Specification of indicators of a national observatory of education system - application to Cameroon education system

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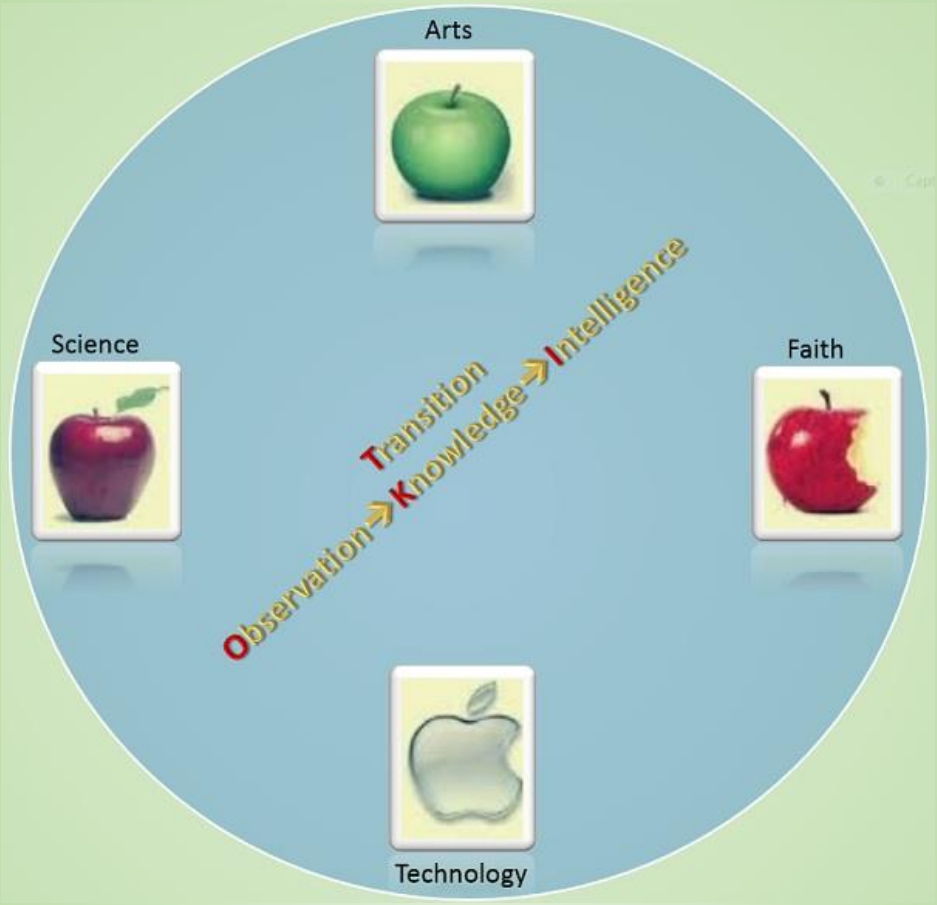

TRANSITION FROM OBSERVATION TO KNOWLEDGE TO INTELLIGENCE

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Specification of indicators of a national observatory of education system - application to Cameroon education system

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Abstract.The main objective of this article is to present the various issues related to specification of indicators of a national observatory for education system. The point of focus of this study will be on the Cameroon education system. We may consider an observatory as a platform for supervision or a guide. Conceptually, it is made up of indicators which shall determine on which base the environment activities of supervision shall facilitate decision making. The diversity and complex nature of an education system, as well as the diversity of the various actors concerned make the conception of the observatory particularly tedious. The focus of the article is on questions linked with the education environment, the human actors involved (teachers, students, decision makers, socio economic organizations) and the evaluation of the education system.

Key words: education system, human actors of the education system, collaborative work, observatory, indicators, users, evaluation, performance.

1. Introduction

The concept of the observatory and indicators which are the bases of our work are going to be presented in order to make their use in our study clear.

Observatory is an "organism for supervision and guidance" and its mission is to observe, check, and analyze the quantitative and qualitative information within the domain of education and training programs in order produce statistics that will serve as instrument for decision making. The observatory is a complex instrument which embodies several domains in education. Its implementation requires the participation of several intervening direct or indirect actors in its domain of application. Its efficiency depends upon the identified indicators.

From the Latin word "indicator", an indicator "is what portrays the responsible element (the accuser), which could be a person, an object, an instruction which alerts……." (DUPASQUIER, 2009). From this fact, its definition and origins have as much importance as its values over time. They are statistics which provide information on the past, present trend and anticipate on that of the future in order to assist decision makers to take decisions which will bring forth the attainment of the expected results.

