

DESIGNING AND DEVELOPING “THE INTELLIGENT PROJECT (TIP)” USING THE VIABLE SYSTEM MODEL IN COLOMBIA

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ABSTRACT

The intelliGENT Project (TIP) has been developed in Colombia to improve export capacity in the software industry. The idea is to support the software industry in achieving levels of international competitiveness that enable the commercialization of high quality software in overseas markets.

A reflection of the impact of the certification for internationalize the software industry, considers understanding, solving, evaluating and implementing the TIP project using the VSM. The VSM was used as an organizational design tool for a better understanding of the software sector, and has been useful in developing the internal managerial capacity to adapt to internal and external change and opportunities.

Keywords: VSM applications, Organizational design, software industry certifications.

“THE INTELLIGENT PROJECT (TIP)” A CASE STUDY

I. Understanding the problem situation to generate portable capacity in software development:

1. The Information Technology Sector context

Colombia has been a competitive country in the topic of software development. The Intelligent Project (TIP) was developed in order to generate export capacity in the software industry; to develop knowledge, training and certification of the human resource in the information technology sector, to increase levels of international competitiveness and to assist the demand of the local and international markets in the software industry.

2. In the Environmental Conditions the study of economical, social, political, government and technological variables is relevant.

In the economical the approval to Colciencias budget by the Colombian Government and the Incentives for foreign investment need to be consider. In the social and political conditions unemployment, decentralization and regional development need to be consider. In the government regulations it is important to consider the regulations for the agreement with the Administrative Entity of Resources, with the Minister of Finance Regulations, the Copes document 3072; Connectivity; and the National System of Science and Technology. Also, in the technological conditions the quick development of technological systems, technological alliances, and the technology changes are relevant.

3. The Transformation process: Developed added value in the Information Technology Sector. Knowledge is the main added value in the Information Technology World Industry. The formed human capital is the critical resource in this industry.

4. The Actors, Clients and Owners

Understanding, Solving and Evaluating The IntelliGent Project

ACTORS: IntelliGent Project, Quality Certified Centres, Administrative Entity of Resources

CLIENTS: Beneficiaries are employed of scarce resources and unemployed

OWNERS: Colciencias; DAPRE

5. The Normative Context

The TIP is ahead by COLCIENCIAS (The Colombian National System of Science and Technology) with the Support of DAPRE (the Administrative Department of the Presidency of the Republic).

The programs of National System of Science and Technology are structured by objectives, goals and fundamental tasks which become projects that public or private entities, community organizations or natural people will carry out

6. The Organizations Involved have different responsibilities:

COLCIENCIAS, DAPRE and THE INTELLIGENT PROJECT

II. Solving the problem situation to design and develop “the intelligent project” (TIP) using the Viable System Model

1. The Intelligent Project General Objective

To consolidate a critical mass of Colombians that can have the abilities to be training in updated information technologies. These should be required by the global market, and recognized by the supplier of the respective technology.

2. The Intelligent Project - Specific Objectives

- To consolidate a number of 5000 Colombians trained in the development of software programs and services which guarantees international recognition and quality in the Information Technology World Industry.

- To promote the creation of Quality Certified Centres that have international experience and the capacity to offer different programs of training that allows beneficiaries to obtain certification, in the software development and/or related services

3. The Intelligent Project - Strategies:

- To evaluate the institutions, to select the Colombians; and to register the payment to the Colombian beneficiaries of TIP by the National Government

- To manage the condition plan for the beneficiaries of TIP, that is able to fulfil the requirements.

4. The Intelligent Project –Mission and Vision

MISSION: Training around 5000 Colombians, in certified programs of software development, based on financial and self financial contracts

Understanding, Solving and Evaluating The IntelliGent Project

VISION: Promotion of the strong, consolidate, and competitive Colombian information technology global industry.

5. The Viable System Model as a design model allows understanding a better way to develop, analyze and interpret the challenges and the opportunities of the TIP and the software sector. The following figure presents the different levels of recursion considered in the TIP.

