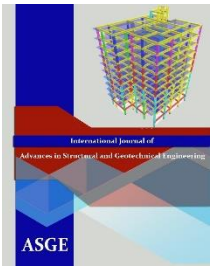

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DYNAMIC BALANCED SCORECARD FOR REAL ESTATE DEVELOPMENT ORGANIZATIONS

Amr Abdel-Latif[1], Ahmed Mohamed[2], Mohamed Marzouk[3]

[1]PhD Candidate, Structural Engineering Department, Faculty of Engineering, Cairo University, Egypt.

E-mail: amr_saad69@hotmail.com

[2]Assitant Professor, Structural Engineering Department, Faculty of Engineering, Cairo University, Egypt.

E-mail: ahmed_s_eldieb@yahoo.com

[3]Professor, Structural Engineering Department, Faculty of Engineering, Cairo University, Egypt.

E-mail: mm_marzouk@yahoo.com

ABSTRACT

Real Estate development organizations are working in an environment that is associated with uncertainties due to many internal and external inherent risks. Further, their structure and operation systems are complex which make them more prone to catastrophes' events. Accordingly, an effective performance measurement system must be built in order to shield these organizations from the negative impact of these specific risks. The standard balanced scorecard is the most popular technique used for measuring performance, but it has many flaws within that hinder it from being fully operative. System dynamics modeling technique is very effective in dealing with complexity within systems, thus integrating it with balanced scorecard will overcome these specific flaws. The paper presents a proposed dynamic balanced scorecard oriented for real estate development organizations in order to measure, control, and upgrades their performance. The model provides detailed system description, identifies key driving factors, and performs a standalone policy analysis. The outcome of the model should enhance the quality of the decision-making process within the organizations toward any adopted strategy.

Keywords: Real Estate Development, Performance Measurement System, Balanced Scorecard, System Dynamics.

INTRODUCTION

Housing sector contributes by 5% of Egypt's GDP and its work force consists of 1.5 million workers and represents 8% of all workforces in Egypt. It is assumed to be the main actor in many industries such as cement, steel, tiles, paints, brick, plumbing accessories, electrical accessories, isolation materials, wood products, glass, aluminum, marble, and so in many other industries (approximately 92 industrial activities representing 60% of all industries activities in Egypt) [1]. Real estate development (here after RED) is a primary actor in the housing sector and it affects many aspects in the economy like taxes, customs, employment, etc., and in the meantime it deals with so many entities such as the government bodies, contractors, suppliers, consultants, and facility organizations.

Basically, RED is defined as the process of undertaking real estate projects by means of operating on the land, design, planning, construction, capital, space and asset market, with the expectation of gain that upon thorough analysis has a high degree of security for the principal amount, as well as security of return [2]. Generally speaking, RED industry has its unique characteristics and the organizations are competing in a complex environment, therefore it is categorized as a high-risk business [3]. Further, in a report conducted by IMF (International Monetary Fund) there was a

conclusion that almost all the countries with twin booms in real estate and credit markets ended up suffering from either a financial crisis or a severe drop in GDP growth rate [4].

Accordingly, stability of these organizations is vital and crucial for them and for the national economy as well. Surely, in order for these organizations to achieve their targets and fulfill their objectives they must hold an effective system for controlling and adjusting their performance. Needless to say, you cannot control what you cannot measure; hence performance measurement systems should be set and implemented within the organizations. Concerning the performance measurements, they should be relevant, significant and informative, well-defined, available and cost effective, attributable, reliable, timely, avoids perverse incentives, comparable, and verifiable [5].

