

# Chapter 35

## The Road to Critical Thinking and Intelligence Analysis

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### ABSTRACT

*In an environment characterized by an ever-increasing flow of data and resulting complexity, the development of intelligence analysis is of core importance. After a brief analysis of three core competences (data processing, empathy, critical thinking), decision making issues are addressed through considering on the one hand cognitive and psychological biases, and on the other hand methodologies based on instrumental rationality. Core factors for the development of critical thinking are then discussed before a specific tool of Game Theory, called Games of Deterrence, is introduced based on bounded rationality. An example of Games of Deterrence's application to critical thinking is given through using these games to model argumentation. Finally, on the basis of the method adopted, a framework is proposed for building a serious game devoted to critical thinking and intelligence analysis.*

### INTRODUCTION

Intelligence analysis is a 'hot' topic due to the acceleration of change and the volume of information flow stemming from the constant progress of information technologies. The activity of intelligence analysis can be considered as the transformation of a set of raw data into meaningful information, which will enable decision-makers who have requested that analysis, to take appropriate actions. Good examples are those concerning criminality or economic intelligence.

Efficient intelligence analysis requires several skills and competences, from understanding and knowledge of specific application fields to the mastering of some information technologies and critical thinking. In turn, as far as critical thinking is concerned, various competences are required, which include methods of both logical and psychological analysis, enabling for instance the determination of cognitive biases (Heuer, 1999).

On the basis of the literature available on each of these topics the present chapter develops a combined approach for developing serious games

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to form experts in intelligence analysis. More precisely, starting from an analysis of relevant competences, the chapter will propose a methodology to support their development accordingly. As addressing comprehensively all issues concerning intelligence analysis is out of scope of a single chapter, we shall focus on key cognitive biases as analysed by Kahneman and Tversky (1979) in their Prospect Theory, and the approaches that should be developed to deal with these. Then, a specific branch of Game Theory, called ‘Games of Deterrence’, which has been already used to model argumentation, will serve as a supporting tool for a serious game devoted to intelligence analysis (Rudnianski, 2012; Rudnianski & Bestougeff, 2008; Rudnianski & Lalonde, 2009).

## RELEVANT COMPETENCES

According to the European Qualification Framework (European Commission, 2008) *competence* means “the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development”. Thus for instance the competences of an Executive MBA include the tasks that the MBA graduate should be able to accomplish as a company top executive manager; i.e., define the vision, the value and the strategy of the firm, take advantage of the opportunities offered by the environment, efficiently manage crises, supervise the company’s organisation and governance, develop corporate social responsibility, team spirit, etc. It can be seen from this example that the capabilities expected from an Executive MBA graduate are diverse: in particular, some require ‘hard’ skills such as the ability to develop a corporate financial plan, while others pertain more to ‘soft’ skills, like leadership, persuasion, etc.

Similarly, what is expected from an expert in intelligence analysis covers a variety of fields. Berkowitz and Goodman (1989) define intelligence analysis as “the process of evaluating

and transforming raw data into descriptions, explanations and conclusions for intelligence consumers”. It follows that the following three fields, representing each one a particular stage in the elaboration of the solution to the issue under scrutiny are of particular importance:

- Data processing
- Empathy
- Critical thinking

## Data Processing

According to the Business Dictionary (2013), data processing can be defined as “operations performed on a given set of data to extract the required information in an appropriate form”. It follows that the operations can be structured under the form of a four stage process:

- **Data Search:** Which consists in looking for data sources that are meaningful with respect to the issue under consideration.
- **Data Selection:** During which the data found in the data sources will be separated between those which are relevant for the issue and those which are irrelevant.
- **Data Connections:** During which connections between relevant data will be built.
- **Data Translation:** During which the connections established between the relevant data will be interpreted with respect to the issue under consideration.

However, such a linear account fails to reflect the complexities of the interplay between these processes. For example, data selection may intervene during data search. Similarly, the information that is looked for at the stage of data translation might impact the connection between data. Furthermore, although data processing looks very much like a hard skill, it includes various subjective evaluations of information, such as meaningfulness, relevance, or interpretations. It has also been

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