Evolutionary paths of performance measurement and management system: the longitudinal case study of a leading SME

Alberto Sardi, Enrico Sorano, Alberto Ferraris and Patrizia Garengo

Abstract

Purpose – *The literature highlights the relevance of performance measurement and management system in small and medium enterprises (SMEs) to face the current competitive environment. However, a number of studies investigate how performance measurement and management system is effective for evolving and how contingency factors could influence this change. Newer experiences are sporadic and rarely investigated by researchers and practitioners. The purpose of this study is to identify the feasible evolutionary path of performance measurement and management system in leading SMEs to respond to current business challenges. Furthermore, it aims to contribute to the understanding of the role of key contingency factors influencing this evolution.*

Design/methodology/approach – *A longitudinal case study, based on retrospective and real-time investigations, is performed to investigate the primary evolutions of the performance measurement and management system and its key determinants.*

Findings – *The findings highlight two evolution paths, increasing the maturity of performance measurement. The first path highlights a strong command and control of performance management; the second path shows a democratic and participative of performance management. Moreover, management information system, organizational culture and management style are highlighted as key contingency factors in the change of performance management.*

Originality/value – *The authors contribute to knowledge in performance measurement field, showing how the efforts for developing performance measurement and management system in a leading SME could determine two different evolutionary paths. Furthermore, the paper describes the increasing role of organizational culture, management style and management information system in performance management evolution, as well as the relevance of online chats and social media in performance management activities.*

Keywords *Performance measurement, Performance management, Small and medium enterprises, Manufacturing, Performance measurement system, Social media*

Paper type *Case study*

Alberto Sardi and Enrico Sorano both are based at the Department of Management, University of Turin, Turin, Italy.
Alberto Ferraris is based at the Department of Management, University of Turin, Turin, Italy and Ural Federal University, Russian Federation.
Patrizia Garengo is based at the Department of Industrial Engineering, University of Padua, Padua, Italy.

Received 22 January 2020
Revised 17 April 2020
Accepted 24 May 2020

Introduction

The adoption of performance measurement and management system (PMMS) is recognized essential in all organizations (Bititci *et al.*, 2012; Franco-Santos *et al.*, 2012; Piscitelli and Mancini, 2018). It is defined as a holistic, balanced and dynamic system able to support the decision-making process through a set of performance measurement activities, e.g. gathering, elaborating and analysing performance (Neely *et al.*, 2001), as well as performance management activities, e.g. communicating, learning and improving performance (Sardi *et al.*, 2018; Smith and Bititci, 2017; Willis *et al.*, 2018). It provides feedback to employees on the outcome of actions reflecting the procedures used to

implement business strategy, as well as the information needed for strategy validation (Bititci, 2015; Bititci *et al.*, 1997; Goshu and Kitaw, 2017; Ittner and Larcker, 2003). The balance between performance measurement and performance management should result from efficient systems (Nudurupati *et al.*, 2016; Smith and Bititci, 2017).

Recent literature agrees to the successful implementation of holistic, integrated and balanced performance measurement and management in large companies. The same cannot be said for small and medium manufacturing enterprises (SMEs) where several constraints obstruct performance measurement and management (Ates *et al.*, 2013; Bititci *et al.*, 2012; Garengo, 2009; Garengo and Sharma, 2014; Moujib *et al.*, 2017). For instance, SMEs highlight lack of availability of human capital, managerial skills, reactive approach and capital resources (Garengo *et al.*, 2005; Hudson *et al.*, 2001). Staff are primarily involved in technical and operational processes, in which they excel rather than intangible asset development. Therefore, SMEs have difficulty with performance measurement and management activities (Sardi *et al.*, 2020). Few of them use performance measurement and management system to drive improvement of organizational performance, which in turn is not very prominent in the literature (Bianchi *et al.*, 2015; Bititci, 2015; Garengo and Biazzo, 2012). Scholars underline that the insufficient empirical and theoretical studies on how performance measurement and management systems are not enough in SMEs and the poor understanding of what organizational factors influence these systems (Bourne *et al.*, 2013; Garengo and Bititci, 2007; Garengo and Sharma, 2014; Jardioui *et al.*, 2019; Taylor and Taylor, 2014).

Adopting a longitudinal methodology, this paper aims to identify how the performance measurement and management system evolves in a leading SME. Consequently, it focused on the study of the organizational conditions in which the PMMS is implemented. In particular, it investigated the impact of the contingency factors on PMMS. Contingency factors are recognized by the literature as key elements that affect the implementation and the use of PMMS. Among the main factors are organization corporate governance structure, business model, management information system (Garengo and Biazzo, 2013; Garengo and Bititci, 2007; Otley, 2016), organizational culture and management style (Bititci *et al.*, 2006; Garengo and Bititci, 2007; Jardioui *et al.*, 2019), but few longitudinal empirical studies support the understanding of how these factors influence the PMMS evolution. To contribute to the above research gaps, the paper answers to the following research questions:

RQ1. How could PMMS evolve in a leading SME to face the new competitive environment? How do contingency factors influence this evolution?

Firstly, we reviewed the existing literature to identify a framework supporting the study of performance measurement and management system maturity. Secondly, we defined the research methodology adopted. Thirdly, we present and discuss the findings. Finally, we addressed the main practical and theoretical contributions, future opportunities and research limitations.

Literature background

From the mid-1980s, scholars and practitioners developed several performance measurement and management models, thus adopting a holistic approach highlighting the significant relevance of tangible and intangible assets (Pimenta, 2017) – see for instance the Balanced Scorecard (Kaplan and Norton, 1992, 1996) and the Performance Prism (Neely *et al.*, 2001; Neely and Adams, 2001). These new models challenged traditional performance models based on control of financial and economic measures (Franco-Santos *et al.*, 2012; Kaplan, 2012; Kaplan and Norton, 2004, 2005; Nudurupati *et al.*, 2016). Their main purpose was to shift focus from control to learning and support the decision-making process (Bititci *et al.*, 2012; Bourne *et al.*, 2013; Jääskeläinen and Laihonen, 2013; Nudurupati *et al.*, 2016; Sardi and Sorano, 2019).

