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The use, by organizations, of business excellence models has been winning more notoriety as they have several benefits. In turn, the application of management systems standards, through the implementation of the corresponding management systems, aims to enhance internal and external efficiency and effectiveness, in terms of responses due to customers and other interested parts. The developed investigation aimed to obtain relevant information that, in various perspectives, would enable the charact...

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**Excellence models, management systems,  
and their integration in SME.  
Case study – “SME leader” and “SME excellence”  
located at the municipality of Vila Nova de Famalicão –  
Portugal**

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**Abstract.** The use, by organizations, of business excellence models has been winning more notoriety as they have several benefits. In turn, the application of management systems standards, through the implementation of the corresponding management systems, aims to enhance internal and external efficiency and effectiveness, in terms of responses due to customers and other interested parts. The developed investigation aimed to obtain relevant information that, in various perspectives, would enable the characterization of the excellence models and management systems and their integration and lean tools used by the “leader or excellence small and medium enterprises” located at the municipality of Vila Nova de Famalicão, north of Portugal. The investigation, whose strategy and method took into account the case study,

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was supported on a survey by questionnaire that was carried out near 163 small and medium enterprises from different business activities. The proposed approach is supported on the performed literature review that include the concepts of business excellence models, management systems, integrated management systems, lean and quality tools, among others. As main findings that we highlight are: globally, the responding small and medium enterprises (31.67% of the total inquired) use the following management models: SWOT analysis, Balanced scorecard, and the EFQM model, and less frequently the PEX-SPQ, and BCG matrix. From the lean tools, the most used by the respondents small and medium enterprises are: 5S, Kaizen, and Lean manufacturing. The least used are: Six-sigma and Lean office. In terms of management systems standards, the most used are: ISO 9001, ISO 14001, and ISO 45001, and the least used are: ISO 56002, ISO 50001, and ISO 22000. In face of the literature review and for our better knowledge, this work provides new knowledge, from the outset with regard to the potential characterization of the “leader and excellence small and medium enterprises”.

**Keywords:** Business models; Lean tools; Management systems; SME excellence; SME leader.

## 1. Introduction

Over time, the concept of excellence has been scattered in the business and academic community [1]. Many business excellence models (BEMs) were proposed. This is the case of the European Foundation for Quality Management (EFQM) excellence model, which is known as a global structure that helps organizations to manage changes and enhance their growth. There are several investigations that demonstrate that BEMs promote organizational competitive advantages and sustained success [2], [3], [4].

According to International Organization for Standardization (ISO) [5], top management's focus on the capacity of organizations to satisfy the needs and expectations of the clients and other relevant interested parts, provides trust that the sustained success can be reached, this means, to reach the objectives (success) in a determined period (sustained) [6].

The municipality of Vila Nova de Famalicão is located in the north region of Portugal, in the district of Braga. Integrated in the valley of Ave River, the city of Vila Nova de Famalicão is the seat of a municipality with 201,59 km<sup>2</sup> and a resident population, in 2021, of 133,590 [7], spreaded on 34 parishes [8].

In 2021, the 14,905 organizations located in the municipality of Vila Nova de Famalicão employed about 60,000 people. The majority of these organizations (94,55 %) held less than 10 employees. With 10 to 19 employees (2,80%), with 20 to 49 employees (1,66%), with 50 to 249 employees (0,88%), and with more than 250 employees (0,11%) [7]. The turnover was 5,845,185 thousands of euros and the gross value added (GVA) of 1,725,000 thousands of euros [7]. The municipality of Vila Nova de Famalicão has several Institutions that promote: (i) the research, development and innovation; (ii) the professional teaching; and (iii) University courses. The cooperation between these Institutions and the business community is considered fundamental for the success that has been achieved [8].

From the website of the municipality of Vila Nova de Famalicão stands out: (i) the relevant contribution of the referred organizations to the development of the economy of the northern region of Portugal, being the third most exporting municipality at national level; (ii) the fact that 203 organizations obtained (in 2018) the status of “SME leader” and “SME excellence”, of which 163 obtained the status of only “SME leader” (80,30%) and 40 the status of only “SME excellence” (19,70%); and (iii) gaps of information about the characterization of the referred “SME leader” and “SME excellence” in the particular in terms of: (iii-1) the BEMs adopted; (iii-2) the management system standards (MSS) vs standardized management systems (MS), implemented and certified, or not, and how - in an individualized manner or in only one integrated management system (IMS)-; and (iii-3) the used Lean and/or Quality tools.

