



Kent Academic Repository

Liu, Wenbin, Meng, Wei, Mingers, John, Tang, Ning and Wang, Wei (2012)
Developing a Performance Management System Using Soft Systems Methodology: A Chinese Case Study. *European Journal of Operational Research*, 223 (2). pp. 529-540. ISSN 0377-2217.

Downloaded from

<https://kar.kent.ac.uk/29894/> The University of Kent's Academic Repository KAR

The version of record is available from

<https://doi.org/10.1016/j.ejor.2012.06.029>

This document version

Author's Accepted Manuscript

DOI for this version

Licence for this version

UNSPECIFIED

Additional information

Versions of research works

Versions of Record

If this version is the version of record, it is the same as the published version available on the publisher's web site. Cite as the published version.

Author Accepted Manuscripts

If this document is identified as the Author Accepted Manuscript it is the version after peer review but before type setting, copy editing or publisher branding. Cite as Surname, Initial. (Year) 'Title of article'. To be published in *Title of Journal*, Volume and issue numbers [peer-reviewed accepted version]. Available at: DOI or URL (Accessed: date).

Enquiries

If you have questions about this document contact ResearchSupport@kent.ac.uk. Please include the URL of the record in KAR. If you believe that your, or a third party's rights have been compromised through this document please see our [Take Down policy](https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies) (available from <https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies>).

Developing a Performance Management System Using Soft Systems Methodology: A Chinese Case Study

W.B Liu, Kent Business School, University of Kent, UK, and Centre of Performance Management,
School of Economics and Management, Shanghai JoTong University, China
W.B.liu@kent.ac.uk

Wei Meng, School of Public Management, East Normal University, Shanghai, China
wengmei2007@gmail.com

John Mingers, Kent Business School, University of Kent, UK*
j.mingers@kent.ac.uk

N.Y Tang, Centre of Performance Management, School of Economics and Management, Shanghai
JoTong University, China
ntyang@gmail.com

W. Wang, Kent Business School, University of Kent, UK
accwangwei@msn.com

*corresponding author

Abstract

The economic crisis created major problems for a successful, hi-tech Chinese company – Tonsan. They already had in place a performance management system based around the balanced scorecard which worked successfully in times of growth and high demand. However, with the world downturn they suddenly found that their current system was not able to cope with the demands placed on it. The authors were called in and decided to design a new, strategic performance management system to overhaul all the key business processes. The approach taken to develop the PM system was based around soft systems methodology (SSM), a well established systems-based approach to problem solving and organizational design. The methodology progressed from the development of key strategic objectives (using the BSC and strategy maps), through a structured decomposition of necessary organizational activities, the construction of key performance indicators, the specification of targets, to communication and future planning. It involved significant levels of participation and communication throughout the organization. The results were judged by senior management to have been very successful, and the company has grown significantly.

1. Introduction

The current economic crisis has brought harsh storms to the entire business world, especially to many small and medium enterprises. Nevertheless it also brought opportunities – it forced such companies to reconsider their strategies and management structures, as did Tonsan in the case study presented below.

Tonsan Adhesives is a typical “fast track” Chinese company: median size, fast growth, leading in its own sector in China. From a small mill with a few people, it has grown, in sixteen years, into the number one Chinese company in the industry adhesives sector with current (2008) profits of RMB100m. Its management structure and style were typically Chinese: informal, personal and reactive. Often a manager would simply set up his or her staff targets, wait for results and then react, which often led to late or wrong decisions in operations and marketing. In the past the explosively increasing demand put operational efficiency and quality issues to the side so that, although the top executives realized the weakness of its management and operations, there was no strong call for any real change.

The economic crisis changed many things: the market suddenly shrunk and became very competitive in cost and quality; managers started to find themselves fighting fires from many directions and felt increasingly unable to cope; and top management realized that they had to significantly improve their management and operations to survive in this new environment. In the autumn of 2008, the top executives came to us to discuss the possibility of a joint project to make the company more proactive in decision-making, competitive on cost and quality, and adaptive towards new markets. Each of these requests was really a major project in its own right, and one which a company like Tonsan would normally hesitate to carry out. For example, the company used to be extremely busy (24-hour) to meet orders, and there would be no time or energy to overhaul their business processes, even though they realized this might make them produce more efficiently.

