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*Full Length Research Paper*

# Refining the objectives oriented project planning (OOPP) into method of informational analysis by objectives

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**After a presentation of the logical framework approach (LFA), also referred to objectives oriented project planning (OOPP), we present our contribution in refining it into the method of informational analysis by objectives (MIAO). This contribution consists of defining new tools that provides elaborate matrix of information that permits the analysis of the informational exchange process between the activities of a project on the one hand, and defining the logic-functional rules of treatments associated to the MIAO permitting us to assure the consistency and hardiness of the analysis on the other hand.**

**Key words:** Project planning, system analysis, objectives oriented project planning (OOPP) method, method of informational analysis by objectives (MIAO).

## INTRODUCTION

The objectives oriented project planning (OOPP) method is considered like a tool of communication, analysis and scheduling of project, whatever is its nature, its situation, its complexity and its sensitivity.

This method is used more and more by several financial backers: World Bank, European Union, Bilateral Cooperation, etc. It is also used to take to terms of development projects of cooperation (Germany, Canada, Belgium, etc) or other. It gave a good satisfaction at the time of its exploitation and several researches have been done very well to develop tools and to prove its strength for the scheduling of projects. The descriptive documentation of the OOPP method indicates that the logic of the OOPP method is not limited in principle to a type of determined problem. Nevertheless, in practice, the method is more appropriated to the following interventions: projects of the technical cooperation and projects of investments with economic and/or social objective (Walter, 1998).

The purpose of this paper is to introduce a method of informational analysis by objectives (MIAO) based on the OOPP method.

This paper can be loosely divided into three parts. First, we present the logical framework approach (LFA) also referred to OOPP. Second, we define a method of informational analysis by objectives (MIAO), while the third presents the logic-functional rules associated to the MIAO of treatments associated to the MIAO.

## PRESENTATION OF THE LFA

The LFA, also referred to as OOPP and in German as Ziel Orientierte Projek Planung (ZOPP) is a structured meeting process. This approach seeks to identify the major current problems using cause-effect analysis and search for the best strategy to alleviate those identified problems (GTZ, 1988). The design methodology of LFA is a rigorous process, which if used as intended by the creators will impose a logical discipline on the project design team. If the process is used with integrity, the result will be a high quality project design. The method is not without its limitations, but most of these can be avoided with careful use of ancillary techniques. Many things can go wrong in the implementation phase of a project, but if the design is flawed, implementation starts with a severe handicap (McLean, 1988; Peffers and Tunanen, 2005).

The first few steps of the LFA are: situation analysis; stakeholder analysis; problems analysis. The document of Situation Analysis" describes the situation surrounding the problem. The source could be a feasibility study, a pre-appraisal report, or be a compilation done specifically "for the project design workshop. Typically, the document describes the problem situation in detail, identifies the stakeholders and describes the effects of the problems on them (Gu and Zhang, 1994).

The stage of "Stakeholder or Participation Analysis" is an analysis of the people, groups or organizations that may influence or be influenced by the problem or a potential solution to the problem. This is the first step to understand the problem. We might say, without people or interest groups there would be no problem. So, to understand the problem, we must first understand the stakeholders. The objectives of this step are to reveal and discuss the interest and expectations of persons and groups that are important to the success of the project (Van Bon, 2006). If there is no agreement between participants on the statement of the problem, it is unlikely that there will be agreement on the solution. This stage of "Problem Analysis" therefore seeks to get consensus on the detailed aspects of the problem. The first procedure in problem analysis is brainstorming. All participants are invited to write their problem ideas on small cards. The participants may write as many cards as they wish. The participants group the cards or look for cause-effect relationship between the themes on the cards by arranging the cards to form a problem tree (Nokes and Kelly, 2007). In the step of "Objectives Analysis" the problem statements are converted into objective statements and if possible into an objective tree. Just as the problem tree shows cause-effect relationships, the objective tree shows means-end relationships. The means-end relationships show the means by which the project can achieve the desired ends or future desirable conditions. Frequently, there are many possible areas that could be the focus of an "intervention" or development project. The objective tree usually shows the large number of possible strategies or means-end links that could contribute to a solution to the problem. Since there will be a limit to the resources that can be applied on the project, it is necessary for the participants to examine these alternatives and select the most promising strategy. This step is called "Alternatives Analysis". After selection of the decision criteria, these are applied in order to select one or more means-end chains to become the set of objectives that will form the project strategy (Peter, 2000).

