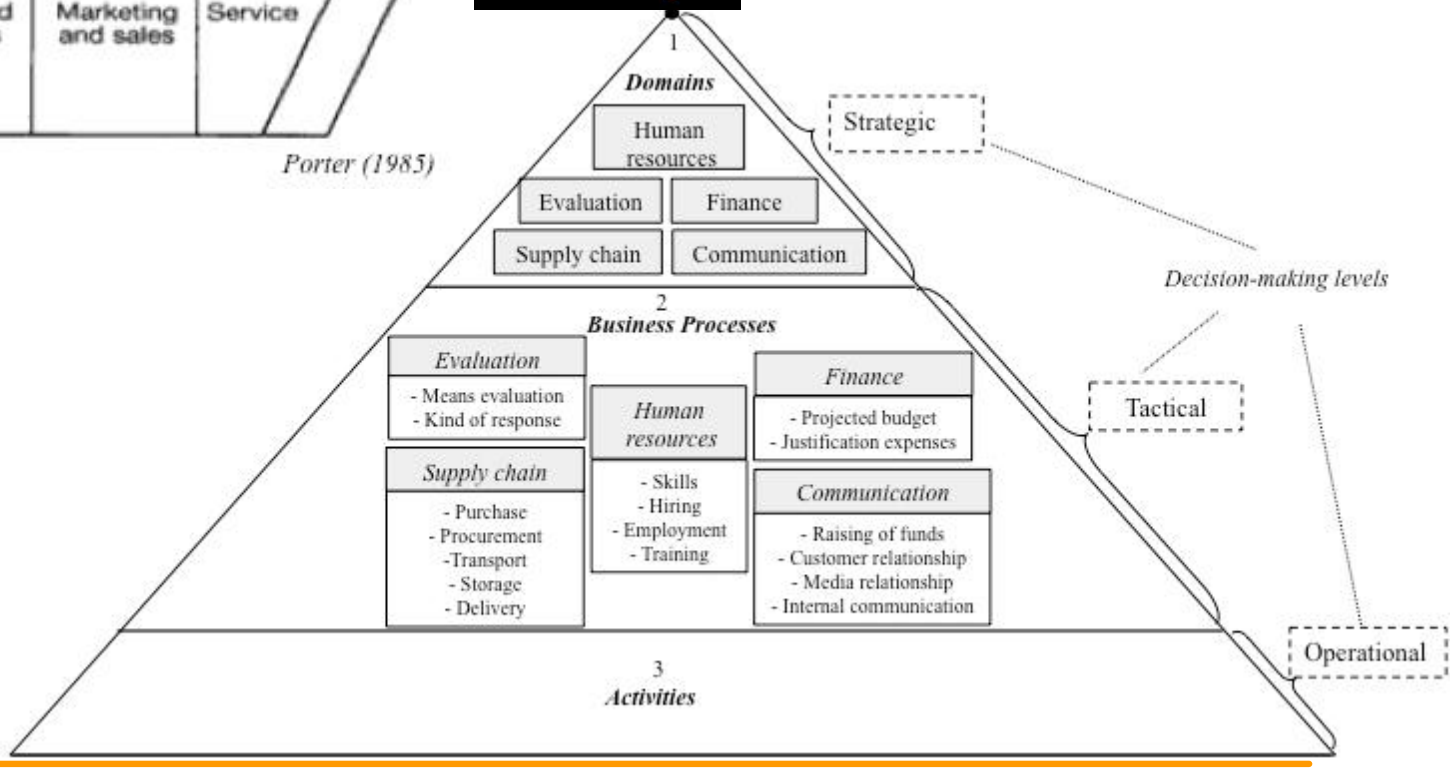


Literature Review: Business Processes to monitor



Porter (1985)

