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A Comparative Study on Strategic Performance Management of Dutch Firms

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Abstract

Strategic performance management (SPM) has become an important vehicle for business management in today's turbulent business environment. SPM has in recent years attracted much research interest from the side of both scientists and policy-makers. This interest is warranted because of the fundamental transformations (e.g. increased competition, changes in the regulatory environment, the impact of technology, growing globalization, shifts in customer behaviour and expectations) in industrial systems created a challenging business environment, which prompted firms to call for insight into their business activities and operational performance at all times. The growing importance of these changes has further intensified the need for alternative strategic control and performance measures to allow businesses to stay competitive and profitable. The performance measures should provide a complete picture of a firm's progress towards the achievement of its mission and goals. The study addresses the need for an efficient SPM and operational Performance Measurement System (PMS) for assessing business performance to cope with continuous changing business circumstances, to develop systematic strategic tools/approaches that shape and measure a firm's capability for continuous competitiveness, to innovate and renew themselves business-oriented climate, which potentially determine the success of the firms. Both the popular and scientific literature indicate that there is evidence that SPM is now implemented (in use) in approximately 70% of medium-to-large firms in the US and Europe, as well as in many governmental departments. There is however, much unjustified belief in the assumed potential offered by the implementation of SPM in Dutch firms. Most studies are anecdotal, case studies, speculative and less based upon empirical facts or solid business management theory. Much work has been carried out on the design and deployment of SPM, but relatively little attention has been paid on the impact of SPM on firms' results. The paper aims to investigate on an empirical basis whether SPM yield the benefits and/or disbenefits, as predicted by the literature, for Dutch firms. And to provide an insight into the reasons behind the implementation of SPM, as predicted by the literature, because each of the reasons for implementing SPM should yield particular benefits or disbenefits. The overarching analysis framework of this paper is based on SPM, because particular attention is paid to the lessons from the strategic performance management literature for measuring the successes (and failures) of Dutch firms. Much empirical studies provide mixed evidence on the strategic benefits from the implementation of SPM. Various literature sources, case studies and practical experience show that firms that have implemented SPM obtain better financial and non-financial results, and improve more their overall quality than competitors or comparable firms that are less SPM-driven over a longer period of time. But, other literature sources reported that SPM has failed through incorrect identification of non-financial indicators, poorly defines metrics to address the requirements of all the stakeholders, wrong and too little or much measurements, use the metrics ineffectively, no clear existence of the link between non-financial and the expected financial results and no clear interactions (correlation(s)) among the benefits, disbenefits and reasons behind the implementation of SPM. The research will deploy sophisticated statistical tools (exploratory factor analysis and multiple regression analysis) to assess systematically the business activities success and (and failures) after implementing SPM in practice.

1 The Role of High-Tech SMEs: Introduction

In today's competitive business world, enterprises are challenged to continually innovate and improve the quality of their products and services to stay ahead of the extreme – often global - competition in which the combined pressures of economic liberalization, technological change and shifts in regulatory systems lead to a complex action space. The world of business environments in a modern economy (e.g., increased openness and globalization) have changed dramatically the way of pursuing business (Spence, 2004), and depends nowadays heavily on the performance in generating utilizing new knowledge, innovations and technologies. This holds even more so in the high technology industry which is usually characterized by an extremely volatile, dynamic and uncertain business climate. High technology firms operate in a volatile environment with continually changing technologies, markets, and business strategies, and shifting consumer needs for products and services. The trend in this high technology sector is that – next to large multinationals corporations - small and medium-sized enterprises (SMEs) emerge and grow continuously thus increasing their employment, while large firms tend to decline in number (down-size and focus on their core activities) and to cut their employment (Tether and Storey, 1998). High-tech firms are the most active forces of the dynamics in SMEs. Policy makers increasingly view high-tech SMEs as key contributors to industrial innovation performance, technological change and economic growth (Jones-Evans and Klofsten, 1997; Bommer and Jalajas, 2002).

High-tech SMEs are creating and implementing technological innovations (a major source of developing the high-tech industry) and represent a powerful medium for the creation of new jobs. The increasingly vital role of high-tech SMEs in innovation - in both regional and national economic and social development and (international) competitiveness - has been widely acknowledged in the economic and entrepreneurship literature (Pavitt, 1990; Berry and Taggart, 1996; Oakey, 2007; Cooper and Park, 2008). High-tech SMEs are designed to be flexible and innovative and are often built around a successful innovative product (Trumbach et al., 2006). However, the death rate of high-tech SMEs is higher than that of large enterprises due to capital scarcity and their small scale, high-tech SMEs are frequently confronted with great challenges in an ever-increasingly fierce, global competition, in combination with fast changing customer demands, de-regulation and blurring industrial boundaries, shortening product life cycles and discontinuous technological changes. High-tech SMEs operate thus in a continually changing business environment; the competition is often so intense that there is no breathing space for relaxation and strategy development (Sureshchandar and Leisten, 2005). The above sketched uncertainty, whether in terms of competition, technology advancements or business cultural (Sureshchandar and Leisten, 2005), warrants the design of a valid and suitable model on firms that shows how firms are performing and that offer the means to improve their performance and to support (control and manage) them better in the challenging business environment in order to enhance their performance by remaining viable and to realise competitive advantages associated with their human capital. As uncertainty increases in the external environment, firms are finding it also increasingly difficult to reach consensus on long-range decisions (Cokins and Paladino, 2007). The growing importance of these changes has further intensified and supported the need for efficient Strategic Performance Management (SPM) and a related Performance Measurement System (PMS) (Davis and Albright, 2004) to encourage businesses to stay competitive and profitable (Zeng and Zhao, 2005). SPM offers opportunities for not only managing human capital, but also for acquiring a competitive advantage. SPM is often seen as a sine qua non necessary for executing an effective business strategy (Mohrman and Mohrman, 1995), because it affects current and future performance of a firm (Millett 1998), offers aids and knowledge to evaluate and monitor how a business performs, and provides reliable and robust steering measures at both the top (macro) level (Critical Success Factors,

