

# Moroccan Agro-Food Companies: Performance Evaluation through the Balanced Scorecard Method

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**Abstract**—This research aimed to examine the performance aspects of the Moroccan industrial food enterprises, which are characterized by its heterogeneous nature (the quality of raw materials, deadlines, volatile customer demand, processes, markets, etc.). Only a very limited number of studies have focused on the implementation of managerial practices within companies operating in the food sector. This study used the qualitative research. Five case studies from various companies in the sector that engage in different activities: Flour milling company (ISO 22000); Cheese manufacturing (ISO 9001); Production of soft drinks (ISO 22000); canned fish (ISO 9001); Coffee production (ISO 9001). The paper presents important issues: development constraints; Strategies; systems set up; performance indicators. The analysis is based on the balanced scorecard, which proposes a global dimension of the piloting with a decline on the operational level. We have classified the determinants of BSC, while using the ABC method, to measure the importance of each indicator, to answer the question: which factors have the most influence on the performance? By answering this question, we can introduce more parameters to strengthen operational and strategic performance. It is assumed that the financial and accounting criteria alone are not sufficient to measure the performance of the company. Through this analysis, we found that the internal process is still a challenge for this kind of business, and must adopt modern methods to become more efficient. This stage of performance evaluation is very important, before proposing improvement actions, or a corrective method for an effective and a permanent strategy.

**Keywords**— Performance, constraints, Balanced Scorecard, Moroccan food companies.

## 1. Introduction

Moroccan agri-food industry is the largest industrial sector in the country, with nearly 2048 enterprises, or 1/4 of total industrial unit, accounting for almost a third of total industrial production and contributing

about one fifth of Moroccan exports. It has been found that the composition of the sector is quite disparate. In terms of size, some categories are characterized by the presence of a significant number of small units such as flour manufacturing units (modern pastry), while others are relatively concentrated (sugar, seed oil, milk). Some branches are more oriented towards the external market (Fruits, vegetables and fish), while others are exclusively linked to the internal market (branch of fats, dairy industry, processing of cereals, meat industry, beverage industry). Considering that the agri-food sector is strategic for the socio-economic development of Morocco, the state has tried to intervene through many programs, as well as structural reforms. We cite as examples (there are others who have targeted particular branches): The Moroccan Green Plan in 2008, designed to lead and reform the agricultural sector, promote the integration of agriculture into international markets, double the production for 2020, using almost the same area as today [1]. Pact for industrial emergence for the period 2009-2015: aims to build a strong industrial sector and continue its growth, the impact is estimated at 10 billion dirhams additional GDP and 24 000 new jobs for 2015 [2]. Industrial acceleration plan (2014-2020): sets the following general objectives for the sector, creation of half a million jobs, growth of nine points from the industry in GDP, from 14% to 23% by 2020. The new strategy establishes 10 key indicators grouped into 3 classes: Industrial ecosystem for a more integrated industry; Support tools adapted to the industrial base; and a stronger international positioning [3]. Significant budgets have been allocated to these plans, but the result still insufficient and food companies remains uncompetitive. These data and statistics justify our interest in studying the Moroccan agri-food companies, In order to offer an effective set of proposals to improve their strategic performance. The specific issues involved in the

study are: Companies' Constraints and specificity. Understanding the use of the performance measurement system in the organization. What performance measures are used? Performance indicators adopted which cover the four axis of the balanced scorecard: Financial, customer, internal processes, organizational. Critical success factors to drive a performance approach. Section 2 is devoted to the literature review on performance measurement. The research methodology is explained in Section 3. The analysis and results are presented in Section 4.

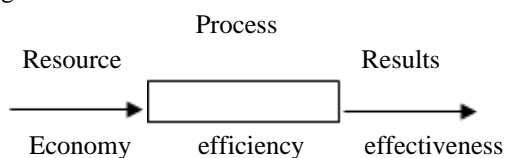
## 2. Literature review

### 2.1 What is performance?

The term "Performance" : In English "to perform", means « to accomplish, to execute » [4]. In French Performance is : completion, the result in time or in distance from an athlete or of a horse after an event [5].