+ Crisis Management Characteristics



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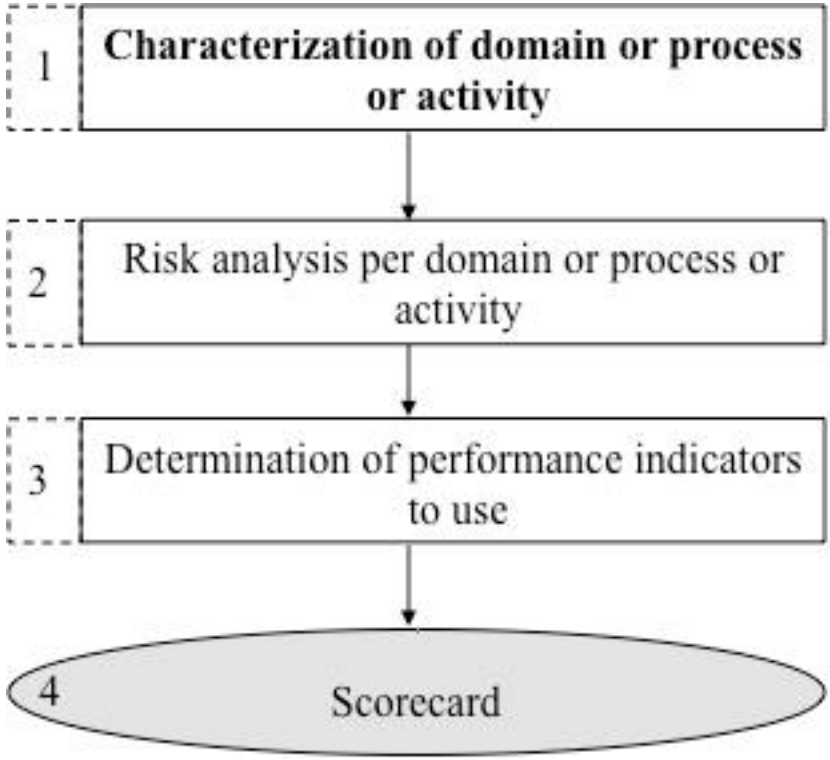
Our proposition: method

- Method proposed :
  - 4 steps;
  - Applicable to various kinds of crisis;
  - Support the definition of a Crisis Performance Indicator System;
  - Repeatable on all decisional level.



