Clarke, P. and O'Connor, R., The Meaning of Success for Software SMEs: An Holistic Scorecard Based Approach, 18th European Software Process Improvement Conference, CCIS Vol. 172, Springer-Verlag, June 2011.

An Holistic Scorecard Based Approach to Examining the Meaning of Success for Software SMEs

Paul Clarke [1], Rory V. O'Connor [2, 3]

[1] Lero Graduate School in Software Engineering, Dublin City University, Ireland
pclarke@computing.dcu.ie
[2] Dublin City University, Ireland
[3] Lero, the Irish Software Engineering Research Centre
roconnor@computing.dcu.ie

Abstract. Software processes support the work of software development and software process improvement (SPI) is concerned with improving the operation of the software process. One of the primary reasons for conducting SPI is to increase the success of a software development company [1], [2]. However, a lack of evidence of the benefits of SPI is reported as a de-motivator for project/senior managers [3]. Therefore, the case for SPI would benefit from evidence of the positive impact of SPI on business success. This paper proposes a new approach that utilises the Holistic Scorecard (HSC) [4] to systematically examine business success in software development companies. Furthermore, we relate the experience of applying this new approach to software small to medium sized enterprises (SMEs).

Keywords: Software Process Improvement, Business Success, Software SMEs.

1 Introduction

Owing to the diverse and dynamic nature of software development settings, software development teams and managers conduct SPI so as to "*create more effective and efficient performance of software development and maintenance through structuring and optimising of processes*" [5]. While there can be many motivations for conducting SPI [6], one of the important considerations is the maximisation of business success [1], [2]. However, there are different views in relation to business success [7]. Consequently, the authors have investigated the different views of business success and identified a reference framework, the HSC [4], which is appropriate for the examination of business success in software development companies. We believe that it is important for SPI studies to have a reliable, systematic and comprehensive method for making determinations in relation to business success and consequently, the HSC framework has been transformed into a survey instrument suited to the task of identifying the business objectives of software development companies. The survey instrument is deployed over time: initially, the instrument is utilised to determine the business objectives for the forthcoming period; subsequently, the instrument is deployed in order to determine the extent to which the original objectives have been achieved. This twin approach to determining business success improves the quality of the business success data by reducing the uncertainty associated with biased and false recollection. The initial component of the business success survey instrument has been deployed to the software SMEs sector, where lessons have been learned regarding the suitability of the HSC framework for use in smaller software development settings. Along with outlining the approach to identifying the business success parameters for software companies, the results of the initial application of the approach to software SMEs are presented.

The remainder of this paper is structured as follows: Section two presents details regarding different views of business success. Section three outlines the approach for establishing the extent to which a software development organisation is being successful, while section four relates the experience of applying this approach to software SMEs. Section five discusses the relevance of the HSC reference framework for software SMEs, and finally, section six presents a discussion and conclusion.

2 Different Views of Business Success

Many studies have demonstrated the benefits of SPI, both in large [8] and in small [9-11] organisations. However, recent contributions indicate that one of the de-motivators for SPI among project managers and senior managers is the lack of direct evidence of the benefits of SPI [3]. For senior managers, evidence of the positive relationship between SPI and business success would help to assuage this concern. But what is business success for software SMEs and how might we go about making determinations in relation to the extent of business success in software SMEs? In the business literature, the term *success* is used interchangeably with the term *performance* and in a general sense they both represent the achievement of something desired, planned or attempted [12]. However, beyond this general description, controversy exists in relation to what exactly is meant and understood by the term business performance [13]. Businesses measure performance for a variety of different reasons including, the identification of improvement opportunities, determinations in relation to customer satisfaction, to enhance understanding of their own processes and to assess the degree of success achieved [14]. This variety of reasons for measuring performance has given rise to a variety of different performance measures that can be classified into one of two groups: financial and non-financial [7].