The indicators are our major concern because they constitute the base of the observatory. Their adequacy shall permit the establishment of the goals that need to be attained by the supervisory and piloting structure. The issues relating to their application is inseparable from that of the actors collecting, processing the information and interpreting them.

The education system is a domain which generates a wide range of information. In order to contribute to its performance, decision makers need facilitating tools to providing access to relevant data. Looking at the increasing rate of information generated in the education

environment, and the complexity associated with their exploitation, information must be collected, organized, treated, evaluated, stored and broadcast to human users in order to help in efficient decision making. The national observatory of an education system shall be one of those efficient tools for efficient decision making. Meanwhile, in the course of its application, we notice the complexity linked with the elaboration of indicators, the issues related to the end-users as well as the interpretation of the results as stated in (DAVID, 2013) "a problem shared does not necessarily imply shared understanding of the problem". A wrong interpretation of the indicators shall lead to a wrong decision. Our approach consists in presenting issues that concern notably the user (decision maker), interpretation of indicators, and the control applied to the decision resulting from the use of the observatory.

2. Education System in Cameroon [7]

Its French and British colonial heritage, Cameroon has two education systems: the English system and the French system that coexist in each retaining its specificity in evaluation methods and certifications.

Cameroon's education system is managed by four different ministries:

- The Ministry of Higher Education;
- The Ministry of Employment and Professional Training;
- The Ministry of Basic Education and
- The Ministry of Secondary Education.

Despite this diversity, the State appears to be the main organizing institution of education.
Defines the system of education;

- Adopt programs and textbooks;

[7] Kolyang, Fleur Nadine Mvondo Mvondo, Les Technologies de l'Information et de la Communication au service de l'enseignement : l'exemple camerounais, Editions CLE, 2013

- Lays down the procedures for creating, opening, operation and financing institutions and private training institutions;
- Control institutions and private training institutions;
- Regulates the systems and methods of student assessment and students and organizes official national examinations and year academic throughout the national territory.

The increase of the number of students in the higher education since the 1990 has led to the bursting the single university and the creation of other state universities without good monitoring.

This has led to the deterioration of education, frequencies too many repetition and drop-out studies. Even more harmful, given the demands of both quantity and quality from the employment market, this has caused a high rate of unemployment.

Cameroon's education system faces several problems, including:

- The high enrollment rate but the dropout rate also.
- The unemployment rate is low but the underemployment is very high
- Inadequate training and employment
- The bursting universities leading to the degradation of the quality of training
- The absence of a coherent system of vocational training.

3. Definition of the indicators

The chosen indicators show “a set of objective and structured information, given the available statistical data, to contribute effectively nourished and coherent reflection on our educational system". It is not useful to have a multitude of indicators. This will not be the length of a dashboard that will make its relevance. Data collection can be costly in time and resources.

SUMMARY OF KEY INDICATORS OF EDUCATION FROM THE REFERENCE YEAR 2005											
INDICATORS	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
MOBILISATION OF PUBLIC RESSOURCES											
Part of education in the budget	16,30%	17,4%	17,9%	18,4%	18,9%	19 ,4%	19,9%	20,5%	21,0%	21,5%	22,0%
ACCESS AND EQUITY											
School enrollment rate	16%	17,5%	18,0%	18,4%	18,8%	19,1	19,4%	19,7%	30,0%	40,3%	50%
Access rate	95,30%	98,4%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Completion rate	56%	64	68%	72%	76%	80%	84%	88%	92%	96%	100%
Gender parity index	0,85	0,88	0,91	0,94	0,97	1	1	1	1	1	1
INTERNAL EFFICIENCY											
Average repeat rate	26%	21,1%	18,9%	16,7%	14,4%	12,2%	10%	10%	10%	10%	10%
Student/teacher ratio	57,1	54,4	53,0	51,6	50,3	48,9	47,5	46,1	44,8	43,4	42,0
% of teachers and supervisors trained in skills-based approach	0	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
% teachers ans supervisors pedagogically recycled	0	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Rate of availability of essential textbooks for students											
QUALITY AND SUITABILITY											
% of students in science and technology	33,4%	34,3%	34,7%	35,5%	35,9%	36,2%	36,6%	36,9%	36,9%	37,2%	37,5%
% of students in distance/E-learning	0	0	0	0	2,5%	4,8%	7,0%	9,2%	11,2%	13,1%	15,0%
% employability after training	7,5%	10,5%	11,9%	13,2%	14,5%	15,6%	16,8%	17,9%	18,9%	19,9%	20,8%
% qualified jobs in relation to with training											