There were several options that could be considered to help them achieve their objectives, such as Business Process Reengineering (Hammer, 1990; Davenport and Short, 1990; Yogesh 1998), Business Process Management (Ko, 2009; Brocke and Rosemann, 2010), and Six Sigma (Pyzdek, et al., 2009; Taylor and Gerald, 2008). However Tonsan thought they were either too time and resource demanding or would not do exactly what they needed. After initial investigations, we believed that the most suitable way in the Tonsan case was to overhaul its performance management and some key operational processes to improve overall effectiveness of its management and operations. This was because we found that many problems were due to lack of co-ordination and communication, lack of planning, and panic reactions.

We proposed to design and implement a full strategic performance management system with built-in functions to re-examine key business processes which could, among other things, bridge the two ways communication between its managers and the staff so that they could anticipate the future business and management issues together, and greatly increase managerial agility.

The system that was introduced and implemented was a performance management approach based on Soft Systems Methodology (SSM) that includes strategy deployment, a performance assessment framework, a performance plan, and feedback and review processes. The new performance management system put much higher demands on managerial skills and there was much for everyone to learn. Under the mounting pressure of the economic crises, we and the top

management (especially the CEO and the Director of the Board) spent much time and energy on training, implementing and learning the new system in a short time with noticeable successes in the end. This process will be presented later in the paper after a brief description of the company.

The project was completed by the end of 2008 and the system started to run in February 2009 (the Chinese New Year) and was highly praised by the majority of Tonsan's managers and particularly by its top management. At the end of February 2010, Tonsan's profit had increased by 50% despite the economic crises, and its performance was even better during 2010. Its executives believed that the new performance management system was a significant help in achieving this. The CEO said, "The most valuable thing of the system is to make manager and staff all plan pro-actively how to achieve their targets step by step so that everyone is engaged. This provides the foundation for our amazing growth. "

Section 2 of the paper will provide a brief literature review of what is a huge field. Section 3 describes the SSM-based approach used in this study. Section 4 describes Tonsan and the problems that it faced. Section 5 describes the application of the methodology in Tonsan although many detailed aspects of the intervention are omitted for space reasons.

2. Performance management frameworks

There is a large body of literature relevant to performance management. Probably the main reason for this is the complex and highly interdisciplinary nature of performance management research, involving many fields of varying states of maturity and methodological practice. Folan and Browne (2005) provide a reasonable overview and they distinguish between structural and procedural frameworks. They argue that for successful performance management both are needed, as well as other performance management tools and definitions of suitable performance measures. Examples of procedural frameworks for generating performance measures from a strategy are the six step process of Sink and Tuttle (1989), as well as those of Lynch and Cross (1991) (which combined with their "performance pyramid" structural model), Kaydos (1991) and Wisner and Fawcet (1991).

Structural frameworks provide a typology or classification of different types of performance measurements without generally specifying how they should be generated. Examples of these are: Fitzgerald et al. (1991) whose framework distinguishes between measures of results and measures of the determinants of results. Lockamy III (1991) who proposed four theoretical performance measurement models based on cost, quality, lead time and delivery dimensions together with linkages between operational and strategic PM systems. Bradley (1996) who proposed AMBITE performance measurement cube which has three axes - business processes, competitive priorities and manufacturing typology. This framework measures enterprise performance in line with time, cost, quality, flexibility, and environment perspectives. Yenyurt (2003) whose structural framework uses a cross-process and cross-border approach and five dimensions of performance measurement: consumer-focus, financial, processes, innovation and culture.

More recently, the structural integrated performance measurement framework, developed by Rouse and Putterill (2003), attempts to integrate a number of other structural frameworks; Paauwe (2004) worked on the concept of the High Performance Work System (HPWS) to relate HRM with performance, see Gilman and Raby (2008) for an analysis of HPWS within SMEs. Finally, Smart et al. (2009) developed a synthesizing framework for business process

management (BPM) with five key themes concerning process – strategy, architecture, ownership, measurement and improvement – but also identified the importance of the conceptual underpinning of BPM within the firm.

