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Proposal for New Tools of the Method of Specification, Development and Implementation of Project

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ABSTRACT

This paper presents the methods used in information system planning and requirements analysis in particular the Method of Specification, Development and Implementation of Project (MISDIP) based on the Objectives Oriented Project Planning (OOPP). In fact, we present our contribution to define on the one hand a method of informational analysis by objectives (MIAO) and on the other hand a method of representation of the information by objectives (MRIO) and we define its new tools: the matrix of links and the matrix of Structures - Informations.

Keywords: *Information System, planning, MISDIP, OOPP method.*

I. INTRODUCTION

The Objectives Oriented Project Planning (OOPP) which is a structured meeting process seeks to recognize the main current problems using cause-effect analysis and search for the most excellent strategy to ease those identified problems [1].

The design methodology of LFA is a precise process, which if used as proposed by the creators will require a logical order on the project design team. If the process is used with integrity the result will be an elevated quality project design [2-4].

The method is not without its limits, but most of these can be avoided with vigilant use of additional techniques. Many things can go incorrect in the implementation phase of a project, but if the design is imperfect, realization starts with a severe handicap [5].

The object of this paper is to present new tools for the Method of Specification, Development and Implementation of Project (MISDIP) based on the Objectives Oriented Project Planning (OOPP).

II. METHODS OF PLANNING

In the literature, we find many methods that have been used to develop participation in Information System (IS) planning and requirements analysis. We review some methods here for the cause that we believe them to be logically representative of the common kinds of methods in use. The methods include multiple criteria decision-making (MCDM), Delphi, total quality management (TQM), OOPP (Objectives Oriented Project Planning), focus groups, and SADT (Structured Analysis Design Technique).

The objective of the Delphi method [6-8] is to get and collective information from many experts so that participants can place a consent solution to a problem.

A method focus groups (or focused group interviews) relies on team or group dynamics to create as many ideas as possible. Focus groups have been applied for decades by researchers in marketing to value customer product preferences [9-11].

MCDM views requirements assembly and analysis as a problem requiring individual interviews [12-14]. Analysts using MCDM center mainly on analysis of the composed data to expose users' requirements, rather than on resolving ambiguities. The aim is to place an optimal solution for the problem of conflicting values and objectives, where the problem is considered as a set of quantitative values that need optimization.

TQM is a method to contain the customer in improvement process, to progress product quality. In a TQM project, data gathering for customers needs, i.e., requirements elicitation can be done with QFD [15-17].

The SADT method signify attempts to relate the notion of focus groups mainly to IS planning, eliciting information from groups of stakeholders or organizational teams. They are characterized by their use of programmed roles for group members and the use of graphical and structured diagrams. SADT capture a future system's functions and data flows with the functions [18-20].

The OOPP method, the idea of this research work, is considered similar to a tool of communication, analysis and scheduling of project, whatever is its character, its situation, its complexity and its sensitivity [1-5].

III. PRESENTATION OF THE OBJECTIVES ORIENTED PROJECT PLANNING

The OOPP method which is also known as Logical Framework Approach (LFA) is a structured reunion process (Figure 1).

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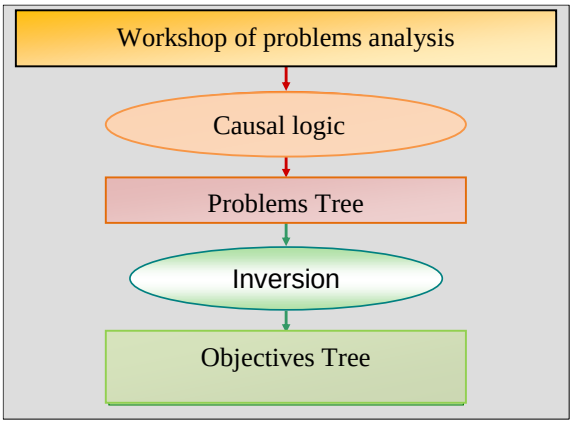


Figure 1. OOPP method.

This approach is composed of four essential steps: Problem Analysis, Objectives Analysis, Alternatives Analysis and Activities Planning. This method seeks to recognize the major current problems using cause-effect analysis and look for the best strategy to ease these identified problems [1-5].

The first step of "Problem Analysis" seeks to get consent on the complete aspects of the problem. The brainstorming is the first practice in problem analysis. All participants are invited to write their problem ideas on small cards. The participants can write as many cards as they desire. The participants group the cards or look for cause-effect relationship between the themes on the cards and arrange the cards to form a problem tree (Figure 2).