4. Issues on the education environment

In an environment where knowledge is globalized and increased competitiveness, policy makers in developing countries have set deadlines for emergence, for which Cameroon has set her own to 2035. This will mean significant improvements in the quality of educational systems. However, if unanimity seems set about identifying problems, it is far from being the case with regard to the action. Recognize that the system suffers from inefficiency is not enough to put the key actors to agree on appropriate indicators and means to implement to achieve the goal.

Regular international surveys evaluate and rank the education systems according to their educational performance (PISA8, PIRLS9, ESLC10 ...) with basic knowledge (science, math, and reading) as indicators. International survey does not give a right picture of performance of education system. Publication of the results of this international assessment can account for governments and citizens of different countries, the state and the evolution of performance of their education systems. Based on this assessment, governments may or not consider reforms, improvements in their education systems. Governments can also organize themselves an evaluation device to control their educational systems. Indicators should think from the beginning of the action and this from two simple questions: what do I want to change the current situation? What it seems efficient to do to set up for this change, in other words, by what means can I expect to change - improve - the current situation?

However, they are not unanimous in their ability to achieve the desired objective, which is the performance of the overall system. Incorporating the specific cultural and socio-economic contexts, each country identifies and defines its own performance indicators. This remains a daunting task since the education system turns out to be complex with a large number of entities interacting with each other. This framework complexity makes forecasting difficult over time. Reform strategies that have produced the desired results are very rare, for example the reduction of size of the groups, new programs and different pedagogical approaches. We believe that the reason is in the choice of performance indicators. Some goals are easily measurable than others such as enrollment, the professional insertion rate, the class repetition ... However, other objectives are more difficult to measure, such as the improvement of well-being at school, the fight against discrimination ... because it is continuous actions or feelings.

[8] Program for International Student Assessment
[9] Progress In International Reading Literacy study
[10] European Survey Language Competences

Specification of indicators in line with the general objectives allow the definition and deployment of a monitoring policy.

To measure the performance of a system such as education, it is necessary to choose appropriate indicators. Performance indicators will be an instrument that provides quantitative information concerning the results achieved in the activity in relation to objectives set in advance. Grouped as dashboard, they are a management tool. They should therefore be carefully selected with the objective to provide an accurate reflection of the activity; quantifiable to ensure effective monitoring; simple to understand and standardized to facilitate interpretation and decision making; the number of indicators should be limited to allow focus to the basics.

5. Issues related to the user

A project such as the establishment of an observatory requires the intervention of several human actors. Working together raises a number of challenges at each stage of the project.

– **From information collection**

Each actor perceives a phenomenon based on his cultural and thematic background as well as his personal and professional constraints. We believe it will be necessary to:

- Define the scope of observation within a common framework. It will be difficult to regroup data if information collection correspond to specific logic
- Involve partners' reflection in the light of technical and relational context. Indicators that are imagined solely will have to be redefined. Alone, one cannot master all the contours of the problem

In a context where conflicts of common interest are frequent, the actors may tend to manipulate information according to their own environment with their specific conceptions and understanding. Based on the fact that "a problem shared does not necessarily presume shared

understanding of the problem", it will be necessary to envisage the process of a collaborative policy.