2.1 Financial Measures of Performance

Traditionally, business performance has been measured in purely financial or accounting terms [15]. Profitability, usually measured by return on investment (ROI), has by convention, been used to assess performance and is widely regarded as the ultimate bottom line test of success [13]. In addition to ROI, other financial measures of business performance include return on sales, sales per employee, productivity and profit per unit production [16]. The financial perspective has been reported as having a significant impact on performance – with Reid and Smith [17] concluding that the pursuit of the highest rate of return on investment is a primary consideration for owners and managers. This view is long established in the business success domain with Ansoff asserting in 1965 that "return on investment is a commonly and widely accepted yardstick for measuring business success" [18].

While financial return is an important indicator of business success, "profits are not necessarily the sole purpose of a firm" [19] and it has been observed that it is far from the only important measure [12], with claims that short term financial measures of performance that emphasise a quick return on investment can come at a cost to long term growth [20]. Financial measurement can be considered as tangible evidence of performance but other important performance measures should also be assessed so as to prevent the "inadequate handling of intangibles" and the "improper valuation of sources of competitive advantage" [21]. The measurement of customer satisfaction demonstrates the importance of intangible measures and highlights the danger of focusing solely on financial data: a company that posts successful financial returns might appear to be performing well but, if all of the clients are dissatisfied, the future profitability prospects for the company will be at risk. As a result of the shortcomings of purely financial performance measurement, there has been a "shift from treating financial measures as the foundation for performance measurement to treating them as one among a broader set of measures" [22] and this has given rise to multidimensional performance measurement frameworks.

2.2 Multidimensional Performance Measurement Frameworks

Owing to the dissatisfaction with traditional accounting-based performance measurement systems, multi-dimensional performance measurement frameworks were created as an alternative approach to business performance measurement [23]. As well as accommodating established financial measures of success, these new frameworks incorporated non-financial, future looking performance measures.

A number of multidimensional performance management frameworks have been created, each trying to unlock the vital measurements that would best provide a complete view of the business performance. The performance pyramid [24] contains a pyramid of measures aimed at integrating performance through the hierarchy of the organisation. The macro process model [25] identifies links between the five stages in a business process (*inputs*, *processing system*, *outputs*, *outcomes* and *goals*), arguing that each stage is the driver of the performance of the next. Kanji's Business Scorecard (KBS) defines four fundamental dimensions to be managed and measured: *organisational value*, *process excellence*, *organisational learning* and *stakeholder delight* while the performance prism [26] consists of five interrelated perspectives: *stakeholder contribution*, *stakeholder satisfaction*, *strategies*, *processes* and *capabilities*. However, it is the Balanced Scorecard (BSC) [27] approach that is the most popular multidimensional performance measurement framework [28] and which has exercised the most influence in the domain of performance management [29]. The BSC identifies four measurement perspectives: *financial*, *customer*, *internal business processes*, and *learning and growth*. While the BSC has presents a packaged performance measurement approach that is considered to offer "good coverage of the dimensions of performance" [30], the novelty of the approach has been questioned, with claims that similar multidimensional approaches have existed since at least the 1960s [31]. Furthermore, some research has criticised the BSC as being difficult to implement and potentially not suited to small companies [32-34] – though it has also been noted that SMEs can derive benefits from the BSC approach without having to implement an administratively demanding measurement regime and that SMEs obtain the most value from the BSC when it is used to as a frame of reference for addressing general business goals [35]. Despite these criticisms of the BSC, it is reported to be the most widely adopted [36-38] and most notable [39] performance measurement framework.

While the BSC approach could be applied to any business type, the software development business, often characterised by high levels of dynamism and uncertainty, requires a broader approach to performance measurement [4]. Consequently, Sureshchandar and Leisten [4] have adapted the BSC approach, rendering a strategic performance measurement and management framework for the software development industry, the HSC. The HSC comprises of six perspectives: *financial, customer, business process, intellectual capital, employee* and *social* (refer to figure 1). While the initial three perspectives are similar to the BSC, the latter three – *intellectual capital*, *employee* and *social* – are new considerations and they reflect some of the key items that may affect the performance of a software business.

