

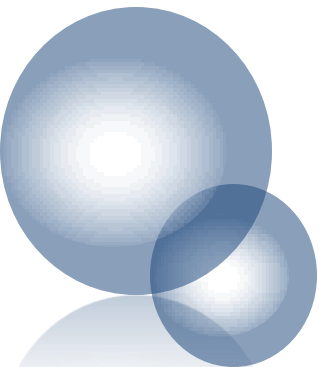
*Competitive intelligence: History,  
importance, objectives, process and  
issues*

**Dhekra BEN SASSI**

**Anissa FRINI**

**Wahiba BEN ABDESLAM**

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# Agenda



Introduction

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Critical Issues

Proposed Solution

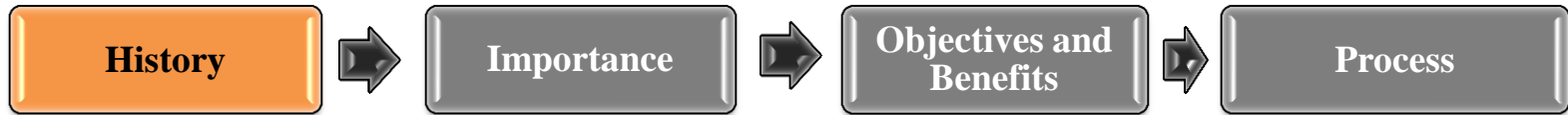
Conclusion and perspectives

# Introduction

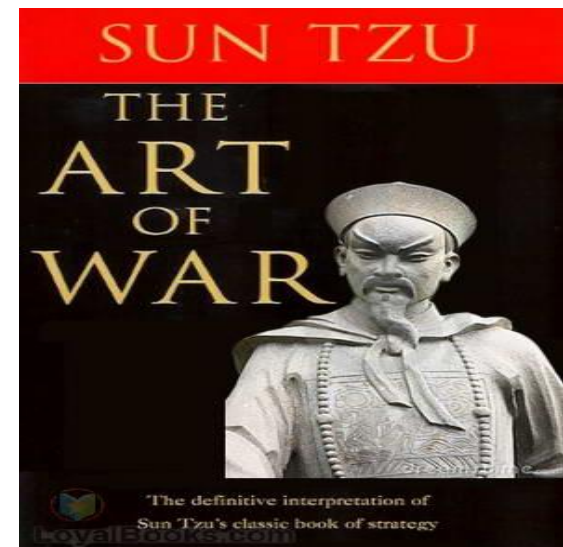
- CI deals with the competitive environment of the company.
- **Definition:** “A systematic and ethical program for gathering, analyzing and managing external information that can affect your company’s plans, decisions and operations” (SCIP).
- CI is not business espionage;
- CI is ethical, legal and legitimate.
- CI uses public, but not necessarily published information



# State of the art



- Initially related to the military domain.
- The earliest reference of CI is “The Art of War” by Sun Tzu.
- CI has undergone progressive evolution.



# State of the art



- Four levels or stages of CI evolution (Prescott, 1999):

## *Competitive Intelligence Gathering*

which consists of developing skills in information acquisition

60s-70s

## *Industry and Competitor Analysis*

which consists of building a business case for CI, spy image and analytical skill development.

1980

## *Competitive Intelligence for Strategic Decision Making*

which consists of demonstrating bottom-line input, role of information technology, CI technology, international CI, demands vs. supply driven CI and counter-intelligence.

1987 to 2000

## *Competitive Intelligence as a Core Capability*

which consists of managing the parallel process, intelligence infrastructures for multinationals, CI as learning and network analysis.

Recently

# State of the art



CI is implemented in large and small companies, in private and public sector, and within any industrial context; but with different level of success.