In the field of management, it is often difficult to give a definition to "performance management" [6]. It is a concept that has a complex set of dimensions (as: processes activities, systems, information flow) [7].

The word performance is widely used although it does not succeed to a universal consensus on its definition [8]; [9]. However, old study insisted on the importance to describe exactly the nature of the concept because it is the only way to measure it [10]. Performance as a goal to achieve was the center of many research and studies, without agreeing on a common definition [11]. All efforts deployed within the company is for the sole purpose of having a high level of performance. We talk about performance when it is actually measurable, it is done by comparing the expected results with the results achieved. For an organization (or individual), to succeed means achieving its predefined goals and objectives [12]. Ref. [13] describes the performance as in the following diagram:



**Figure 1.** Performance Description [13]

The resources used are purchases of materials, wages, and investments. The results obtained are: profits, calculated as the difference between the

selling price and the cumulative financial charges deployed this diagram presents two main criteria of performance; Efficiency and effectiveness

- Efficiency: Ref. [14] define efficiency as the relationship between the factors as human resources, financial to realize the aim.

Efficiency means the quality of business operations, and the use of internal resources such as raw materials, machinery, employees, capital ... to achieve profit maximization [15]; [16].

This definition does not identify the effectiveness of performance. Rather, it is the ability of an organizational unit to realize its objectives set. Being able to satisfy its customers is one of the example of the efficiency of the organization [17].

- Effectiveness: according to ref. [13] (a financial approach), is the maximum quantity of the finished product that can be obtained through some means and resources used, Have determined Effectiveness by achieving the desired goals while undergoing pressure different charges and costs.

### 2.2 Performance measurement system and indicators:

Assessing the level of performance is now a major concern of management sciences [18].

The goal of performance management is to identify the best combination of special system measures to manage and improve the performance of organizations [19].

Only a one dimensional concept of performance that has been considered for a long time, the performance has therefore been reduced to its financial dimension. A performance that wants to achieve the profit required by the owners of the capital, maintain the turnover and the market share that guarantees the survival of the company. This is no longer the case. A wider concept of performance is included, now we are talking about a complementarity of financial indicators of past performance with those of future [20]. The overall performance of the company, apart from the economic perspective, with the appearance and intervention of other actors (associations, unions, customers, suppliers...), and we introduce other parameters, such as social and environmental perspectives [17]. Ref. [21] insisted on integrating

the set of financial and non-financial indicators, in a clear and flexible manner that uses few variables. With many more arguments from different publications we can say that the traditional aspect of performance is no longer valid for today's company [18]; [22]; [23]. In this new economy, the main source of benefit is Cognitive Capital, which results from the investment of companies in their personal (non-physical assets) as research and development for increasing innovation to enhance competitiveness and ensure sustainability and sustainability. success cannot be achieved without taking into consideration the human factor, especially those who directly contact customers [18].

It is through the performance indicators, that the organization can determine and measure its evolution and its gradual transformation against the predefined goals.

However, it is often not easy to know the appropriate measures (KPI), which aligns with the objectives of the organization activity [24]. Ref. [25] gave an attempt to clarify the general models that are important for a measurement of the management performance in a global approach, by presenting the performance models cited in the literature. There are always attempts to find the ideal models of management performance, and research in the field is still in development [26]. The wrong choice in the selection stage and the planning of different measures and indicators can lead to negative results on the overall strategy of the organization.

In this context, it is important to define the different stages of the life of the company. To determine the type of measures required at each stage of evolution: in the first rank, there is a basis of the appropriate indicators, for the company that is still in its infancy Reliability, speed and efficiency, for the second level (growth phase), the most important measure may be the market share. Afterwards in more developed and more mature growth stages, several indicators intervene: price, cost of the internal process (production), capacity of the production, which can constitute the pivot. Finally, for an older industry, the cash flow indicators that can predominate[27].