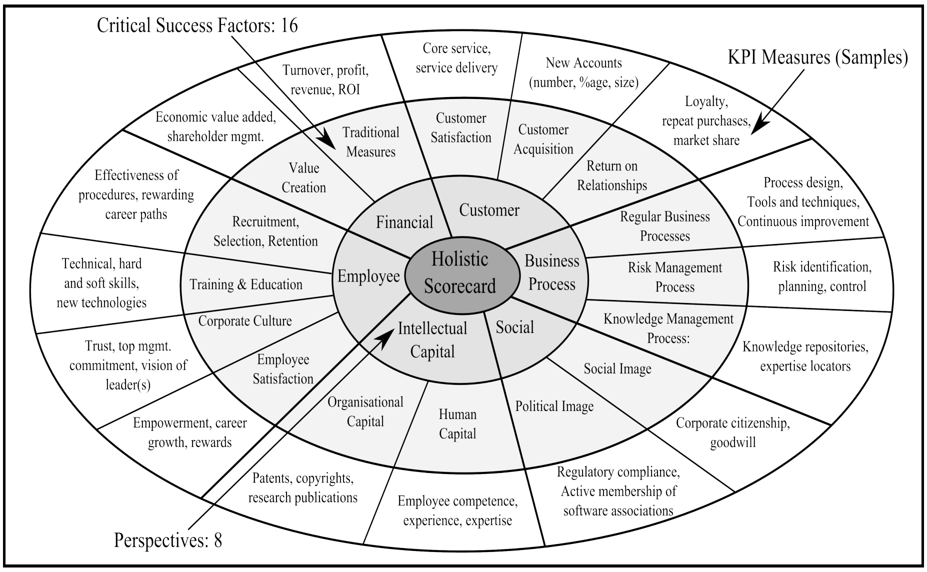

Fig. 1. Holistic Scorecard Overview

The HSC is a software development focused extension of the dominant generic business performance measurement framework, the BSC, and it outlines a framework for examining performance in software development companies. As indicated by Andersen, Cobbold and Lawrie [35], such balanced scorecard-based approaches are beneficial for SMEs when implemented in a light-weight fashion that supports the definition and measurement of strategic business goals. We have therefore harnessed the HSC as a reference framework to construct a business success survey instrument that can be used to determine the extent to which a software development company is achieving its objectives.

3 Harnessing the HSC to Examine Business Success

While the HSC identifies a broad spectrum of the various performance parameters that are considered important for software development companies, it does not provide a survey-based instrument for identifying and measuring these parameters. Neither does the HSC offer guidelines on how to reliably collect the business objectives data. Therefore, using the HSC (refer to figure 1) as a reference, we constructed a business success survey instrument. Each of the six perspectives and the sixteen Critical Success Factors (CSFs) are clearly identifiable in the resulting survey instrument – such that it is clear that the survey instrument has been derived from the HSC. The survey instrument is deployed in two phases: firstly, it is utilised to determine the business objectives for the forthcoming period; secondly, it is deployed in order to determine the extent to which the original objectives have been achieved (refer to figure 2). This two-phased approach to determining the extent of business success helps to ensure that the reported success in achieving business objectives is free from biased or false recollections – also, it helps to formally identify the objectives in settings where no such formal description exists. Additionally, a series of questions are added to the survey instrument so as to support the disclosure of objectives that may be beyond the scope of the HSC framework, a step that is encouraged by the HSC creators [4]. The survey instrument was carefully and systematically constructed using the HSC as a reference and was subsequently subject to a pilot implementation with an SME industry partner. This piloting stage in the instrument creation helps to ensure that the instrument is complete and fit for purpose. Following the pilot phase, a final rendering of the survey instrument for the identification of the business objectives for software development companies was produced.

The initial deployment of the survey instrument was applied to investigate the business objectives of seventeen additional SMEs. The participating SMEs are all primarily involved in the development of software and are from a broad range of sectors, including mobile telecommunications, insurance, web development, data mediation, embedded systems and email systems. Each of the participating companies then participated in separate interviews in order to determine their objectives for the forthcoming year. While brief notes were taken during the interviews, the primary interview noting was conducted after the interview using a voice recording. Each voice recording was carefully analysed in order to accurately record the response of the interviewee, taking care to note any key phrases or remarks from the interviewee. This analysis resulted in a post-interview survey document for each participating SME. When building the post-interview survey documents, we assigned a weight to each objective using the following Likert scale: 0 (no objective exists in this area), 1 (an objective exists, but with no explicit target), 2 (an objective exists, with an explicit target), 3 (a major objective exists, but with no explicit target), and 4 (a major objective exists, with an explicit target). Having completed the initial data transcription and objective grading exercise, a second pass was taken across all interviews to ensure that the grading was consistent for all interviews. Finally, a set of seventeen consistently-graded suites of business objectives was produced. Following an in-depth evaluation of the graded suites of objectives, the average importance of the various objectives was then calculated.