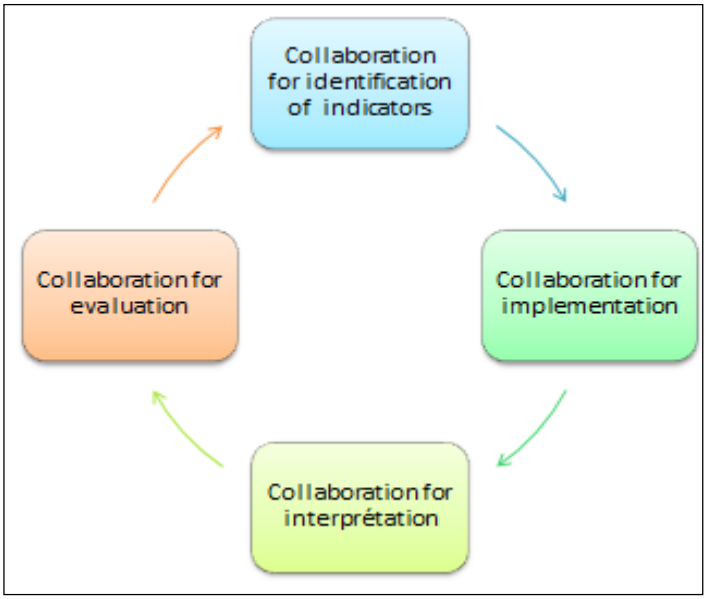

Figure 1 : Collaborative policy

According to ODUMUYIWA (2010), within of collaboration, participants share the same views and work together to achieve the set goal. On the one hand, understanding of the problem is shared. On the other hand, the involvement of each collaborator is ensured. As such various stages of the work of the observatory will be performed more consciously; the processed data handled with rigor and objectivity. When anyone feels concerned, he is more engaged. Collaboration is therefore necessary at each stage of implementation of the project.

– **On the interpretation of results**

Let's take the case on the measure of school attendances rates and identify the services concerned with education in Cameroon: MINEDUB[11], MINESEC[12], MINESUP[13], and MINEFOP[14].

Each of these ministries wants to know the rate of school attendance in Cameroon. The problem here is that they all do not have the same definition of the rate of school attendance since they belong to different services. As such several rates could be calculated of which each could appear legitimate in the eyes of each actor.

It therefore becomes fundamental from this example to define indicators by limiting their mode of exploitation and the interpretation which may prevail. Actors must then specify their expectation from the observatory and also the appropriate mode of interpretation of the retained indicators. When considering implementing a performance strategy, there are many different strategies that one can consider. In order to decide on which to use for analysis and which indicators to retain, all stakeholders must be consulted. Because of the diversity of opinions that may arise, it is sometimes hard to minimize simultaneously all the risks even when most of the potential benefits are given. Decisions may need compromise between requirements which are sometimes contradictory.

The choice and definition of indicators should take into account the objectives of each stakeholders. The consideration of these objectives will take into account their respective contexts but also their sources of information. Actors must specify what they expect from the observatoryand specify the appropriate mode of interpretation of the indicators. The usefulness of indicators (figure 2) is summarized best by Deming's wheel, an illustration of the quality method PDCA (Plan-

[11] Ministry of Basic Education
[12] Ministry of Secondary Education
[13] Ministry of Higher Education
[14] Ministry of Professional Training

do- check –act). Four stages, each leading to the other end by producing a virtuous circle.

Indicators should give a reliable image of the object observed so as to instill confidence. However it should be noted that several risks are related to indicators:

- The choice to highlight the most reliable image of the object;
- Delay to provide information which may be considered crucial ;
- Issues related to data acquisition for producing the indicators (system or human problem).

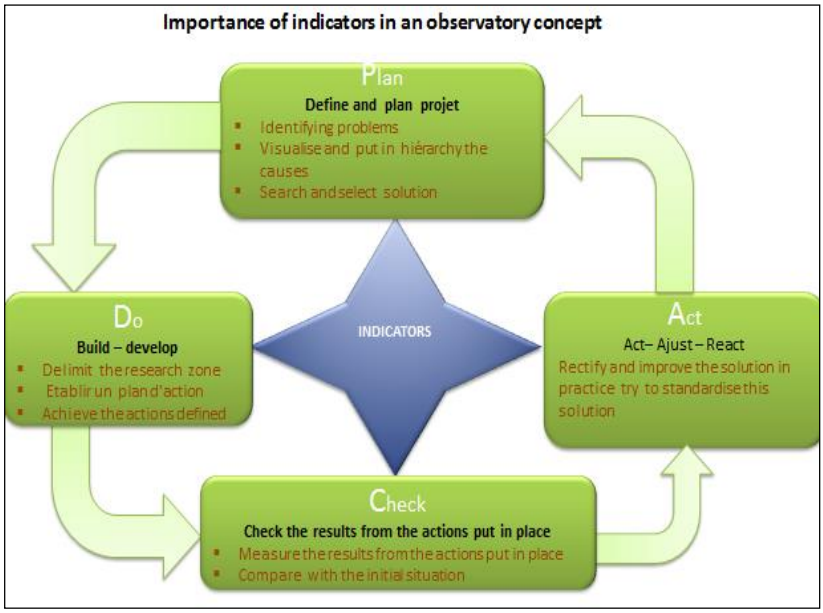

Figure 2 : Importance of indicators in an observatory platform

6. Issues related to the evaluation of results

Though information is just to help ensure that best decisions are taken and the agreed objectives are achieved, it is essential that the former appears exact, complete and objective. It is the role of the decision makers to determine the best solutions.

