



*Review*

## **Increasing productivity and sustainability of corporate performance by using management control systems and intellectual capital accounting approach**

**Leo-Paul DANA<sup>1,2</sup>, Mohammad Mahdi Rounaghi<sup>3,\*</sup> and Gholamreza Enayati<sup>4</sup>**

<sup>1</sup> Montpellier Business School and Labex Entreprenre, 2300 Avenue des Moulins, 34080 Montpellier, France

<sup>2</sup> Rowe School of Business, Dalhousie University, Halifax, Canada

<sup>3</sup> Independent Researcher, Mashhad, Iran

<sup>4</sup> Department of Management, Mashhad Branch, Islamic Azad University, Mashhad, Iran

\* **Correspondence:** Email: mahdi\_rounaghi@yahoo.com.

**Abstract:** The purpose of this article is to provide an overview of the literature covering the area of management control systems (MCS) and intellectual capital accounting approach in logistics and related these concepts to sustainability of corporate performance. Management control system (MCS) is system in companies which gathers and uses information to assess the performance of diverse company resources like human, physical, financial aspects of the companies. The application of a management control system in the field of quality management is found to be useful in explaining what changes are necessary to maintain high quality levels. The other useful method, for assessing the performance of diverse companies' resources like intangible assets is intellectual capital accounting approach. Intellectual capitals are intangible assets that create value for business units and are one of the main factors in creating competitive advantages for companies. Attention and focus on intellectual capitals in organizations and companies are one of the fundamental segments in value chain in the direction of value creation, and measurement and accurate disclosure of intellectual capital make managers and stakeholders successful in conducting the organization. The current study develops necessitates of using these methods for reach to corporate sustainability and sustainable development in companies.

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**Keywords:** productivity; sustainability; corporate performance; management control systems; intellectual capital accounting

**JEL Codes:** L21, L25, M41, P47

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## 1. Introduction

In recent years, firms have utilized a broaden variety of activities in an attempt to develop service and product quality, curtail production cycle times, lower costs, boost their focus on core competencies, and, in general, increase companies' effectiveness (Gilley et al., 2004). In today's world, the extent of public sector agencies in all areas of governance is complex and needs to lead to the specialization and increasing productivity and sustainability of corporate performance (Rounaghi and Basafa, 2014). Businesses and academics worldwide agree regarding the benefits of sustainable development (SD). Improving reputation and branding and increasing revenues by reducing costs are the primary strategic objectives of any entity (Rounaghi, 2019).

Also, in manufacturing sector, producing quality and reliable products at a reasonable cost has always been an elemental objective for reach to corporate sustainability and sustainable development in companies (Farooq et al., 2017). For this purpose, management accounting and financial accounting methods if use properly, it accelerates reaching the goals of companies for SD.

The advancement in management accounting introduce with the activity-based costing (ABC) in the early 1980s, albeit this focused on generating information for bettered decision-making rather than control. However, it was rapidly pursued by other methods often lumped together under the general heading of strategic management accounting (Otley, 2016). Nowadays, management control system and their methods that rooted from management accounting area has been used in many companies.

This review paper consists of a four-step study. Firstly, we systematically review frameworks on sustainability of corporate performance. Secondly, we conduct a systematic review of the main contributions of the literature on of management control systems methods. Thirdly, we identify and propose some management control systems methods. Finally, we conduct a systematic review of intellectual capital accounting approach and analysis how this approach increases the productivity and sustainability of corporate performance.

Consequently, our research question is: how should the management control systems methods, such as the Balanced score approach, Activity based costing system, and intellectual capital accounting approach, be considered and used to develop the management innovation processes to achieve sustainability of corporate performance in the companies?

Management control system as a valuable method is gathered information and used information to prepare and coordinate the process of making planning and control decisions through-out the organization and to controller the behaviour of its managers and employees.

In recent years some valuable research investigated the relationship between using of management control systems with other important sustainability indicators.

Anthony and Young (1999) showed that management accounting systems have three major subdivisions: full cost accounting; differential accounting and management control or responsibility accounting.