Industrial competitive intelligence became more and more important because of:

- ✓ The permanent change in competitive environment
  - The increased level of competition
  - The diversity of goods and services
  - The volatility of opportunities
- ✓ The development of information technology and the role of the Internet



# State of the art



- ✓ The increasing number of conferences, books, articles...
- ✓ The increasing role of Society of Competitive Intelligence Professionals (SCIP)
- ✓ The integration of competitive intelligence in academic courses and professional programs



# State of the art



## Competitive Intelligence objectives / benefits :

- ✓ Detecting market trends opportunities, forces, risks and threats.
- ✓ Processing and combining data to provide new knowledge about competitors, customers and suppliers.
- ✓ Predicting business environment's evolutions
- ✓ Developing appropriate plans to compete successfully
- ✓ Enhancing organization's competitiveness.
- ✓ Predicting influences generated by political changes



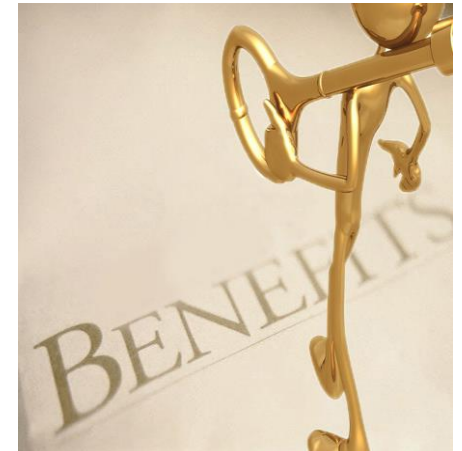


# State of the art



## Competitive Intelligence objectives / benefits :

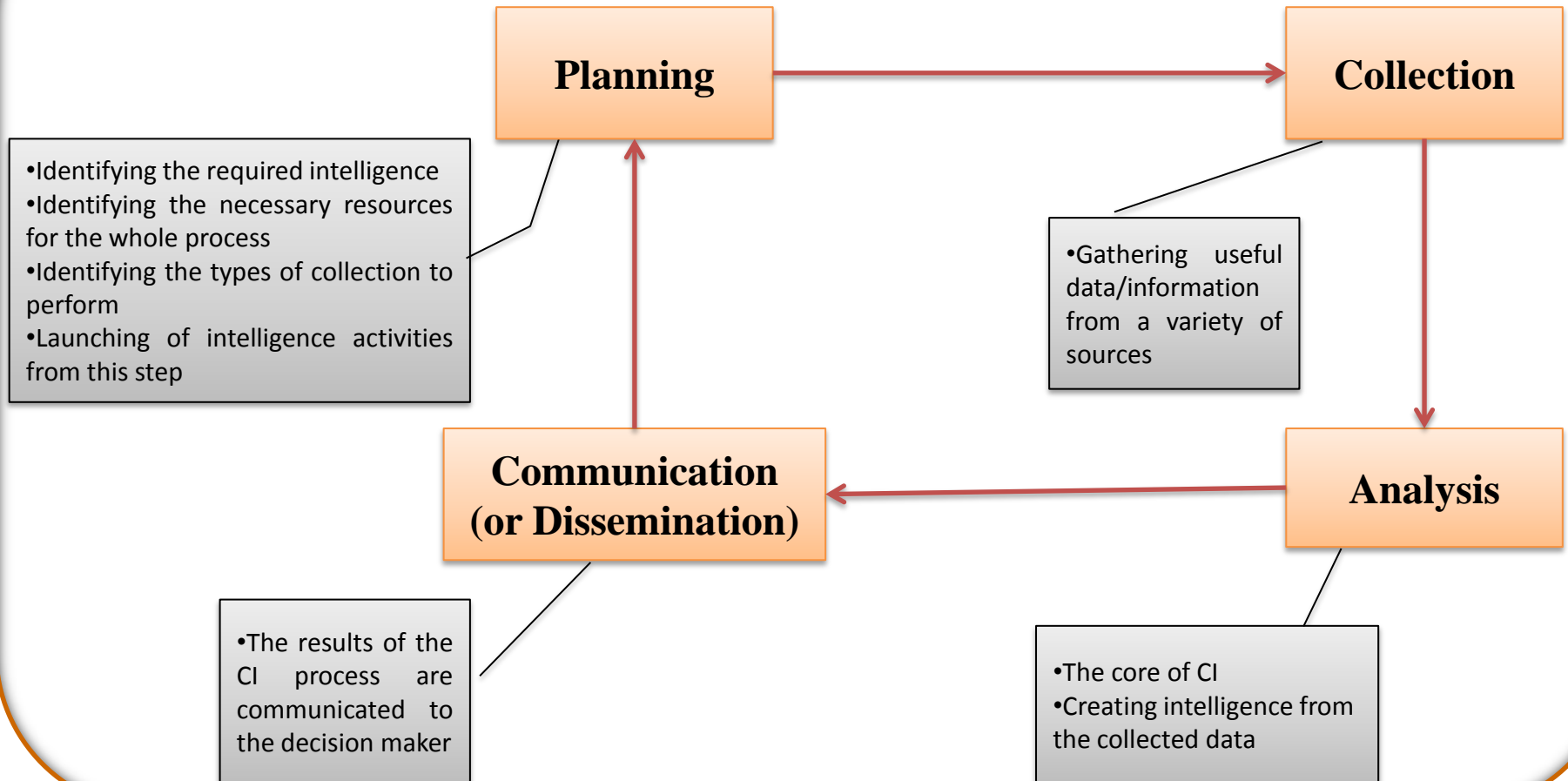
- ✓ Increasing analytical skill for managers and the ability to anticipate moves of the other actors from organization's business environment.
- ✓ Sharing ideas and knowledge inside organization in order to develop new ideas or knowledge.
- ✓ Shedding light on competitor strategies.
- ✓ Improving understanding of external influences.
- ✓ Providing the basis for continuous improvement.