According to other authors, it is important to respect certain conditions and requirements when choosing performance indicators [28]:

1. Comparability / measurability: they should be a means to discern changes in performance;

2. Sensitivity: a way that shows up to harm (loss), choices and opportunities for performance improvement and the power of more effective decision making;

3. Integrity: the indicators should cover the main dimensions and aspects of the sustainable development of the enterprise;

4. Persistence and Continuity: they should be used constantly to follow up and act in periods of changes and fluctuations;

5. Clarity and transparency: the indicators must be lucid, clear and specific, easy to understand, to avoid misunderstandings.

6. Effectiveness: This effectiveness will come from the simple and reasonable nature of the indicators put in place, in order to facilitate their use, which will increase the effectiveness of the efficient reporting system. The well-selected indicators are necessarily the key to the success of the organization. therefore, it is essential to put in place a set of reliable and measurable result indicators.

The Performance indicators can be classified into three categories [29]:

- Warning indicators: mention an anomaly, a malfunction in the system that requires immediate intervention.
- The indicators of equilibration: indicate the progress of the work, they ensure the follow up all along the path of the achievement of the objectives.
- Anticipation indicators: allow to reconsider and evaluate the strategy adopted by the organization.

### 2.3 Balanced scorecard

Based on the literature , There are several models that can be adopted by organizations, which allows to measure the performance of the system, as: generic performance measurement system, function based measurement system, hierarchical based measurement system, supply chain operations reference model, performance prism, efficiency based measurement system, interface-based measurement systems, medori and steeples framework, supply chain balanced score card system [21].

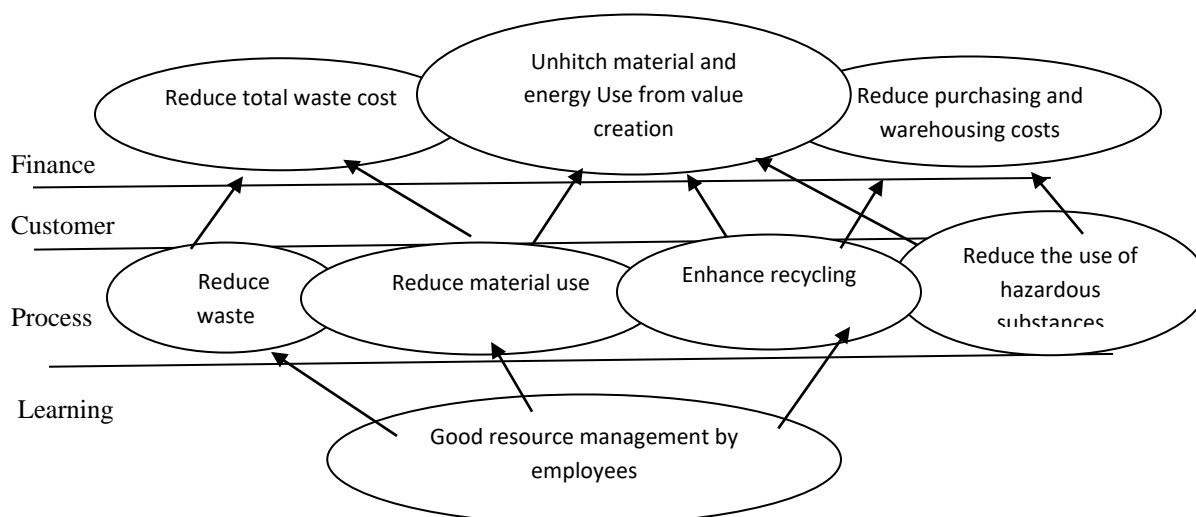
Balanced scorcard (BSC) was proposed by authors in ref [30]. They observed that American firms were based solely on a cost calculation, which once constituted the main pillar of decision making. A proposal resulting from experiments on 12 company in one year. Only the different costs (material, production, storage...) were there to drive the company, they even constituted a basic criterion for

evaluating its performance, neither the mode of financing, and the environment had any influence [30]. the balanced scorecard can be introduced in any type of manufacturing production [21].