Guenther et al. (2016) found that using management control systems (MCS) in integration of sustainability and environmental aspects of companies is very useful. Also, management control system influences the behaviour of companies' resources to set companies strategies.

Chenhall (2003) mentioned that the terms management accounting (MA), management accounting systems (MAS), management control systems (MCS), and organizational controls (OC) are sometimes used interchangeably. In this regard, MCS consists of collection of practices such as budgeting or product costing. Given that, different managers have various responsibilities in an organization and therefore various kinds of information are needed by them to manage the activities in their respective areas. So, MCS should be able to develop, collect and communicate information to management at different levels in the organization. Also, MCS should help to prepare financial as well as non-financial information as needed by different managers.

The other method, for assess the performance of management innovation processes to achieve sustainability of corporate performance is intellectual capital accounting.

In the field of organizational performance, managers always need to be aware of the importance of accounting in economy for decision-making in economic units, financial reports being considered an index for decision-making of investors (Gogan et al., 2016; Gogan, 2014). However, in the knowledge era, where intellectual capital represents a large part of the value of a product, the traditional annual financial statements report only partially the value of intangible assets (concessions, licenses, patents, trademarks, etc.). In fact, intellectual capital is an important activity for organizations which want to be efficient on the market and thus to obtain sustainable competitive advantage.

Measuring intellectual capital became a main research area in the 1990s. The importance of intellectual capital comes from the fact that traditional accounting systems do not reflect reality for managers or investors in such a way that they understand how their resources—many of which are intangible—create value in the future. Moreover, evaluation tools provided by them are becoming less relevant and less suitable for measuring the value of intellectual capital for companies.

Nowadays, managers know knowledge and the ability to create and apply knowledge as the most important source of sustainable competitive advantage. On the other hand, knowledge-based business environment requires a new approach to include companies' intangible assets such as knowledge and competence of human resources, innovation, customer relations, companies' culture, systems, companies' structure, and etc. Therefore managers by using intellectual capital approach can create competitive advantages for companies.

## **2. Theoretical background and review of literature**

Organisational situations, together with human behaviour, create an uncertain situation and this uncertainty is present in internal and external circumstances and given that all organisations have definable organisational objectives, for this reason by using management control system method, resources used effectively and efficiently in the accomplishment of the organization's objectives. There are generally five elements of a corporate entrepreneurship management control system. There are planning, establishing standards of performance, monitoring and evaluating actual performance, comparing actual results with desired results and finally, rectifying deviations and taking corrective action.

Management control system consists of both formal control system and informal control system. A formal control system depends upon the organization should have clear-cut rules, strategy, guidelines and plans relating to different managerial aspects.

Nowadays, such methods of management control system such as cost accounting system, management accounting system, production engineering systems, human resource system, quality maintenance system are used to guide, direct, motivate the managers and other employees and coordinate their behaviour to achieve companies' goals.

In comparison with formal management control systems, informal management control systems play an important role in the implementation of business goals and strategies with the unwritten norms about good behaviour of managers and employees, loyalties, shared values, mutual commitments among managers and employees. Also, informal management control systems help the organization to attain high degree of motivation and goal congruence (Higgins, 1955; Gross, 1966; Di Vaio et al., 2018).

Management control system includes both formal control system and informal control system. A formal control system requires that an organization should have clear-cut rules, procedures, guidelines, plans relating to different managerial aspects. Such things are needed to guide, direct, motivate the managers and other employees and coordinate their behaviour to achieve organizational goals. In an organization, many formal control systems may exist such as cost accounting system, management accounting system, production engineering systems, human resource system, quality maintenance system etc.

Some factors influencing the design of management control systems are as follows:

**Size and Spread of the Enterprise:** The size and spread of a large firm is bound to be different compared with that of a small firm. This would certainly determine the content and nature of the control system for each organization.

**Organizational Structure, Delegation and Decentralization:** Statutes and conventions govern organizational structure, and the extent of decentralization and delegation in all enterprises.

**Nature of Operations and Divisibility:** Nature of operations and their divisibility affect management control systems.