In essence, the balanced scorecard (here after BSC) is a concept for measuring organizational performance which provides a balanced picture of the operating performance [6]. It has four perspectives as follows: learning and growth (measures the performance of staff), processes (measures the performance of operations), customer (measures the ability to satisfy customer), and financial (measures the ability to make profit) [7]. In fact, it has many advantages such as linking performance measures with the strategies of the business units, focusing on the employees' role in fulfilling the organization mission, making bridges between the different functional areas, keeping balance between internal and external aspects of the business, allowing managers to understand how measurement results are affected by their actions [8]. Bezdrop and Bico-Car [9] reported that a research performed after a decade from BSC model appearance showed that its concept was accepted and used in over 40% of organizations worldwide and that the number is increasing every day. Consequently, deploying BSC in a RED organization, which is a profitable organization, is applicable. In addition, Kaplan and Norton who introduced the concept clarified in all their works that it is generally applicable and that it can be used equally successfully by different sizes companies or companies from different industries [9]. Lindholm and Nenonen [10] asserted that the BSC is the most known and adapted measurement system in the corporate real estate management which is a business unit within the organization.

Although the BSC approach has many advantages, but also suffers some significant limitations. These limitations can be summarized as follows: it focuses on unidirectional causality, unable to distinguish delays between actions and their impact on performance, has a dearth of validation capabilities, integrates insufficiently strategy with operational measures, and suffers from internal biases [11-13]. System dynamics approach provides specific solutions for these shortcomings such as: feedback loops rather than unidirectional causality, explicit separation of cause and effect in time, mechanisms for rigorous validation, linking strategy with operations, and broadening focus by challenging system boundaries [11]. About system dynamics (here after SD), it is a method to describe, model, simulate and analyze dynamically complex issues and/or systems in terms of the processes, information, organizational boundaries and strategies [14]. In SD, feedback loop systems are communicating by means of causal loop diagrams (here after CLDs). A feedback loop is a chain of causal connections from a factor or element that comes back to affect that element. Regarding elements' relationships, one can trace arrows that represent the influence it has for an element on another element. Variables can move in the same direction; they might both increase or decrease. The variables can also move in opposite directions. There are essentially two kinds of feedback in a system; a reinforcing loop refers to a dynamic in which most of the factors build on each other, each one contributing to or augmenting an overall dynamic of exponential growth. In a balancing loop, the dynamic serves to return a system to a state of equilibrium or to counteract the dynamic of a reinforcing loop [15]. For deploying SD in RED, Zhang et al [16] demonstrated that SD can provide intuitive and transparent models that should be able to improve pedagogy for educating large numbers of potential real estate entrepreneurs particularly in emerging market countries.

Notably, CLD is the instrument utilised in analysis in this paper. The outcomes of this analysis operation will facilitate recognising the following: providing a detailed system description, clarifying system's behaviour, revealing policies consequences (stand alone policy analysis), identifying key system drivers, and capturing the benefits of adopting the feedback loop approach. Lastly, this paper main target is to develop a dynamic BSC oriented to RED organizations to

enhance their performance measurement system. Hence, the research explores previous studies concerning this specific subject area. Subsequently, an analysis process for the four branches of the BSC based on SD methodology is performed in order to clarify the inherent measurements and their relations.

LITERATURE REVIEW

The previous studies that discussed the combination process between BSC and SD have different perspectives and objectives. For example, Wei and Zhang [12] combined SD with BSC to form a dynamic balanced scorecard in order to evaluate the organization's performance under its implementation of ERP system. Also, Yeoryios and George [17] construct another dynamic model of the project-based organization to provide a practical tool for strategy alternatives under various scenarios. Moreover, Barnabe [13] showed that the combined use of the two systems has the potential to be developed into a comprehensive management flight simulator to be used as a strategic management tool. In this context, Nielsen and Nielsen [18] also built the same type of model in order to study the effects of skills, customers, and work in process on the return on capital employed. Following the same line, Schoeneborn [6] did the same task but to examine the effect of strategic measures on the entire enterprise system. Further, Todd and Palmer [19] designed a dynamic BSC in a local government organization in New Zealand to determine which current measures were useful and which were not. Following the same line, Lee and Yang [7] studied the complex system of Taiwan's pharmaceutical industry by means of combining the two techniques in order to enhance its performance. From another perspective, Capelo and Dias [20] and Bianchi and Montemaggiore [21] developed another dynamic BSC models to improve managers' mental models. Finally, it is observed that integrating BSC with SD is effective in representing different measurements for various objectives. However, the deployment of this coupling technique in RED organizations is not yet popular. Therefore, this paper is trying to share with small contribution in this particular area to provide extra knowledge.