Though highlighting important results in large companies, this approach could not be extended to SMEs because these have specific attributes not shared by large companies, especially in manufacturing, such as lack of financial resources, high reliance on few customers and lack of a clear organizational structure (Ates *et al.*, 2013; Bititci *et al.*, 2012; Cannavacciuolo *et al.*, 2015; Garengo, 2009; Garengo *et al.*, 2005; Garengo and Sharma, 2014). As stated by Garengo *et al.* (2005), these specific attributes can prevent the implementation and use of PMMS. Staff are mainly involved in technical and operational processes, in which they excel rather than intangible asset development. However, the maturity of an SME affects the success of PMMS and quality management systems (Sousa and Aspinwall, 2010).

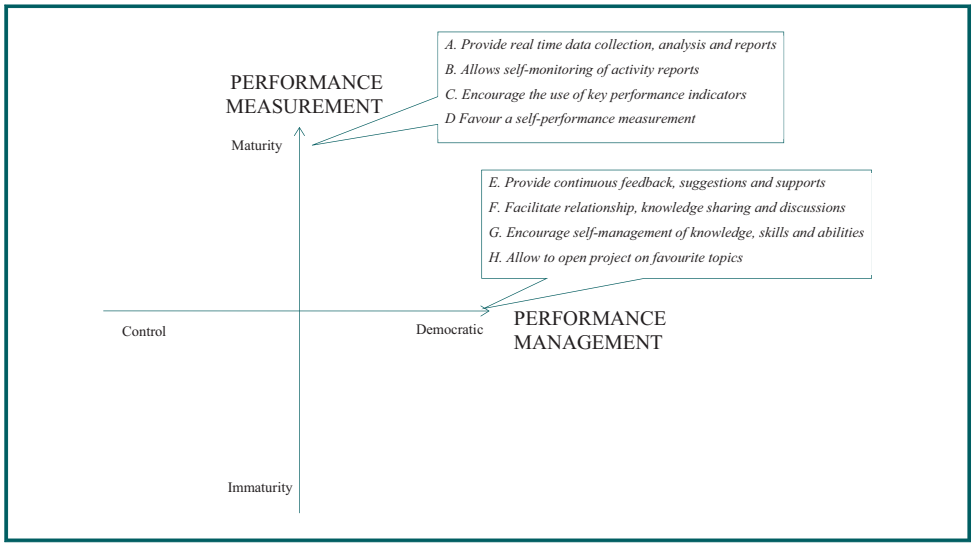
Consequently, SMEs have difficulty with PMM. Performance measurement often involves inadequate awareness of the causal relationship of measures, few managerial skills and insufficient performance reviews as against balanced metrics, regular and short interval control (Bititci, 2015; Smith and Bititci, 2017). Performance management implies work specialization, job standardization and internal competition as against appreciation of employees' differences, willingness to share new ideas and encourage autonomy and self-management (Bititci, 2015; Smith and Bititci, 2017).

Despite the significant progress made in terms of knowledge in performance measurement and management model improvement, scholars and practitioners still highlight problems impeding the effective adoption of PMMSs by SMEs (Bititci *et al.*, 2012). Research papers currently available point to the fact that few SMEs adopt an advanced PMMS (Garengo and Bititci, 2007; Hudson Smith and Smith, 2007). The efforts made to identify an effective approach to meet the needs of these companies are too sporadic considering the existing competitive and challenging environment (Bititci *et al.*, 2013; Garengo and Biazzo, 2012), although recent researches offer new insights. For instance, some researchers describe new low-cost PMMS using information that is easily available to owner-managers, showing that SME performance can be managed using a simple system built around the firm's financial statements (Moujib *et al.*, 2017).

To demonstrate that the context within which the use of PMM is changing, Bititci *et al.* (2012) identified eight global trends affecting PMM, i.e. collaborative organizations, knowledge work, networks, turbulent operating environment, culture, servitization, open innovation, global sustainability and information technologies. They also explained numerous gaps and specific challenges for PMM within a holistic systems-based framework.

To explain these new trends, scholars are studying PMMS as a system of systems (Bourne *et al.*, 2018) and as an interplay between performance measurement process (i.e. what to measure) and performance management process (i.e. how the measures are used to manage organizations' performance, Bititci *et al.*, 2012; Melnyk *et al.*, 2014). Recently, Smith and Bititci (2017) developed a framework to show the interplay between performance measurement and performance management defined as two separate but interdependent organizational control processes (Otley, 2012; Smith and Bititci, 2017). This theoretical framework bases on the different maturity of two processes named performance measurement and performance management. Performance measurement maturity highlights characteristics such as the balance of target setting, interval control and the time of performance reviews (Speckbacher *et al.*, 2003); whereas the maturity of performance management process depends by industrial democracy, the degree of autonomy and job enrichment. This framework was recently upgraded with the new characteristics shown in Figure 1 (Sardi *et al.*, 2018). In terms of performance measurement dimension, this upgrade highlighted the growing use of technological tools (e.g. social media and enterprise social networking) to increase a real-time data collection, analysis and reports; self-control of activity reports and the major use of key performance indicators. Considering the performance management dimension, the increasing use of these tools shows the growing relevance of continuous feedback, relationships, discussions and an inclination at a self-

Figure 1 Framework characteristics typical of performance measurement and management



performance measurement (Sardi *et al.*, 2018). The effective balance of the performance's dimensions supports the design, the implementation and the use of a PMMS (Bititci, 2015) encouraging people to discuss performance (Otley, 2012; Smith and Bititci, 2017). This theoretical framework gave a robust basis for research, especially to describe the evolutionary path of the interplay between performance measurement and management (Smith and Bititci, 2017).

Adopting a contingency approach, Garengo and Bititci, (2007) showed the relationship between contingency factors and performance measurement, and they highlighted the role of organizational governance structure, business model (Afuah and Tucci, 2003), management information system (Garengo and Biazzo, 2013; Mithas *et al.*, 2011; Sardi *et al.*, 2018; Sørensen *et al.*, 2010), organizational culture and management style (Bititci *et al.*, 2006; Jardioui *et al.*, 2019; Schein, 1996) (Table 1). They also showed that advanced information practices and behaviours impact people engagement, a necessary condition for the effective its implementation and adoption in SMEs (Garengo and Bititci, 2007).

Methodology

The case study methodology is more than simply researching a single individual or situation (Baxter and Jack, 2010; Yin, 2018). It favours the exploration and explication of complex situations and it allows the researcher to describe a phenomenon within its context (Baxter and Jack, 2010; Easterby-Smith *et al.*, 2002; Eisenhardt and Graebner, 2007).