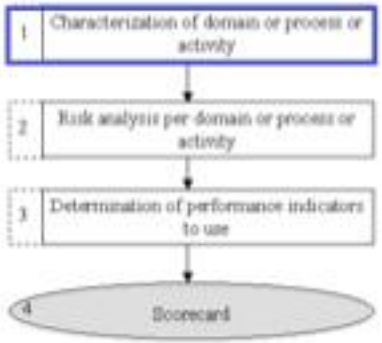
Case Study: Humanitarian sector

- NGO studied: **French Red Cross**

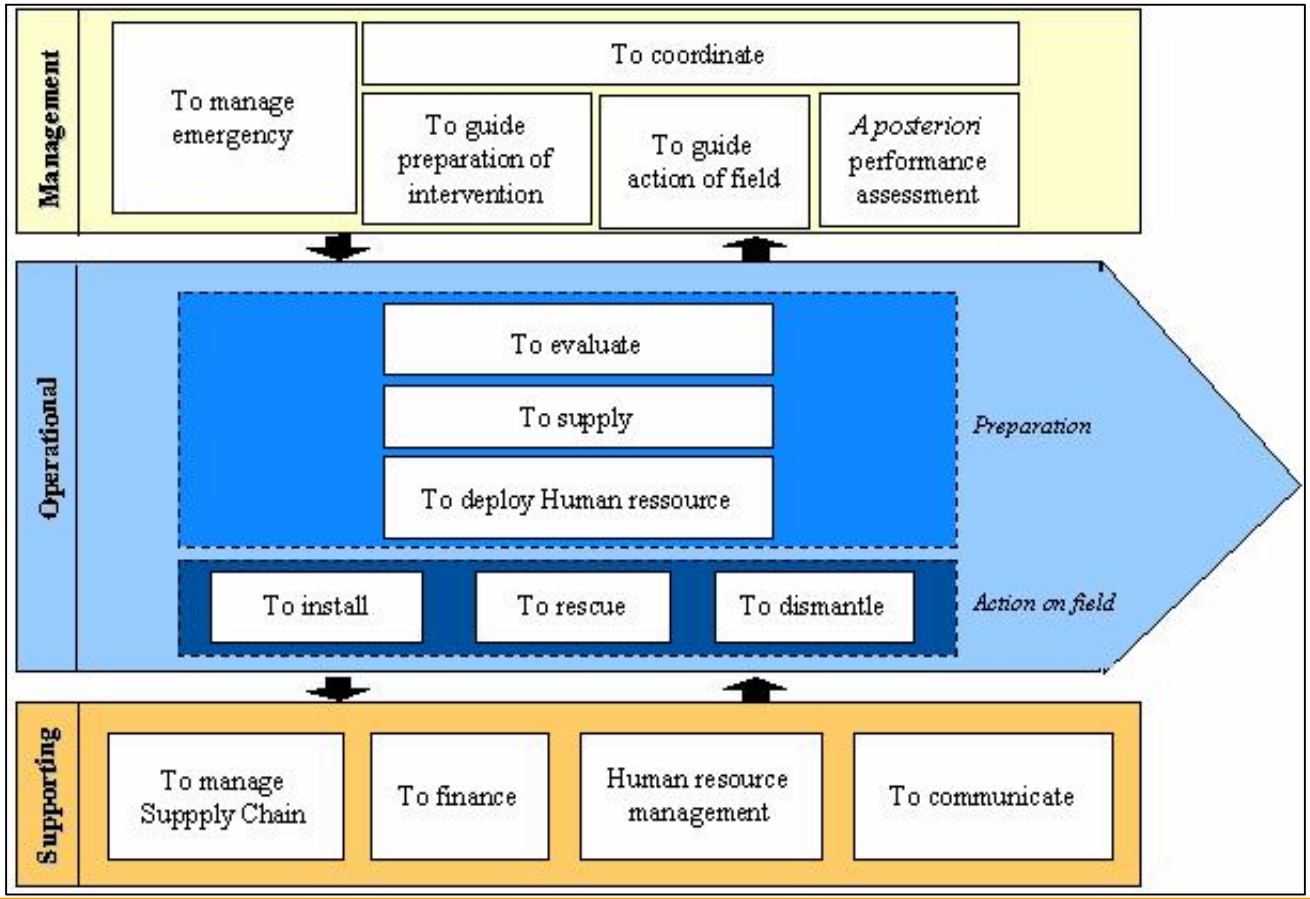
croix-rouge française

- Crisis studied: Yogyakarta's **earthquake**
  - **May, 27 of 2006, 5h54:** main earthquake
  - Mg 6.3 (Richter scale); 450 secondary tremors
  - **6000 deaths, more than 38000 injuries, 1,5 million victims**

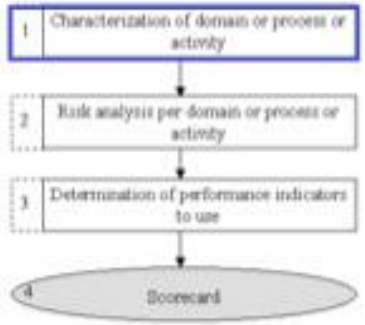
Case study: detail of step 1

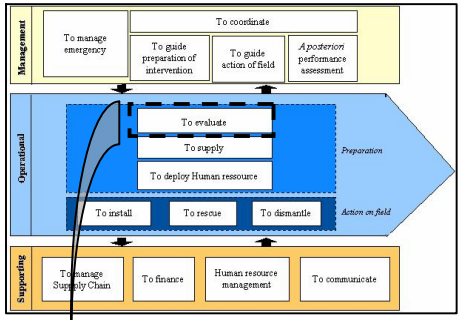


- Cartography of response process:
  - Strategic decisional level is divided in 3 parts according to ISO 9000;
  - Tactical decisional level is divided in Business Processes;
  - Each process can be modelized in detail with BPMN language.