THE DYNAMIC BSC PERFORMANCE MEASUREMENTS SUBSYSTEMS

In this research, major performance measurements are identified in the RED as well as the basic relationships between them by extracting all the required information from the related literature [12, 22-27]. Subsequently, the CLD for each branch of the four branches (i.e. financial, customer, process, and learning & growth) of the BSC will be constructed separately. Moreover, all the relationships between the elements within each sector will be interpreted and analyzed. Finally, an integrated CLD combining all these sectors together will be developed to introduce the proposed dynamic BSC for performance measurements of the RED organizations. There are four subsystems; financial, customer, process, and learning & growth). Theses subsystems are described in below subsections

Financial Subsystem Measurements

The major element in Financial Subsystem Measurements is net income (profit) which is a primary measurement and there are five loops connected to it. Loop B1 shows the effect of tax expenditures while loop R1 demonstrates how borrowing is justified if the profit is not fulfilling the organization's financial commitments. Borrowing usually represents an overburden on the budget but it has some benefits regarding tax obligations which is clarified in loop B2. Loops B3 and B4 are mainly focusing on assets and its increasing rate which is influenced by the net income, but on the other hand it could perform a considerable heavy loading on the organization's liabilities as well. The remaining loops (R2 to R9) contain the most significant accounting ratios and their relationships. These accounting ratios are: net gearing, current ratio, return on assets, assets turnover ratio, return on equity, profit index, and debt ratio as shown in Fig. 1. Finally, it could be concluded that key driving factors in this subsystem are net income, debt ratio, and asset turnover ratio due to many attached links connected them with other elements. Therefore, they should be considered as the fundamental measurements of organizational financial performance. Further, the CLD in this particular case is providing a detailed system description for all financial issues and indicators within the organization. All correlations between different financial measurements are revealed, which facilitate recognizing the effect that they have on each other. This should

have a significant impact regarding any decision concerning financial issues. For instance, if there is a measurement with low value that should be moved upward by specific actions, the impact of this action on the other measurements will be known.