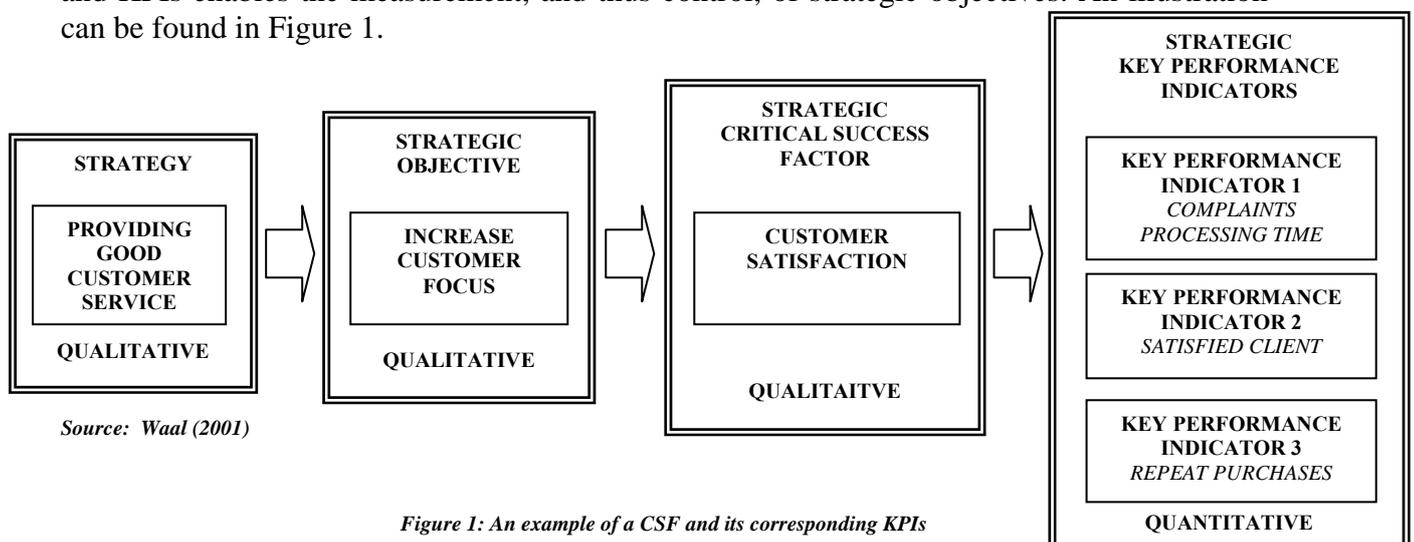
CSFs) and at the operational (micro) level (Key Performance Indicators, KPIs) that are in tune with the manifold circumstances of high-tech SMEs. In conclusion, in a turbulent and discontinuous economic development, concrete and operational measures to study, investigate, analyse and improve business performance are a prerequisite for high-tech SMEs' sustainable growth and development. According to Sureshchandar and Leisten (2005), in an environment of rapid change and fierce competition attempting to measure and manage performance is obligatory. Such measures should efficiently and effectively address all facets of a firm's business excellence (Sureshchandar and Leisten, 2005). This is in line with Bourne's et al. (2003) notion that firms have to focus on a wider range of stakeholders, and have to pay attention to all important drivers of business performance.

Against this background, the present paper aims to review the current state-of-art knowledge on SPM, with a particular view to the high-tech SME sector. A systematic framework will be offered to position various contributions from the recent literature and to create a frame of reference for our comparative studies. The empirical part consists of a summary of findings from a previously undertaken study on corporate firms, followed by dichotomic comparison of the success of SPM strategies of large firms and SMEs. The paper will be concluded with an outline of future research in the SPM area.

2 Strategic Performance Management

2.1 2.1 Prefatory remarks

Strategic Performance Management (SPM) is *“a continuous process where steering of the organisation takes place through the systematic definition of mission, strategy and objectives of the organisation, making these measurable through critical success factors and key performance indicators, in order to be able to take corrective actions to keep the organization on track”* (Waal, 2001). Firstly, firms have to formulate a strategy and a mission: *what do we want to accomplish and how can we achieve that mission?* In order to make a firm's strategy concrete and tangible, strategic objectives need to be formulated, so that it becomes clear which activities have to be undertaken in order to implement the organization's strategy. Whether or not objectives are being achieved can be monitored with the help of leading indicators that are expressed in the form of critical success factors (CSFs) and key performance indicators (KPIs) (lagging indicators). A CSF provides a qualitative description of an element of the strategy in which the organization has to excel in order to be successful. The CSF is quantified and operationalized by means of a KPI. The use of CSFs and KPIs enables the measurement, and thus control, of strategic objectives. An illustration can be found in Figure 1.