After defining the objectives and specifying how they will be measured (OVIs) and where and how that information will be found (MOVs) we get to the detailed planning phase: "Activities Planning". We determine what activities are required to achieve each objective. It is tempting to say; always start at the situation analysis stage, and from there determine who are the stakeholders.

## METHOD OF INFORMATIONAL ANALYSIS BY OBJECTIVES

The OOPP method constitutes a tool of a global systemic modelling enabling to analyze a complex situation by a hierarchically decomposition until reaching an elementary level allowing an operational planning. This method, widely used in the planning of complex projects, involves many operators and partners (Annabi, 2003).

The application of the OOPP method to the identification of activities of work stations is important. The management of a system is conditioned notably by ties between its entities-activities (EA), being able to be according to their hierarchical specific objective (SO) level, of results (R), of activities (TO), of under-activities (S), of tasks (T), etc. These ties are materialized in fact by exchanges of information (If) produced by certain activities and consumed by others. The restraint of these ties requires an extension of the method. This new extension permits to identify the manner to execute these activities and to manage the different phases of the system (Lakhoua and Annabi, 2006).

We define an informational analysis method by objectives (MAIO) permitting to elaborate a matrix of information that allows us to analyze the informational exchange process between activities.

### Analysis of the information

The identification and the analysis of the information exchanged by the activities indicate the dynamics and the communication between the elements of the system that we propose to study or to manage (Lakhoua and Ben Jouida, 2010).

So, an information matrix was defined. This matrix establishes a correlation between activities and their information. The information concerning an activity can be classified in two categories (Souissi, 2002):

1. An imported information by an activity is supposed to be available: it is either produced by another activity of the system, or coming from outside.
2. The produced information by an activity reflects the state of this activity. This last information may be exploited by other activities of the project.

In fact, the information produced by an activity can be considered like a transformation of imported information by this activity.

### Constitution of the information matrix

In order to specify this information, we define an information matrix (Table 1) associated to OOPP analysis enabling to determine the relations between the activities

**Table 1.** Information matrix.

| N° | Activity | Information | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **If1** | **If2** | **If3** | **If4** | **If5** | **If6** | **If7** |
| 1 | A1 | 0 | 0 | 1 | 1 | | | |
| 2 | A2 | | 0 | 0 | | 1 | 0 | |
| 3 | A3 | 1 | 0 | 0 | 0 | | 0 | 0 |
| 4 | A4 | 0 | 0 | 1 | 1 | | | |
| 5 | A5 | | 0 | 0 | | 1 | 0 | |

or between the concerned structures that identify the information sources, and determine the manner in which the information is exploited (Ben Jouida, 2008).

To make sure of the quality of information system, we define some logic-functional rules reflecting the coherence, the reliability and the comprehensiveness of the analysis by an information matrix in which the lines are related to activities and the columns to information. This matrix is constituted as follows (Annabi, 2003):

1. The first line is reserved for the first activity A1, the first column is reserved for the first information If1 associated to this activity;
2. If If1 is imported by A1, we inscribe « 0 » in the correspondent box, if it is produced by A1, we inscribe « 1 »;
3. We pass after that to the second information If2 and we associate the corresponding binary character: « 0 » if the information is imported by the activity A1 and « 1 » if it's produced by the same activity;
4. We proceed in the same way until all the information concerning A1 are exhausted;
5. We pass after that to the second line corresponding to the second activity A2;
6. If If1 concern A2, we inscribe the corresponding binary number (0 or 1 according to how this information is imported or produced), otherwise, we leave a blank in the correspondent box, then we add the new information that concern the current activity;
7. We follow the same step as far as exhausting of all activities and of all corresponding information.