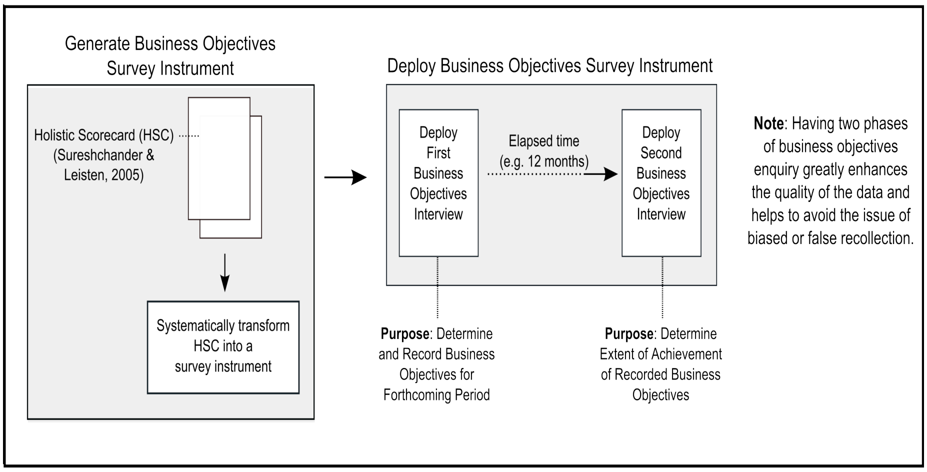

Fig. 2. Two phased approach to determining achievement of business objectives

In addition to examining the average importance of the various business objectives, it is helpful to also examine the standard deviation within this grouping (the standard deviation being “the average of the distances of all the scores around the mean” [40]). By examining the standard deviation, it is possible to “gauge how consistently close together the scores are, and correspondingly, how accurately they are summarized by the mean” [41]. Lower standard deviation figures demonstrate greater uniformity in a data set and examination of the standard deviation for the business objectives data set reveals that in general, the deviation from the mean is generally relatively low – 41 of the 49 objective areas have a standard deviation of less than 1.

4 Business Objectives for Software SMEs

An evaluation of the business objectives data informs us that the participating SMEs consistently have high priority objectives in six key areas: *revenue*, *profit*, *extension of product offerings*, *new client acquisitions*, *repeat business from existing clients*, and *business process management*. Growth in revenue is the single most important objective for SMEs, followed closely by profit considerations. Objectives in relation to profitability appeared to be somewhat eclipsed by a more basic need for survival – highlighting the difficult operating realities faced by some software SMEs. After revenue and profit targets, the next highest priority objectives are reported to be the extension of product offerings and the acquisition of new clients. Many of the participating SMEs could not identify the exact product extensions, stating only that they had strong intentions in this area and that product extension initiatives would be client-led. In relation to new client acquisition objectives, the majority of the participating SMEs had clearly identifiable targets. Gaining repeat business from existing clients and business process management are the final two areas that are generally reported as having high priority objectives. The majority of participating SMEs report strong targets in relation to gaining repeat business from existing clients, while business process management objectives tend to be more diverse in nature – some SMEs intend to improve the sales process while other SMEs have an objective to change the deployment licensing model for their software products.