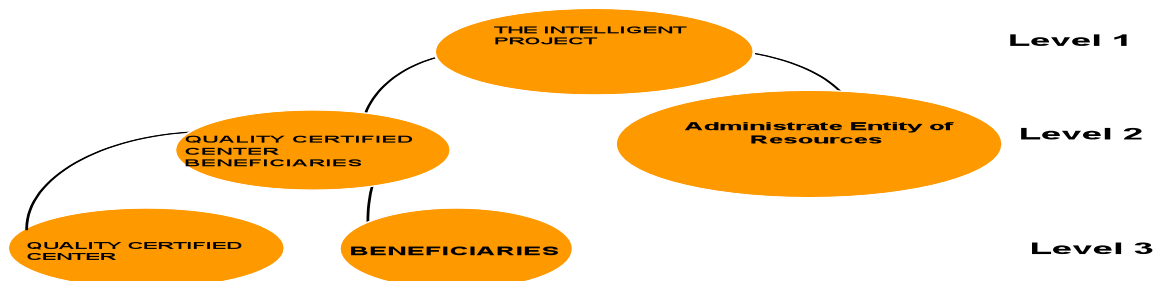
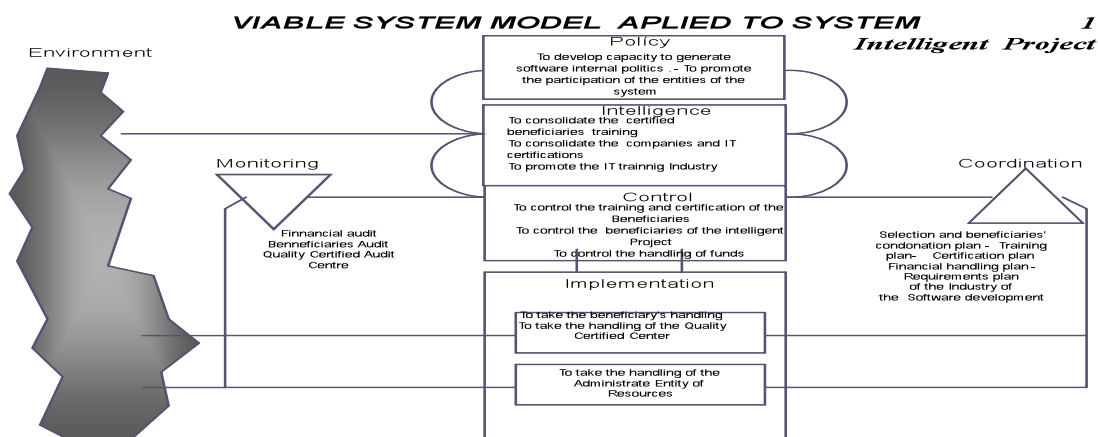


Figure 1 TIP's Recursion levels

The Intelligent Project belonging to the Level 1 is presented in figure 2. It was designed through the VSM. The ideal situation considered what should be offered to the beneficiaries, taking into consideration the potential of the five managerial functions: implementation, coordination, control, intelligence and politics. The understanding of these functions in detail allows to design the appropriate structuring of TIP and each recursion level process.



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Figure 2 Viable System Model Applied To TIP Level 1

In Figure 3 the chain of the beneficiaries' value appears. It is important approaching the project from the demand. This figure allows articulating the different processes necessary for a potential beneficiary in order to be certified.

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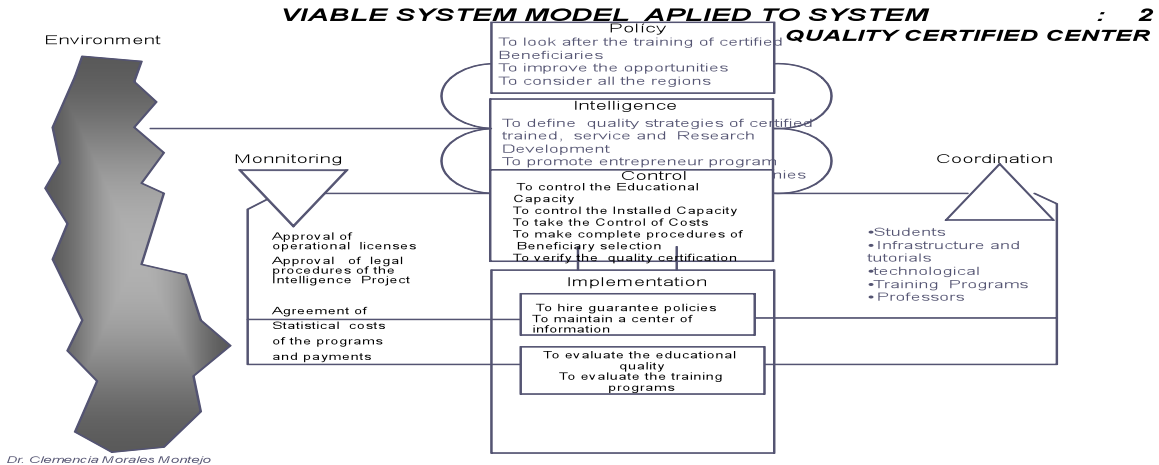