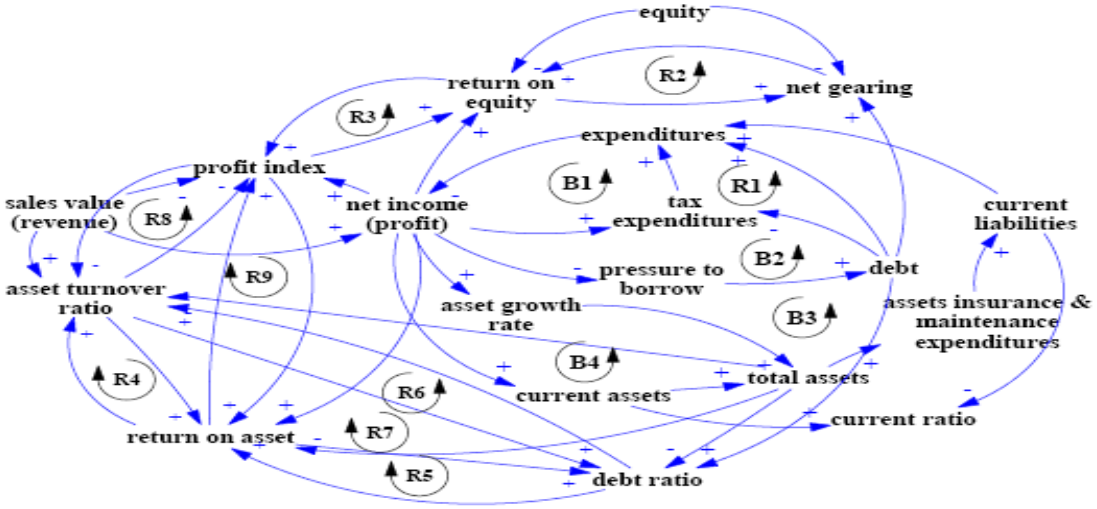

Fig. 1: Financial Subsystem Measurements CLD

Customer Subsystem Measurements

This sector has many measurements but the fundamental one is customer base and that is why it is related to all loops in the causality diagram shown in Fig. 2. Loop B6 reveals the most significant reason in losing customers which is organization capacity for handling customers' complaints, if it could not fulfill their needs and expectations this will cost the organization its customers. However, if the organization took the required action to enhance its customer management process without delay, this action will remedy the situation as demonstrated in loop R11. Loops B5 and R10 are concentrating on a major measurement which is brand name index, it is more comprehended than customer satisfaction index because it is constructed on the current customers perspective and the potential ones.

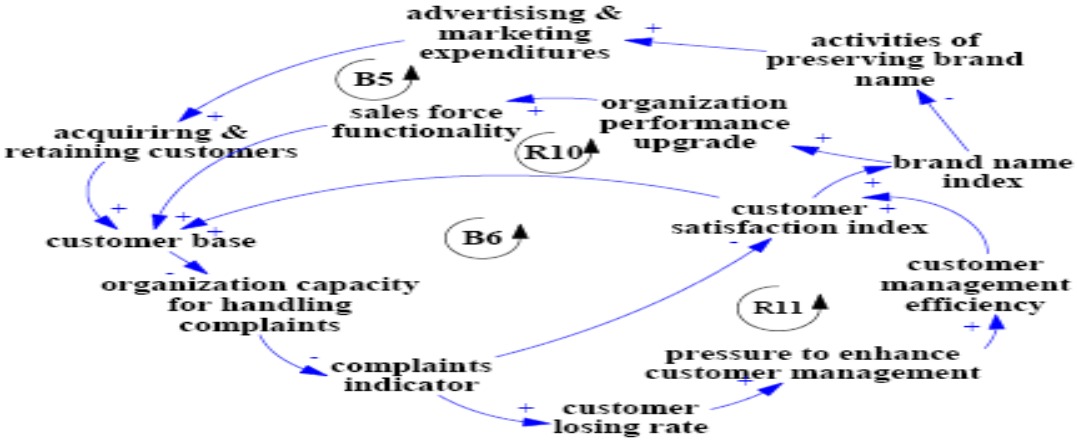

Fig. 2: Customer Subsystem Measurements CLD

The two loops are also addressing two important elements which are: sales force functionality and marketing activities, by them the organization can afford to retain its customer base and even grow it more. In terms of analysis, there are two balancing loops which mean that there is a struggle between variables; this struggle is forcing the loop to be in a state of equilibrium. In case

of loop B6, complaints indicator and customer satisfaction index are having a negative correlation that affect customer base badly, but organizational capacity in handling complaints is keeping the loop in a state of equilibrium. This conclusion should encourage the decision makers to increase this capacity on regular basis. Likewise, in loop B5, the basic idea asserts that the organization should not rely on the high rank of its brand name but must take all precautions to preserve this rank without lingering.

Process Subsystem Measurements

The process subsystem is mainly about the construction phase of RED project because it is the most consuming resources in the entire lifecycle. The primary measurement in this CLD in Fig. 3 is projects performance indicator and that is why it is presented in all the loops. Loops B8 and B9 are clarifying the consequences of ignoring safety policies and quality control systems on the performance indicator as well as on stakeholder satisfaction. Loop B7 explains and rationalizes the reasons to adopt risk management applications and techniques in the organization's daily operations, mainly because they safeguard it from many shortcomings in the schedule and also in the projects' budgets. Loop B10 analyzes the role and the goal of innovation within the organization and how to achieve it by establishing a division for research and development and feed it by talented staff and financial resources. As witnessed, all loops are balancing in a nest form, which indicates that they all are seeking for the same goal. This goal is satisfying stakeholders, mainly due to their huge impact on organization's surviving. Further, the nested form is revealing that even with no direct relation between driving factors (cost, time, quality, safety, and innovation) but they all have significant influence on projects performance. This outcome should enforce the management board to never underestimate these driving factors.

