The Meaning of Success for Software SMEs: An Holistic Scorecard Based Approach

Paul Clarke[1] and 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]. While evidence of the benefits of SPI exists, project/senior managers report that their motivation for conducting SPI would be strengthened by the provision of further evidence of the positive impact of SPI on business success [3]. 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). This novel approach to examining success in software development companies provides a suitable mechanism for SPI researchers and practitioners seeking to establish evidence of the business benefits of SPI.

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, we have transformed the HSC framework 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

R.V. O'Connor, J. Pries-Heje, and R. Messnarz (Eds.): EuroSPI 2011, CCIS 172, pp. 72–83, 2011.

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, it has been suggested that one of the de-motivators for SPI among project managers and senior managers relates to a shortfall of direct evidence of the business benefits of SPI [3]. For senior managers, evidence of the positive relationship between SPI and business success would help to assuage this concern. In order to conduct a business success investigation we must first identify a suitable reference framework of the dimensions of success for 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 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 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.

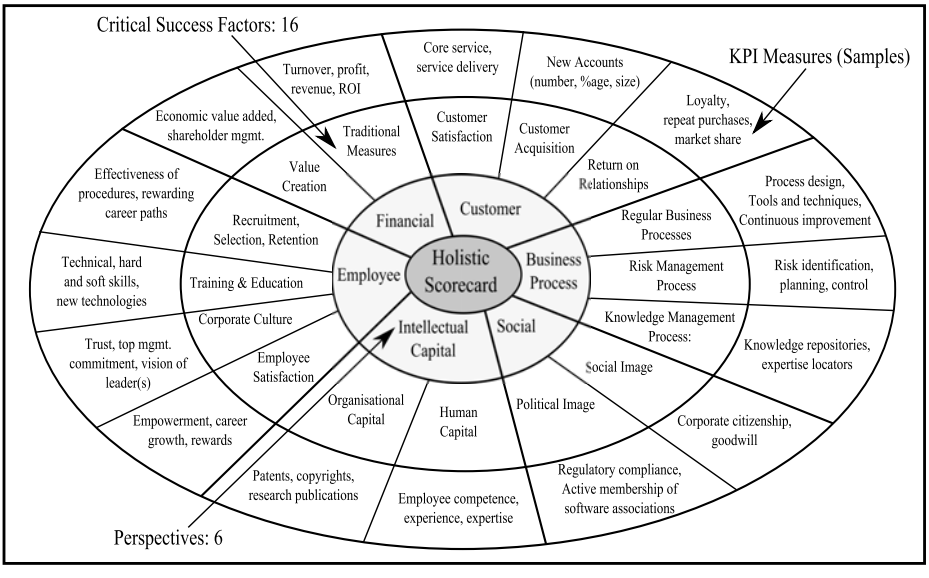

Fig. 1. Holistic Scorecard Overview

The HSC is a software development focused extension of the dominant 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 fashion that supports the definition and measurement of strategic business goals. We have harnessed the HSC to support the construction of 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 performance parameters that are 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 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 (refer to figure 2): 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 objectives are achieved. 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 – it also 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 to support the disclosure of objectives that are beyond the scope of the HSC framework, as encouraged by the HSC creators [4]. The survey instrument was carefully 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 ensures that the instrument is complete and fit for purpose. Following the pilot phase, a final rendering of the survey instrument for the examination of business in software development companies was produced.