We adopted the longitudinal case study based on retrospective (from 2004 to 2016) and real-time investigations (from 2017 to 2019) of a leading SME and selected as a suitable method for an in-depth understanding of little-explored managerial activities (Garengo and Biazzo, 2013; Yin, 2018). The main stages of the longitudinal case study are as follows:

- case study selection;
- data collection; and
- data analysis.

Table 1 Contingency factors

Factors	*Definition*
Management information system	It is part of the overall management system in an organization and form parts of company technology such as enterprise resource planning. It supports almost all management activities providing the identification of key performance indicators (Sørensen *et al.*, 2010). The adoption of technology often leads organizations to focus their attention on technical aspects rather than on human aspects (Garengo and Biazzo, 2013), Mithas *et al.* (2011), Sardi *et al.* (2018). Although scholars outline the importance of analysing human behaviours concerning the information system, they do not enough investigate their impact on information systems Garengo and Bititci (2007)
Organizational culture and management style	Organizational culture is a set of values, beliefs and way of working for individuals in an organization Schein (1996). Change culture is a challenging process. So, it is considered a shared and stable factors by members of an organization for a long time Jardioui *et al.* (2019). Management style is a practice adopted by leaders in people engagement, information management and decision-making process Schein (1996). It is recognized as a key factor influencing organizational culture due to its impact on work sharing, decision-making time and activities control (Garengo and Bititci, 2007).

Case study selection

To select a leading manufacturing SME, we adopted the two criteria suggested and used by Kirby (2005) and Richard *et al.* (2009) and Bititci *et al.* (2012). These two criteria were to be the best performer in its business sector according to some economic and financial indexes (Kirby, 2005; Richard *et al.*, 2009; Bititci *et al.*, 2013) and to match the emerging performance measurement and management trend as shown in recent literature (Bititci *et al.*, 2012). AA, to preserve anonymity, was a leading SME operating in Italy:

- AA was globally the best performer in its sector. It had a significant increase in turnover (+480%), number of employees (+173%) and ROE (+231%) from 2004 to 2019.
- AA matched the performance measurement and management trend stated by Bititci *et al.* (2012). A preliminary interview with the Company Director revealed that the Company exhibited all the emerging trends suggested by the literature as shown in the below list:

Emerging performance measurement and management trends:

Emerging trends

1. Collaboration and networks – PMMS includes relationships and trust between stakeholders:
    - AA collaborates with customers, suppliers and other business partners. AA believes that internal and external relationships are essential to improve employees' skills, knowledge and products. To foster relationships, the company has set up a laboratory that hosts international students and designers to promote creativity, friendliness and knowledge exchange. It also proposes an online blog for continuous discussion of how to improve furniture.
2. Multicultural environment – PMMS includes diversity management:
    - AA thrives to develop innovative initiatives to introduce new products and new ideas. An example is "The Apartment" initiative, comprising a temporary shop that embodies the continued insight of AA in the idea of redefining and re-inventing spaces for selling and uniting stakeholders.

3. CSR and sustainability – PMMS includes quality measures of social performance:

   - Corporate social responsibility is a crucial point for the Company. Headquarters premises are made of wood and glass, thus providing a peaceful environment for staff. AA promotes cultural initiatives, e.g. open days to show the features of its business, and has an environmentally friendly approach in the design and manufacture of its products, thus monitoring the impact of products on the environment.

4. Innovation and knowledge-based work – PMMS covers innovation and knowledge base:

   - Innovation and knowledge are distinctive features of all functions. For instance, AA communicates with customers through social media and interactive showrooms. Living showrooms enable people to learn about furniture design.

Data collection

We collected the data using a retrospective approach (twelve years) and real-time investigation. From 2004 to 2016, we gathered data through interviews, historical information and documents, whereas from 2017 to 2019, data were collected from three sources: interviews, documents and observations. Because of these three sources of evidence, we collected documents, information and reports to understand their actual PMMS. As required by Yin (2018), the information was collected as follows:

- Interviews– No. 24 semi-structured interviews with middle-senior managers.
- Documents– No. 165 documents with the main performance measures.
- Observations– No. 120 full-job-days subdivided between all functions.

We recorded and printed all the available data on digital and paper supports. The data were entered on predefined forms to facilitate summarizing and comparison.

Data analysis

Scholars suggest the analysis of data collected during qualitative studies through within-case and cross-case analysis (Eisenhardt, 1989; Garengo and Bititci, 2007; Miles and Huberman, 1984; Yin, 2018). According to these scholars, we analysed data in two ways:.

1. Within-case study:

   The within-case study focuses the researchers' attention on the search for explanations and causality within the case study (Eisenhardt and Graebner, 2007; Yin, 2018); it aims to understand the case and identifying emerging models (Eisenhardt, 1989; Miles and Huberman, 1984). The within-case analysis is conducted through an accurate description of the cases that highlights the relationships between the factors investigated (Yin, 2018).
   To understand the enterprise context, we summarized the main company information (e.g. turnover and number of employees) and the main features of their performance measurement and management (Table 2).

2. Cross-analysis:
   The cross-case analysis supports the generation of models deriving from the case study (Yin, 2018). It is essential to increase internal validity and the ability to generalize research results. Eisenhardt (1989) argues that subjects have a limited analytical ability because they have access to a limited amount of data, are excessively influenced by other individuals and sometimes ignoring basic statistical properties or inadvertently

Table 2 Company history and PMMS evolution

Enterprise AA	
Main information	
Turnover	€29m
Employees	194
Country	Italy
Profile	Innovative brand in the field of Italian furniture design, producing home furniture
Main events	
1900s	Family business in woodworking.
1950s	Launched production of bedrooms and other furniture.
1980s	Started to produce the living room furniture.
2006	Changed to joint-stock company, supplying over 400 stores and various single brands
PMMS	
2006	Company reported, collected and analysed information without specific measurement method, frequency and purpose
2009	Company implemented the first PMMS, but did not cover all departments. Method and frequency of collating data based on financial, sales and production requirements. Management communicates performance data weekly
2013	Company improved PMMS through the implementation of business object and other tools

neglecting evidence that does not confirm the expected results (Eisenhardt, 1989; Miles and Huberman, 1984).

To develop the cross-analysis, we used Smith and Bititci's (2017) theoretical framework because it is one of the best conceptualized in performance measurement literature and it considers the current turbulent operating environment in which a company acts today, one of the key elements on the design, implementation and adoption of PMMS (Bititci *et al.*, 2012). Its adoption supports the develop of the cross-analysis (Table 4) and the identification of the evolutionary path of the performance measurement and management in SME (Figure 3).