Authors in ref. [30] have proposed balanced scorecard (BSC) as a strategic tool to measure performance; to clarify and define the overall strategy while combining the goals and actions needed to achieve the goals. Determining measure and monitoring performance through indicators is a systemic approach [31]. According to a recent study [32] the BSC had built on a four dimensions:

Financial dimension; Stakeholder dimension (customer, staff, community, government, etc.); Supply chain dimension (includes the performance of internal operations and the service of supply chain processes); Learning,

growth and innovation (ability to change and improve the sustainability).



**Figure 2.** Causality chain for an SBSC [33]

The strongest point of BSC lies in its ability to illustrate cause-effect relationships between strategies and processes across the four "financial" perspectives; "Customer," "Internal Process"; "Organizational learning" The content of four BSC perspectives [34]. Ref. [35] has deeply analyzed these causal relationships, and claims that managers want the most to believe in the correctness of causal linkages, it is a logical relation rather than causal. Many authors, considered The BSC as the ideal tool that can ensure the follow up of overall performance as in ref [36]; [37]. That means, Performance includes other dimensions as economic, social and environmental. Whence the name Sustainability Balanced Scorecard [38]. Ref. [21], stresses the importance of a balanced

relationship between these three dimensions. Ref.[39] is a literature review about the relationship between organization success through multidimensional performance measurement systems. There are recent studies on this subject, Ref.[32] proposes a framework for assessing the sustainability of service supply chains using the concept of a balanced scorecard with the consideration of its three dimensions of sustainability, economic, social and environmental. The Balanced scorecard was developed in four main axes: financial, internal process, clients and organizational learning, the first part consists of a set of traditional financial elements; the other three involve non-financial performance measurement indices [40]. Ref. [41] affirms that, the BSC directly links the objectives with the expectations in a clear and easy way.

### 3. Empirical study

#### 3.1 Research methodology

Given the little empirical knowledge on the performance measurement system in the Moroccan agro-food industry, and the exploratory nature of this study, the qualitative case study approach has been considered appropriate for this research.

We interviewed people from companies specializing in food processing, an attempt was made to gain insight into the composition of their value chain (from the supply of the raw material to the destination of their products) to gain a general view of a large sample of activity.

Each interview exceeded one hour of discussion. Respondents were senior managers (table 1), who may have a good overview of performance management because of their involvement in system assessments and planning processes.

We asked them about:

- General information (the date of creation of the company, turnover, number of employees, the destination of their products, quality system adopted) (table 1).

- Their opinions on the government measures taken, for companies in this sector, by evaluating each measure in the latest new 2014-2020 industrial acceleration strategy and also evaluate and indicate their participation in the INMAA program "Moroccan Initiative for Improvement" for Lean

Management lunched by the Ministry of Industry in 2011 in Moroccan SMEs.

- We asked them to identify the major issues facing their organization to remain competitive (see Table 2).

- Evaluate the overall strategy of the company: is it well defined? Is it well understood by the employees?

- Do they think that the performance evaluation system used within the company is based on the BSC; is it used to reward some or all of the employees, or is it just a control tool?

- What is the degree of integration of Financial Measures with non-financial measures in their dashboards?

- Evaluation of the level of use of the axes that make up the BSC namely the financial axis, customer focus, internal process and organizational learning. As well as the classification of determinants according to the method followed in society.