The main objectives of the investigation, from which the corresponding questions are easily inferred, were to evaluate and characterize: (i) the BEMs adopted, or in the process of being adopted, by “SME leader” and “SME excellence”; (ii) the tools, Lean and/or Quality, adopted, or in the process of being adopted, by “SME leader” and “SME excellence”; (iii) the standardized management systems adopted, or in the process of being adopted, by “SME leader” and “SME excellence”; (iv) the standardized management systems adopted by “SME leader” and “SME excellence”, those that are already certified and those that are undergoing certification; (v) the standardized management systems adopted by “SME leader” and “SME excellence”, those that are fully or partially integrated into an IMS; and (vi) enhance the identification of possible conclusions, recommendations and future challenges that, from a competitiveness perspective, can support the top management of SMEs, in a critical reflection aiming, from the outset, at its evolution towards Global Quality and Business Excellence.

## **2. Literature review**

Micro, small and medium-sized enterprises (SMEs) are the engine of the European economy. In Europe, and in the circumstance at Portugal, SMEs play an important

role in the “non-financial business economy”, representing 68,3% of added value and 77,4% of employment [9].

The use of BEMs gained notoriety in the last decade of the twentieth century, with benefits for organizations that adopted them [10]. Business excellence can be defined as a philosophy, or as models and guidelines for organizations to achieve excellence in strategy, business practices and performance results related to the various interested parts, to become the best possible [11]. Many strategies are implemented and BEMs have been seen as frames of reference that organizations use to develop a culture of excellence [12]. The literature highlights several models: (i) the EFQM 2020 model [13] which is oriented to help organizations achieve success, measuring where they are and indicating the way to create sustainable value [14]; (ii) the PEX-SPQ model, which aims to promote public recognition of organizations established in Portugal [15]; (iii) the Total Quality Management (TQM), which aims to improve quality and productivity in organizations, and most companies consider that there is a relationship between TQM and performance [16], [17], plus the fact that TQM reflects the culture of an organization committed to customer satisfaction through continuous improvement [18]; (iv) the Balanced Scorecard (BSC), defined as a strategic planning and management system by which the organization translates its vision and strategy into concrete objectives [19]. The BSC is a performance metric that is used frequently in strategic management initiatives [20]; (v) The BCG matrix (developed by Boston Consulting Group) which is based on the product/market lifecycle concept, that combined constitute the structure of the BCG product portfolio matrix, and the experience curve [21]; and (vi) SWOT (strengths, weakness, opportunities and threats) model focused on internal analysis to identify the distinctive competences of a company (strengths and weaknesses) and its subsequent confrontation on a temporal basis with the risks (threats and opportunities) of the external context, in order to identify the best alternatives and combinations of opportunities and resources to establish the organization’s strategy [22], [23].

In turn, Standardization is the activity that, in an organized way, enables the elaboration of standards [24]. In particular, the ISO management systems standards (MSSs) which have the common purpose to help organizations improve their performance by assisting them in managing the risks associated with delivering products and/or services to Customers and other Interested Parts [25]. They also serve as the basis for the Economy and are the fundamental pillars of Innovation and competitiveness in a global market scenario [26]. The operationalization of management systems (MSs) promotes the obtaining of benefits for: the Planet (Environment); the Economy (Quality); and for People (Occupational Health and Safety, and Social Responsibility), contributing to the creation of progressively more sustainable businesses [27]. ISO MSSs can be applied to any Organization, large or small, whatever the product

or service and regardless of the sector of activity, and the benefits arising from the implementation of a MS include: (i) more efficient use of resources; (ii) better risk management; and (iii) increased customer satisfaction [28].

According to ISO [25] the individualized implementation of MSs in organizations is an option that can lead to under-optimization of these MSs with consequent loss of competitiveness. The concept of integrated management system (IMS) began to become important, with the publication, in 1996, of the ISO 14001 MSS, but it has become increasingly relevant and comprehensive with the growing proliferation of other MSS which, implemented on an individual basis, potentiate the loss of value for organizations, their relevant Interested Parts, and the Society in general.

Actually there are proposed in the literature, several integration methodologies and models for integration to support the organizations to implement, on an IMS, the several standardized MSs [29], [30].

### **3. Methodology**

The research strategy and method used was basically based on: (i) literature review, supported by scientific articles published in international peer-reviewed journals; and (ii) a case study using a survey by questionnaire to collect qualitative data. The questionnaire was sent, by e-mail, to 163 SMEs (“SMEs leader” and “SMEs excellence”) from different business activities. Of the total of received questionnaires, 23 (21,1%) were validated, which constitute the research sample. The used software for data processing was the Microsoft Excel.