To carry out the cross-analysis, we first assessed the two processes by the scoring dimensions of the main PMM characteristics in 2004, according to the historical documents and interviews with the senior managers. Consequently, we assessed the characteristics of two processes in 2019, according to the documents and interviews with various functions as shown in Figure 2. We evaluated the PMM characteristics to score their maturity (Garengo, 2009; Smith and Bititci, 2017). Range of evaluation scale was 0 to 5, i.e.:

- 0 = PMMS does not show the characteristic; and
- 5 = PMMS shows fully the characteristic.

To graphically compare the data collected, we described the evolutionary path of PMMS through the theoretical framework suggested to Smith and Bititci (2017).

We analysed two contingency factors proposed to Garengo and Bititci (2007), i.e. organizational culture and management style and management information system. Corporate governance structure and business model were not investigated as they did not change during 15 years.

To evaluate these factors, we assessed data collected through interviews using the frameworks shown in Figure 4. To investigate organizational culture and management style, we used the framework proposed to Bititci *et al.* (2006) because it has already shown its validity in previous studies (Garengo and Bititci, 2007; Garengo and Sharma, 2014; Jardioui *et al.*, 2019). It allowed studying the relationship between performance measurement, organizational culture and management styles through categorization of culture with corresponding management styles (Hofstede, 1980).

Figure 2 Cross-analysis

JOB POSITION	PMMS CHARACTERISTICS – 2004								PMMS CHARACTERISTICS - 2019							
	Performance Measurement				Performance Management				Performance Measurement				Performance Management			
	A. Provides real-time data collection, analysis and reporting	B. Allows self-monitoring of activity reports	C. Encourages the use of key performance indicators	D. Facilitates self-performance measurement	E. Provides continuous feedback, suggestions and support	F. Facilitates relationship, knowledge sharing and	G. Encourages self-management of competences	H. Allows open projects on favourite topics	A. Provides real-time data collection, analysis and reporting	B. Allows self-monitoring of activity reports	C. Encourages the use of key performance indicators	D. Facilitates self-performance measurement	E. Provides continuous feedback, suggestions and support	F. Facilitates relationship, knowledge sharing and	G. Encourages self-management of competences	H. Allows open projects on favourite topics
Administration Senior Manager	0	1	1	0	1	1	0	0	2	2	3	3	0	0	1	0
Administration Middle Manager									3	3	4	2	0	1	1	0
Administration Junior Manager									2	2	4	2	2	0	2	2
Customer Senior Manager	0	2	1	0	1	1	1	0	4	2	3	3	0	0	1	0
Customer Middle Manager									2	2	4	3	2	0	2	2
Control Senior Manager	0	2	2	2	2	2	2	1	4	4	3	3	1	0	0	1
Control Middle Manager									4	4	5	3	2	1	2	2
Sales Senior Manager	0	1	2	1	0	1	0	0	4	3	3	3	3	4	4	3
Sales Middle Manager									4	4	3	4	4	3	3	3
Marketing Senior Manager	0	2	2	0	0	2	0	0	3	4	4	4	4	4	4	3
Marketing Middle Manager									5	4	4	4	4	3	4	4
Designer Senior Manager	0	0	0	0	0	0	0	0	5	4	5	3	4	4	4	4
Designer Middle Manager									5	3	5	3	4	4	5	4
Designer Middle Manager									4	4	4	4	4	3	4	4
R&D Senior Manager	0	0	0	0	0	0	0	0	4	4	3	3	4	3	3	4
R&D Middle Manager									4	4	4	4	4	2	4	4
IT Senior Manager	0	2	2	1	1	1	1	0	4	4	4	4	4	2	2	1
IT Middle Manager									4	4	3	3	4	1	2	1
Supply Chain Senior Manager	0	1	1	1	1	2	1	1	4	2	2	2	2	0	1	0
Supply Chain Middle Manager									2	2	3	3	0	2	1	1
Purchasing Senior Manager	0	0	1	0	0	1	0	0	2	3	2	4	2	0	1	1
Purchasing Middle Manager									2	2	3	3	0	1	1	0
HR Senior Manager	0	1	1	0	0	0	0	0	2	2	3	3	0	1	1	0
HR Middle Manager									3	3	4	2	0	2	1	1
Total Average Score for each characteristic	0,0	1,1	1,2	0,5	0,6	1,0	0,5	0,4	2,9 4,2	2,7 3,8	3,3 3,8	2,9 3,6	1,3 3,9	0,7 3,6	1,3 3,9	0,8 3,7
	Performance Measurement				Performance Management				Performance Measurement				Performance Management			
Total Average Score	**0,7**				**0,6**				**3,0**		**3,8**		**1**		**3,7**	

To study management information system, we adopted Garengo and Bititci's (2007) framework, which was based on technology, management practices and human behaviours dimensions. The technical aspects were assessed according to investment on information technology (IT). To evaluate management practices and employees' behaviours concerning the information system, we gathered the main practices adopted and employees' perceptions of the use of technology through interviews and observations.

Findings

The enterprise in question was a furniture SME operating in Italy. It was set up at the end of the nineteenth century as a family-run business, unchanged in the last 15 years. AA has about 400 stores located in major cities including London, Paris and Barcelona, and is the best performer in its field, exhibiting the performance measurement and management system trend as per Bititci *et al.* (2012). It collaborates with an active network of customers, suppliers and universities. The Research & Development (R&D) department has international students participating in research projects to create new products and services and promotes other initiatives with continuous interactions in a multicultural environment.

The within-case study shows how the PMM approach has developed (Table 2) from initial collection, analysis and reporting information without specific measurement methodology, frequency or purpose, thus merely highlighting financial and economic indicators. In 2009,

the first PMMS was implemented because of several managerial projects. Although not yet covering all departments, the method and frequency of data collection were adequate to meet financial, sale and production requirements. In 2013, the PMMS was improved by implementing sophisticated information systems. However, some departments still collected and analysed data using other tools. Employees often autonomously collated and processed data using managerial software, Excel spreadsheets and paper sheets. To move on, AA employed new staff for data integration in a management information system, which facilitated collection, processing and circulation of data in support of the decision-making process.

All company processes were controlled using financial and production indicators, sales turnover and marketing data. Interviews yielded 165 performance parameters such as production list per month (Operation Department), calls per month (IT Department), email campaign per week/month (Marketing Department) and market analysis per year (Sale Department). Parameters were compared to those of previous year or specific periods.