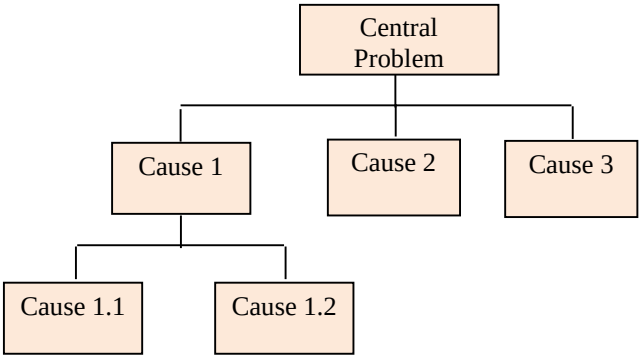


Figure 2. Problem tree of the OOPP

In the step of "Objectives Analysis" the problem statements are transformed into objective statements and likely into an objective tree (Figure 3). Just as the problem tree shows cause-effect relationships, the means-end relationships are showed by the objective tree. The means-end relationships show the means by which the project can do the preferred ends or future desirable conditions.

The objective tree habitually shows the great number of possible strategies or means-end links that could give a solution to the problem (Figure 3). While there will be a limit to the resources that can be useful to the project, it is essential for the participants to look at these alternatives and choose the most promising strategy. This step is called "Alternatives Analysis".

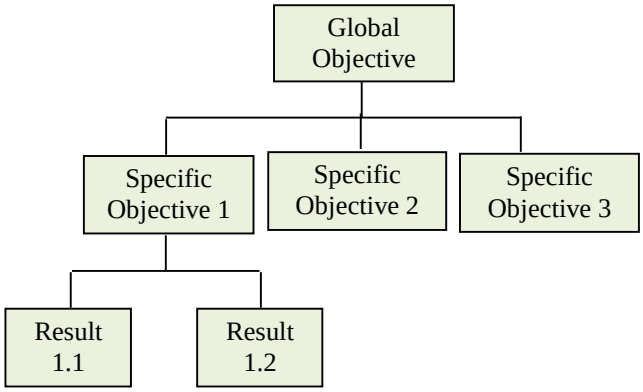


Figure 3. Objective tree of the OOPP.

After selection of the decision criteria, these are useful in order to select one or more means-end chains to develop into the set of objectives that will structure the project strategy.

After defining the objectives and specifying how they will be considered (Objectively Verifiable Indicators: OVIs) and where and how that information will be found (Means of Verification: MOVs) we obtain the complete planning phase: "Activities Planning". We verify what activities are necessary to understand each objective. It is attractive to say; always start at the situation analysis stage, and from there conclude who are the stakeholders.

This method is used progressively by numerous financial backers (World Bank, bilateral Cooperation, Union European…). It is also used to take to terms of development projects, of cooperation (Germany, Canada, Belgium...) or other. It gives a good satisfaction at the time of its utilization and a number of researches have been done very well to increase tools and to show its power for the scheduling of projects [21].

The descriptive documentation of the OOPP method shows that the logic of the OOPP method is not in principle restricted not to a type of a determined problematic. However, in practice the method is more appropriated to the next interventions: investments projects and projects of the technical cooperation and with economic and / or social objective.

We present several studies in IS planning based on the OOPP method that has been presented in a variety of researches:

Researchers, Peffers K. & al. [22], have used information theory to validate the use of a method to assist managers better understand what new IT (Information Technology) applications and features will be mainly valued by users and why and apply the method in a case study of mobile devices concerning the development of financial service applications.

Researchers, P. Gu & al. [23], have presented an object-oriented approach to the progress of a generative process planning system. The system is composed of three functional modules: object-oriented product model module, object-oriented process planner and object-oriented manufacturing facility model module.

Researcher, Peter S. Hill [24], has question the suitability of strategic planning approaches in complex situations and change, using as a case study of the Cambodian-German Health Project. He has confirmed the limitations of

these planning processes in complex situations of high uncertainty, with little consistent information and a fast changing environment.

Researchers, Killich S. & al. [25], have presented the experiences and results of the improvement and implementation of a software-tool for a SME-network in the automotive supply chain industry in Germany. The tool called TeamUp enables the communication of experts as well as the harmonization of discussion groups in order to build use of synergetic potentials.

