The Strategic Relationship between Technology and the Success of the National Development Programs: The Case of Egypt

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Abstract

Growth and development have always been powerful and motivating forces for people, business and nations. One can say the old saying " you are either growing or shrinking, there is no middle ground." The country development aims to create and implement strategies that achieve both economic and societal value for better future. One of the critical issues in learning, learning and learning, and the role of knowledge science and technology in the development process. Brainpower, the soft side of technology, is becoming an organization's most valuable asset and conveys a competitive edge in the market place. Only countries that make use of their science, technology, knowledge, capabilities and expertise will succeed in a dynamically competitive environment and achieve desirable future development. The real challenge, however, is how to apply successfully the two sides of technology (soft and hard) and focus on strategically on the priorities of development process. The 2004 Nobel prize Winner in Economics: Professor Edward Prescott, Arizona State University, states that the difference among nations in development is on how to conduct their technology towards clear and specific objectives rather than wasting their time criticizing the reasons of failure. Thus, Egypt, in its quest for success and desirable development, must face the real challenge of application of both sides (soft and hard) of knowledge, science and technology in the society. Life is no longer simple, one cannot anymore just hope that "things will work themselves out". Egypt is challenged to become strategic thinker rather than wishful thinker, if it desires to achieve future development and ensures prosperity and modernization to its people.This research aims to provide a composite picture of the critical relationship between knowledge and technology and future development programs. In addition, an integrated strategic methodology is introduced to build the necessary requirements and what aught to be done for achieving future development of Egypt.