# State of the art



Generally CI process is composed of four steps:



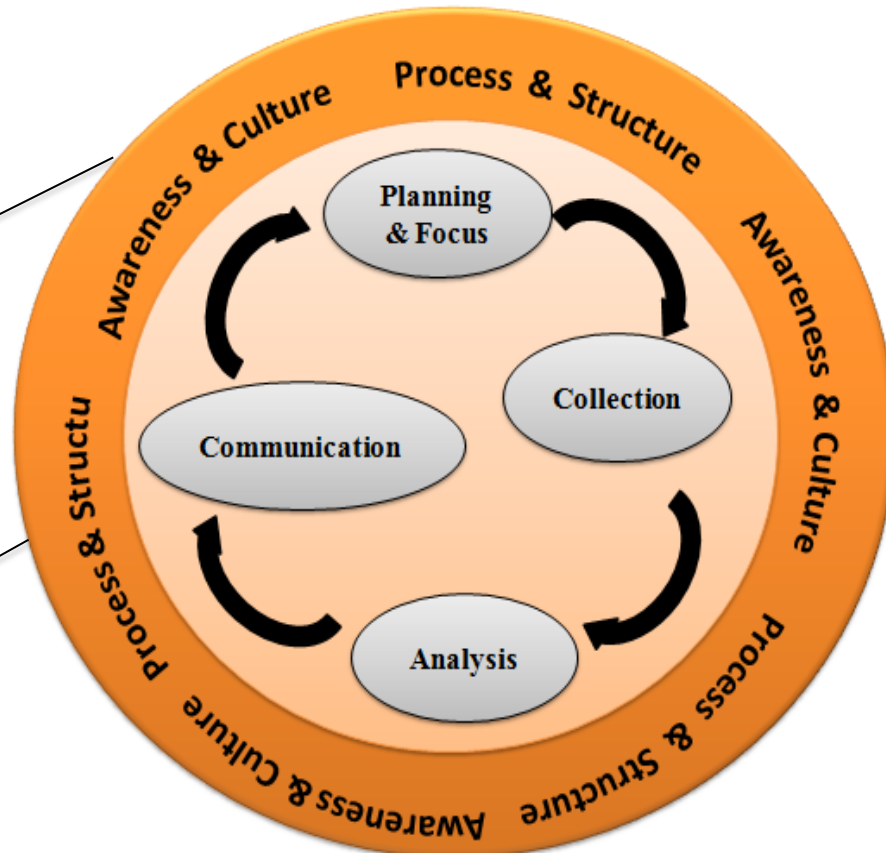
# State of the art



An extended process with continuous activities - United States Central Intelligence Agency (CIA)

- A continuous and a necessary activity
- Ensure the well execution of CI
- Consists of creating the right environment for CI and it requires continuous staff training, emphasizing the importance of competitive intelligence

Defining and installing the appropriate policies, procedures, and infrastructure required by the CI



# Critical Issues

Existing work define the concept of CI and propose a scheme for the CI process and its stages.