Source: Waal (2001)

Figure 1: An example of a CSF and its corresponding KPIs

Faced with a turbulent business environment (e.g., increasing globalization and competition), Figure 1 shows that providing good customer service is critical of importance for a firm's success (Waal, 2001). Firms have to acknowledge the critical importance of being customer-oriented throughout the organization. A customer service focus assists firms to provide better products and services and thereby increasing customer satisfaction and in turn enhances their competitiveness. The number of customers that repeatedly buy products or services reflect whether customer service is satisfactory. An important activity that helps to keep customers satisfied is to respond quickly to complaints ('complaint processing time') and their needs (Waal, 2001). Firms have to avoid poor service levels and offer the best service levels to satisfy customers. It is therefore critical for firms to inculcate consumer needs and wishes into their firms' strategy and to implement effective SPM to improve customer service. If performance indicators that measure the execution of the strategy and the creation of value are not included in the SPM process, it will not be transparent whether strategic objectives and value creation are being achieved (Waal, 2001). If organizations cannot define the overall performance of their organization, they cannot measure or manage it (Armstrong and Baron, 1998). To link the company's long-term strategy to the day-to-day operations an operational Performance measurement system (PMS) has to be designed (Kald and Nilsson, 2000). PMS may be defined as: the formal process of collecting data and tracking information (information-based routines and procedures) by managers used in SPM to maintain or alter pattern in organizational activities (Simons, 2000; Waal, 2002). There are numerous, major methods and movements type of SPM to regularly increase the performance of firms (e.g., shareholder value, human resource accounting, activity-based costing, knowledge management scorecards). The currently most popular PMS method in business practice is the Balanced Scorecard (BSC), created by Kaplan and Norton (1992, 1996a, 2001a,b). It is a strategic management system that uses CSFs and KPIs for translating an organization's mission and strategy into a balanced set of integrated performance measures (Ho and Chan, 2002; Brignall, 2002). The performance measures provide a complete picture of an organization's progress towards the mission and goals (Ho and McKay, 2002). The BSC contains a diverse set of performance measures, a combination of non-financial measures (leading indicators) and financial measures (lagging indicators) organized according to four distinct perspectives, namely financial performance, customer relations, internal business processes, and the organization's learning and growth activities (Kaplan and Norton 1992; Lipe and Salterio, 2000). Figure 2 gives an illustration of a supply chain BSC framework.

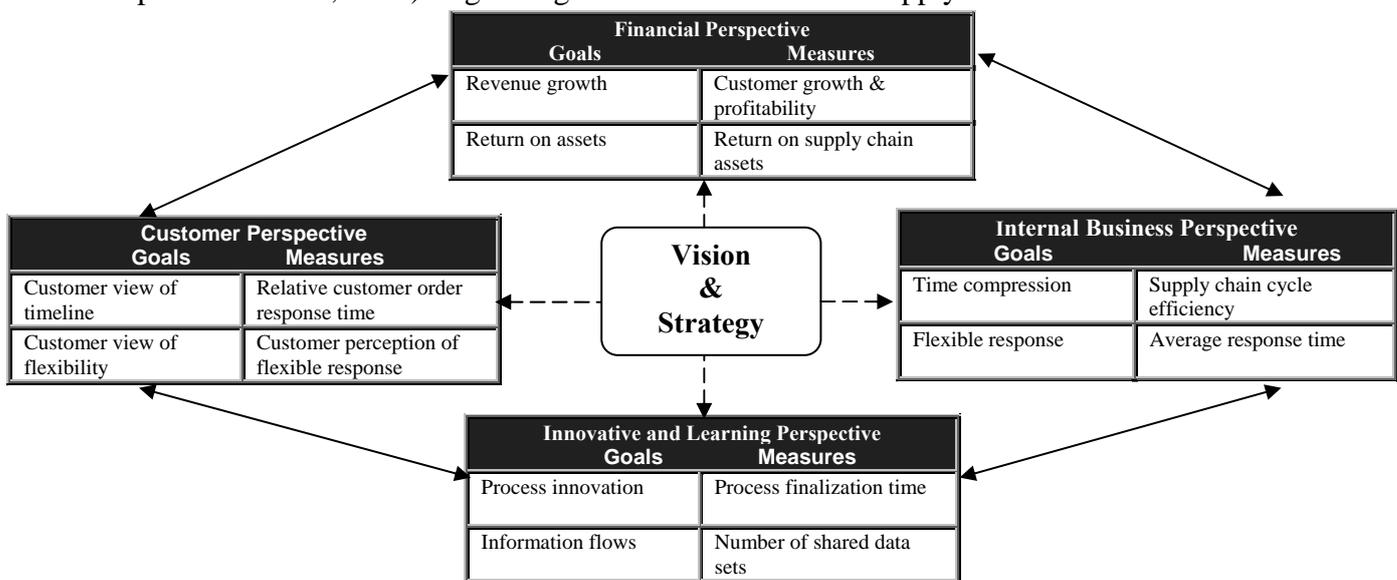


Figure 2: An example of the balanced scorecard

The BSC adopts four main angles to get a balanced overview of the organization's performance (Waal, 2001), to offer an understanding of where the organization was and where it is going, and to check whether the organization's strategy execution is still on track. The BSC essentially follows a linear one-way approach (Kaplan and Norton 1992), it assumes the following causal relationship: it starts with the learning and growth perspective and culminates in financial results outcomes (Brignall, 2002). This research does not only concentrate on the BSC tool, but on all types of measurement tools, and therefore the more general term SPM is used in this research.