**Types of Responsibility Centres:** Different control systems are needed for the various responsibility centres or sub-systems within an organization. Whether the performance of a responsibility centre should be measured in terms of expenses or profitability or return on investment depends on the type of responsibility centre.

**People and their Perceptions:** Perceptions of people in the organization about the likely effects of the control system on their work life, job satisfaction, job security, promotion and general well-being could differ across organizations. These considerations will significantly influence the nature and content of the management control system needed in the organization and must be duly considered while designing management control systems.

To accomplish that objective, managers must assign responsibilities and develop performance evaluation criteria that motivate employees to work toward the company's goals. A management control system is most effective when it establishes evaluation criteria that encourage goal-congruent behaviour and is implemented through a responsibility accounting system that employees trust to report their performance.

The other approach that increases productivity, profitability and sustainability of companies is intellectual capital accounting.

Due to the transition from a manufacturing-based to a knowledge-based economy, the relevance of intellectual capital (IC) in firm value creation processes has significantly increased. Considering that traditional financial disclosures do not contain IC-related information, various stakeholders have long asked companies to voluntarily disclose their intellectual resources for those to be incorporated into firm performance considerations and valuations (Salvi et al., 2020; Mavridis and Vatalis, 2012).

**Table 1.** Studies about management control systems and intellectual capital accounting approach.

Authors	management control systems approach	intellectual capital accounting approach
Daina et al. (2019)	Improving performance of a pharmacy in a Romanian hospital	
Vaio et al. (2019)	Management Control Systems in port waste management	
Crespo et al. (2019)	The adoption of management control systems by start-ups	
Secundo et al. (2020)		Sustainable development, intellectual capital and technology policies
Adesina (2019)		Bank technical, allocative and cost efficiencies in Africa: The influence of intellectual capital
Rezende et al. (2017)		The intellectual capital and the creation of value in research units
Secundo et al. (2017)		An Intellectual Capital framework to measure universities' third mission activities
Schulze & Heidenreich (2017)	Linking energy-related strategic flexibility and energy efficiency—The mediating role of management control systems choice	
Di Vaio et al. (2018)	Management Control Systems in Inter-organizational Relationships for Environmental Sustainability and Energy Efficiency	
Lábas & Bács (2015)	Management Control System in the University of Debrecen	
Alvino et al. (2020)		Intellectual capital and sustainable development
Di Vaio et al. (2019)	Management Control Systems in port waste management	
Yu et al. (2017)		The role of Intellectual Capital Reporting (ICR) in organisational transformation
Di Vaio et al. (2020)		Human resources disclosure in the EU Directive 2014/95/EU perspective

Intellectual capital (IC) is increasingly recognized as a factor of production. It represents the “value creation” potential of human, relational and structural capital and their interactions (Abhayawansa, 2014). Intellectual capital (IC), which has become increasingly important with the rise of the knowledge-based economy, has the potential to explain many of the differences causing divergence between a firm’s market value and its book value (Sujan and Abeysekera, 2007). Studies of analysts and users of financial reports show a somewhat mixed picture in regard to disclosing more information about IC in company reports (Sakakibara et al., 2010; Larsen et al., 1999).

In recent years, many researchers have studied about different aspect of management control systems and intellectual capital accounting approach that affected the productivity and sustainability of corporate performance that we shown these studies in Table 1.

### **3. Management control systems approach**

It is obviously that making good decisions will influence managerial achievement. The component of management control systems which are useful for decision making are those that have the influence of broad scope, timeliness, aggregation, and integration (Chenhall and Morris, 1986). Available information conferred on time (timeliness) will be valuable to be taken into application timely in the decision making before the information drop its ability to influence on decisions.

With timely information managers could be capable in making good decisions since it prepare fast and timely information in taking proper action. Furthermore, manager can prepare fast feedback from the decision made as well. The right aggregated management control systems reflect a good coordination between the segments of the organization and of the sub-units with each other. For achieve the goals of management control system in companies, different management accounting information methods can be used:

#### *3.1. Enterprise resource planning*

The integrated business management system that covering functional areas of an enterprise like Logistics, production, finance, accounting and human resources is enterprise resource planning (ERP) system.