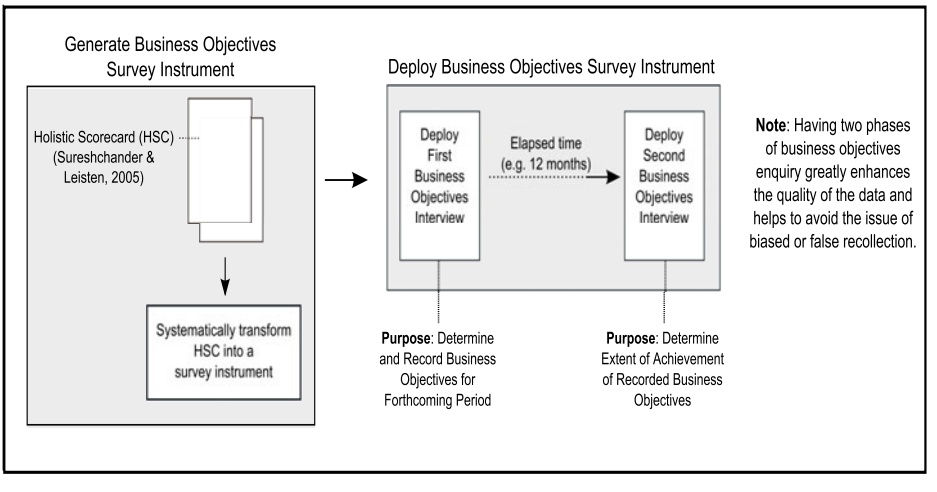

Fig. 2. Two phased approach to determining achievement of business objectives

3.1 Using the HSC Survey Instrument in Software SMEs

The first business objectives interview is designed to elicit business objectives for the forthcoming year, and over a six month period, we used the instrument to investigate the business objectives of seventeen additional SMEs. Each interview took around ninety minutes and the post-interview transcription required approximately six hours per interview. 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. 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 diligently examined in order to accurately record the response of the interviewee, taking care to note key phrases and remarks. Following the completion of the interview transcriptions, the data was analysed so as to identify the importance of the individual objectives. This analysis resulted in a post-interview spreadsheet for each participating SME, which assigned a weighting 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 the consistency of grading. Thereafter, we calculated the average importance of the various objectives across all participating organisation by summing the individual recorded priorities for the objectives and dividing the total by the number of participating organisations.

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

Following the data analysis and business objective prioritisation, we conducted an evaluation of the data. The data evaluation, which took approximately two months to complete, supported the development of an understanding of the data and facilitated the identification of key findings. The evaluation utilised the spreadsheets, averages and standard deviations output from the earlier data analysis, and revealed 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 considered 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 targets. 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, we prioritised each of the HSC objectives with respect to their relevance for SMEs. This prioritisation involved taking the business objective averages calculated earlier and using these to develop 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.

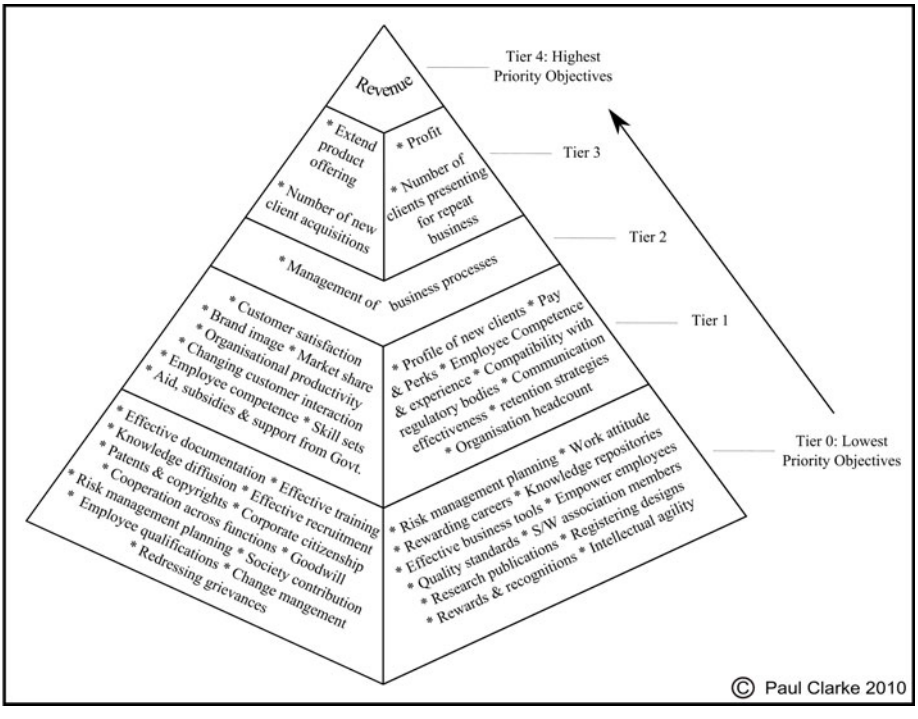

Fig. 3. Hierarchy of HSC Business Objectives for Software SMEs

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.

The initial business objectives interview required on average a ninety minute interview with a senior manager from each of the participating SMEs, and later interview transcribing required a minimum of six 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 additional 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. In addition, 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 produced a number of important lessons which have been outlined for the benefit of future researchers in the software process and SPI domains.

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 (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 (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 (1990)
25. Brown, M.G.: Keeping score: Using the right metrics to drive world-class performance. Quality Resources, New York (1996)

26. Neely, A.D., Adams, C., Kennerley, M.: The performance prism: The scorecard for measuring and managing business success. Prentice Hall, London (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. In: Business Performance Measurement - Theory and Practice. Cambridge University Press, Cambridge (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, Department of Production, 2GC Limited, pp. 103–112. Aalborg University, Aalborg (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 (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 (1997)
41. Heiman, G.W. (ed.): Understanding research methods and statistics. Houghton Mifflin Company, Boston (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)