2.2 SPM and high-tech SME

SPM has become a critical and an increasingly important (systematic) guidance (process) for business management in today's unpredictable, dynamic business world. SPM can be used (Kaplan and Norton, 1996b; Chow et al., 1998; Zairi and Jarrar, 2000; Niven, 2002; Andersen et al., 2006) e.g., to perform health checks throughout organizations; to clarify and translate vision into operational strategy; to communicate and link strategic objectives and business measures; to set targets and align subsequent strategic initiatives; to enhance strategic feedback and learning; to monitor the overall performance of the organization; to set strategic direction and use measurements to ensure adherence to this direction; to use performance levels to conduct detailed operational planning of activities and processes; to develop cost estimates for products and services based on past performance history; to base production planning on up-to-date performance data; to establish early warning through monitoring of key indicators (leading indicators); to influence and alter employee behaviour to promote desired changes; to establish incentives through focusing on specific performance indicators and using performance data as basis for bonuses and rewards; to improve project evaluations; to use performance data as a communication tool for providing feedback; and to check the effectiveness of past decisions and plans. The question is: has this broad coverage of SPM been experienced successful in practice by high-tech SMEs? SPM have recently gained much interest, yet solid empirical-quantitative research is scarce, and on high-tech SMEs in particular. Both the popular and scientific literature indicates that there is evidence that SPM is now implemented (in use) in approximately 70% of medium-to-large firms in the US and Europe, as well as in many governmental departments (Silk 1998; Rigby 2001; Neely et al., 2004; Marr et al., 2004). Various literature studies and case-studies (Hronec, 1993; Lynch and Cross, 1995; Lingle and Schiemann, 1996, 1999; Kaplan and Norton, 1996b; Atkinson et al., 1997; Armstrong and Baron, 1998; Waal, 2001; Lawson et al., 2003) show that organizations that have implemented SPM obtain better financial and non-financial results, and improve more their overall quality than competitors or comparable organizations that are less PM-driven over a longer period of time; these organizations are labelled as High Performance Organizations (HPOs)¹. But are high-tech SMEs indeed HPOs as defined in the recent business economics literature? Most studies are anecdotal (Neely et al., 2004), case studies, speculative and less based upon empirical facts or solid business management theory and focus on research in large firms in general, and not high-tech SMEs in particular. Further, much work has been carried out on the design and deployment of SPM, but relatively little attention has been paid on the impact of SPM on firms' results in general (Bourne et al., 2000; Neely and Bourne, 2000; Neely et al., 2004). There is also a lack of empirical evidence of the successes and failures of SPM within the high-tech SMEs. The evidence is more generic in nature and not specific to the high-tech SMEs. Thus, there is little empirical

¹ A High Performance Organization (HPO) is an organization that achieves financial and non-financial results that are better than those of its peer group over a longer period of time; they have a) high-quality management; b) openness and action orientation; c) long-term orientation; d) continuous improvement; and e) renewal and high-quality employees.

evidence that high-tech SMEs implement SPM to gain a competitive advantage and to stay profitable. SPM tools within the high-tech SMEs are limited. Moreover, several practitioners and academics (Covin and Slevin, 1989; Smith and Fleck, 1987; Berry and Taggart, 1996) have argued that SPM is inappropriate for firms operating within the turbulent environment such as high technology industries where conditions change so fast that environmental forecasting becomes meaningless and (long) strategic planning is of questionable value. The gap in the literature is the perception of high-tech SMEs regarding SPM, because these firms tend to over-emphasise the purely technological side of their business and neglect other key strategic issues (Knight, 1986; Oakey, 1991); the day-to-day activities are less standardised and more complex. The understanding and application of SPM concepts by high-tech SMEs is unknown. It is therefore important to ask whether the SPM concept is useful for analyzing and insuring future financial performance – or other achievement indicators - in organizations in general (Norreklit, 2000; Haas and Kleingeld, 1999) and high-tech SMEs in particular. It is essential to know whether the implementation of SPM in various firms and organizations will yield the benefits - or maybe even the disadvantages – as predicted by the literature. Most likely, modifications to existing SPM are required in order to support the emerging flatter, decentralised, flexible, and team-oriented structures often characteristic of high-tech SMEs. Robinson (2004) also mentions that, despite recent empirical research, little is actually known about the specific reasons why high-tech SMEs or normal organizations have implemented SPM, because (each) reason(s) for implementing SPM can bring along automatically particular advantages or disadvantages. There is also little known about the question whether particular SPM advantages can bring along automatically other specific advantages (e.g., a link between non-financial and expected financial results) and disadvantages. Therefore, a critical review whether the SPM concept is a valid model in firms is certainly warranted. Clearly, empirical studies provide mixed evidence on the strategic benefits from the implementation of SPM. Much research offers no convincing support, or at the best mixed evidence. This calls for further investigation into the actual benefits of SPM within high-tech SMEs. Therefore, the present paper will present empirical research to add insight into the reasons behind the implementation of SPM, advantages, disadvantages and experiences of SPM in high-tech SMEs in practice (see for a general framework model Figure 2).