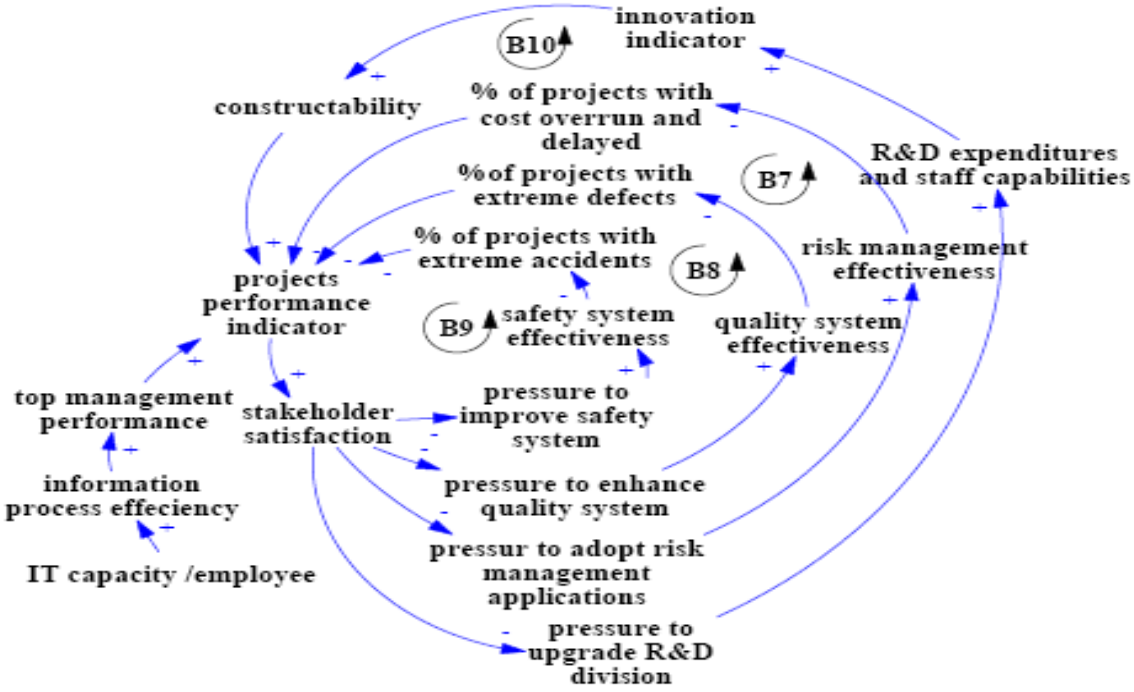

Fig. 3: Process Subsystem Measurements CLD

Learning & Growth Subsystem Measurements

The causality diagram in Fig. 4 with its three loops B11, R12, and R13 encompasses the related measurements for learning and growth prespective of the BSC approach. A basic measurement is the staff capabilities indicator which is a representitave of the employees' skills and knowledge. This particular indicator is governed by different factors such as: training programs, experienced staff hiring percentage, and average servivce life per employee. Conversely, it has huge positive influence on empowerment, productivity, and general knowledg level of the organization's staff.

Another significant and critical measurement is employee satisfaction index which is controlled by many factors such as: incentive system, promotion strategy, job design, motivation, and corporate social responsibility. lastly, it is worth noting that the CLD in this branch is performing a stand alone policy anlysis. This is clearly obseved in the two reinforcing loops R12 and R13 which emphasis the positive impact of empowerment, reward system, knowledge level, and job design on employess. On the other hand, the balancing loop B11 clarifies how the elements mitigate each orher; employess satisfaction against turnover ratio and average service life against hiring experienced staff. Accordingly, this should guide decision makers to balance between the different policies adopted toward employess in order to reach the desired goal of upgrading their capabilities.