In order to guide them, decision makers need to be confident on the impartiality and accuracy of the information provided. Unfortunately,

the situation is such that the actors involved in the implementation of the observatory do not always understand that their role is limited to providing advice. For example, they sometimes avoid giving decision makers results on strategies or ignore signs of growth in a particular sector, because according to them, this might lead to reduction of attributed resources for their service within the organization or a threat to the post they are occupying instead of recruiting more staff.

Each project must be followed up and the results evaluated. Follow up activity is a continuous function to ensure decision makers monitor the impact of the indications particularly on the progress or lack of progress in achieving the expected results.

The evaluation as to allow it to access objectively the progress in achieving an effect.

Similarly, the feedback is essential for improving the efficiency and effectiveness of the action taken. This evaluation shows the gap between the expected results and that obtained. This is a means of monitoring what has been achieved and what is left to be accomplished to achieve the expected results. Two factors are important from the evaluation of the project:

- The status of the situation and the specific efforts made within a specified period of time;
- Future trends that will refine plans and increase the capacity of anticipation in the intermediate orientations.

If evaluation is needed, it must be emphasized that it is essential that it be performed by an independent structure, different from that of actors and decision makers. This is necessary for removing the possibility of concentrating on personal opportunities rather than on the global objective. The independent organ would play a sort of counter-power to ensure the effectiveness and the efficiency of the projects. On the one hand there would be the project and all stakeholders and decision makers, and on the other side there would be an independent

organ that oversees the operation of the project and advice the decision makers on how to achieve the defined targets (figure 3).

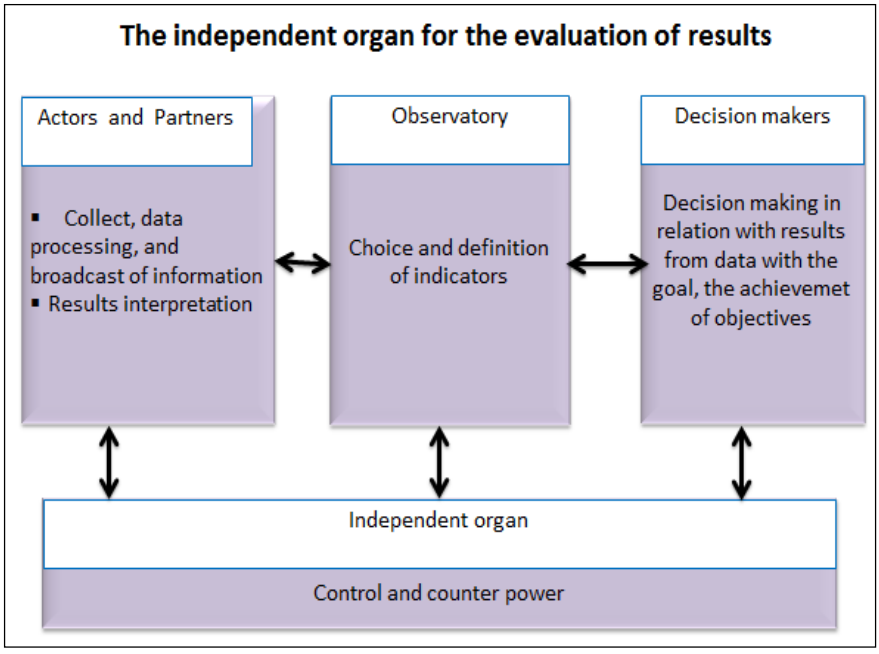

Figure 3 : The need for an independent organ for the evaluation of results

7. Conclusion

We of e presented various issues related to the implementation of an observatory for decision making, (issues related to the environment, the user and the evaluation of results). It is clear that the choice and specification of indicators are crucial in for developing an observatory. Poorly chosen or poorly defined indicators can provide an incomplete or inadequate representation of observed objects, and thereby distort decision making.

Solutions to the issues raised can be provided through collaborative work. Indeed, all the figures (1, 2, 3, 4) illustrate the central role of collaboration between stakeholders and between institutions without which the realization of a work such as the implementation of an observatory cannot succeed. A collaborative work goes well beyond individual action.