An enterprise resource planning (ERP) system can aid a company assimilate its activities by acting as a company-wide computing environment that shared database—delivering consistent data across all business functions in real time (Umble, 2003).

ERP helps different departments with variety needs to connect with each other by sharing the same information in a single system. Thus, enterprise resource planning increases cooperation and interaction between all business units in companies on this basis. Enterprise resource planning goals consists of high levels of customer service, productivity, cost reduction, and inventory turnover, and it prepare the foundation for effective supply chain management and e-commerce.

#### *3.2. Balanced score card*

Kaplan and Norton (1992) initially conceived of the BSC as a performance measurement tool for use by the private sector. Contrary traditional financial measures, the BSC incorporated financial and non-financial component (i.e. customer, finance, internal business processes, and learning and

growth) to appraise the performance of these private organizations. The BSC emphasizes the idea of investing in the future to achieve visions and goals; that is, by investing in people, systems, and procedures. However, the BSC also connects the vision and strategic goals to long-term plans and annual budgets, and provides feedback systems for updates and periodical enhancement of the vision and strategy. The BSC is highly regarded by a number of academics, due to its effectiveness in guiding successful strategy implementation (Atkinson, 2006; Kloot and Martin, 2000; Sharma and Gadenne, 2011; Rasoolimanesh et al., 2015; Kaplan and Norton, 1996).

### *3.3. Activity based costing system*

An activity-based costing system is established on the idea that products make use of certain general activities advanced inside the company and these activities need some resources to be done (Carli and Canavari, 2013). It means that, first, the cost of the resources is allocated to the activities and, then, the costs of activities are allocated to the products (costs objects) using specific activity drivers for each activity. ABC prevents some distortions related to product cost information that arise from traditional accounting systems where the overheads (indirect costs) are arbitrarily attributed, usually in proportion to an activity's direct cost.

### *3.4. Lean accounting*

The terms "lean manufacturing" and "lean inventory" refer to an approach to production that eliminates waste and shortens the time between receiving and delivering orders. Lean accounting is geared toward streamlining accounting processes in comparable ways. It also uses accounting to support lean production by gathering useful information about how effectively operations are flowing. Assembling and organizing this information often involves rethinking the assumptions embedded in traditional accounting systems. Lean accounting treats some traditional accounting principles in non traditional ways because conventional accounting protocols don't fully reflect the value that comes from a lean manufacturing approach. The concepts of lean manufacturing revolve around paring down manufacturing and inventory to streamline your operations toward filling current orders with as little turnaround time as possible. This approach redefines efficiency, focusing on throughput (completing and delivering finished products to customers who have placed orders). Traditional accounting instead measures efficiency in terms of how many units your production line completes, regardless of whether customers have placed orders for these units. Lean manufacturing and inventory show up on a pro forma cash-flow statement in the form of lower expenses that result in a less-urgent need for outside operating capital, reflecting a lean approach to finance. A business using lean manufacturing practices can also develop customized accounting reports that measure its success using lean parameters.

Lean accounting methods make essential financial information available throughout a company. They allow people in the financial community to contribute to the implementation of lean manufacturing and distribution, instead of remaining on the sidelines, waiting for improvements to show up on the bottom line. Lean management accounting aims to provide information useful to the people in production plants who are actively implementing and sustaining lean manufacturing.

### 3.5. Resource consumption accounting

Resource consumption accounting (RCA) is presented as a system that fits this description combining German cost management with activity-based costing and focusing on resources rather than cost objects. RCA should be considered if a company has unplanned wasted resources, complaints from managers related to charges for idle capacity costs, distorted decisions related to products, a shortage of resources, under costing of resources in cost planning, inadequate information for outsourcing decisions, or lack of information for performance evaluation. RCA defines capacity in relation to resources, not in relation to activities. Although unused resource costs (excess or idle capacity) are reported as variances, these costs are never allocated to individual products. The idea is to make the unused capacity visible to promote accountability for capacity utilization and to facilitate resource acquisition decisions.