Parameters were placed on the internal managerial platform using automated procedures to be accessed by all management functions and selected staff. They were circulated as daily or weekly reports via email on the intranet or software. Some were printed and posted on department boards to facilitate circulation. This visual approach enabled all employees concerned to see the reports, especially benefiting senior staff with limited technological fluency. Reports were often shared on an internal platform and social media, e.g. Facebook and WhatsApp. Results were discussed during one-to-one meetings (formally) and private group chat (informally). In meetings, all management functions discussed operational aspects such as project management and marketing campaigns. At the end of the presentations, the management set out activities to achieve the targets for the period, e.g. week and month.

To analyse the evolution of PMM characteristics over the years, we carried out a cross-analysis. Figure 2 shows the job position of interviewer and the assessment of the different PMM characteristics if the paper will be print in black and white we should write light grey. The yellow cells show averagely the PMM characteristic as listed in Figure 1. In turn, the blue cells show insufficiently the performance management characteristic. This cross-analysis identified the two different approaches below:

1. the first approach, namely “Maturity and Control Path”, based on the characteristics of performance measurement and less frequently on the characteristics of performance management; and
2. the second approach, namely by “Maturity and Democratic Path”, based on the characteristics of PMM.

Both approaches were based on performance measurement activities for real-time data collection, analysis and reporting, each employee self-monitoring own activities through the use of parameters (key performance indicators), with new management software and technological tools such as Facebook and WhatsApp playing a key role. In turn, these aids permit continuous feedback, suggestions and support, facilitate knowledge sharing and discussion and promote self-management of knowledge, skills and open-project proposals on specific topics. They also support explorative organizational learning and encourage connective networks and bonding among stakeholders.

To show PMMS paths through cross-case analysis between 2004 and 2019, we calculated the average score for 2004 and 2019. We graphically compared case studies by the evolutionary paths of PMM (Figure 3).

Finally, we carried out a contingency factor analysis (Figure 4).

Management information system

AA introduced company management software several years ago. It invested in IT to obtain an advanced management information system that supported the development of performance measurement and management system based on a large data amount to answer strategic and operative needs. This progressively increased the maturity of its performance measurement inclusing real-time data collection, analysis and reporting with each employee being able to self-monitor own activities. This management information system was based on formal practices and consuetudinary behaviours.

In recent years, part of the company started the use of informal performance management sources like social media, WhatsApp and other freeware, cross-platform messaging and voice over internet protocol. This informal management information system encouraged participative and democratic performance management permitting continuous feedback, suggestions and support; it facilitates knowledge sharing and discussion, and self-management of knowledge, skills and competences and proposals of open projects on specific topics. This management information system was based on informal practices and consuetudinary usual behaviours.

Organizational culture and management style

AA used an authoritative management style and power culture as a starting point. The authoritative management style favoured the initial implementation of a PMMS in the company. After the implementation, the use was split up in two different approaches.

The first was based on an achievement culture and a consultative management style. The development of an achievement culture favoured people engagement. They worked hard to achieve goals and better the company as a whole. The company had highly motivated people who need little to no supervision but of sharing. This SME had ethical value but not too many rules and procedures because they may interfere with the accomplishment of

Figure 3 Evolutionary paths of performance measurement and management

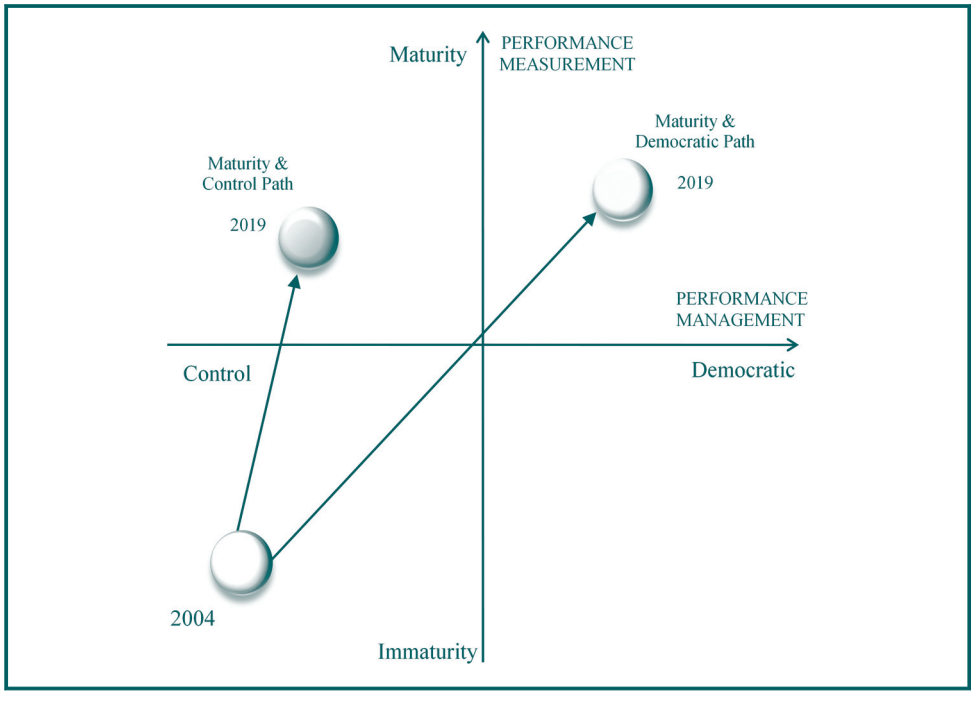
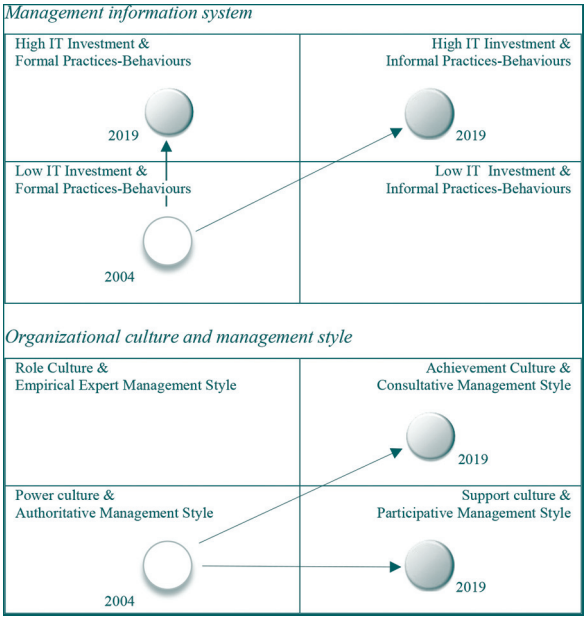


Figure 4 Contingency factors



work. The leadership style was based on humility and the ability to communicate equally to anyone, especially between colleagues from the same department/office.