There is no work, that touched the practical aspect of the field or developed a complete CI solution that can be delivered to the decision maker. This is due to the difficulty of information collection and competitor decision anticipation.



# Research objective

To develop a method which model competitor preferences and anticipate competitor decision's based on Artificial intelligence (AI) and Multi-criteria decision aid (MCDA) fields.

To propose the pillar of a new knowledge domain that we called: **Multi-criteria Intelligence Aid (MCIA)**



# Proposed Solution

To solve the problem:

➤ We propose to develop a new multi-criteria approach to anticipate the decisions of competitors.

managing large amount of technical data/information in such context and in extracting relevant knowledge for decision-making



manage conflicting criteria in a complex environment

**New domain knowledge: multi-criteria intelligence aid (MCIA).**

# Challenges

To develop a CI method, we face several challenges:

- Some information is not available and the data collection might be difficult.
- The competitor is not involved. There will be no negotiation or validation of the results.
- The preferences of the competitor should be predicted and modeled.
- All stages of the anticipation of the decision will be made in a context of uncertainty.



# Proposed Solution

Fuzzy sets and linguistic variables will be explored.

**multi-criteria aggregation method in the context of uncertainty will anticipate competitor actions**

AI techniques, especially automated reasoning techniques will be explored and an approach will be proposed.

**Method for competitor preferences prediction and modeling.**

The learning techniques of AI and automated reasoning techniques will be explored and an approach will be proposed

**competitor action generation**



# Proposed Solution

**Interest towards combining the two areas is shared by the scientific community :**

Multi-criteria community is interested in combining multi-criteria decision methods with the artificial intelligence techniques

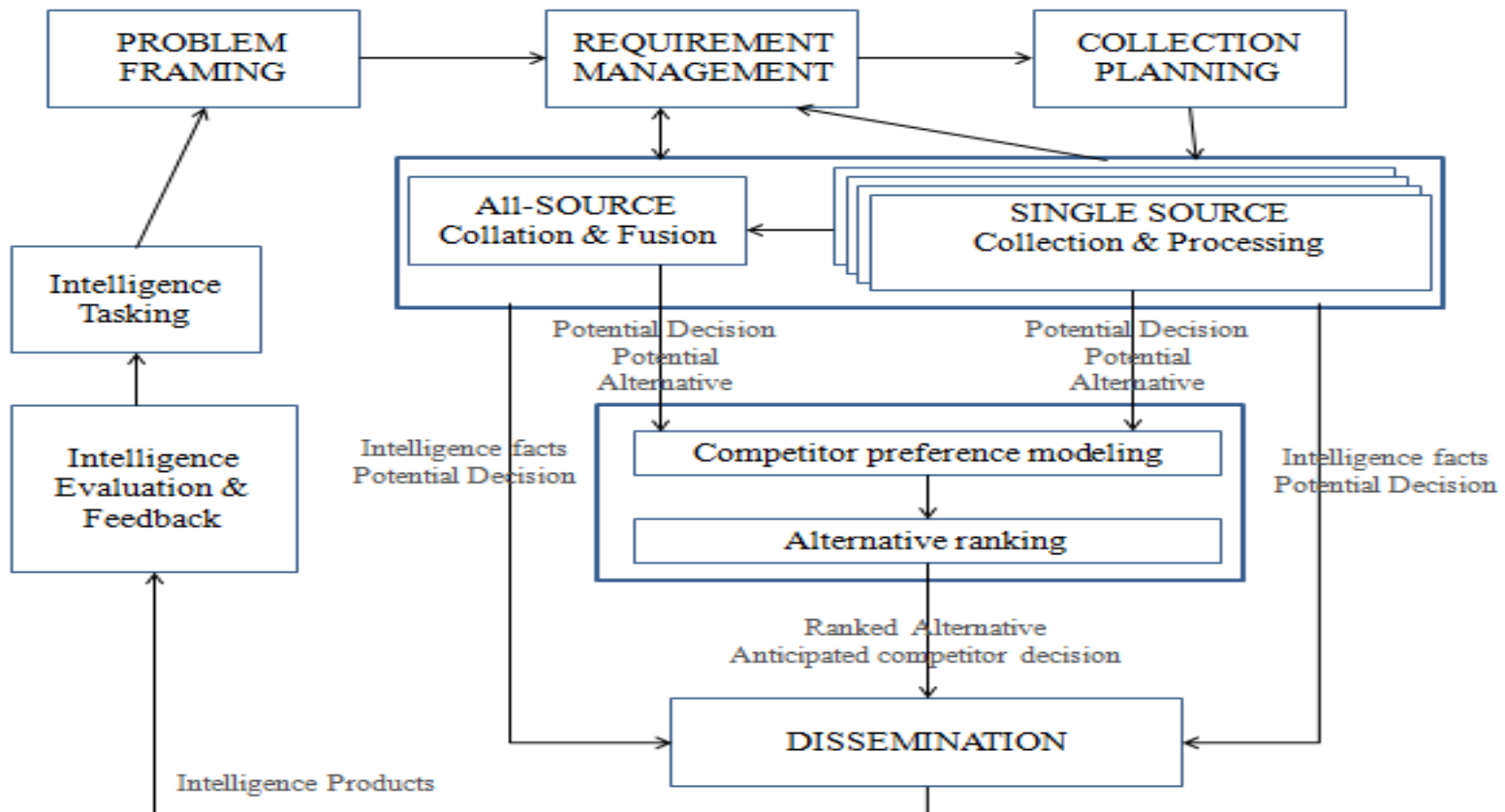
European Working Group on multi-criteria decision has devoted his biannual meeting specifically for AI and MCDA combinations