The evaluation of the business objectives data also reveals that there are a number of areas where software SMEs have low priority objectives. Most notable among these objectives are: *contributing to society*, and *redressing grievances* which essentially don't feature for the any of the participating organisations. The absence of objectives in these areas appears to be related to survivability concerns which exert a significant pressure on the business as a whole. There was also a strong message from the participating SMEs that they do not intend to invest in training programmes and that they essentially have no objectives with respect to seeking or retaining a recognised quality standard. SMEs can therefore be characterised as organisations where best practice models are only implemented where their absence is considered to be a barrier to sales development, thus confirming the findings of earlier studies [42]. Furthermore, in software SMEs, training is "on the job" and there is very little interest in pursuing research publications.

In addition to identifying the high and low priority objectives for software SMEs, we also made a number of additional interesting observations. Very few of the participating companies manage risks in an organised or systematic way and they have no plans to start formalising risk management. Risk management is one dimension of self-reflection and is a conduit for continuous improvement – therefore, SMEs might derive some of the benefits of continuous improvement by establishing a risk management discipline. We were also interested to discover that several of the participating SMEs held the view that maintaining existing levels of customer satisfaction was going to be difficult if the business was to expand – since the small number of existing clients were presently receiving very high levels of dedicated support. The participating SMEs also report that other than "on the job" skills development, there is very little focus on career development for staff and that career growth was not consider to represent a high priority objective for the business. Furthermore, there appears to be "no place to hide" for underperforming employees (who are perhaps weeded out). These findings are somewhat at odds with the theoretical high importance of knowledge workers in software development – where continued career development may lead to increased motivation and higher retention rates among staff members. A further interesting observation was made in relation to the patenting ambitions of the participating SMEs, where only a few of the organisations have expressed patenting objectives. The general belief among the participating SMEs is that patents are very expensive to file and that they offer little protection for the technology. For those SMEs that are engaged in patenting, the principal reported benefit is the protection of the valuation of the company for investors or purchasers.

Using the business objectives data gathered in the initial deployment of the HSC-based business success survey instrument, it is possible to prioritise each of the HSC objectives with respect to their relevance for SMEs. The result of this prioritisation exercise is a hierarchy of business objectives for software SMEs - as depicted in figure 3. An evaluation of this hierarchy allows us to examine the relevance of the HSC for software SMEs.

5 Relevance of HSC to Software SMEs

For the purposes of this research, the HSC has provided a comprehensive framework from which to assess the objectives of software SMEs. Interviewees were expressly asked if there were any objectives that were not covered as part of the interview, and consistently they reported that the interview was comprehensive – with comments such as “quite comprehensive”, “it’s a fairly comprehensive framework” and “good questions”. However, there are some indications that the scope of the HSC may in fact be overly-broad for the purpose of examining software SMEs. Furthermore, a number of additional objectives were identified. Therefore, equipped with the data analysis and evaluation from this research, there are a number of recommendations that can be made with respect to the use of the HSC as a reference framework for future research in the area of business success for software SMEs.