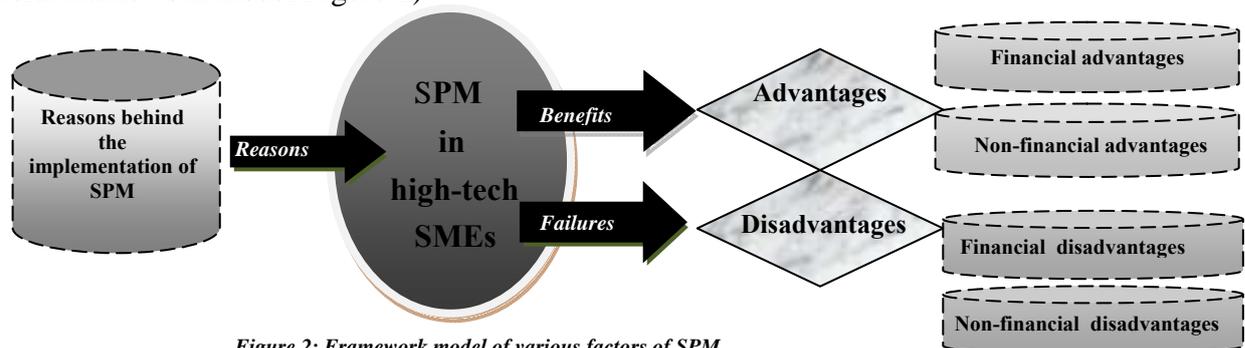


Figure 2: Framework model of various factors of SPM

3 Previous Results: SPM in Big firms

3.1 Approach previous study

Recently, a major study on SPM among major business firms in the Netherlands and Belgium was carried out (Kourtit, 2007). After a review study to extract relevant items from various management and scientific literature studies, a survey questionnaire was designed. The questionnaire consisted of three sections, namely advantages (3 financial and 22 non-financial items), disadvantages (8 items) and reasons (15 items). The variables were measured on two levels, namely ordinal and interval scales. In the case of the ordinal scale a

five-point Likert type scale ranging from 1 (not) to 5 (very) (for advantages and disadvantages) and from 1 (very) to 5 (not) (for reasons) was applied. The aim was to test whether identified items in the literature are experienced in practice by 17 big firms (4 à 5 interviews per organization) - and their employees (52 respondents) - operating in different branches and/or industries and located in the Netherlands and Belgium. The research instrument was a self-structured questionnaire administrated in a personal interview within the participating organizations.

3.2 Dimensions of SPM

The research used the ‘common factor analysis’ (CFA) based on a 'Maximum Likelihood Method' as a multidimensional analytical tool, because the aim was to identify the underlying factors as a set of independent components, to avoid an overwhelming amount of data and to operationalize the experienced items. We make a distinction here between advantages, disadvantages and reasons. The analysis of advantages results in a four-factor structure, the disadvantages in a two-factor structure and the reasons in a two-factor structure.

- **Advantages**

The analysis of advantages results in a four-factor structure, namely Result-Orientation (RO), Clarity (CI), Internal Quality (IQ) and External Quality (EQ). The results of the CFA for the advantages are summarized in Table 1.

Table 1: Overview of the four-factor structure for the advantages

CFA for the advantages	
<p>Factor 1: Result-Orientation (RO) Increase in profit Higher operational efficiency Better decision-making Better management of the organization Reduction in costs More effective management control Increase in revenue Better achievement of organizational goals Better focus on what is important for the organization</p>	<p>Factor 2: Clarity (CI) More clarity on the part of personnel regarding their contribution towards achievement of the strategy and goals Better focus on the achievement of results Better understanding by personnel of the strategy More clarity on the part of employees about their roles and goals</p>
<p>Factor 3: Internal Quality (IQ) Higher pro-activity Greater commitment of personnel Stronger process orientation Better strategic alignment of organizational units</p>	<p>Factor 4: External Quality (EQ) More effective communication on organizational strategies Higher employee satisfaction Strengthened reputation of the organization as a quality firm Higher quality product/service Better strategic planning process More accurate quality performance information</p>

The Factor RO can be viewed as a focused learning process and improvement factor with a continuous provision for making objectives SMART (Specific, Measurable, Achievable, Realistic and Time (when to achieve the set objectives)). The second Factor CI can be viewed as process clarity and an accountability factor with a continuous thinking-process, which translates the strategies into focus, points and clearly identifies individual activities (responsibility), and which also stimulates the participation of personnel. Next, the Factor IQ can be viewed as process participation and communication to inform people about the business’s performance. A factor with a learning- and thinking process of making people more aware of and providing a better understanding of the business direction, processes, and to encouraging them to be more engaged, concerned, and cooperative. Finally, the Factor EQ can be viewed as communication process and managing the real value drivers "behind" new business factor with a continuous strategic planning process combined with learning- and

thinking process for value-creation. This means that this factor uses specific concepts (taxonomy) that everyone is expected to know, enhancing the reputation of the organization, and getting more focused discussions with regard to what is important for the organization and its shareholders and how it is doing as an organization.

- **Disadvantages**

The analysis of the disadvantages results in a two-factor structure, namely Internal Miscommunication (IM) and Uncovered Information (UI). The results of this CFA for the disadvantages are summarized in Table 2.

Table 2: Overview of the two-factor structure for the disadvantages

CFA for the disadvantages	
Factor 1: Internal Miscommunication (IM) Too much internal competition Too much financial information Too expensive and too bureaucratic	Factor 2: Uncovered Information (UI) Too many performance indicators Too aggregated performance information Insufficient strategic information in the system Too subjective and unreliable performance indicators

The Factor IM can be viewed as component that causes misunderstandings and unnecessary discussions. The Factor Uncovered Information (UI) can be viewed as a component that leads to a meaningless discussion and unclear focus on the business.

- **Reasons Factors**

The analysis of the SPM reasons results in a two-factor structure, namely Understand Strategy (US) and Clarity and Openness (CO). The results of this CFA for the reasons behind the implementation of SPM are summarized in Table 3.