### **4. Results and discussion**

Below are the questions presented on the questionnaire and correspondent feedback, the analysis, and consequent discussion. So, in line with the structure of the questionnaire, in the “Group 1 – Objectives”, the purposes of the questionnaire were identified in terms of the information to be collected from the surveyed SMEs. In “Group 2 – General data”, among other, were received: (i) 22 respondents SMEs (95,65%) have “SME leader” status; (ii) 9 respondents SMEs (39,13%) have the “SME excellence” status; (iii) 1 respondent SME (4,35%) belongs to the category of micro companies (<10 People); (iv) 12 respondent SMEs (52,17%) belong to the small business category (10 to 49 People); (v) 10 respondent SMEs (43,48%) belong to the category of medium-sized companies (50 to 249 People); (vi) 17 respondent SMEs (73,91%) are family businesses; (vii) 6 respondent SMEs (26,09%) are not family businesses.

### **“Group 3 – Management models”, with four main questions:**

**Question 3.1:** From the list of six management models identified below indicate, please, those that are implemented in your Organization.

Among others, the following responses were received: (i) that 4 respondents SMEs (17,39%) have the EFQM model implemented as a management model; (ii) that 1 respondent SME (4,35%) has TQM implemented as a management model; (iii) that 6 respondents SMEs (26,09%) have the BSC implemented as a management model; (iv) that 1 respondent SME (4,35%) has the BCG Matrix implemented as a management model; (v) that 13 responding SMEs (56,52%) have the SWOT analysis implemented as a management model; and (vi) that none of the 23 respondents SMEs have implemented the PEX-SPQ as a management model.

**Question 3.2:** From the list of six management models please, indicate which ones are being implemented in your Organization.

Among others, the following responses were received: (i) that 2 respondents SMEs (8,70%) have in the implementation phase the EFQM model; (ii) that 1 respondent SME (4,35%) has TQM being implemented as a management model; (iii) that 4 respondents SMEs (17,39%) have the BSC in the implementation phase as a management model; and (iv) that none of the respondents SMEs have in the implementation phase the PEX-SPQ, the BCG matrix, and the SWOT analysis.

**Question 3.3:** Please, identify other management models that are already implemented in your Organization.

From the analysis of the received responses to this question 3.3, it can be inferred that 4 respondents SMEs (17,39%) have implemented other management models beyond the six other models identified in the question 3.1. Namely: the “PDCA; “quality management system (QMS)””; “environmental management system (EMS)””; and “occupational health and safety management system (OH&SMS)””; and “Failure Mode and Effect Analysis (FMEA)””.

**Question 3.4:** Please, identify other management models that your Organization intend to implement in the next three years.

From the analysis of the received responses to this question 3.4, it can be concluded that none of the respondents SMEs have identified any other management model that intend to implement in the next three years.

### **“Group 4 – Lean tools”, with four main questions:**

**Question 4.1:** From the list of seven Lean tools identified below, please indicate those that are already implemented in your Organization.

Among others, the following responses were received: (i) 4 respondents SMEs (17,39%) have the Kaizen implemented as a Lean tool; (ii) 6 respondents SMEs (26,09%) have implemented the 5 S's as a Lean tool; (iii) that 1 respondent SME (4,35%) has the Kanban implemented as a Lean tool; (iv) that 4 respondents SMEs (17,39%) have Lean manufacturing implemented as a Lean tool; (v) that 3 respondents SMEs (13,04%) have Just in Time (JIT) implemented as a Lean tool; and (vi) that none of the respondents SMEs has Six Sigma and Lean office implemented as a Lean tool.

**Question 4.2:** From the list of seven Lean tools identified below, please indicate indicate which ones are being implemented in your Organization.

Among others, the following responses were received: (i) 2 respondents SMEs (8,70%) have Kaizen in the implementation phase as a Lean tool; (ii) 1 respondent SME (4,35%) has the 5S's in the implementation phase as a Lean tool; (iii) 1 respondent SME (4,35%) has Kanban being implemented as a Lean tool; and (iv) that none of all the respondents SMEs has, as a Lean tool on implementation phase : the Lean manufacturing; the Six Sigma; the Just in Time; and the Lean office.

**Question 4.3:** In addition to the identified Lean tools, please indicate others Lean tools that are already implemented in your Organization.

From the analysis of the received responses to this question 4.3, it can be inferred that 2 respondents SMEs (8,70%) have implemented other Lean tools that were not considered in the scope of the question 4.1.

**Question 4.4:** Please, identify other Lean tools that your Organization intend to implement in the next three years.

From the analysis of the received responses to this question 4.4, it can be concluded that, only 1 company (4,35%) identified another Lean tool – the Kaizen–, that intend to implement in the next three years.

**“Group 5 – Management system standards (MSSs)”, with four main questions:**

**Question 5.1:** From the list of six MSSs identified below, please indicate those that are already implemented in your Organization and whose MSs are already too certified by a certification body.