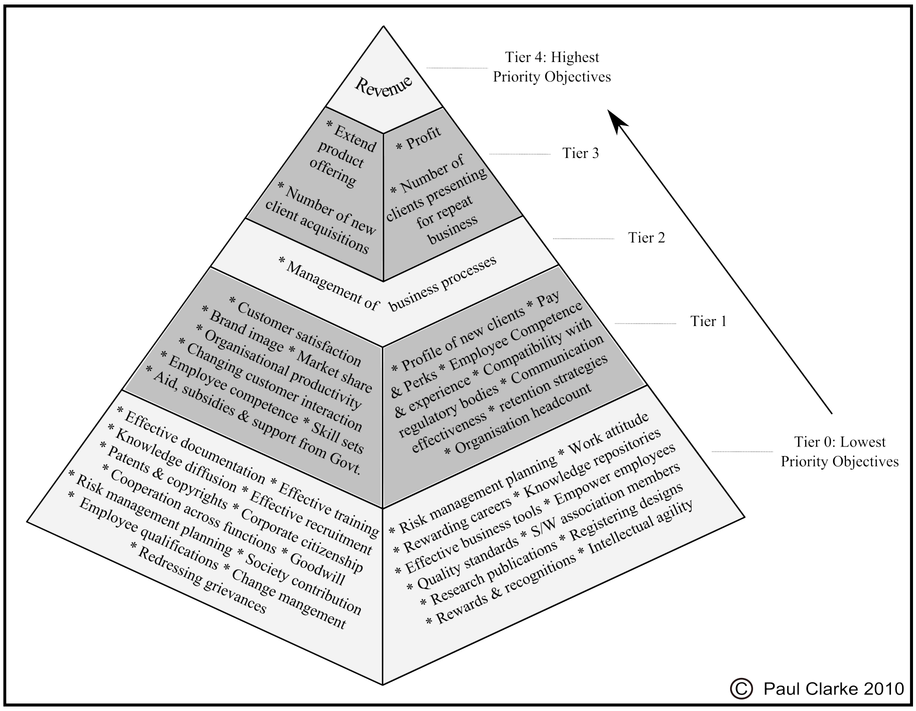

Fig. 3. Hierarchy of HSC Business Objectives for Software SMEs

The initial business objectives interview required on average a 1 hour interview with a senior manager from each of the participating SMEs, and later interview transcribing required a minimum of 5 hours per interview. This is a time consuming process for both the interviewee and the interviewer. Furthermore, the bulk of the HSC business objectives feature as relatively low priority items for the software SMEs in this study. Indeed, one of the interviewees commented that there was "a lot of emphasis on objectives which certainly in a small company doesn't ring true… [that] we've got revenue and product type objectives, other than that we tend to sort of blow with the wind a little and react, rather than being overly pro-active in the sense of setting any particular targets." Therefore, our first recommendation is as follows:

> **Recommendation 1**. If a future study of business objectives in SMEs were to use the HSC (or the HSC-based survey instrument produced by this research), the researchers could consider removing or consolidating the objectives that are in the lowest tier of the hierarchy in figure 3.

While recommendation 1 could be adopted by a future research effort in the software SMEs sector so as to make the identification of objectives more efficient, we consider that it is important to retain closing questions that permit the interviewee to comment on any additional objectives. It is difficult for any survey instrument to be absolutely complete and the inclusion of such closing questions permits the elicitation of objectives that are beyond the scope of the survey instrument or that have possibly been overlooked. In our own application of the HSC-based survey instrument to SMEs, such closing questions allowed us to discover a number of additional objectives that are not native to the HSC. Consequently, our second recommendation is that questions in relation to a number of additional objectives should be included in the survey instrument:

> **Recommendation 2**. Future research into the business objectives in software companies should include questions relating to objectives in the areas of (1) financial liquidity (sometimes termed cash flow); (2) off-shoring or outsourcing some aspects of the development work; (3) mergers and acquisitions (M&A).

6 Discussion and Conclusion

Software processes and SPI support software development efforts, and the success of these efforts affects the success of the overall business. Therefore, when making determinations in relation to the efficacy of software processes and SPI activities, we will sometimes need to examine business success. The case for SPI would benefit from studies that demonstrate the positive influence of SPI on business success, especially in SMEs. In order to support research efforts that examine the relationship between SPI and business success, we have identified a comprehensive reference framework, the HSC [4], for examining business success. In addition, we have outlined an approach to applying this framework to examining business success in software development organisations. This involves a two-phased engagement with companies (refer to figure 2), an approach which improves the reliability of the success data, especially in companies where business success criteria are not well defined in the first instance.

SPI is just one of many factors that can affect the success of software development organisations. Therefore, attempts to correlate SPI efforts with business success may require multi-organisational research. Nonetheless, we should have a sound and reliable approach for determining business objectives and for evaluating business success – so that we have the possibility to correlate software process initiatives with business success. In this paper, we have presented one such approach. Furthermore, we have applied this approach to seventeen software SMEs. The results of this application indicate that revenue, profit, client acquisitions and extension of product offerings are strong business success criteria for software SMEs. However, we also find that SMEs have weak or non-existent objectives in relation to contributing to society, redressing grievances, patenting, conducting research and seeking recognised quality standards. Furthermore, our research has indicated that the HSC reference framework would benefit from the addition of objectives related to financial liquidity, off-shoring/outsourcing software development, and mergers and acquisitions. In future work, we will revisit the participating SMEs and use the survey instrument to determine the extent of business success relative to the stated objectives.