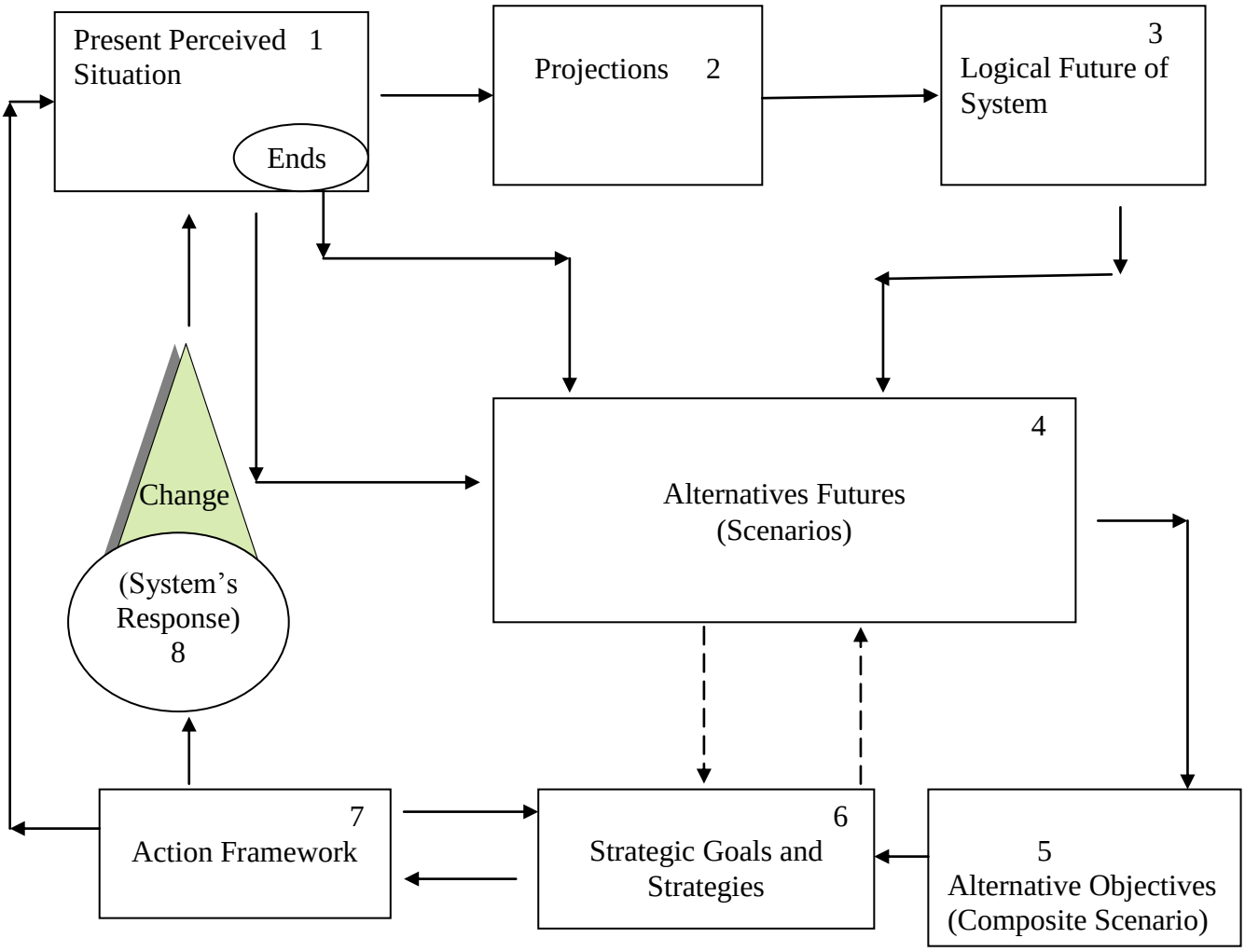
I. Introduction and Overview

The twenty-first century has begun and newly emerged challenges have shaped their forms and directions in our today's societies. Developing Countries are at one of their most significant stages in history. Global competition has become a way of life. Changes in technology, science, knowledge, international affairs, business practice, and organizational social responsibility are causing decision-makers to reexamine their methods and objectives, as well as place increased emphasis on sustainable development programs, effective leadership and knowledable brainpower.Economic development does not account only for growth but includes other factors that ensure prosperity in the country. These factors are technological, market, institutional, economic, ecological, demographic and political. All should contribute to sustain the prosperity of economic development in a given society. Also, future development aims at the efficient propision and use of instruments likely to create promising changes in the above factors through education, health care and jobs in relation to the expansion of investment with the creation of a viable future development programs.(Driouchi and Azelmad, 2004) Recent research has recognized the role of technology and science (knowledge) in future process of development by being a global public good (Stiglitz, 1998, 2003)

The 2004 Nobel Prize Winner in Economics: Professor Prescott, states that the degree of economic development stages of nations depends largely on how these nations conduct and apply technology, science and knowledge in their societies. The future development programs of a country are functions of its technology, science, knowledge, management leadership modes. The success or failure of such programs depends, a great deal, on the capability and ability of management leadership, its behavior and the way of thinking and future outlook. Leadership's role is responsible for building learning climate, shared vision and challenge prevailing mental task. It is also responsible for building organizations where people are continually expanding their capabilities to shape their future for desirable outcomes. Shakespeare once said: " Some are born leaders, some achieve leadership, and some have leadership." Also, strategic human resource knowledge is considered, thesedays a valuable asset and a competitive advantage factor for any sustainable development.

Thus, Egypt, in its quest for successful future development, must redesign its destiny through strategic thinking towards effective leadership knowledable human resources, conducting appropriate technology and science to ensure the desirable prosperity of its people.