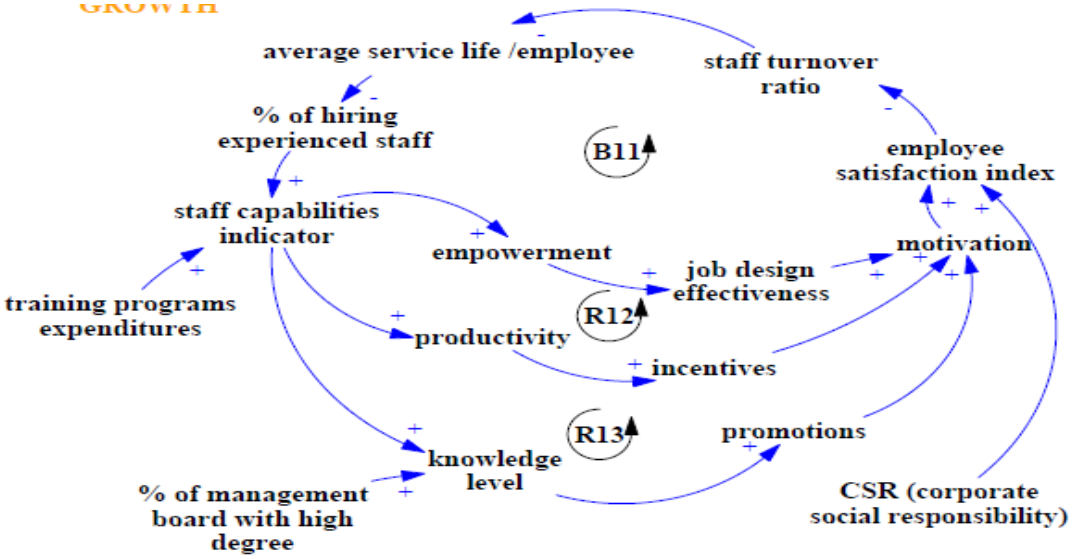

Fig. 4: Learning & Growth Subsystem Measurements CLD

Integrated Performance Measurement System

All four subsystems are integrated in one comprehensive CLD as shown in Fig. 5. While the relationships betweeen elements in one subsystem and the other could be entangled and ramified due to subjectivity and cognitive thinking, the select ones were rationale and consensus in order to add value to the structure of the CLD. For example, brand name and customer satisfaction indices from the customer subsystem measurements will have a positive influence over the revenue growth and in reverse they will be influenced by the projects performance indicator. Additionally, Projects cost overrun in the process subsystem will affect the net profit within the financial sector in a very bad way. Following the sme line, empowerment increase rate within learning and growth subsystem will enhance innovation which in turn will make productivity grow faster, leading to a permanent solution for project's delay problem. Within same context, staff capabilities indicator will cause the sales force functionality within customer sector to be more effective in its mission. Furthermor, information process effeciency within process sector will lead to an improvement in the knowledge level. Finally, at this stage, it could be stated that the CLD is functioning as strategy visualization tool and providing comprehensive map of the system which in this case is the RED organization.