We believe that the approach to examining business success that has been outlined in this paper is of use to future researchers in the software process and SPI domains. Furthermore, we believe that the approach outlined may be of benefit to software development practitioners, whose SPI initiatives could be more successful if guided by the key business objectives identifiable using our survey instrument. The findings of the initial application of the business success survey instrument to software SMEs has provided an interesting insight into the objectives of software SMEs, and has permitted the construction of a hierarchy of objectives for software SMEs. This initial application has also provided an opportunity for feedback on the survey instrument and a number of important lessons have been learned and outlined for the benefit of future researchers in this area.

Acknowledgments. This work is supported, in part, by Science Foundation Ireland grant 03/CE2/I303_1 to Lero, the Irish Software Engineering Research Centre (www.lero.ie).

References

1. Rico, D.: Using Cost Benefit Analyses to Develop Software Process Improvement (SPI) Strategies. Wright-Patterson Air Force Base: A DACS State-of-the-Art Report, Air Force Research Laboratory – Information Directorate, Dayton, Ohio, USA. (2000)
2. Horvat, R., Rozman, I., Gyorkos, J.: Managing the Complexity of SPI in Small Companies. Software Process: Improvement and Practice, 5 (1), 45-54 (2000)

3. Baddoo, N., Hall, T.: De-Motivators for Software Process Improvement: An Analysis of Practitioners' Views. Journal of Systems and Software, 66 (1), 23-33 (2003)
4. Sureshchandar, G.S., Leisten, R.: Holistic Scorecard: Strategic Performance Measurement and Management in the Software Industry. Measuring Business Excellence, 9 (2), 12-29 (2005)
5. Van Solingen, R.: The Cost and Benefits of Software Process Improvement. In: Proceedings of the 8th European Conference on Information Technology Evaluation, pp. 455-465. MCIL, Reading, U.K. (2001)
6. Baddoo, N., Hall, T.: Motivators of Software Process Improvement: An Analysis of Practitioners' Views. Journal of Systems and Software, 62 (2), 85-96 (2002)
7. Hart, S.: Dimensions of Success in New Product Development: An Exploratory Investigation. Journal of Marketing Management, 9 (1), 23-41 (1993)
8. Van Solingen, R.: Measuring the ROI of Software Process Improvement. IEEE Software, 21 (3), 32-38 (2004)
9. Biro, M., Ivanyos, J., Messnarz, R.: Pioneering Process Improvement Experiment in Hungary. Software Process: Improvement and Practice, 5 (4), 213-229 (2000)
10. Sanders, M. (ed.): The SPIRE handbook. better, faster, cheaper software development in small organisations. Centre for Software Engineering Limited, DCU, Dublin, Ireland (1998)
11. Von Wangenheim, C.G., Weber, S., Hauck, J.C.R., Trentin, G.: Experiences on Establishing Software Processes in Small Companies. Information and Software Technology, 48 (9), 890-900 (2006)
12. Maidique, M.A., Zirger, B.J.: The New Product Learning Cycle. Research Policy, 14 (6), 299-313 (1985)
13. Morgan, R.E., Strong, C.A.: Business Performance and Dimensions of Strategic Orientation. Journal of Business Research, 56 (3), 163-176 (2003)
14. Parker, C.: Performance Measurement. Work Study, 49 (2), 63-66 (2000)
15. Jennings, D.F., Seaman, S.L.: High and Low Levels of Organizational Adaptation: An Empirical Analysis of Strategy, Structure, and Performance. Strategic Management Journal, 15 (6), 459-475 (1994)
16. Ghalayini, A.M., Noble, J.S.: The Changing Basis of Performance Measurement. International Journal of Operations & Production Management, 16 (8), 63-80 (1996)
17. Reid, G.C., Smith, J.A.: What Makes a New Business Start-Up Successful? Small Business Economics, 14 (3), 165-182 (2000)
18. Ansoff, H.I.: Corporate strategy. McGraw-Hill, New York, USA (1965)
19. Nonaka, I., Toyama, R.: The Theory of the Knowledge-Creating Firm: Subjectivity, Objectivity and Synthesis. Industrial and Corporate Change, 14 (3), 419-436 (2005)
20. Hayes, R.H., Abernathy, W.J.: Managing our Way to Economic Decline. Harvard Business Review, 58 (4), 67-77 (1980)
21. Bharadwaj, S.G., Varadarajan, P.R., Fahy, J.: Sustainable Competitive Advantage in Service Industries: A Conceptual Model and Research Propositions. The Journal of Marketing, 57 (4), 83-99 (1993)
22. Eccles, R.G.: The Performance Measurement Manifesto. Harvard Business Review, 69 (1), 131-137 (1991)
23. Bourne, M., Mills, J., Wilcox, M., Neely, A., Platts, K.: Designing, Implementing and Updating Performance Measurement Systems. International Journal of Operations & Production Management, 20 (7), 754-771 (2000)
24. Lynch, R.L., Cross, K.F.: Measure up! yardstick for continuous improvement. Basil Blackwell, Cambridge, Massachusetts, USA (1990)
25. Brown, M.G.: Keeping score: Using the right metrics to drive world-class performance. Quality Resources, New York, USA (1996)