The second was based on support culture and a democratic management style. It encouraged explorative organizational learning and facilitated connective networks and bonding among stakeholders, often including informal activities based on the use of social technologies. This style of leadership favoured a strong moral reinforcement that led to product and process innovation. People often talked to each other of company performance in formal and informal meetings. This dialogue made it possible to improve listening and communication of company performance.

Discussion

The results of this research identified two evolution paths with a net increase in the maturity of performance measurement. The first path, namely, maturity and control path, highlights a strong command of performance management, whereas the second path, namely, maturity and democratic path, highlights participative performance management. They also encourage the use of performance measurement parameters and facilitate self-monitoring of activity reports, but differ from performance management activities. The maturity and control path applies to performance activities based on formal support without changes to sharing, commenting and posting of main information, rarely allowing self-management of information. The maturity and democratic path is the favourite among the new generations of employees. Management is increasingly breaking new ground, thus opting for completely different use and perception of information technologies. Different skills, competencies, preferences and interaction processes are emerging, with continuous feedback and widespread use of social media and nano-technology. In turn, wireless sensor networks, cloud computing, embedded systems and mobile internet are supporting the development of computer systems able to continuously interact with the physical system in which they operate. New technologies are changing how enterprises perceive

and manage their assets (Nudurupati *et al.*, 2016) because products and services are enhanced with digital capabilities that increase their value. In this scenario, PMMS relies on continuous feedback, open communication and knowledge sharing, helping interaction of employees from different teams, departments and enterprises. Social media and chats now enable employees to dialogue with peers about performance, as stated in the literature (Bititci, 2015), thereby changing business communication, both internal and external. This revolutionary tool and the new topics arising from it, which gives researchers opportunities for future studies on performance management, although the performance measurement literature does not carry much investigation on the relationship between PMM and the new social technologies.

The maturity and democratic path answers to the recent literature, which defines PMMS such as a holistic, balanced and dynamic system able to support the decision-making process through a set of performance measurement activities and performance management activities (Smith and Bititci, 2017; Willis *et al.*, 2018). However, the balance between performance measurement and performance management, which should give a basis of an efficient system, it was still rarely identified especially in SME (Bourne *et al.*, 2018; Smith and Bititci, 2017).

To understand the contingency factors of the implementation and use PMMS, the study emphasized the key role played by management information system and organizational culture and management style for the development of a maturity and democratic path. Firstly, high IT investment and informal practices and behaviours on management information system strongly impact on the improvement of performance management. Secondly, the study highlights the impact organizational culture and management style on the different development of PMM. An achievement culture and a consultative management style favoured the development of a maturity and control path, while a support culture and participative management style favoured a maturity and democratic path.

As highlighted by the institutional theory, the resilient and deeper aspects of social structure are recognized as authoritative guidelines for social behaviour perspective (Di Maggio and Powell, 1991; Scott, 2001). Institutions are described as social structures that have attained a high degree of resilience. The company investigated showed the same company governance structure since the 1900s. AA was a traditional family; the company capital is held by a small group of shareholders belonging to the same family; the board of directors play a "service role", while the decision-making regarding strategy and management is of the owners. Although different components explain how organizations create, diffuse and adapt over space and time, the institutions are stable but are subject to change processes (Scott, 2001, 2004; Di Maggio and Powell, 1991). As specified to Burns and Scapens (2000), the relationship between actions and institutions highlights the importance of organizational routines and institutions in shaping the processes of management accounting change (Burns and Scapens, 2000). As seen by the findings of this research, the issue of PMMS implementation and evolution in the logic of management accounting changed in the company. The results agree with the institutional theory and Burns and Scapens (2000)'s study.

The findings gap iterature need as expressly required by recent publications, i.e. to understand how SMEs respond to new and current business challenges and how to improve performance management in SME (Garengo and Biazzo, 2013; Mithas *et al.*, 2011; Sardi *et al.*, 2018; Sørensen *et al.*, 2010). Moreover, recent literature underlined the need of holistic, integrated and balanced PMMS in SMEs (Ates *et al.*, 2013; Bititci *et al.*, 2012; Garengo, 2009; Garengo and Sharma, 2014). The findings connect these literature needs offering a participative and democratic approach to managerial improvement in manufacturing SMEs as required by scholars to the performance measurement field (Ates *et al.*, 2013; Bititci *et al.*, 2012; Garengo and Sharma, 2014). These results address the design of efficient and balanced PMMSs in SMEs based on new requirement of the digital

era, i.e. engage people in conversations about performance (Bititci, 2015; Nudurupati *et al.*, 2016; Smith and Bititci, 2017). The maturity and democratic path connects performance measurement activities and performance management activities supporting people on the decision-making process by specific feedback based on real-time data collection, analysis and reporting data (Bititci, 2015; Bititci *et al.*, 1997; Goshu and Kitaw, 2017; Ittner and Larcker, 2003).

Conclusion

The paper shows how the efforts for developing PMMS in a leading SME could determine two different evolution paths into the same company because of the influence of management information system, organizational culture and management style.

Research implications suggest how the results can be important for policy, practice, theory and subsequent research. Through the frameworks adopted by this research, SMEs may evaluate their PMMS to understand their weaknesses and seek improvement solutions. A possible solution introduced by this research is the use of informal tools such as chats and social media in performance management activities. In this sense, SMEs should forecast strategical management of informal tools for improving performance management activities to engage people in conversation about performance.

This project offers academic and practical contributions in the form of a longitudinal, in-depth assessment of the PMMS adopted by a leading SME. The academic aspect covers the understanding of the evolutionary path of performance measurement and management in a manufacturing SME. The practical contribution offers a path, namely, maturity and democratic path, to managerial improvement in leading manufacturing SMEs. Hopefully, these results will drive the design of efficient and balanced PMMSs in SMEs. However, the main purpose of the project remains the recognition of the increasing role of chats and social media in performance management activities.

The main limitation of this study is that only one SME was investigated. However, its strength is that it permits an in-depth understanding of performance measurement and management of the best performing SME for 15 years.