Researchers, Lakhoua et al. [26], have presented the LFA also referred to OOPP. In fact, the contribution consists in developing this method into MIAO. This contribution consists on defining new tools permitting to realize a matrix of information permitting to study the informational exchange practice between the project activities on the one hand, and defining logic-functional rules of treatments connected to the MIAO permitting us to promise the consistency and the hardiness of the study, on the other hand.

Researchers, Lakhoua et al. [27], have presented the OOPP method and how to define a MRIO. In fact, a MIAO was defined in order to elaborate an information matrix permitting to study the informational exchange process among the activities of a project and to verify the relations between these activities. In order to develop the exploitation of the information matrix more easily, we define the MRIO inspiring of the Structured Analysis Design Technique method and we describe its tools.

Researchers Lakhoua & al. [28], have presented the participative methods in use to develop participation in IS planning and requirements analysis in the one hand and the OOPP method in the other hand. They have presented a review on different applications in a sports meeting using image processing techniques. In fact, they have exploited the OOPP method in order to analysis an athletic event. The aim of the work is to explain and to plan the different steps of the graphics on TV of an athletic event by OOPP formalism.

IV. SPECIFICATION, DEVELOPMENT AND IMPLEMENTATION OF A PROJECT

The OOPP method is considered which is instrument of communication, analysis and scheduling of project, whatever is its nature, its situation, its complexity and its sensitivity [21].

In this part, we introduce some tools of a Method of Informational Analysis by Objectives (MIAO) and a Method of Representation of the Information by Objectives (MRIO) based on the OOPP method [29-33].

The use of the OOPP method to identify of activities of work stations is essential. The management of a system is conditioned particularly by ties between its Entities - Activities (EA), being able to be according to their hierarchical Specific Objective level, of Results, of Activities, of Under-activities, of Tasks... These ties are materialized indeed by relations of information (If) created by certain activities and consumed by others. The restraint of these ties requires an extension of the method. This novel extension permits to recognize the manner to accomplish these activities and to control the different phases of the system.

We define an Informational Analysis Method by Objectives (MAIO) permitting to elaborate a matrix of information that allows us to examine the informational exchange process among activities.

The identification and the study of the information exchanged by the activities designate the dynamics and the communication between the elements of the system that we intend to study or to manage.

As a result, an information matrix was presented. This matrix establishes a correlation connecting activities and their information. The information relating to an activity can be described in two categories:

- An imported information by an activity is supposed to be accessible : it is also created by another activity of the system, or coming from outside,
- The produced information by an activity reflects the status of this activity. This previous 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.

In order to identify this information, we describe an information matrix (Table 1) associated to OOPP analysis enabling to decide the relations between the activities or between the concerned structures, to identify the information source and to decide the manner in which the information is exploited.

Table 1. Information matrix.

N°	Code	Activity	If_1	If_2	If_3	If_4	If_5	If_6	If_7	If_8	If_n
1		A_1	0	0	1	1					
2		A_2		0	0		1	0			
3		A_3	1	0	0	0		0	0	1	
4		A_n									

To make convinced of the quality of IS, we present some logic-functional rules reflecting the consistency, the dependability and the comprehensiveness of the analysis by an information matrix where the lines are concerning to activities and the columns to information.

If the OOPP analysis is well conducted and if the fields of information (imported and produced) are well specified, then the information matrix is simple to construct; but its big dimension is complex. So, we define a Method of Representation of the Information by Objectives (MRIO) and we define its tools.

In order to help the exploitation of the information matrix, there is place to analyze it simply in exploitable under-matrixes. This decomposition can make himself for instance according to the Specific Objectives, Results and the derivative levels.

Moreover, we define a graphic representation of the OOPP formalism, and this while analyzing the matrix of activities in blocks of entity-activities and even as regrouping information in packets of information; what comes back to condense stamps it vertically of information and horizontally.

The wording of a block replicates the entity-activity; its parameters are the informational type and can be classified

in information of entrance, exit and internal circulation.

Inspiring of the SADT method, the blocks are ordered of a hierarchical manner, ties are the informational type: a block is bound to another if there is an exchange of information according to the gait customer-supplier.

The different block representation drifting the decomposition of a superior level permits to show the different ties between the blocks.

A link between two blocks is established when a block produces an information that the other block consumes.

In fact, a tie is represented by an oriented arrow (the block producer to the block consumer) and weighted by the number of information considered.

V. PROPOSAL FOR TOOLS OF MISDIP

In this part, we introduce new tools of the Method of Specification, Development and Implementation of Projects (MISDIP). It's about the matrix of links and the matrix of Structures - Informations.