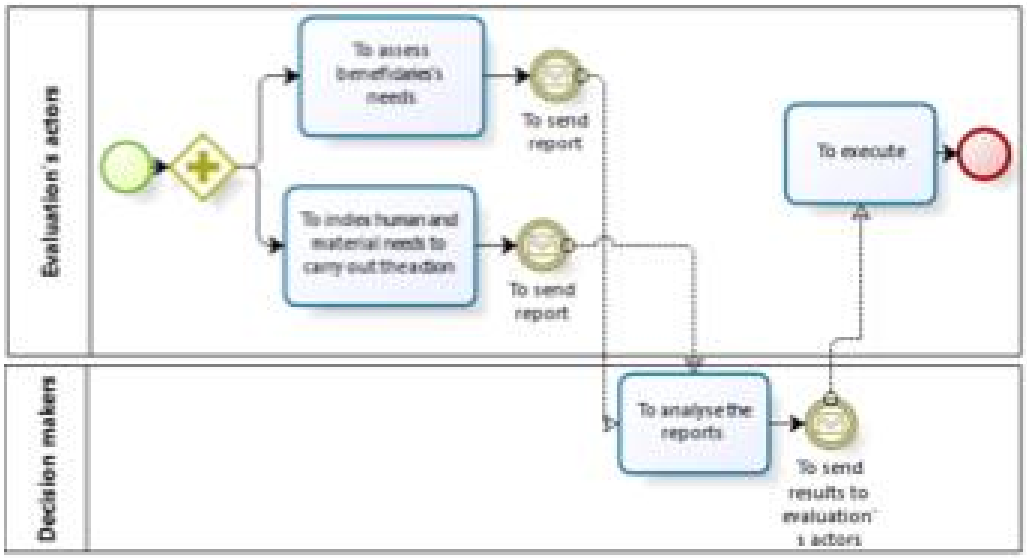


Case Study: Step 1



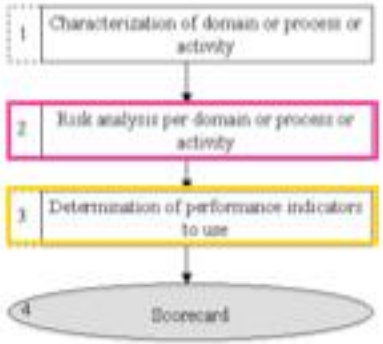


- Example of business process « To Evaluate »:
  - Evaluation of beneficiaries' needs
  - Evaluation of necessary means



→ Step 1: on which level is the assessment made.

Case Study: Step 2 & 3



- Step 2 – Risk Analysis:
  - Are « beneficiaries' needs critical?
- Step 3 – KPIs Definition:
  - A KPI has to be defined for each critical Risk.

Process: Needs evaluation						
Risks				KPI		
Names	Causes	Consequences	Criticity D x G x O	Name	Formulation	Classes
Slow evaluation	Bad organization of estimation	Waste of time	6 x 9 x 3 = 162	Cycle time	1-Days between the beginning of crisis and appeal	Responsiveness
Error on the assessment of needs	Pessimistic estimation: too many means requested	Waste of means	6 x 9 x3 = 162	Coherence between orders and needs	2-Number of items asked (order)/number of items requested (crisis area)	Effectiveness
					2 2-Ref. asked (order)/ref. requested (crisis area)	Effectiveness
	Optimistic estimation: not enough means requested	Lack of means	9 x 9 x3 = 243		2 3-Number of means asked (order)/number of means requested (crisis area)	Effectiveness

→ Step 2: selection of processes thanks to a risk analysis

→ Step 3: the creation of key performance indicators

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Work In Progress : *Application case*