Among others, the following responses were received: (i) 16 respondents SMEs (69,57%) have a Quality Management System (QMS) implemented and certified according to ISO 9001; (ii) 8 respondents SMEs (34,78%) have an Environmental Management System (EMS) implemented and certified according to ISO 14001; (iii) 3 respondents SMEs (13,04%) have an Occupational Health and Safety Management System (OH&SMS) implemented and certified according ISO 45001; and (iv)



that none of all the respondents SMEs has: one Food Safety Management System and/or one Innovation Management System and/or an Energy Management System implemented and certified according to the correspondent MSS — ISO 22000; ISO 56002; and ISO 50001—, respectively.

**Question 5.2:** From the list of six MSSs identified below, please indicate which ones are implemented already in your Organization but whose MSs are not yet certified by a certification body.

Among others, the following responses were received: (i) 2 respondents SMEs (8,70%) have a QMS implemented according to ISO 9001, but not certified yet; (ii) 1 of the the respondents SMEs (4,35%) have an EMS implemented according to ISO 14001, but not certified yet; (iii) 2 respondents SMEs (8,70%) have an OH&SMS implemented according to ISO 45001, but not certified yet; (iv) 2 respondents SMEs (8,70%) have a FSMS implemented according to ISO 22000 but not certified yet; (v) 1 respondent SME (4,35%) has an Innovation MS implemented according to ISO 56002, but not certified yet; and (vi) that none of the respondents SMEs has an Energy MS implemented and certified according to ISO 50001.

**Question 5.3:** In addition to the identified MSSs please indicate others ones that are implemented too in your Organization.

From the analysis of the received responses to this question 5.3, it can be inferred that 2 respondents SMEs (8,70%) have implemented other MSSs that were not considered in the scope of the questions 5.1, and 5.2, namely: HACCP - Hazard Analysis and Critical Control Point; ISO 13485:2016 – Medical devices QMS; FSC - Forest Stewardship Council; GOTS - Global Organic Textile Standard, and SMETA - Sedex Members Ethical Trade Audit.

**Question 5.4:** Please, identify other MSSs that your Organization intend to implement in the next three years.

From the analysis of the responses to this question 5.4, it can be inferred that, 5 respondents SMEs (21,74%) intend to implement, in the next three years, other MSSs, namely: (i) ISO 14001, and ISO 45001; (ii) IFS – International Featured Standards; (iii) ISO 9001, and ISO 14001; (iv) ISO 39001:2012 – Road traffic safety MS; and (v) ISO 9001.

**“Group 6 – Integration of implemented MSs”.** Six options of integration were presented. Through two questions, the inquired SMEs were asked to identify the integration option adopted by them to integrate their MSs into an IMS.

From the analysis of the responses it can be inferred that: (i) 10 respondents SMEs (43,48%) consider that there QMS, EMS, and OH&SMS are implemented, and cer-

tified in an integrated way. Namely: the QMS (ISO 9001) integrated with the EMS (ISO 14001), in 6 respondents SMEs; and the QMS (ISO 9001) integrated with the EMS (ISO 14001) and OH&(ISO 45001), in 4 respondents SMEs; (ii) the implementation, in an integrated way, of the two MMSs — [QMS (ISO 9001) integrated with OH&SMS (ISO 45001)]; [(EMS (ISO 14001) integrated with OH&SMS (ISO 45001)]; [QMS (ISO 9001) integrated with InMS (ISO 56002)]; [QMS (ISO 9001) integrated with EnMS (ISO 50001)] — does not occur in any of the respondents SMEs; and (iii) the implementation into an IMS of the two MSs — [QMS (ISO 9001) integrated with EMS (ISO 14001)] is the most observed — 60% of the respondents SMEs. One respondent SME considered a different integration option.

## 5. Conclusions

To be competitive, organizations (entreprises and others) must progressively, consistently and in a balanced way meet, in the medium/long term, the needs and expectations of their relevant interested parts. There is a long way to go in the path of global quality, competitiveness, effective business excellence, sustainability and sustained success. For this, organizations have at their disposal several: national and international MSSs vs. standardized MSs; technologies 4.0; BEMs; Lean and Quality tools; methodologies and models to support an integrated implementation of standardized MS into a lean IMS, and consequent certification. This being the path that organizations must follow. In particular the SMEs in face of its relevance to the development of the economy. However, the literature reveals that there are gaps in terms of knowledge, namely through Case Studies, about the reality of SMEs. In the circumstance the SMES, with the status of “SME leader” and “SME excellence”, located at the municipality of Vila Nova de Famalicão – the major exporter of the north of Portugal.

The obtained information through the questionnaire survey potencieate new scientific knowledge about the status of relevant organizational, operational and management areas of the focused organizations – the SMEs with the status of “SME leader” and “SME excellence” located at the municipality of Vila Nova de Famalicão. This study should be developed at other municipalities of north Portugal or to whole country.

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