A. Matrix of links

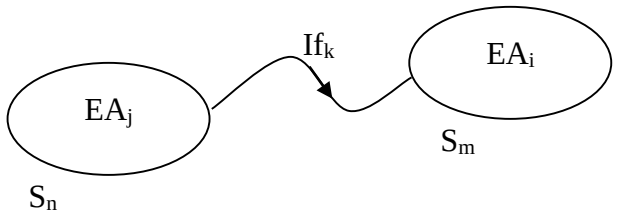
The Entities-Activities (represented by blocks) are bound between them by an information exchange. We define then a matrix of links where columns and lines represent the Entities-activities and where we specify in every compartment the exchanged information; this is the way the "compartment 1-2" indicate that EA0 give to EA1 the information If4, and that the "compartment 4-3" indicate that EA3 give to EA2 information If3 and If6 and that the "compartment 5-6" indicate that EA4 give to EA8, that is to the external environment, the information If7. The Table 2 illustrates the matrix of links for the matrix of information.

Table 2. Matrix of links.

Entité Activité	**EA0**	**EA1**	**EA2**	**EA3**	**EA4**	**EA∞**
EA0		If4	If2	If4		
EA1				If1	If1	
EA2					If5	
EA3			If3, If6		If3, If6	If6
EA4						If7
EA∞						

B. Matrix Structures-Informations

Entities-Activities is realized by a person in charge (and collaborators possibly) belonging to a given structure. This structure is called to realize possibly other Entities-Activities (Objectives, Results, Activities...). This is the way the structure Sm responsible for the realization of Entité-Activité EAi importing an information Ifk is bound (connected) to the structure Sn producing the same information; the connection being of the type "Sn supplies the information Ifk to Sm through its Entité-Activité EAi". Sn produces this information by one of his Entities-Activities (EAj for example) the figure 4 illustrates this connection.



Sn supplies the information Ifk produced by Entity-Activity EAj to Sm for the needs for his Entity-Activity Eai.

Figure 4. Exchange of informations between 2 structures

Having specified the structures responsible for Entities Activities, we define a matrix of structures-information representing the relation of every information with the structures. Moreover the structures are responsible for lots of coherent activities that is they can answer the forms of a job. It is so, as a structure if it is consumer of the information, the corresponding compartment takes one (0) and if the structure is producing of the information (through one of its activities), the corresponding compartment takes the value (1).

Supposing that the structures responsible for EA0, EA1, EA2, EA3, EA4 and EA8 is respectively StrExFrn (external structure supplier of information), Str1, Str2, Str2, Str1 and StrExCl (customer external structure consumer of informations) as indicated in the Table 3, the matrix Structures-information is illustrated by the Table 4.

Table 3. Structures responsibles des Entities-Activities.

Entity-Activity	Structure
EA0	StrExFrn
EA1	Str1
EA2	Str2
EA3	Str2
EA4	Str1
EA∞	StrExCl

Table 4. Matrix Structures-Informations.

N°	**Structure**	**Informations**						
		If1	**If2**	**If3**	**If4**	**If5**	**If6**	**If7**
1	StrExFrn		**1**		**1**			
2	Str1	1, 0		0	0	0	0	1
3	Str2	0	0	1, 0	0	1	1, 0	

4	StrExCl						**0**	**0**

We so notice that from the structural point of view:

- The structure Str1 is:
  - producer of If7 who is exclusively intended outside,
  - producer while being consumer of If1 which is also consummate by Str2. This information contributes then to the internal traffic and it is of the type "x",
  - consumer of If3 resulting from Str2, from If4 resulting from StrExFrn, from If5 and from resulting If6 both of Str2.
- The structure Str2 is:
  - producer while being consumer of If3 which is also consummate by Str1. This information contributes then to the internal traffic and it is of the type "x",
  - producer of If5 who is only consumed by Str1,
  - producer while being consumer of If6 which is also consummate by Str1 and StrExCl. This information contributes then to the internal traffic and it is of the type "y".

VI. CONCLUSIONS

In this paper, we presented the method of specification, development and implementation of project (MISDIP) based on the OOPP method.

In order to present MISDIP, we define the Method of Information Analysis by Objectives (MIAO) and the Method of Representation of the Information by Objectives (MRIO). In fact, new tools are defined in order to elaborate the matrix of links and the matrix of Structures - Informations of MISDIP.

Staring from this case study of defining the method MISDIP discussed in this paper, work is in progress to develop others tools of MISDIP and analyse many industrial applications including agricultural engineering.

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