Table 3: Overview of the two-factor structure for the reasons

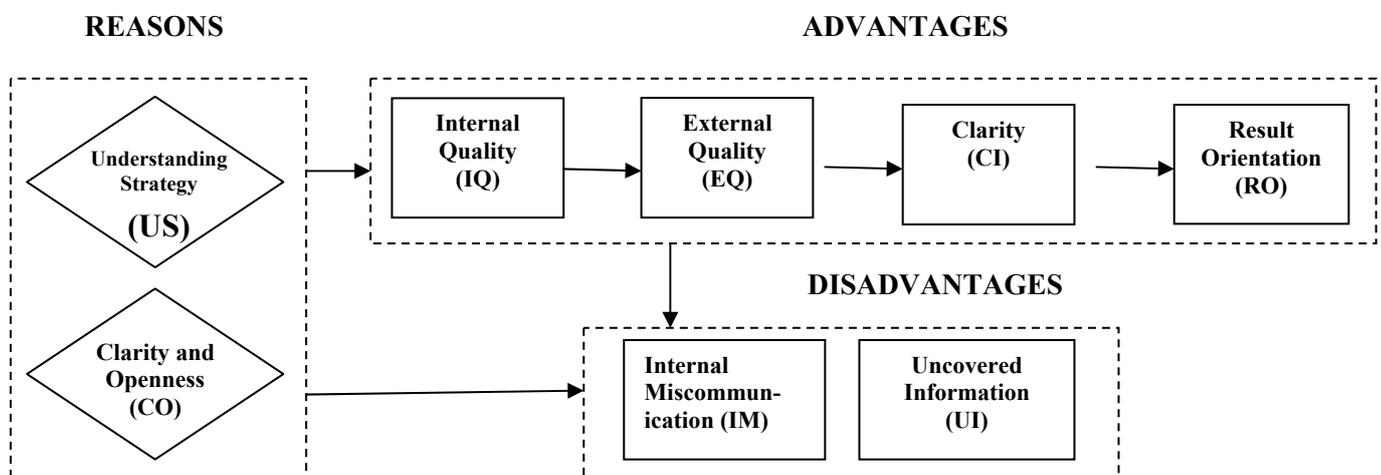
CFA for the reasons behind the implementation of SPM	
Factor 1: Understand Strategy (US) Strengthen involvement in the strategy Better control and 'obedience' Create clarity in the responsibilities of organization parts Manage increases in the complexity of the organization Improve quality Strengthen the responsibility of personnel Better measure the performances of organization parts	Factor 2: Clarity and Openness (CO) Describe mission, strategy and goals of the organization Improve performance of the organization Tune the behaviour of personnel on the strategy Communicate the strategy to everyone Translate the strategy to the operational level Couple reward to strategy Create a better focus on the strategy Obtain a better understanding in knowledge and skills of people

The Factor US can be viewed as a learning process and a component that leads a member of an organization to clear up and understand the strategy better and to show the opportunities and what is good for them, their organization and the society. These opportunities changed their image from 're-active' to 'pro-active' (e.g., stimulated a stronger team spirit) and have a better focus on the business (e.g., performance and results). The Factor CO can be viewed as an effective communication approach to measure better the performance of organization parts, to create clarity in the responsibilities of organization parts and to illuminate particular attention points better.

In summary, these results show that the big firms have experienced various benefits that can be attributed to the introduction in practice of SPM, as described in the management and scientific literature. The introduction of SPM has had a positive impact on the financial and non-financial performance of firms, but firms experienced the financial advantages frequently indirectly. The indirect increase in financial performance was mainly due to the non-financial advantages (e.g., higher operational efficiency, better decision taking, and better management of the

organization) and depends on various external factors (e.g., rapidly growing markets, increased competition, impacts of technology, shifts in customer expectations and economic growth). It turns out that the SPM advantages: RO, CL, IQ and EQ do not significantly differ from each other. This suggests there is no particular advantage that plays a dominant role in the experienced advantages of SPM. However, the SPM disadvantages: IM and UI turned out not to be experienced or less than expected by the majority of the respondents. Finally, results show that the organizations experience in practice various reasons behind the implementation of SPM, as described in the management and scientific literature. This suggests there is no particular reason that plays a dominant role in the decision to implement SPM. If various reasons behind the implementation of SPM and the advantages and disadvantages factors are inserted in a schematic overview, a testable ‘conceptual model’ can be created (see Figure 3).

Figure 3: Conceptual model of experienced advantages, disadvantages and reasons behind the implementation of SPM and the relationship among these factors



This conceptual scheme was originally developed in a previous study (Kourtiti, 2007) to analyze and develop the concept so as to better reflect the impact (benefits and failures) and reasons behind the implementation of SPM in practice. The model shows that reasons for implementing SPM yield or creating particular advantages and disadvantages. Furthermore, the various SPM advantages can automatically bring along particular disadvantages. Finally, particular SPM advantages can also automatically bring along other particular advantages, starting with the IQ and culminating in RO. This will be further discussed in subsection 3.3.

3.3 Direct effect between the factors

Now that it has been established that the “self-constructed” questionnaire can be used for measuring experienced in practice the advantages and disadvantages and reasons behind the implementation of SPM; the question is now: are relationships exist between the given dimensions for improving organisational performance? Using multiple regression analysis can next test the two assumptions, namely:

1. There is a positive relationship between reasons behind the implementation of SPM and advantages and disadvantages.
2. There is a positive relationship between the advantages, which links actions across the, IQ and EQ, CI and RO advantages. Whereby achieving IQ advantage (e.g., greater commitment of personnel) leads to create or improve CI advantage (e.g., higher employee satisfaction) that then leads to create or improve EQ advantage (e.g., higher quality product/service), which in turn leads to strengthen RO advantage

(e.g., increase in revenue, reduction in costs).