The results give scope for future research opportunities, thus encouraging more case studies for exploration, testing, validation or improvement. Note that additional research is required to explain how performance measurement and especially performance management activities are evolving in SMEs. Moreover, further investigation is required on the use of innovative technology in performance management activities.

References

Afuah, A. and Tucci, C. (2003), *Internet Business Models and Strategies*, McGraw Hill, Boston, MA.

Ates, A., Garengo, P., Cocca, P. and Bititci, U.S. (2013), "The development of SME managerial practice for effective performance management", *Journal of Small Business and Enterprise Development*, Vol. 20 No. 1, pp. 28-54.

Baxter, P. and Jack, S. (2010), "Qualitative case study methodology: study design and implementation for novice researchers", *The Qualitative Report*, Vol. 13 No. 4, pp. 544-559.

Bianchi, C., Cosenz, F. and Marinković, M. (2015), "Designing dynamic performance management systems to foster SME competitiveness according to a sustainable development perspective: empirical evidences from a case-study", *International Journal of Business Performance Management*, Vol. 16 No. 1, pp. 84-108.

Bititci, U.S. (2015), *Managing Business Performance: The Science and the Art, Managing Business Performance: The Science and the Art*, Wiley Blackwell, Edinburgh.

Bititci, U.S., Carrie, A.S. and Mcdevitt, L. (1997), "Integrated performance measurement systems: a development guide", *International Journal of Operations & Production Management*, Vol. 17 No. 5, pp. 522-534.

Bititci, U.S., Firat, S.U.O. and Garengo, P. (2013), "How to compare performances of firms operating in different sectors?", *Production Planning & Control*, Vol. 24 No. 12, pp. 1032-1049.

Bititci, U.S., Garengo, P., Dörfler, V. and Nudurupati, S. (2012), "Performance measurement: challenges for tomorrow", *International Journal of Management Reviews*, Vol. 14 No. 3, pp. 305-327.

Bititci, U.S., Mendibil, K., Nudurupati, S., Garengo, P. and Turner, T. (2006), "Dynamics of performance measurement and organisational culture", *International Journal of Operations & Production Management*, Vol. 26 No. 12, pp. 1325-1350.

Bourne, M., Franco-Santos, M., Micheli, P. and Pavlov, A. (2018), "Performance measurement and management: a system of systems perspective", *International Journal of Production Research*, Vol. 56 No. 8, pp. 1-12.

Bourne, M., Mills, J., Wilcox, M., Neely, A. and Platts, K. (2000), "Designing, implementing and updating performance measurement systems", *International Journal of Operations & Production Management*, Vol. 20 No. 7, pp. 754-771.

Bourne, M., Pavlov, A., Franco-Santos, M., Lucianetti, L. and Mura, M. (2013), "Generating organisational performance: the contributing effects of performance measurement and human resource management practices", *International Journal of Operations & Production Management*, Vol. 33 Nos 11/12, pp. 1599-1622.

Burns, J. and Scapens, R.W. (2000), "Conceptualizing management accounting change: an institutional framework", *Management Accounting Research*, Vol. 11 No. 1, pp. 3-25.

Cannavacciuolo, L., Iandoli, L., Ponsiglione, C. and Zollo, G. (2015), "Knowledge elicitation and mapping in the design of a decision support system for the evaluation of suppliers' competencies", *VINE*, Vol. 45 No. 4, pp. 530-550.

Di Maggio, P.J. and Powell, W.W. (1991), *The New Institutionalism and Organizational Analysis*, University of Chicago Press, Chicago, IL.

Easterby-Smith, M., Thorpe, R. and Lowe, A. (2002), *Management Research, an Introduction*, Sage, London.

Eisenhardt, K.M. (1989), "Building theories from case-study research", *Academy of Management Review*, Vol. 14 No. 4, pp. 116-121.

Eisenhardt, K.M. and Graebner, M.E. (2007), "Theory building from cases: opportunities and challenges", *Academy of Management Journal*, Vol. 50 No. 1, pp. 25-32.

Franco-Santos, M., Lucianetti, L. and Bourne, M. (2012), "Contemporary performance measurement systems: a review of their consequences and a framework for research", *Management Accounting Research*, Vol. 23 No. 2, pp. 79-119.

Garengo, P. (2009), "A performance measurement system for SMEs taking part in quality award programmes", *Total Quality Management & Business Excellence*, Vol. 20 No. 1, pp. 91-105.

Garengo, P. and Biazzo, S. (2012), "Unveiling strategy in SMEs through balanced scorecard implementation: a circular methodology", *Total Quality Management & Business Excellence*, Vol. 23 No. 1, pp. 79-102.

Garengo, P. and Biazzo, S. (2013), "From ISO quality standards to an integrated management system: an implementation process in SME", *Total Quality Management & Business Excellence*, Vol. 24 Nos 3/4, pp. 310-335.

Garengo, P. and Bititci, U.S. (2007), "Towards a contingency approach to performance measurement: an empirical study in Scottish SMEs", *International Journal of Operations & Production Management*, Vol. 27 No. 8, pp. 802-825.

Garengo, P. and Sharma, M.K. (2014), "The management of operations performance measurement system contingency factors: a cross analysis of Italian and indian SMEs", *Production Planning & Control*, Vol. 25 No. 3, pp. 220-240.

Garengo, P., Biazzo, S. and Bititci, U.S. (2005), "Performance measurement systems in SMEs: a review for a research agenda", *International Journal of Management Reviews*, Vol. 7 No. 1, pp. 25-47.

Goshu, Y.Y. and Kitaw, D. (2017), "Performance measurement and its recent challenge: a literature review", *International Journal of Business Performance Management*, Vol. 18 No. 4, pp. 381-402.

Hofstede, G. (1980), *Culture's Consequences*, Sage, Beverly Hill, CA.

Hudson Smith, M. and Smith, D. (2007), "Implementing strategically aligned performance measurement in small firms", *International Journal of Production Economics*, Vol. 106 No. 2, pp. 393-408.

Hudson, M., Smart, A. and Bourne, M. (2001), "Theory and practice in SME performance measurement systems", *International Journal of Operations & Production Management*, Vol. 21 No. 8, pp. 1096-1115.

Ittner, C.D. and Larcker, D.F. (2003), "Coming up short on nonfinancial performance measurement", *Harvard Business Review*, Vol. 81 No. 11, pp. 88-95.