### 4. Results of the study:

**Table 1.** General information of companies

company	activity of company	Creation date	Function of people interviewed	Effective	markets	Quality approach type
A	Flour milling company	1976	General manager	200-500	-national market	ISO 22000
B	Cheese manufacturing	1984	Marketing Group Leader	200- 500	-National market -Africa	ISO 9001
C	Soft Drink Company	1971	Deputy Director General	500-1000	-National market	ISO 22000 - continuous improvement system
D	Canned fish production.	1946	Quality Manager	More than 1000	-National market - Europe - Africa -USA	ISO 9001
E	Coffee production	1987	Director of the production site	About 50	-National market	ISO 9001

All interviewed people judged all initiatives taken by the state insufficient, either those relating to industrial compensation or the financial support that varies from one industry to another. Improving the competitiveness of enterprises also seems inadequate. Despite "Moroccan Initiative for Improvement" which came to ensure the accompaniment of industrial enterprises, wishing to put in place an operational improvement program (an average of 800 companies by 2020) in lean manufacturing for a more efficient output, a more effectiveness of production process. Respondents gave average importance to this incentive, but none of these companies participated.

The quality management system appears to be the main approach adopted by agri-food companies; they asserted that their companies are only satisfied with the quality approach system, either the traditional system as iso 9001 or else developed as 22000. Besides that, company C (production of soft drink) put in place a system of continuous improvement.

**Table 2.** Companies challenges to stay competitive

company	Challenges to stay competitive
A	Enrichment of the raw material Logistical costs (fuels...)
B	intensity of competition Control supply costs.
C	Innovation through the development of new products.
D	Improve the cost price. The intensity of competition. Develop human skills through continuous training. Differentiation of value added products. search for a new market
E	Competition on the market. Improve the quality of the products.

*Company A:* The unstable prices of raw materials is a real challenge for large industrial mills, which absolutely requires a good supplier relationship management ,also if the purchase costs are not well controlled, it can produce harmful consequences. Then Maintain and track supply costs is the most important thing.

On another side, Informal sector companies manifest the intensity of competition at the level of the national market. This constituted a real obstacle, at this level we can say that Government could not yet organized the activity yet.

*Company B:* For the butter and fat's Moroccan industry, characterized by a complex production, Innovation is a first concern, at the product or method level, also the efficiency of research and development is essential for this type of production. Further, acquire international markets (especially African market) pushes the company to seek to develop new products.

*Company C:* one of the three bottlers of a multinational company in Morocco, produce up to 60,000 liters of drink per hour. Its first concern is the diversity of the raw material, then optimization of logistics costs, for example fuel.

*Company D:* that targets international markets is in front of a more demanding clientele and intense competition by products of a high quality, operators in this sector are forced to work on the development of human skills through continuous training. Then the mastery of the production process is atop of their concerns.

*Company E:* coffee's companies are still in a first level of development. The most important thing for them, for remaining competitive in front of the other competitors, is the optimization of the cost price.

Interviewees, who belong to large companies, said that the strategy of their companies is well defined; apparently, they are not sure if it is well understood by the employees. Moreover, we cannot talk about the compensation of all employees through the established systems of performance evaluations. It is only for some (commercial or officials) at the tactical or strategic level; other employees consider it as means of control. Table 3 shows the classification of the determinants and their weights deduced in our survey.

Table 3. The weight of the determinants of the performance of Moroccan agri-food companies, according to the BSC axis