### 3.6. Kaizen method

Kaizen refers to any activities that continually improve all business functions or processes and involves every employee from the CEO to the assembly line workers. Labeling industrial or business improvement techniques with the word “kaizen” is the common practice in Japan. It also applies to processes, such as purchasing and logistics, that cross organizational boundaries into the supply chain. In practice, Kaizen can be implemented in corporations by improving every aspect of a business process in a step-by-step approach, while gradually developing employee skills through training education and increased involvement. Support throughout the entire structure is necessary to become successful at developing a strong Kaizen approach. Management as well as workers need to believe in the Kaizen idea and strive toward obtaining the small goals in order to reach overall success. Therefore, all members of an organization need to be trained in a manner to support this idea structure. Resources, measurements, rewards, and incentives all need to be aligned to and working with the Kaizen structure of ideas.

## 4. Intellectual capital accounting approach

Among the important factors in the companies competitive pattern are using and training specialists, using knowledge and update technology in industry, therefore, the conversion factor of resources to the maximum value is the same value creating loop creation in organizations (Todericiu and Șerban, 2015).

The accounting literature recognizes this concept as intellectual capital. Intellectual capital is a collection of knowledge, information, intellectual property, experience, competence and organization learning that can be used to create wealth. In fact, intellectual capital of all employees includes organization knowledge and its abilities in creating added value and it also leads to continuous competitive advantages.

Nowadays, intellectual capital reporting (ICR) has garnered increasing attention as a new accounting technology that can engender significant organisational changes. The main idea behind intellectual capital reporting is that financial information informs about the past performance of the enterprise but tells nothing about its future potential. The future potential of an enterprise does not lie within its financial capital, but in its intellectual capital. Creating transparency about the enterprise's



intellectual capital will enable it to manage its intangible resources better, to increase its staff's confidence and motivation as well as imparting greater certainty to investors and other stakeholders about its future earnings potential.

#### *4.1. Components of intellectual capital*

Accounting for intellectual capital (IC) and monetization of public sector services are key measures of achieving organization strategy (Rooney and Dumay, 2016; Chang et al., 2008). In summing up the multiple definitions of IC and its components, it can be stated that IC can be divided into three categories: human capital, structural capital and customer capital. Because IC represents an organization performance embedded competency that is valuable in managing uncertain situations, we argue that IC should have a positive influence on the management of alliances. Firms with better IC should realize greater gains from inter-firm collaboration.

Human capital is the most important asset of an organization and a source of creativity and innovation. In an organization, tacit knowledge assets of employees are of the most critical components that have a significant impact on organization performance. Also, human capital is a combination of knowledge, skill, innovation power and the abilities of people in the company to perform their duties and also it includes values, culture and philosophy of the company.

According to a study by Edvinson and Malone, intellectual capital can be classified into three main components which include human capital, the structural capital and the relational capital.

Structural capital is defined by Edvinson and Malone as hardware, software, database, organization structure, organization exclusive rights, trademarks and all the capabilities of organizations that support employees' productivity. Structural capital is something that when employees go home at night, remain in the company. Capital structure is divided into several categories: corporate culture, organization structure, organization learning, operational processes and information systems. Customer capital, which is considered as a bridge and a catalyst in the activities of intellectual capital, is of the main and determinant requirements of conversion of intellectual capital to market value and thus the business performance of the company which placed value in marketing and communication channels, the channels that the company has industrial and commercial communications with their leaders.

#### *4.2. Features of intellectual capital*

In Harvard's opinion, intellectual resources of the company have exclusive and unique mode and are not able to be copied and to be imitated, so they are valuable to the company and have the capability to create competitive advantage. Intellectual properties are non-competitive properties, unlike physical assets that can only be used for a specific task at a specific time, intellectual properties can be used simultaneously for the several specific tasks. For example, customer support system can provide support to thousands of customers at a certain time. This ability is one of the most important superiority criteria of intellectual properties over physical assets. Human capital and relational capital, can not become private properties, but must be common between employees and customers, and suppliers. Thus, the growth of this type of asset needs serious care and attention. Successful management of intellectual capital for a positive impact on the future value of the

business, it is necessary to have a better understanding of the IC and the latest tools available to identify, measure and manage this important cause of value creation.