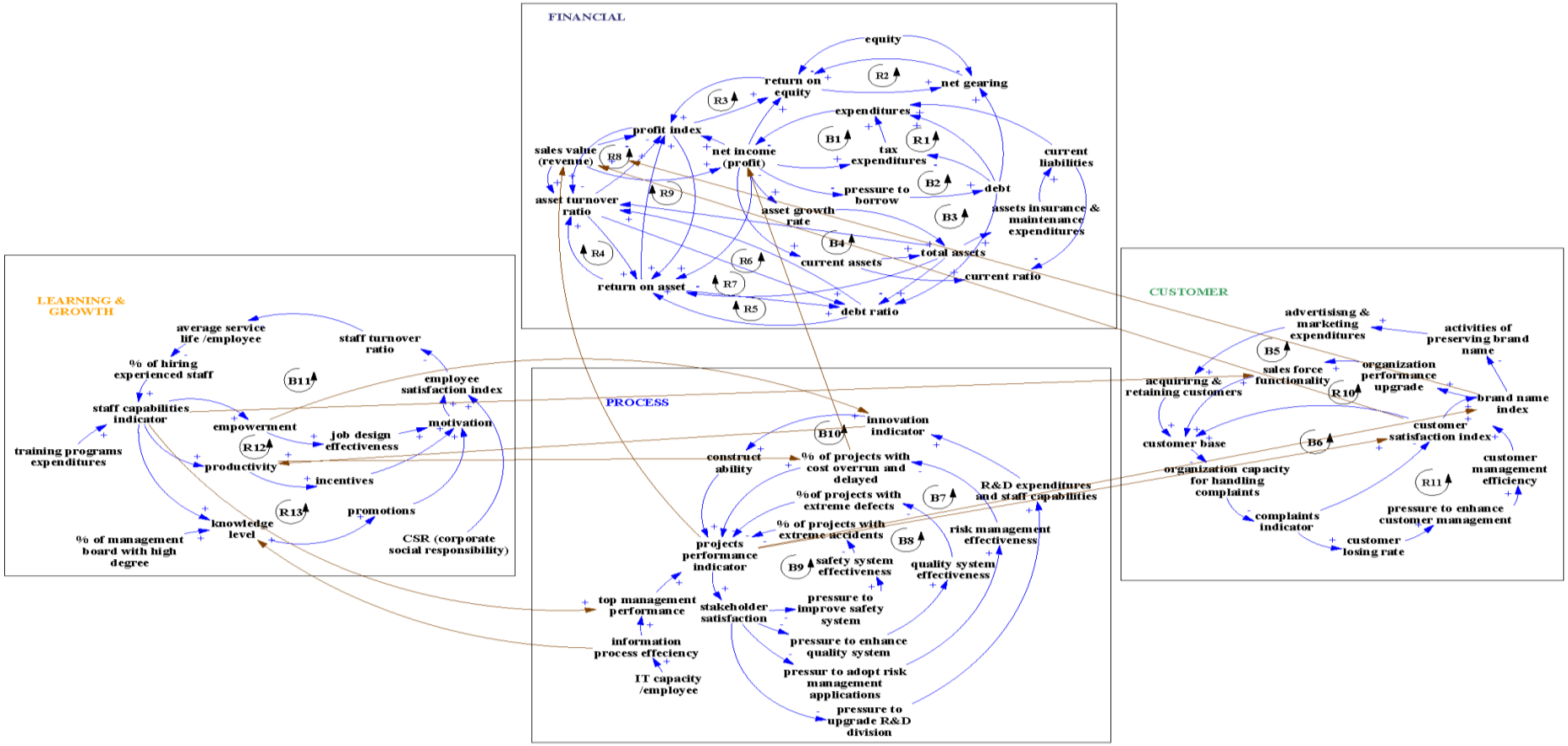

Fig. 5: integrated Performance Measurement System CLD

CONCLUSIONS

This research paper main purpose was to provide decision makers within RED organization with an effective tool in measuring performance. This tool is a dynamic BSC that was built by integrating SD modeling technique with BSC fundamentals and was presented in CLD form. Input data and necessary information required for the model construction process were collected by reviewing the relevant literature. An analysis process for the correlations between different factors within each branch of the dynamic BSC was performed. The outcome of this process facilitated recognizing key driving factors which are the significant measurements within each sector. Some of these driving factors are: debt ratio, asset turnover, brand name index, projects performance indicator, and employee satisfaction index. Further, detailed system description for each sector was presented which provided more insight about them. In addition, a stand alone policy analysis for any adopted strategy within each sector could be conducted which in turn will enable the decision maker to decide whether to go on with it or not. Eventually, an integrated CLD for all branches was produced which represents the proposed dynamic BSC. The major function of the model is to monitor all the daily operations of the organization which are already having representing factors for them. Consequently, this monitoring process will allow tracking any shift of normality in the measurements regarding any sector. As soon as this shift is captured, there will be then enough time to take preventive or corrective actions to handle the situation. In closing, it is clearly obvious that the model is qualitative in nature, so the CLD should transform into stock and flow diagram which is the quantitative part of the SD modeling technique. This transformation process will give numerical values for all elements within the model which is the proposed future research for this topic.

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