**New domain knowledge: multi-criteria intelligence aid (MCIA).**

International Journal of Multi-criteria Decision Making" has launched in September 2012 a call for proposals for articles on the theme "multi-criteria decision and artificial intelligence."

# Proposed Solution

**Proposed conceptual model** including the anticipation of competitor decisions as a crucial activity.

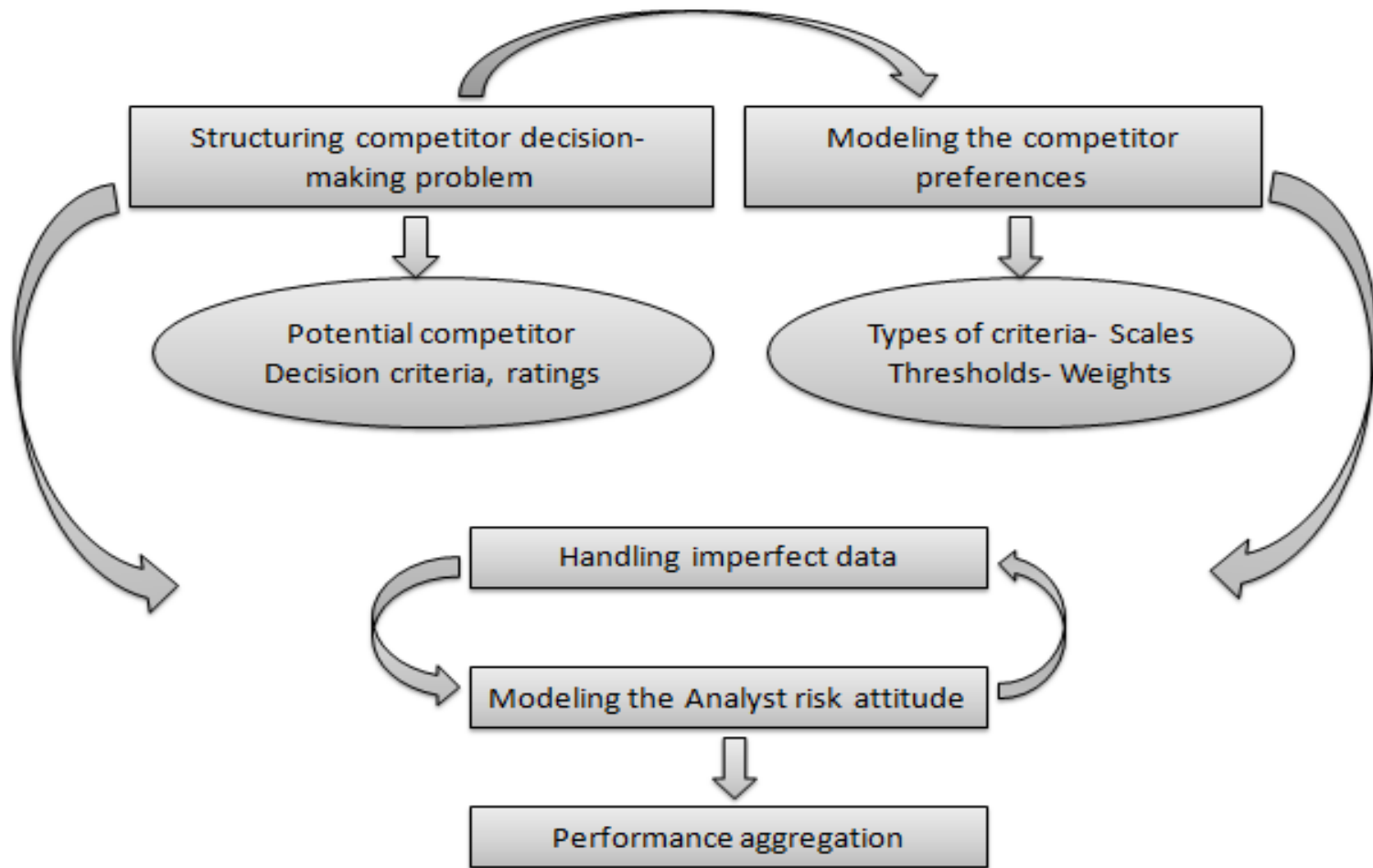


# Proposed Solution

Phase	Sub-phase	Activities
Gather Analyze Fuse	Single Source Collection & Processing	<ul style="list-style-type: none"> <li>- Acquiring <i>raw data</i>;</li> <li>- Sorting, filtering, indexing and organizing <i>information</i>;</li> <li>- Evaluating information reliability and source credibility;</li> <li>- Reasoning (analyzing and processing)</li> </ul>
	All-Source Collation & fusion	<ul style="list-style-type: none"> <li>- Matching together single sources intelligence;</li> <li>- Evaluating the quality of each SS intelligence data/information;</li> <li>- Analysis and fusion to produce <i>competitive intelligence</i>.</li> </ul>
Anticipate	competitor preference modelling	<ul style="list-style-type: none"> <li>- Modeling competitor preferences;</li> </ul>
	CoAs ranking	<ul style="list-style-type: none"> <li>- Structuring competitor's decision-making problem;</li> <li>- Handling imperfect data;</li> <li>- Modelling the risk attitude;</li> <li>- Aggregating performance.</li> </ul>

# Proposed Solution

**Proposed conceptual model** including the anticipation of competitor decisions as a crucial activity.



# Proposed Solution

Phase	Outputs	Methods/Techniques