Strategic Multistage System Planning Methodology



2.The Role of Technology and Knowledge in Economic Performance

Driouchi and Anders conducted a regression analysis of the effects of knowledge (technology, science, etc.) on aggregate economic performance using data from the United National Development Program (UNDP) and the World Bank for four groups of countries during 1995-2001. the results indicated that knowledge is a key driver of economic growth for each group of countries. Also, variation in economic performance among these groups may be related to the timing of investment in education, R&D, and information technology, as well as economic policies that affect trade and foreign direct investment. (Driouchi and Anders, 2003) In Recent years, a great deal of research on the role of technology, science and knowledge in future development and its impacts on nations growth and prosperity have been conducted by many scholars and top authorities in the interdisciplinary fields. The research findings are significant and useful for countries which want to enrich their knowledge, technological capability and ability profiles and adopt the appropriate market competitiveness factors for desirable growth, performance, and prosperity. Factors such as infrastructure building, missing institutions establishment, human and natural resources investment, socio-cultural development, image positioning, consumer-driven, quality focused, motivation, ethics, communication, loyalty, etc. are critical for future development reality.

3. Major Trends in Technology (Knowledge) Components and Development Indicators for Egypt:

A number of cross-cultural empirical research in developing countries repealed that the overall development performance indicators are related directly to the role of science, technology and knowledge in societies. (Driouchi and Azelmad, 2004)

Such indicators can be briefly grouped as follows:

1. Population and labor force;

2. Life expectancy at birth and health issues;
3. Income per capita;
4. School enrollment;
5. Secondary and tertiary enrollment;
6. Gross tertiary science enrollment;
7. Qualification of human capital;
8. Researches in R&D;
9. Patents granted to residents;
10. Trade in high technology and technology achievement;
11. Telephone network;
12. Number of computers,
13. Internet hosts and users;
14. Cultural attributes (i.e., radio receivers, television receivers, books, journals and newspapers, other cultural factors, etc.);
15. Illiteracy in the country; and
16. Unemployment in the country

There are critical indicators group which can be briefly measured as follows:

1. The human development and trends;
2. The human freedom and democracy;
3. Gender empowerment measure;
4. Economic freedom and diversity;
5. Corruption perception and practice;
6. Human poverty levels;
7. Urbanization rate;
8. Health system performance indicators;
9. Environment climate and performance; and
10. Knowledge overall performance

4. Strategic Multistage Systems Planning Methodology

This research aims to provide a composite picture of the critical and close relationship between technology, science and knowledge and future development of a given country such as Egypt. Thus, a strategic multistage systems planning methodology is introduced to build the necessary requirements, and what ought to be done for achieving a bright and successful future development in Egypt. The methodology consists of three stages and seven steps composed of various internal "phases" as follows:

STAGE I Construction of a Reference Projection

Step 1: The Present Situation
Step 2: Projection of Present Situation.
Step 3: The "Logical Future" of the System which Determines the "Critical Continuous Problems "

STAGE II Construction of the Normative Plan: What Ought to be Done?

Step 4: Alternative Futures Design (Scenarios)
Step 5: The Composite Scenario and Setting Objectives

STAGE III Construction of the Strategic Plan: What Can be Done?

Step 6: Designing the Tactical and Organizational Plan: What Will be Done?
Step 7: Modifying the Plan Through Field Testing and the Continuous Adjusting System (CAS)

STAGE I: Construction of a Reference. Projection

The initial planning task consists of the construction of a Reference Projection, whose basic purpose is defining the interactive problems that might be found in today's situation in a country.

Step 1:

It will represent an extrapolation of present societal trends (e.g., cultural, social, economic, political; increased urbanization; static, increasing or decreasing rates of population growth, agricultural production, industrial output, state of technology and science, etc., according to present trends) and yield a picture of what a social system (e.g., a country, a city, a company, etc.) will be like at various points in the future (10, 20, 30 years) if there are no planned interventions during its evolution, namely if growth and development remain uncontrolled.

Step 2:

The basic projection can be constructed to show three future levels of events: (i) optimistic, (ii) pessimistic, (iii) most likely (logical future).

Step 3:

From the three future levels one can determine the true nature of the critical continuous (chronic) problems that are latent in the present-i.e. those which are to remain severe problems far into the future which will require special attention. From such a map of the situation, it becomes possible, then to begin to design appropriate scenario, which will reveal in a general way the types of interventions (policies) that should be considered

STAGE II: Construction of Normative Plan: What Ought to be Done?