Ad1: Direct effect advantages and disadvantages and reasons

In the conceptual scheme it is presumed that reasons, the exogene variables, behind the implementation of SPM are related to advantages, endogene variables.

Reasons (exogene variable)	Standardised Bêtacoefficient (β)	t	Sig.	Result
US reason (exogene variable)	-.046	-.476	.636	Rejected
CO reason (exogene variable)	-.379	-2.820	.007	Rejected
Model 1	F= 4.391	R²= .119	p= .018	
Endogene variable: RO advantage				
US reason (exogene variable)	-.361	-2.669	.010	Rejected
CO reason (exogene variable)	-.070	-.518	.607	Rejected
Model 2	F= 3.995	R²= .107	p= .025	
Endogene variable: CI advantage				
US reason (exogene variable)	-.115	-1.059	.295	Rejected
CO reason (exogene variable)	-.641	-5.907	.000	Rejected
Model 3	F= 19.386	R²= .424	p= .000	
Endogene variable: IQ advantage				
US reason (exogene variable)	-.122	-.919	.363	Rejected
CO reason (exogene variable)	-.381	-2.869	.006	Rejected
Model 4	F= 5.048	R²= .139	p= .010	
Endogene variable: EQ advantage				

Table 4: Multiple regression results for the relationship between advantages and reasons

Table 4 summarizes the regression analysis. It indicates that the CO reason behind the implementation of SPM, the exogene variable, has a negative effect on (the endogene variables): *RO advantage*, because of the high cost of labour-intensive work, other additional costs and the abstract cascading of the strategy; *CI advantage*, because reports that support understanding and clarify the execution of the strategy do always not reach employees on the operational level, there is insufficient cascading of the strategy to the operational level; *IQ advantage*, because some managers monitor only historical data, the high rush in business, too low qualified and insufficient capacity of the (right) people, no alignment between the performances and the strategy and alignment of organizational units and less motivated personnel through a culture change in the organization; and *EQ advantage*, because customer satisfaction is not always measured (well), the reputation of the organization is only regulated on a high level, monitoring quality through the delivery of a physical product instead of also the delivery of knowledge as a result and value creation depends on how people deal with SPM. Finally, the US reason, exogene variable, does not bring along automatically endogene variables RO, CI, IQ and EQ *advantages*. The conceptual model suggested that each reason for implementing SPM (or creating an advantage) can yield particular disadvantages, but the regression analyses, in table 5, show that the models are statistically insignificant, which indicates that the data does not confirm the hypothesized models.

Reasons (exogene variable)	Standardised Bêtacoefficient (β)	t	Sig.	Result
US reason (exogene variable)	-.088	-.625	.535	Model 1
CO reason (exogene variable)	-.234	-1.663	.103	Statistically insignificant
Model 1	F= 1.774	R²= .030	p= .181	
Endogene variable: IM disadvantage				
US reason (exogene variable)	.269	1.930	.060	Model 2
CO reason (exogene variable)	-.176	-1.263	.213	Statistically insignificant
Model 2	F= 2.346	R²= .051	p= .107	
Endogene variable: UI disadvantage				

Table 5: Multiple regression results for the relationship between disadvantages and reasons

Finally, the conceptual model also suggests that there is a mutual correlation between the advantages.

Advantages (exogene variable)	Standardised Bètacoëfficiënt (β)	t	Sig.	Result
CI (exogene variable)	.273	2.189	.033	<i>Accepted</i>
IQ (exogene variable)	.285	2.088	.042	<i>Accepted</i>
EQ (exogene variable)	.252	1.893	.064	Rejected
Model 1	F= 11.228	R²= .376	p=.000	
Endogene variable: RO advantage				
RO (exogene variable)	.332	2.189	.033	<i>Accepted</i>
IQ (exogene variable)	.194	1.253	.216	Rejected
EQ (exogene variable)	.105	.691	.493	Rejected
Model 2	F= 6.354	R²= .239	p= .001	
Endogene variable: CI advantage				
RO (exogene variable)	.293	2.088	.042	<i>Accepted</i>
CI (exogene variable)	.163	1.253	.216	Rejected
EQ (exogene variable)	.320	2.428	.019	<i>Accepted</i>
Model 3	F= 10.472	R²= .358	p= .000	
Endogene variable: IQ advantage				
RO (exogene variable)	.276	1.893	.064	Rejected
CI (exogene variable)	.094	.691	.493	Rejected
IQ (exogene variable)	.342	2.428	.019	<i>Accepted</i>
Model 4	F= 8.820	R²= .315	p= .000	
Endogene variable: EQ advantage				

Table 5: Multiple regression results among the advantages

Table 5 shows that a regression analysis in Model 1 indicates that CI and IQ advantages (as exogene variables) have a positive effect on the RO *advantage* (as an endogene variable), because of a better communication, warning tools, higher employees involvement, improvement of the forecasting process and information reports. However, the RO advantage (as an exogene variable) in model 2 also has a positive effect on the CI *advantage* (as an endogene variable), because of the focus on what really matters, clear and more transparency structures of organizations, movement of ‘loose control’ to ‘tight control’ and monthly review meetings. The results in model 3 also show that both RO and EQ advantages (as exogene variables), have a positive effect on the IQ *advantage* (as an endogene variable), because of a more effective communication on organizational strategies, more accurate management information, higher quality in products and services and strengthened reputation of the organization as a quality firm. The findings in model 4 show next that the IQ advantage (as an exogene variable) has the highest influence on the EQ *advantage* (as an endogene variable), because of highly pro-activity, greater commitment of personnel, a better strategic process orientation and a better strategic alignment of organizational units. Further, the existence of a relationship between the EQ advantage (as a exogene variable) and the RO *advantage* (as an endogene variable) in model 1; between the IQ and EQ advantages (as exogene variables) and the CI *advantage* (as an endogene variable) in model 2; between the RO and CI advantages (as exogene variables) and IQ *advantage* (as endogene variable) in model 3; and between RO and CI advantages (as exogene variables) and the EQ advantage (endogene variable) in Model 4 are not supported by the results.