26. Neely, A.D., Adams, C., Kennerley, M.: The performance prism: The scorecard for measuring and managing business success. Prentice Hall, London, United Kingdom (2002)
27. Kaplan, R.S., Norton, D.P.: The Balanced Scorecard - Measures that Drive Performance. Harvard Business Review, 70 (1), 71-79 (1992)
28. Kennerley, M., Neely, A.: Performance measurement frameworks: A review. Cambridge University Press, IN: Business Performance Measurement - Theory and Practice. Cambridge, UK (2002)
29. De Waal, A.A.: Behavioural Factors Important for the Successful Implementation and use of Performance Management Systems. Management Decision, 41 (8), 688-699 (2003)
30. Hudson, M., Smart, A., Bourne, M.: Theory and Practice in SME Performance Measurement Systems. International Journal of Operations & Production Management, 21 (8), 1096-1115 (2001)
31. Pandey, I.M.: Balanced Scorecard: Myth and Reality. Vikalpa, 30 (1), 51-66 (2005)
32. Gautreau, A., Kleiner, B.H.: Recent Trends in Performance Measurement Systems - the Balanced Scorecard Approach. Management Research News, 24 (3), 153-156 (2001)
33. McKenzie, F., Shilling, M.: Avoiding Performance Measurement Traps: Ensuring Effective Incentive Design and Implementation. Compensation and Benefits Review, 30 (4), 57-65 (1998)
34. Chow, C.W., Haddad, K.M., Williamson, J.E.: Applying the Balanced Scorecard to Small Companies. Management Accounting, 79 (2), 21-27 (1997)
35. Andersen, H., Cobbold, I., Lawrie, G.: Balanced Scorecard implementation in SMEs: reflection in literature and practice. In: Proceedings of the fourth SMESME Conference, pp. 103-112. Department of Production, 2GC Limited. Aalborg University, 9220 Aalborg, Denmark (2001)
36. ADB.: Balanced scorecard for state-owned enterprises. Asian Development Bank, Technical Assistance Project Team 3933-PRC. Philippines (2007)
37. Lim, A.H.L., Lee, C.S.: Integrated Model Driven Business Evaluation Methodology for Strategic Planning. International Journal of Business Information Systems, 3 (4), 333-355 (2008)
38. Barnes, D., Hinton, M.: The benefits of e-business performance measurement systems. CIMA Publishing, Oxford, UK (2008)
39. Tapanya, S.: Examining the Factors which Influence Performance Measurement and Management in the Thai Banking Industry: An Application of the Balanced Scorecard Framework. (2004)
40. Malim, T., & Birch, A. (eds.): Research methods and statistics. MacMillan Press Ltd., Basingstoke, Hampshire, U.K. (1997)
41. Heiman, G. W. (ed.): Understanding research methods and statistics. Houghton Mifflin Company, Boston, Massachusetts, USA (2001)
42. Coleman, G., O'Connor, R.: Investigating Software Process in Practice: A Grounded Theory Perspective. Journal of Systems and Software, 81 (5), 772-784 (2008)