Figure 3 Viable System Model Applied To Quality Certified Centre Level 2

The interrelation of the chain value in each UEN, it is designed through the VSM. For effects of summarizing the case study, only the chain of the beneficiaries' value is presented in the present chapter in Figure 4.

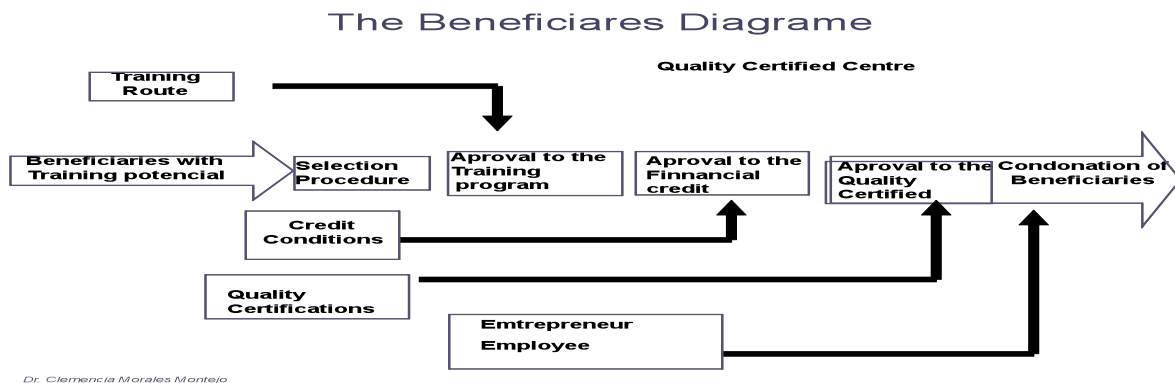


Figure 4. The Beneficiaries Diagram

The VSM allows flexibility in each one of the UEN of the recursion level 2 of the IntelliGent Project. The Figures 3, 5 and 6 help to understand the recursion level 2 of Beneficiaries, Quality Certified Centre and Administrating Entity of Resources.

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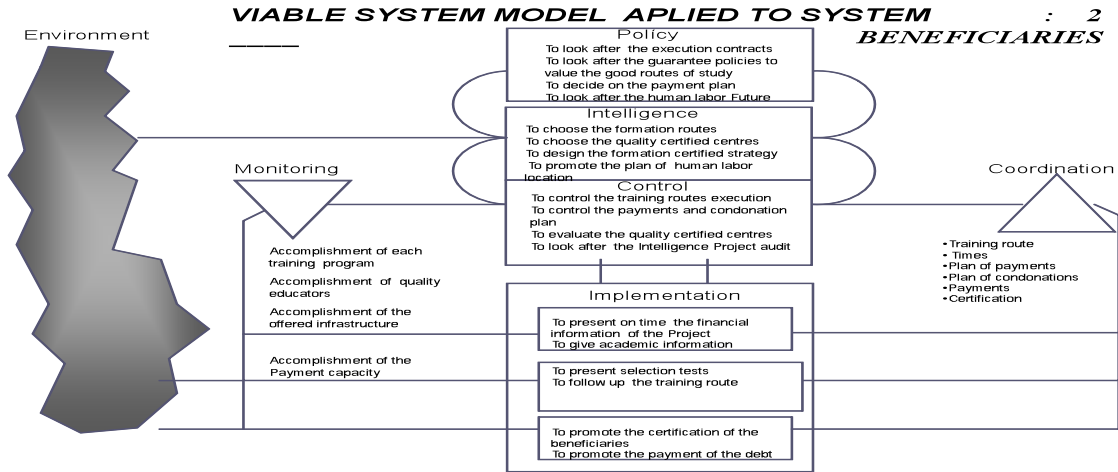


Figure 5. Viable System Model Applied To Beneficiaries Level 2

The Administrative Entity of Resources is the one in charge of the project sustainability in time. Their conceptualization should keep in mind the relationship between what is wanted to offer and its demand on the time. It is taking into consideration in Figure 6.