In summary, there results show that most of the hypotheses are rejected especially those between the reasons behind the implementation of SPM and the advantages. The regression analysis results show that many reasons behind the implementation of SPM have a negative effect on the advantages. This means that not each reason behind the implementation of SPM yields particular advantages. This in itself is not very surprising, because organizations are at the beginning of the implementation of the SPM process. Other possible reasons for this negative effect are that for firms at the beginning of the implementation of a SPM process, strategy is too abstract and not sufficient translated into operational objectives, the supported reports do not (yet) reach the employees on the operational level; the introduction of SPM is labour-intensive (expensive in terms of the well-educated employees) while a time scale of

approximately 1 à 2 years is too short. The implementation of SPM is time-consuming and organizations have to be patient to reap the fruits of the implementation of SPM. Furthermore, many correlations among the advantages are significant, but there are differences in the relationships among the four SPM advantages. The regressions analyses results show that there is a strong correlation between the advantages IQ and EQ, RO and CI, and EQ and IQ, and these are inserted in Figure 3 with black arrows in the following way:

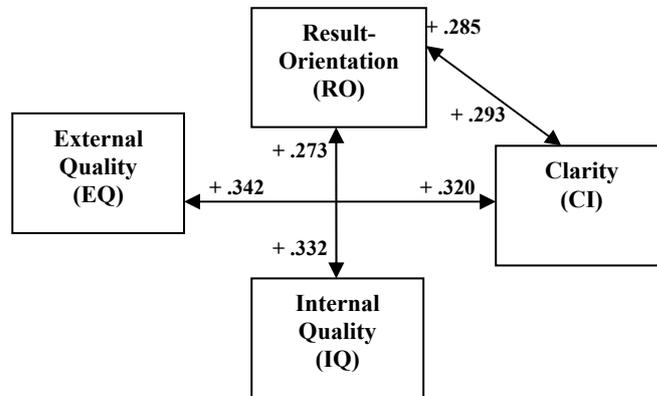


Figure 4: Results of the relationship among the advantages.

The results demonstrate that the outcome of each advantage does not always influence the outcome of other advantages. Figure 4 indicates that the outcome measures of particular advantages can sometimes be lagging outcome measures and at other times they can be leading indicators. This means that each advantage, as an independent variable, has a multiple positive effect. The advantage EQ may best be predicted through both advantages RO and EQ. Thus, knowing that organizations have a higher IQ would lead them to influence their EQ and RO. Furthermore, CI had, as predicted, a positive influence on the outcome measures of RO and also the other way round.

4 SPM in High-tech SMEs

The previous chapter reviewed previous empirical research that presented the experiences of big firms for gaining a competitive advantage from SPM. This prior study provides now the basis for crafting a conceptual framework, which can be used for further research on experiences of advantages, disadvantages and reasons behind the implementation of SPM in high-tech SMEs.

4.1 Methodology new research

The same quantitative and qualitative methodological approach outline in Section 3 is undertaken for our study in order to address experienced advantages, disadvantages and reasons behind the implementation of SPM in high-tech (knowledge-based) SMEs operating in the electronics industry in the Netherlands that are familiar with the firm's SPM and performance. High-tech SMEs refers to highly innovative and technology and knowledge-based SMEs engaging in development, manufacture, distribution of high-tech products, technology transfer and consultation. High-tech SMEs usually cover specific industry sub-groups such as information, electronic equipment, medicine, materials, etc (Radauer, 2002). In this new study big firms were deliberately excluded from this study. The sample of 20 high-tech SMEs (11 high-tech SMEs with SPM implementation and experiences and 9 high-tech SMEs without SPM implementation) has been drawn from Syntens (an innovation network for entrepreneurs that stimulates and accompanies entrepreneurs in the SMEs via many innovation projects) with management personnel. The main research instrument was a

self-established survey questionnaire from the previous research and in-depth interviews. This research also will use the 'common factor analysis' (CFA) based on the 'Maximum Likelihood-method' to identify the underlying factors, to avoid a large amount of data and to measure the experienced advantages within high-tech SMEs. The research is primarily incomplete at this moment! The analysis for this study will be continued as follow:

4.2 Dimensions of SPM in high-tech SMEs

1. *Advantages Factors*: The analysis of the advantages results of SPM in high-tech SMEs.
2. *Disadvantages Factors*: The analysis of the disadvantages results of SPM in high-tech SMEs.
3. *Reasons Factors*: The analysis of the reasons results of SPM in high-tech SMEs.
4. *Conceptual model*

4.3 Direct effect between the factors

5 Comparing big firms and high-tech SMEs

	SPM	SPM
High-tech SMEs	X	O
B.F. (Big Firms)	X	O

6 Conclusion

Primarily incomplete!
The analysis for this study will be continued.

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