Jääskeläinen, A. and Laihonen, H. (2013), "Overcoming the specific performance measurement challenges of knowledge-intensive organizations", *International Journal of Productivity and Performance Management*, Vol. 62 No. 4, pp. 350-363.

Jardioui, M., Garengo, P. and El Alami, S. (2019), "How organizational culture influences performance measurement systems in SMEs", *International Journal of Productivity and Performance Management*, Vol. 69 No. 2, pp. 217-235.

Kaplan, R.S. (2012), "The balanced scorecard: comments on balanced scorecard commentaries", *Journal of Accounting & Organizational Change*, Vol. 8 No. 4, pp. 539-545.

Kaplan, R.S. and Norton, D.P. (1992), "The balanced scorecard–measures that drive performance", *Harvard Business Review*, Vol. 70 No. 1, pp. 71-79.

Kaplan, R.S. and Norton, D.P. (1996), "Linking the balanced scorecard to strategy", *California Management Review*, Vol. 39 No. 1, pp. 53-79.

Kaplan, R.S. and Norton, D.P. (2004), "Measuring the strategic readiness of intangible assets", *Harvard Business Review*, Vol. 82 No. 2, pp. 52-63+121.

Kaplan, R.S. and Norton, D.P. (2005), "The balanced scorecard: measures that drive performance", *Harvard Business Review*, Vol. 83 Nos 7/8, pp. 172-180+194.

Kirby, J. (2005), "Toward a theory of high performance", *Harvard Business Review*, Vol. 83 No. 7–8, pp. 30-39+190.

Melnyk, S.A., Bititci, U.S., Platts, K., Tobias, J. and Andersen, B. (2014), "Is performance measurement and management fit for the future", *Management Accounting Research*, Vol. 25 No. 2, pp. 173-186.

Miles, R.E. and Huberman, A.M. (1984), *Quantitative Data Analysis – A Source of New Methods*, Sage, London.

Mithas, S., Ramasubbu, N. and Sambamurthy, V. (2011), "How information management capability influences firm performance", *MIS Quarterly: Management Information Systems*, Vol. 35 No. 1, pp. 237-256.

Moujib, B., Josée, S.-P. and Ouafa, S. (2017), "Performance measurement and management for manufacturing SMEs: a financial statement-based system", *Measuring Business Excellence*, Vol. 21 No. 1, pp. 17-36.

Neely, A. and Adams, C. (2001), "The performance prism perspective", *Journal of Cost Management*, Vol. 15 No. 1, pp. 7-15.

Neely, A., Adams, C. and Crowe, P. (2001), "The performance prism in practice", *Measuring Business Excellence*, Vol. 5 No. 2, pp. 6-13.

Nudurupati, S.S., Tebboune, S. and Hardman, J. (2016), "Contemporary performance measurement and management (PMM) in digital economies", *Production Planning & Control*, Vol. 27 No. 3, pp. 226-235.

Otley, D. (2012), "Performance management under conditions of uncertainty: some valedictory reflections", *Pacific Accounting Review*, Vol. 24 No. 3, pp. 247-261.

Otley, D.T. (2016), "The contingency theory of management accounting and control: 1980-2014", *Management Accounting Research*, Vol. 31 No. 1, pp. 45-62.

Pimenta, D.G.A. (2017), "A balanced scorecard for marketing", *International Journal of Business Performance Management*, Vol. 18 No. 4, pp. 476-494.

Piscitelli, D. and Mancini, G. (2018), "Performance measurement systems in business networks: a literature review", *International Journal of Business Performance Management*, Vol. 19 No. 1, pp. 87-104.

Richard, P.J., Devinney, T.M., Yip, G.S. and Johnson, G. (2009), "Measuring organizational performance: towards methodological best practice", *Journal of Management*, Vol. 35 No. 3, pp. 718-804.

Sardi, A., Garengo, P. and Bititci, U.S. (2018), "Measurement and management of competences by enterprise social networking", *International Journal of Productivity and Performance Management*, Vol. 68 No. 1, pp. 109-126.

Sardi, A. and Sorano, E. (2019), "Dynamic performance management: an approach for managing the common goods", *Sustainability*, Vol. 11, p. 6435.

Sardi, A., Sorano, E., Garengo, P. and Ferraris, A. (2020), "The role of HRM in the innovation of performance measurement and management systems: a multiple case study in SMEs", *Employee Relations (in press)*.

Schein, E.H. (1996), "Culture: the missing concept in organization studies", *Administrative Science Quarterly*, Vol. 41 No. 2, pp. 229-240.

Scott, W.R. (2001), *Institutions and Organizations*, Sage, Thousand Oaks, CA.

Smith, M. and Bititci, U.S. (2017), "Interplay between performance measurement and management, employee engagement and performance", *International Journal of Operations & Production Management*, Vol. 37 No. 9, pp. 1207-1228.

Sørensen, C.G., Fountas, S., Nash, E., Pesonen, L., Bochtis, D., Pedersen, S.M., Basso, B. and Blackmore, S.B., (2010), "Conceptual model of a future farm management information system", *Computers and Electronics in Agriculture*, Vol. 72 No. 1, pp. 37-47.

Sousa, S. and Aspinwall, E. (2010), "Development of a performance measurement framework for SMEs", *Total Quality Management & Business Excellence*, Vol. 21 No. 5, pp. 475-501.

Speckbacher, G., Bischof, J. and Pfeiffer, T. (2003), "A descriptive analysis on the implementation of balanced scorecards in German-speaking countries", *Management Accounting Research*, Vol. 14 No. 4, pp. 361-387.

Taylor, A. and Taylor, M. (2014), "Factors influencing effective implementation of performance measurement systems in small and medium-sized enterprises and large firms: a perspective from contingency theory", *International Journal of Production Research*, Vol. 52 No. 3, pp. 847-866.

Willis, G., Cave, S. and Kunc, M. (2018), "Strategic workforce planning in healthcare: a multi-methodology approach", *European Journal of Operational Research*, Vol. 267 No. 1, pp. 250-263.

Yin, R. (2018), *Case Study Research: Design and Methods*, 6th ed., Sage, Los Angeles, CA.

Further reading

Scott, T., Mannion, R., Marshall, M. and Davies, H. (2003), "Does organisational culture influence health care performance? A review of the evidence", *Journal of Health Services Research and Policy*, Vol. 8 No. 2, pp. 105-117.

Corresponding author

Patrizia Garengo can be contacted at patrizia.garengo@unipd.it