PIQUET (2009) said that there is collaboration when “an organized group of actors guides and negotiates collective interactions to an end which everyone knows cannot be achieved by a single actor”. Individual contributions then have meaning only in their integration, merger and all other not by their mere juxtaposition. The mutual engagement of stakeholders engaged in coordinated effort to perform the same task, jointly solve the same problem, and actually require greater interactivity and the human factor (respect, solidarity, trust and motivation) becoming important.

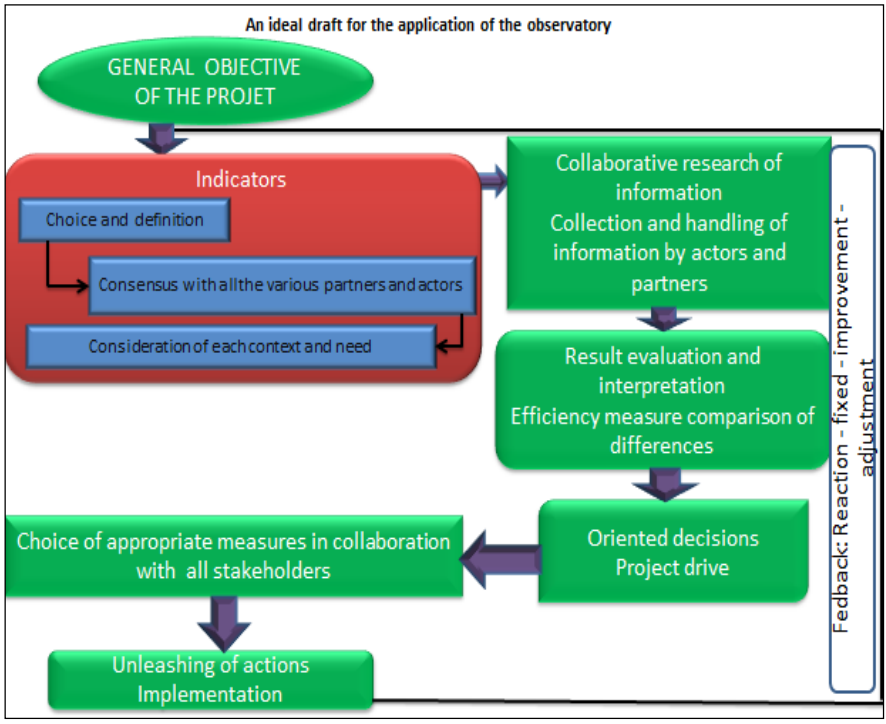

Figure 4 : An ideal draft for the application of the observatory

The success of a project such as that of the establishment of a national observatory for education that involves several departments through a collaborative work requires mutual consultation. For effective and efficient performance, it would be preferable that

evaluation be carried out by an independent organ to safeguard the objectivity of the project.

The diagram of the implementation of an observatory (figure 4) shows central role os collaboration and makes it the hub on the flow of information, which is essential to build confidence in the group. When there is feedback from the base to summit, and from the summit to the base, the problems are diagnosed and effective decisions can be made at the appropriate time.

To the issues related to the specification of the indicators identified is added the problems of information sources. Indeed, how are the relevant sources of information identified faced with the multitude of internal and external stakeholders involved in the education system? How can it be defined, the scope of interconnection of the various sectors interacting within the education system and have a direct impact on the evaluation of its performance?

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Some scientific fields that are currently receiving more attention both from scientific communities and in the general public are competitive intelligence, smart city (intelligent city), and territorial intelligence. Common to all these fields are the concepts of information, information systems, knowledge, intelligence, decision-support systems, ubiquities, etc. The advantages for industries (production and service industries) and governments (federal, state and local governments) cannot be overemphasized. This resurgence is due to the impact of technologies for dematerialization of objects and human activities.

Since the term “intelligence” is central for the theme of this conference, there is need to specify its meaning that we are using for the conference.

Intelligence is a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a broader and deeper capability for comprehending our surroundings—"catching on," "making sense" of things, or "figuring out" what to do.

Individuals differ from one another in their ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought. Although these individual differences can be substantial, they are never entirely consistent: a given person's intellectual performance will vary on different occasions, in different domains, as judged by different criteria.

From this definition, it is obvious that intelligence in a way or the other rely on the process of **observation** (comprehending our surroundings) and ensuring that the observation is transformed into **knowledge** ("catching on," "making sense of things”, or "figuring out what to do”).

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