<b>Single Source Collection &amp; Processing</b> <b>All-Source Collation &amp; fusion</b>	<ul style="list-style-type: none"> <li>- Intelligence facts on competitors, their intent, capacity, opportunities, etc.</li> <li>- Intelligence facts on possible competitor's actions</li> </ul>	<ul style="list-style-type: none"> <li>- Information management and exploitation techniques</li> <li>- Ontologies</li> <li>- Automated reasoning</li> <li>- Rule-based, description logic, case-based reasoning</li> </ul>
<b>Anticipation of competitor decision-making process</b>	<ul style="list-style-type: none"> <li>- Anticipated decision-making process of competitor</li> <li>- competitor preference modelling</li> <li>- Anticipated competitor decisions</li> </ul>	<ul style="list-style-type: none"> <li>- Game theory</li> <li>- Multi-criteria decision aid methods</li> <li>- Fuzzy logic</li> <li>- Automated reasoning to infer competitor preferences</li> </ul>

# Perspectives

In future research, the artificial intelligence techniques, especially automated reasoning techniques will be explored and an approach combining artificial intelligence and multi-criteria decision aid techniques will be proposed.



**THANK YOU !**

To contact the authors

Dhekra Ben sassi: [bensassi.dhekra@yahoo.fr](mailto:bensassi.dhekra@yahoo.fr)

Anissa Frini: [Anissa Frini@uqar.ca](mailto:Anissa_Frini@uqar.ca)

Wahiba Ben Abdeslam: [wahiba.bak@gmail.com](mailto:wahiba.bak@gmail.com)