- (1) Identifying the IC of value key business
- (2) Tracing value key factors
- (3) Measuring IC
- (4) Managing IC
- (5) Reporting IC

The first step is identifying the IC of value key business. This phase involves measuring its value, all IC are not automatically valuable for a business, these capitals are valuable when they help advance the business objectives. IC can be identified through interviews, workshops or through online surveys. When the IC is detected, its value can be measured. When valuating the IC, we should remember that the value of IC depends on the business strategy and dynamically interacts and depends on other sources. The next step is tracing the map of value creation. This step has two primary functions: to ensure that the strategy is coherent and consistent with all of the factors of value of IC, and creation of the possibility of easy communication of strategy and the role and importance of IC in advancing the strategy. After identifying and outlining the factors of value of IC, the businesses can start their measurement. There are many tools and techniques for measuring IC. When the IC is measured, it can be managed. By the help of related valuations, we can identify the current levels of performance, know whether IC has improved or deteriorated, and discover what activities or programs had impact on performance. This information can be used in decision making, study and investigation of strategy and management of risks related to IC. The final step is reporting the IC. The purpose of IC reporting is providing some information about IC of an organization to its stakeholders. Traditional reporting can not describe the value of IC. Different ways have been created for considering the limitations of traditional financial reporting in disclosure of information on IC, but still there is no agreement on any of the standards. As a result, various organizations have submitted voluntary reports and have understood its obvious benefits such as improved stakeholder identification of businesses strategy and improved image of the business and its reputation.

## **5. Conclusion and suggestions**

This paper analyzed how management control systems and intellectual capital accounting facilitate companies to realize their intended strategies.

Recent new directions in management control systems and structural intervention strategies have transformed management accounting control systems as the new administrative control innovations mechanisms for managing teams' performance and activities in industrial organizations. Experimental research in recent decades has provided considerable insight into the complex processes by which MCS manage horizontal cooperation and competition and thus influence companies' performance. Also, past research has traditionally argued that management control systems (MCSs) may present a hindrance to the creativity of innovation companies.

The adoption of MCS is build by perceptions of the environment. Next to this conventional view, some studies shows that MCS use simultaneously build environmental perceptions. In other words, there is a reciprocal relationship between MCS adoption and environmental attitude. MCS are expected to motivate managers to ensure that companies goals are accomplished. Also, management accounting information systems constitutes an essential informational source for the firm's management, because:

activities inevitably generate costs; the determination of the costs is able to explain the efficiency of the economic activity and to determine the deviations from the purpose proposed, while the information provided by the calculation of the costs is strategic information for corporate piloting. For decision making, the key word is relevance. Also, eco-efficiency is one of the most popular concepts for the integrated measurement of corporate environmental and financial performance (Callens and Tyteca, 1999; Ciroth, 2009; Huppel and Ishikawa, 2005a, 2005b, 2009; Lambertson, 2005).

The other indicator that we need to achieve corporate sustainability and sustainable development is intellectual capital accounting. There is growing interest in the new techniques of intellectual capital accounting (ICA) as a method of measuring and reporting the range of human and knowledge-based factors that create sustained economic value. Also, IC has been widely recognized as an important resource in creating value and competitive advantage for companies.

Although the importance of IC to many industries and knowledge-based corporations in the era of a knowledge economy has become evident, the research of IC and its impacts in the construction industry have rarely found. In an era of global competition and a knowledge economy, the key factors determining national and corporate competitive success are no longer traditional natural resources and capital, but rather the creation and utilization of new knowledge. Therefore, Understanding the correlation between IC and business performance is critical, while aiming to sustain in a competitive environment, not only for industries and corporations but also for a nation

Attention and focus on IC in organizations and companies are one of the fundamental segments in value chain in the direction of value creation, measurement and accurate disclosure of IC make managers and stakeholders successful in their goals that they want from ideal companies.

## Acknowledgments

The authors would like to thank the editor and the anonymous reviewers for their valuable comments and suggestions which improved the paper considerably.

## Conflicts of interest

All authors declare no conflicts of interest in this paper.

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