- Web-based PMS: characteristics
  - To show an overview of crises (different crises; processes and KPI for a crisis…)
  - To add, consult and store all the measurements of KPI
  - To make a graphical analysis of measurements
  - To generate report
  - To permit exchange of documents
  - Easy to use and efficient
  - To improve communication and collaboration between stakeholders on field and at the headquarters

→ Characteristics respond to the French Red Cross's needs

Application Case: *example of results*

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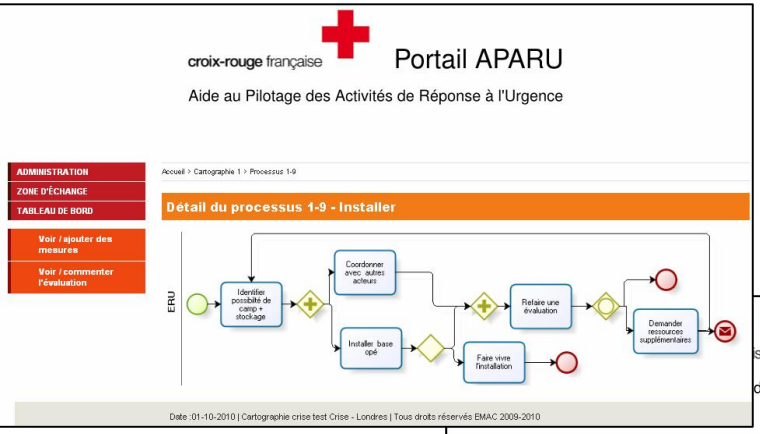
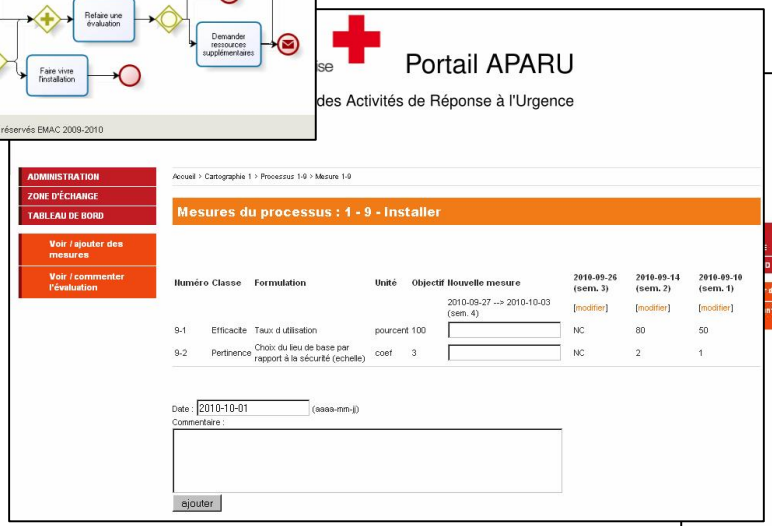
- **Process**