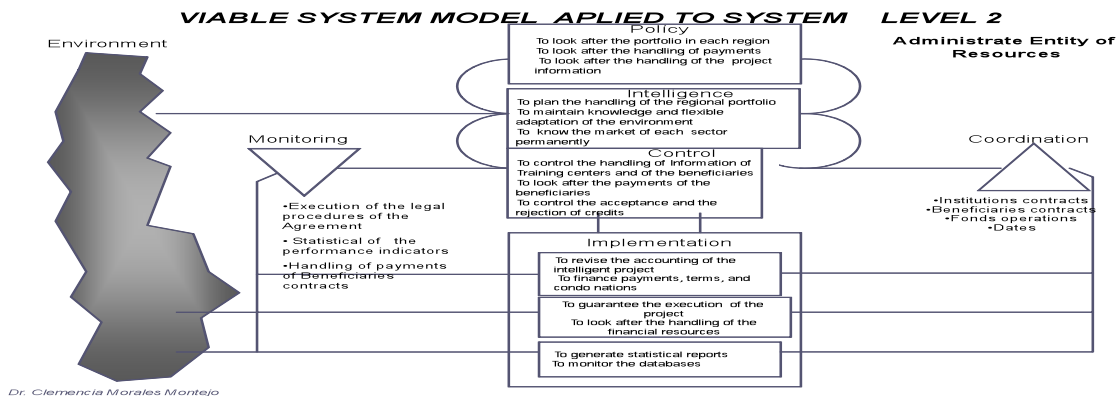


Figure 6. Viable System Model Applied To Administrative Entity of Resources Level 2

III. Evaluating the problem situation to diagnose the TIP, using the VSM

1. The Viable System Model methodology allows TIP's evaluation through:
 - The definition of evaluation approaches through the identification and design of the indicators
 - The periodic evaluation of performance indicators of the Quality Certified Centre, the Beneficiaries, and the Administrative Entity of Resources
2. The VSM allows evaluation of the Quality Certified Centre, the Beneficiaries, and the Administrative Entity of Resources Business Units
 - The identification and definition of selection criteria for Quality Certified Centres and the curricula programs according to academic, organizational and logistical aspects

Understanding, Solving and Evaluating The IntelliGent Project

- The identification and definition of performance indicators that supports technologies and academic audit related to relevant contents, methodologies and technologies
 - The definition of approaches and procedures for the conduction of the Beneficiaries credits
3. The VSM evaluation of TIP as a whole applied to level 0 allows:
- To monitor and evaluate the Quality Certified Centre, the Beneficiaries, and the Administrative Entity of Resources in a Total System.
 - To develop an observatory for the implementation of the Intelligent Project considering a quantitative analysis in relation with return of investment, costs, good distribution of Beneficiaries among others.