We finally construct progressively a matrix of big dimension if the system is complex; it constitutes « 0 », « 1 » and « blank ».

The information matrix defined enables us to establish a correlation between the activities and their information. The procedure of development of the information matrix earlier developed can be described by an algorithm (Figure 1). A lexicon explaining the various codes and symbols constitute and is elaborated with the OOPP analysis. We notes by ($a_{mn}$) the content of a slot of the matrix to M entity-activity (EA) and N information (If). So, m varies 1 to M and n varies 1 to N. $a_{mn}$ can take the value "1", "0" or "white".

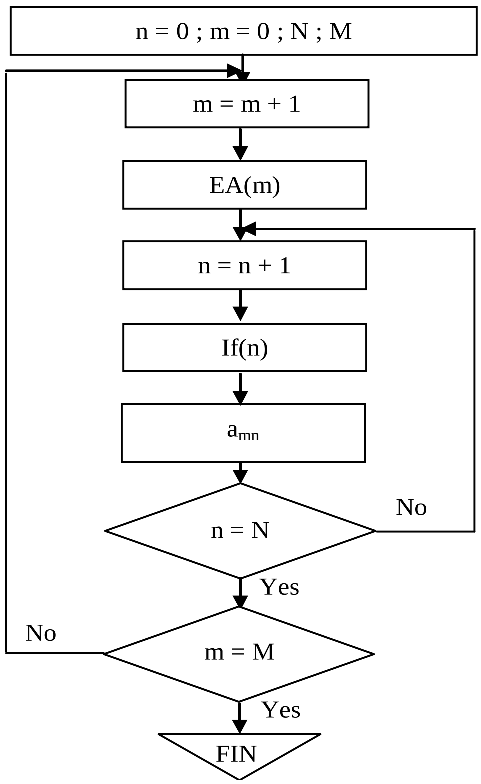


**Figure 1.** Algorithm of the information matrix.

## LOGIC- FUNCTIONAL RULES OF THE MIAO

We indicate in this part some logic-functional rules of treatments permitting us to assure the consistency and the hardness of our analysis (Annabi, 2003). Besides, some treatments permit the characterization of EA according to the criteria of relevance and nature (critical, dependence, source, etc).

### Rules of information

### Rule 1

Information is only produced by one and one activity only, so the corresponding column to information, include only one alone "1"; the sum of numbers by columns is equal to 1.

**Rule 2**

An information is used by an EA at least, so a column includes a "0" at least and (M-1) at most, since one among M EA produced this information.

**Rule 3**

The number of "0" by column gives information on the partage degree and solicitation of information. This is however, for an information data, the number of "0" of its column is raised more, and more information is applicable. We define this effect a rate of exploitation (or indication of relevance of the $If_n$ information) $\tau exp^{-n0}$ expressing the report of this number of "0" in relation to the number total M of EA.

**Rule 4**

An EA produces at least an information (otherwise, not presenting what it worth, besides the fact that it is useless): a line contains at least a "1" and to the more N.

**Rule 5**

The number of "1" by line informs the degree of production of information of the EA. This is however, for an EA data, the more the number of "1" of its line is raised, the more the EA is applicable. We define to this effect a rate of production (or indication of relevance of the EA) τprod-m1 expressing the report of this number of "1" in relation to the total number of N information.

**Rule *6***

An EA consumes more (N-1) information, and the number of 0 by line is then strictly lower to the total number of N information. A line cannot contain a "0" because it is the case notably of activities of data base exploitation and of referential.