Details of one process



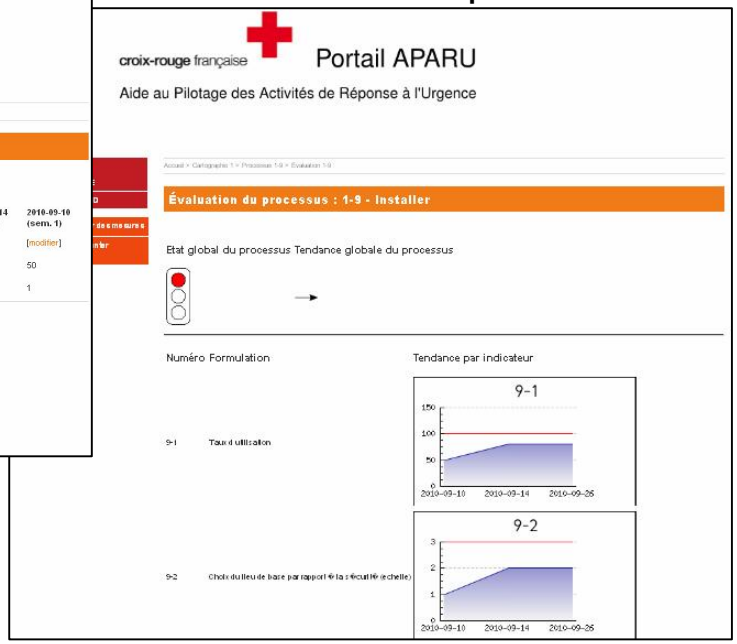
- **Measurement**

List of KPI and measurement for each KPI



- **Assessment**

Performance results for the process



Application Case: *example of results*

- Performance assessment for the process : 2 levels of results

  - KPI tendency:

  Graph shows evolution of results per week

  - State and tendency for each process :

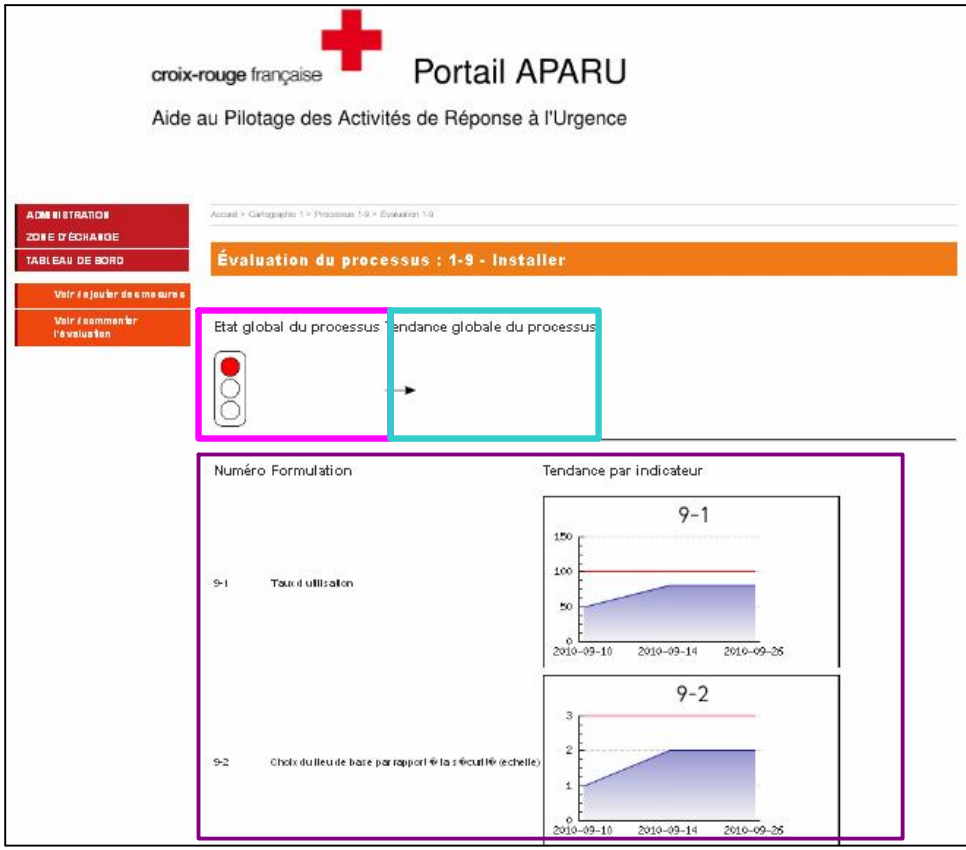
  given by comparing results with objectives

  State is the average calculated with an aggregation of all KPI results for the week

  Symbolized with a traffic light: red = bad; orange = medium and green = good

  Tendency is the average evolution between two weeks calculated with an aggregation of all KPI evolutions between two weeks

  Symbolized with an arrow: downward = deterioration; medium=stable and upward = improvement