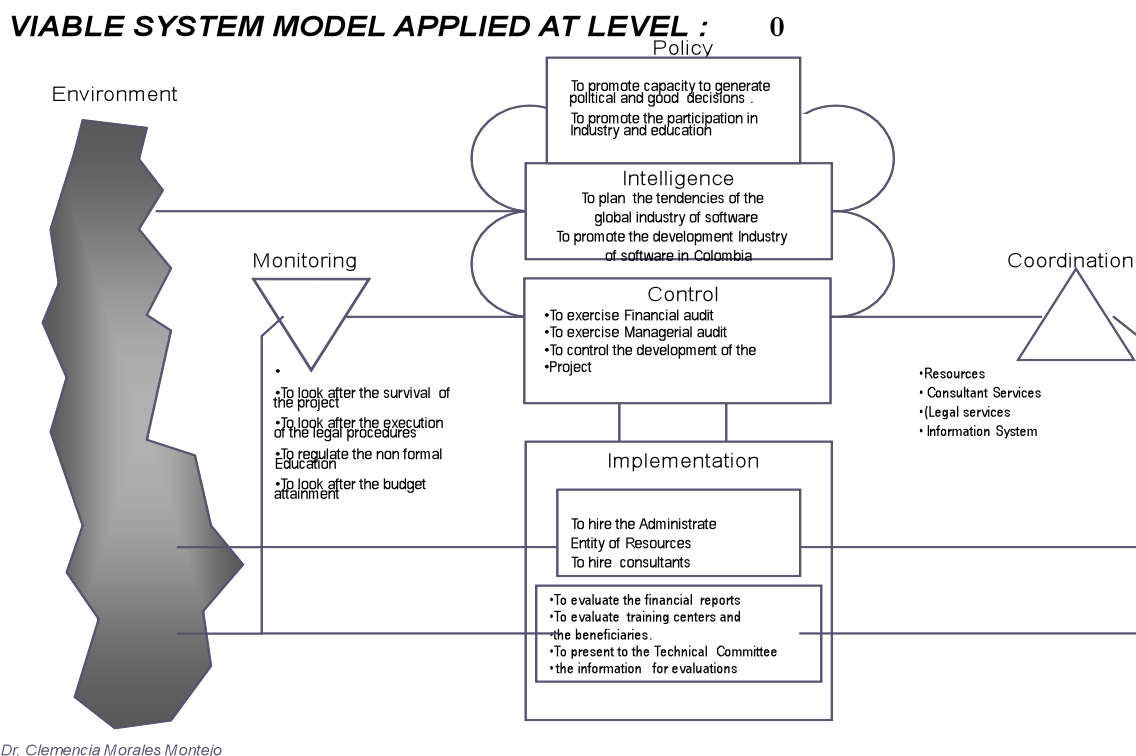


Figure 7. Viable System Model Applied To Level 0

The previous Figure is the result of the development of an appropriate structuring of the project, which should be very well articulated in this Level 0 corresponding to the VSM of the Agreement

IV. Implementing “the intelligent project”(TIP) using a Facilitation Plan

The evaluation of the Facilitation plan through the VSM signs some relevant points. In the following numeral IV, some adjustments have been considered:

1. Government

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- To re-define the Government roll. It has been focused considered different variables and not only the financial budget.
- To approve the training institutions it is difficult to predict the best training standards. It has been focussed in relation to more relevant quality standards
- To evaluate the TIP as a whole. TIP evaluation has been made considering separately indicators (institution, professors' quality, etc.).
- To decentralize TIP in different cities and regions according to the regional investments and quality partners.
- To define a single operator entity for TIP. TIP has been sending from one executor to another.

2. TIP assembly strategies

- To develop an observatory for software development in different platforms (Microsoft, SUN, IBM, Cisco, Novell, Oracle and SAP)
- To define programs and routes of training according to beneficiaries' interests. (Web pages, pamphlets, newspaper and official statements)
- To design the Evaluation System which consider the beneficiaries' evaluation in relation to Quality Certified Centre and the Administrate Entity of Resources
- To define procedures for condo nation of the credits for the beneficiaries.

3. Academic audit

- To give support in the execution of academic audit
- To focus the academic audit in following topics: Information Systems and Networks, Software Development, Internet Applications, Electronic Commerce, Administration and Design of Databases, Graph Design and Multimedia

4. TIP Managerial Systems

- To generate a Managerial Systems that manages TIP as a whole system.
- To design a managerial indicators that feed the Managerial Information System
- To develop an observatory for monitoring the environmental changes (certifications, software development, costs, among others).

5. The Quality Certified Centre

- To define the curricula according to the beneficiaries.
- To define students admission exams according to the curricula.
- To define training routes and certification according to work opportunities

6. Beneficiaries:

- To develop self-study, hard work and responsibility considering the importance of government scholarships.
- To produce periodic evaluation reports

V. CONCLUSIONS

The VSM allows the global visualization of the TIP Project as a whole Evaluation System. It allows the periodic evaluation of the Quality Certified Centre, the Beneficiaries, and the Administrate Entity of Resources through the pursuit of each activity in the different recursion levels reaching the evaluation of the project as a whole. At the same time, allows the external changes an opportunities in the environment, taken into consideration the institutions involved in the different Colombian's regions. Important topics are taken into consideration as survival, innovation, creativity, business

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models, and entrepreneurship. It helps to create and development social responsibility in the formal and informal education of TIP's beneficiaries.

This model should consider the different instances that intervene in the definition of indicators that filter and amplify information feeding the whole evaluation system. This Evaluation System as a whole works as an observatory that allows the permanent evaluation incorporating feedback stages of the TIP as process of organizational learning. It allows the definition of the parameters for measuring the different indicators, by focus those which are important for the team of people responsible for the Integral Evaluation System at national and regional level.

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