**Rule 7**

The number of "0" by line informs the degree of dependence of another entity EA. This is however for an EA data, the more the number of "0" of its line is raised, the more the EA depends on others. We define to this effect a rate of dependence (or indication of dependence of the entity-activity) τdep-m0 expressing the report of this number of "0" in relation to the total number of N information.

**Rule 8**

Entity-activities can be classified according to the density of their "0" and the density of their "1". We distinguish:

1. Activity ‘more production’ and ‘few consumer of information or activity’ "source": it is an activity of which the density δ1 of the "1" is raised, whereas the density δ0 of the "0" is very weak. Such an activity is considered critical since it conditions others strongly, whereas it only depends little on some,
2. Activity ‘more consumer’ and ‘few production of information or activity’ "node": it is an activity whose density δ0 is raised, whereas the density δ1 is very weak. Such an activity is considered integrative, since it transforms a lot of information emanating from other EAs in number that reduces the information of the type applicable indicators. These information are especially used for control panels or for strategic decisions.
3. Activity ‘few consumers’ and ‘few production of information or activity "little appreciable": it is an activity of which densities as well δ0 and δ1 is very weak,
4. Activity ‘fairly consumer’ and ‘production of information or normal’ "activity": it is an activity of which densities δ0 and δ1 are middle,
5. Activity ‘greatly consume’ and ‘production of information or complex’ "activity": it is an activity of which densities δ0 and δ1 are raised. There is often place to analyze such an activity in order to give back it better manageable. This necessity of decomposition could condition the phase of development of the system of information.

**Rules of ties**

**Rule 1**

Ties between EA are determined by the "0" contents in a column and the "1" of this same column.

**Rule 2**

The hardness of the analysis verified all information, so, has a source and the number of parameters of an EA corresponds to the number of "0" of the line corresponding to this EA, in the case where this one contains only 1.

**Rule 3**

Two EA coupled much information produced by one of

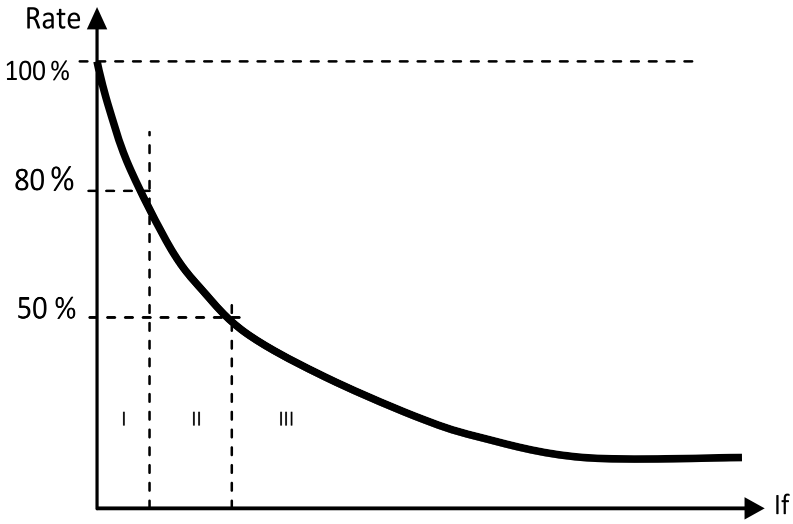


**Figure 2.** Curve of ordering of the rate according to Information/Entity-Activity.

them strongly, so, they are imported by the other. It appears by a stake in correspondence of the "1" of the EA, and of the "0" of the other. As for circuits to electromagnetic coupling, one can define three types of coupling: critical coupling, loose coupling and tight coupling.