→ To have a detailed vision per KPI and a global vision per process

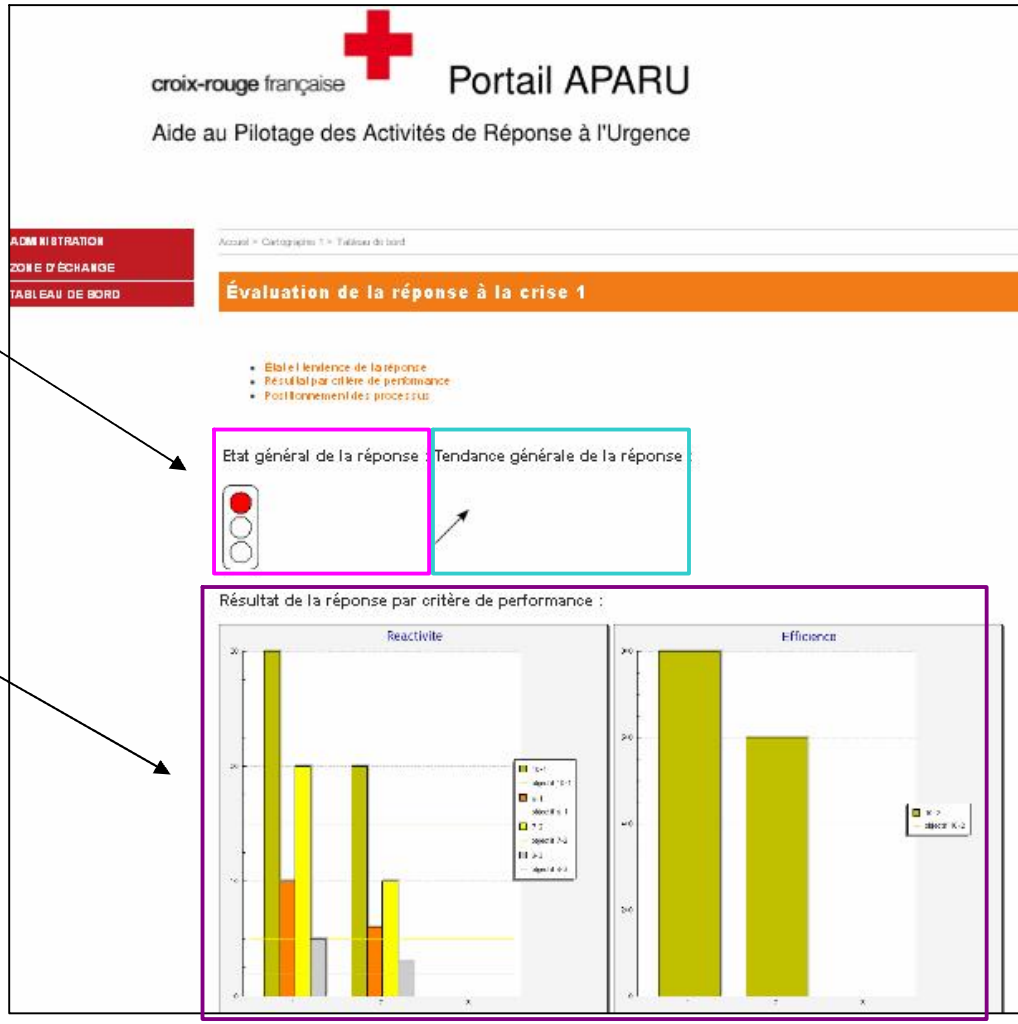
Application Case: *example of results*

- Global performance assessment

- State and tendency for the crisis: aggregation of previous results

- Performance by components : performance results selected by components (reactivity, efficiency, effectiveness, relevance) per week

Symbolized with histogram



→ To have a detailed vision per component and a global vision per crisis

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Conclusions

- We have seen based on literature:
  - How processes to monitor are selected
  - How KPI are defined
- PMS created permits
  - to improve collaboration
  - To guide stakeholders during response
  - To increase data to make capitalization and experience feedback
- Work in progress
  - To test the web-based PMS on real case
  - To validate it with the French Red Cross and other NGO

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Thanks for your attention