Axis	Déterminant	Weighting of the importance
Financial	<ul style="list-style-type: none"> <li>• Improved productivity and reduced costs</li> <li>• Increased turnover</li> <li>• Use of assets</li> <li>• Reduced financial risks</li> </ul>	<ul style="list-style-type: none"> <li>• 35%</li> <li>• 30%</li> <li>• 20%</li> <li>• 15%</li> </ul>
Customer	<ul style="list-style-type: none"> <li>• Acquisition of new clients</li> <li>• Service quality</li> <li>• Customer retention</li> <li>• Market share and customer portfolio share</li> <li>• Profitability by segment or by customer</li> </ul>	<ul style="list-style-type: none"> <li>• 30%</li> <li>• 25%</li> <li>• 20%</li> <li>• 20%</li> <li>• 5%</li> </ul>
internal Process	<ul style="list-style-type: none"> <li>• production</li> <li>• supplier relationship</li> <li>• Innovation</li> <li>• After sales service</li> </ul>	<ul style="list-style-type: none"> <li>• 40%</li> <li>• 35%</li> <li>• 20%</li> <li>• 5%</li> </ul>
Organizational learning	<ul style="list-style-type: none"> <li>• Potential of employees</li> <li>• information systems (information flow)</li> <li>• Reorientation of skills</li> <li>• Quality and leadership development</li> <li>• Alignment of individual objectives with those of the company</li> </ul>	<ul style="list-style-type: none"> <li>• 35%</li> <li>• 35%</li> <li>• 15%</li> <li>• 10%</li> <li>• 5%</li> </ul>

#### Financial axis:

Managing and reducing costs and improving productivity remain the key determinants of Moroccan agribusiness performance. This will imply an automatic increase in turnover. The agri-food industry is a mass production that requires special management to reduce financial risks, by rational use of assets and efficient management of materials inventory and perishables. The financial axis that measures the economic performance of the company is an important pillar for any company and without the mastery of its determinants; it will not be able to master other axes that are more global.

- Customer axis:

The most important determinant for large agribusiness companies in Morocco is the acquisition of new customers either nationally or internationally. Quality of Service comes second, it is an important indicator of customer satisfaction, and this requires appropriate technological means in distribution logistics, as essentially the mastery of the cold chain for fresh products, it is a mandatory condition, because products for export are subject to sanitary standards without them it would be impossible to access foreign markets. In a highly competitive market, customer retention is a necessity for these companies, while market share or segment profitability comes last in the management

of the customer focus.

- Internal process axis:

Strong competition is pushing agri-food companies to increase their efficiency and reduce waste. Mastery and monitoring of production process is the mainstay of food processing companies, companies in this sector generally experience underutilization of installed capacity (from 30% to 70%), companies in this sector generally experience an underutilization of installed capacities (from 30% to 70%), and a basic level of technologies used. Secondly, the supplier relationship is the second indicator, which requires rational management, to ensure an efficient supply chain, in terms of time and costs. This has a direct influence on production costs; all companies in the food industry are oriented towards their supply abroad, the choice of suppliers is mainly based on quality and price. Also on the basis of the services offered, Keeping a good relationship with the suppliers is very important and this has a positive impact on the quality of the products. Agri-food SMEs are putting more emphasis on food security, meet regulatory requirements for food hygiene and safety. Thirdly, innovation comes from better management of the research and development department, with the aim of enhancing the variety and quality of products, either at the level of export or at the level of domestic demand, especially since there is a

strong competition manifested by the orientation of consumers towards imported products. While the after sales service does not matter for this industry.

- The organizational learning axis:

An empirical study has shown that two parameters positively influence this axis: the motivation of employees and their learning capacity, if the company gives strong knowledge to members, it will become a strong target for external partners [42].

Employees also like to know their capabilities in a measurable way (objectives and measures), this makes them more involved.[43]

It has been found that the potential of employees is the first indicator for these companies in this axis, employees are invited to respect labor standards and processes, which requires a significant investment in human capital, but technical supervision and staff training, remain low and the rate remains below internationally accepted standards.

Then the development of the information system, which is a requirement for these companies, to ensure the circulation of the information and to be based on the evaluation of the indicators of performance, to carry out corrective actions. The reorientation of the competences is related to the level and quality of leadership in the field of people management, their skills, training, working conditions, work organization, time management, and culture. Alignment of individual goals with those of the company is not a concern for these companies it is ensured by already fixed standards and procedures.

We deduced from this survey that Moroccan agribusiness companies are not interested in the

organizational learning axis, which should have more attention and interest; it is understood as a "facilitator" of the change.