## Mathematical formalism

In order to describe these rules according to a mathematical formalism, we adopt the following notations (Ben Jouida, 2008):

1. MIf: Information matrix (M the number of Entities-Activities and N the number of information).
2. $If_n$: nth information, n: 1 to N.
3. $EA_m$: mth Entity-Activity, m: 1 to M.
4. $If_{n0}$: Number of « 0 » of the nth colon corresponding to the nth information $If_n$.
5. $If_{n1}$: Number of « 1 » of the nth colon corresponding to the nth information $If_n$.
6. $EA_{m0}$: Number of « 0 » of the mth line corresponding to the mth Entity-Activity $EA_m$.
7. $EA_{m1}$: Number of « 1 » of the mth line corresponding to the mth Entity-Activity $EA_m$.
8. L($EA_{m\text{-}n1}$ ; $EA_{h\text{-}n0}$): Ties between the Entity-Activity $EA_m$ producing the information $If_n$, and the Entity-Activity $EA_k$ consuming the information $If_n$.

While formalizing some of the stated rules, we get:

- Rule 1: $$\mathrm{If}_{n1} = 1 \quad (1)$$

- Rule 2: $$0 < \mathrm{If}_{n0} \leq (M\text{-}1) \quad (2)$$

- Rule 3: $$\tau_{\text{exp-n0}} = 100\frac{\mathrm{If}_{n0}}{M} \quad (3)$$

- Rule 4: $$1 \leq EA_{m1} \leq N \quad (4)$$

- Rule 5: $$\tau_{\text{prod-m1}} = 100\frac{\mathrm{EA}_{m1}}{N} \quad (5)$$

- Rule 6: $$0 \leq EA_{m0} < N \quad (6)$$

- Rule 7: $$\tau_{\text{dép-m0}} = 100\,\frac{\mathrm{EA}_{m0}}{N} \quad (7)$$

$$\sum_{m=1}^{M} EA_{m1} = N \quad (8)$$

To verify the consistency of the information matrix, we define two relations:

$$\sum_{m=1}^{M} EA_{m} = \sum_{n=1}^{N} \mathrm{If}_{n1} = N \quad (9)$$

$$\sum_{m=1}^{M} EA_{m0} = \sum_{n=1}^{N} \mathrm{If}_{n0} = K \leq N.(M-1) \quad (10)$$

Relations 9 and 10 permit the verification of the consistency of production of lines and columns for the respectively produced information and consumed. Rates τexp, τprod and τdep can provide curves of decreasing pace (Figure 2) reflecting information or the less and less

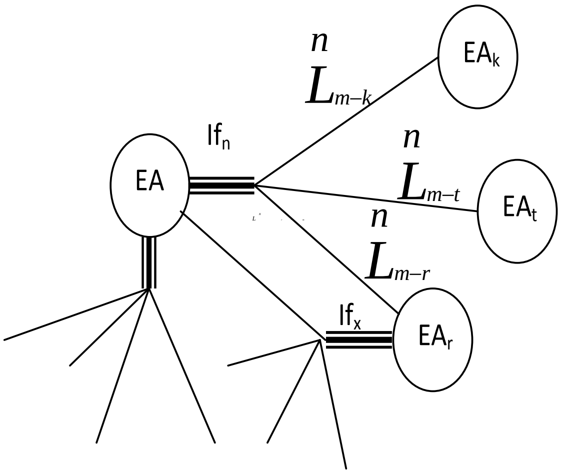


**Figure 3.** Diagram of ties between the Entity-Activity.

appreciable activity entity. We can distinguish various zones of sensitivity.

### Graph of ties

In order to elaborate a graph of ties between the entity-activity, we proceed to a treatment according to the logic presented in Figure 3. So, the tie between EA3 and the two entities EA2, EA5 through information If3 are identified (Ben Jouida, 2008).

The graph of ties gotten between the various entities-activities is represented according to the example that is famous to the tie, through the Ifn information, between the entity-activity EAm source and entities-activities EAk destination, EAt and EAr.

In order to determine this graph, the different link research done through information is given by the algorithm (Figure 4). Hence, to elaborate the information matrix, we start with fixing a column corresponding to an information data. While sweeping the column from top to bottom until the interception of the "1" correspondent to the entity-activity source (s), then we restart the sweep from the first line until the interception of the first "0". This last correspondent to the first entity activity destination (d) bound to the entity source through information. This process of research of "0" is redone, with the increment of a unit to every time that we find an entity destination, until weariness of entities-activities.