The following task is developing the Normative Plan. The formulation of such *a* plan consists in the setting of desired "ends", "objectives", and "goals".

Step 4: Designing Alternative Future (Scenarios)

The main procedure for "end-setting" is that of the visualization of alternative desirable futures that one is capable of conceiving in replacement of the "Logical Future" obtained by building the Reference Projection. Once the Reference Projection has been constructed, the question becomes how to change it to gain desired or preferred outcomes. This is done by "willing" other patterns of evolution, hence other outcomes. The vehicle that serves accomplish this procedure is called scenario, meaning judgmental definition (and description) of alternatives.If more than one scenario has been developed, then one obtains a set of alternative futures. Such futures differ from the logical future in the sense that they are willed rather than extrapolated; they represent the results of imagined volutaristic interventions into the current situation

Step 5: The Composite Scenario and setting objectives

The next step can be taken by integrating the scenarios (alternative futures) that were found to be acceptable (desirable, preferable) into *a* Composite Scenario. This scenario attempts to bring together the major developments foreseen in the fields of politics, economic, attitudes, technology, science, urbanization patterns, and other similar dimensions of the generally accepted future insofar as they are relevant to the planning being done. The Composite Scenario needs to be worked on until it can be said that it represents the state or outcome toward which the decision-makers want the whole system to evolve. In analyzing the Composite Scenario, it will be also necessary to clarify the most important trade-offs {i.e. the costs to other values in terms of implementing any specific decision), thereby clarifying for the decision-makers the best options that are open to them, as well as specifying the kinds of situations which could or should be selected as objectives to be pursued. The completion of this stage of planning is what is called the "Normative Plan". The Composite Scenario defines what ought to be done.

STAGE III: Construction of the Strategic Plan: What Can be Done?

Once the overall image of the desired future has been clarified in terms of objectives to be pursued and of the situation that is relevant to them, planning enters the "how" phase. This generally consists of the determination of the means that will be needed, and of the best--most efficient, most economical, most direct, etc.--strategies that could be adopted to reach the objectives. The guiding concept of a strategy is the goal. The development of alternative strategies, their selection and ordering under specified goals, is the core of Strategic Planning. It is at this stage that the whole process begins to be bounded by analyses of what the system can do. The important aspect of Strategic Planning is the Control Scenario, wherein the characteristics of the future situation are then projected backward into the present illuminating the present situation from a new angle of vision. The Control Scenario both adjusts and enriches the feasible image that is taking shape as the planning process moves forward.

Step 6: Designing the Tactical and Organizational Plans: What Will be Done?

Tactics are often defined as activities needed to implement strategies. Either the system must be reorganized to define (at the tactical or operational level) interventions--i.e. policies--or a special instrumentality must be designed and set in place as part of the system to carry out such policies and control their manifold short-run effects from day-to-day. The design (and management) of these instrumentalities belongs to "organization planning" which involves also the design of new institutions. In conjunction the phases of this task define what, under surrounding circumstances, i.e. recognized constraints, will actually be done. The forgoing work will yield a general plan, which will organize the overall objectives and define the trade-off relationships between them. In other words, it will tell to what extent one may pursue one objective at what cost to other objectives, and will thus enable one to seek a balanced policy for the maximum realization of all of our objectives taken together. Thus, an order of priorities in planning and implementation, becomes established.

Step-7: Modifying the Plan Through Field Testing and the Continuous Adjusting System (CAS)

It is both possible and highly advisable, after completing all the above work to subject the conclusions reached to a survey of selected sets of decision-makers chosen by the Interest Party. In light of the findings obtained in the survey and adjusted to what emerges as the real views and desires of decision-makers.

This method of adapting findings to authoritative options can be iteratively continued to change the basic plan as it is being implemented, thereby keeping it flexible and dynamic. The following Figure illustrates the multistage strategic systems planning methodology and its various steps.

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