The application of key performance indicators improves the performance of the organization and changes the culture of people so that they have more decision-making capacity [44]

Traditional performance indicators used in this area such as absenteeism or accidents, are insufficient, they must be more developed to make work more efficient. Example of more developed indicators: the ability of people to initiate, accompany, accept change, and the sharing of knowledge and the sharing power.

As well, the existence of solid relationships constitutes an important cognitive capital and the collaboration lead to a high level of knowledge [45]

**Table 4.** the cumulative importance weight of the BSC determinants

Determinant	Weighting of importance / Axis	Overall weighting of importance	Cumulative weighting
production	40 %	10 %	10 %
supplier relationship	35 %	9 %	19 %
Improved Productivity and Cost Reduction	35 %	9 %	28 %
Potential of employees	35 %	9 %	37 %
information systems (information flow)	35 %	9 %	46 %
Acquisition of new customers	30 %	8 %	54 %
Increase in turnover	30 %	8 %	62 %
Service quality	25 %	6 %	68 %
Innovation	20 %	5 %	73 %
Customer retention	20 %	5 %	78 %
Market share and customer portfolio share	20 %	5 %	83 %
Use of assets	20 %	5 %	88 %
Reduced financial risks	15 %	4 %	92 %
Reorientation of skills	15 %	4 %	96 %
Quality and leadership development	10 %	2 %	98 %
Profitability by segment or by customer	5 %	1 %	99 %
Alignment of individual objectives with those of the company	5 %	1 %	100 %



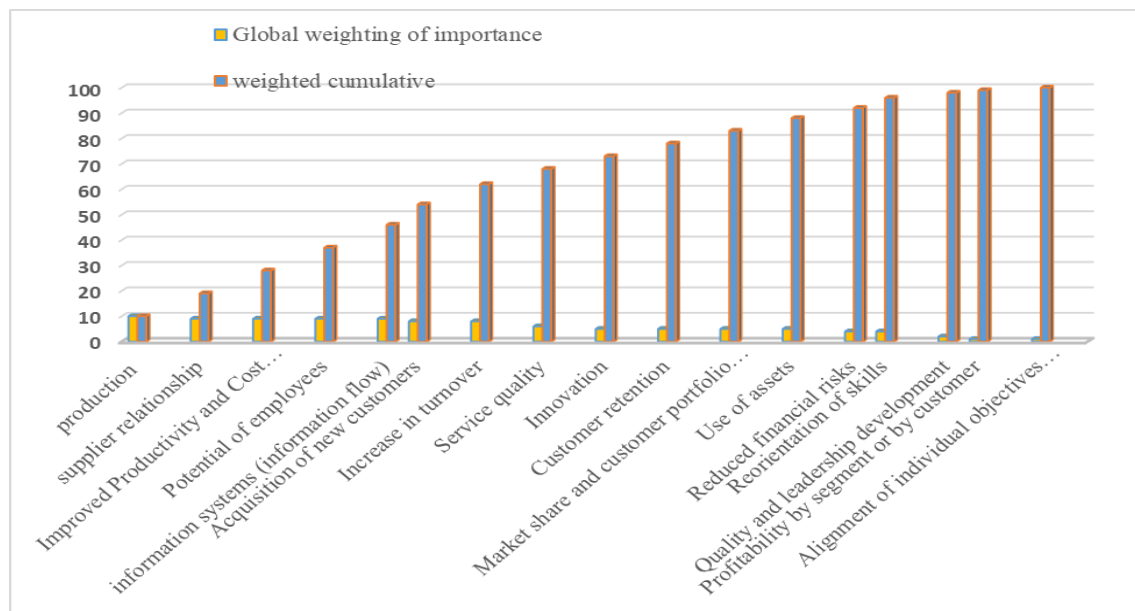


Figure 3. Ranking of determinants of performance according to the BSC

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