Thus, the number of ties through the considered information is given by the number of entities destinations (Ben Jouida, 2008).

### Conclusion

In this paper, we presented a method of informational analysis by objectives (MIAO) based on the OOPP method.

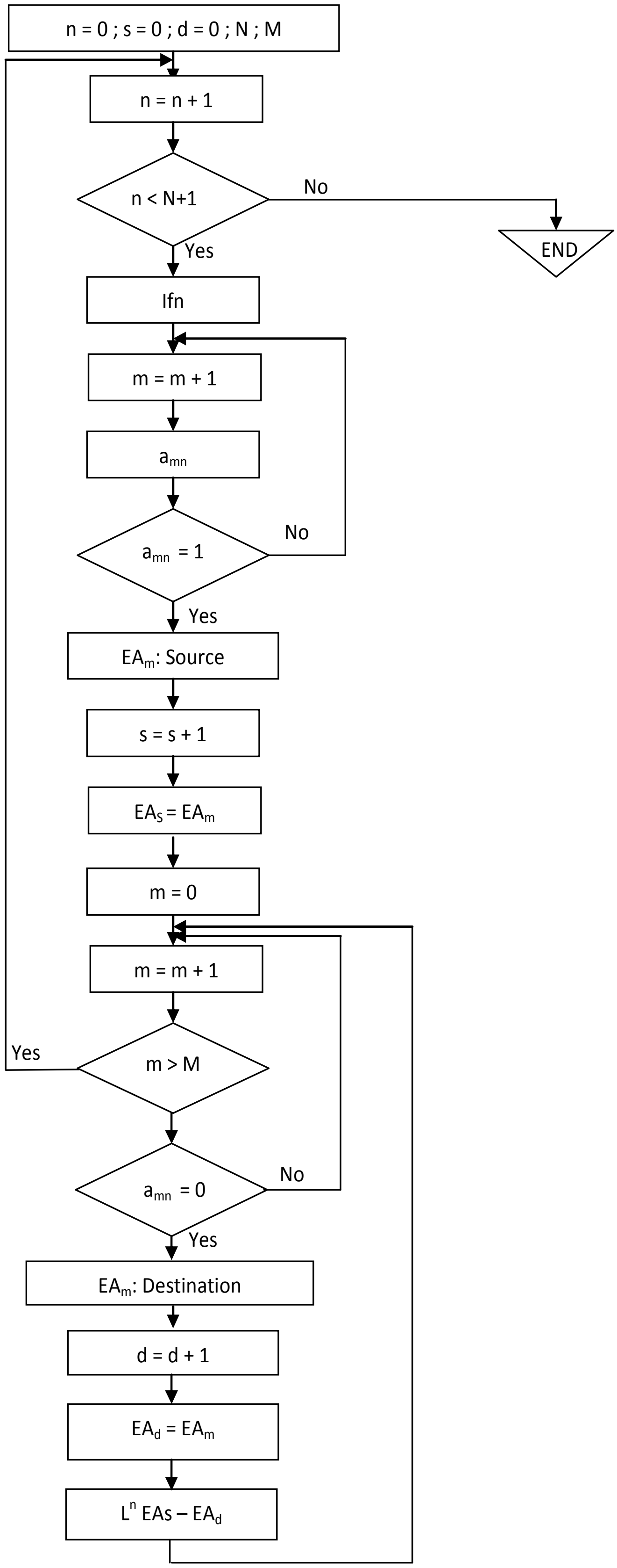


**Figure 4.** Algorithm of ties census between entities-activities.

Our contribution consists on defining an information matrix associated to the OOPP method that allows us to analyze the informational exchange process between activities, on one hand and some logic-functional rules of treatments associated to the MIAO permitting us to assure the consistency and the hardness of the analysis, on the other hand.

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