Although there are so many different frameworks, some principal components of performance management have been identified by, for example, Otley (1999), Ferreira and Otley (2009), Smith and Goddard (2002), Armstrong (2006), and Cokins (2004). We found useful Otley's (1999) framework, extended in Ferreira and Otley (2009), suggests the following five components: identifying key organizational objectives; formulating and implementing strategies and plans, and associated performance measurements; setting performance targets; creating reward systems relevant to achieving the performance targets; and ensuring appropriate information flows to monitor performance and support learning.

However, we also felt that it was important to adopt stakeholder theory as a fundamental part of the approach, see Jawahar and McLaughlin (2001), Agle et al. (2008), Phillips et al. (2003) And Mitchell et al. (1997). In particular, we think the interests of key stakeholders at several levels in the organization need to be taken into account and balanced, a view that is strongly proposed by Neely et al (2001).

An important end result of a performance management system is the definition and implementation of specific performance indicators. There are already many well-known models for this such as activity-based costing (Meyer, 2002), Balanced Score Card (BSC) (Kaplan and Norton, 1996), structural performance pyramid (Lynch and Cross, 1991) or, more comprehensively, total performance scorecard (Rampersad, 2002). There are also more OR-oriented approaches to the development of performance indicators: some are based on DEA (Jain et al, 2011, Amado and Dyson, 2008, Mingers et al, 2009); but other methods are used – Wisniewski and Dickson (2001) implemented the balanced scorecard in a public sector organization – a police force, and Bititci et al (1997) based their approach on Beer's viable systems model (VSM).

Furthermore, the Business Excellence Model (BEM) type, such as the EFQM model and the Baldrige National Quality Program (Bell and Elkins, 2004), are also popular in improving organizational performance. However, as Andersen et al. (2000) state "in spite of sharing a number of apparent similarities, BSC and the EFQM Business Excellence Model (BEM) are based on fundamentally different concepts about how best to improve the performance of an organization." The BSC type tools focus on the specific strategies adopted by an organization, providing a robust tool onto which other management processes can be built. Since our project mainly focuses on how to implement the company strategies, we will adopt a BSC-type of approach, which has been mostly widely used (Lohman et al, 2004, Patel et al, 2008). However as explained below, we found the existing approaches fell short of what was needed to help Tonsan and so our methodology is very different from the BSC itself.

The Balanced Scorecard has been mostly widely used and studied in the literature. There are already many references on BSC and it is impossible to even give a very brief review here. Instead we refer the readers to Kaplan and Norton (2001a, 2001b), where in-depth analysis and case studies were presented. In fact, by now BSC is not clearly defined itself as many companies which used multi-dimensional matrix measurements all claim that they implemented BSC. Speckbacher et al (2003) identified three classes of implementation in practice, where BSC-III has the fullest contents to support action plans and incentives. There are already many existing approaches to implementing the balanced scorecard, using different numbers of steps, for

example, Ahn (2001), Brewer (2002), Letza (1996), Lohman et al. (2004), and Papalexandris et al. (2005), who gave an integrated method to combine the existing approaches. Kaplan and Norton themselves, in a more recent book – “The Execution Premium” (Kaplan and Norton, 2008) – locate the BSC as the core of a systems approach that integrates strategy with operations.

There are criticisms of the BSC approach, and they are relevant to what was found by Tonsan. Tapinos et al (2011) conducted a large survey of strategy developers to study the effects of using the BSC. They concluded that their results did not support the idea that BSC was widely used throughout the strategy development process; that it required considerable time and resources for its implementation; and that the strategy process of users was neither more efficient nor more effective than non-users. Jackson (2006) points out that the BSC adopts a very machine-like view of the organization. Although it claims to embrace different viewpoints, in fact it imposes the same viewpoint to a range of organizational activities and thus tends to stifle creativity.

What we needed, as discussed in more detail later, was a lean implementation for this SME in a short time (see Fernandes et al., 2006) and an extension of BSC-III with a constructive modeling function to deal with the issues of improving the key processes, and building action plans and bi-way communication mechanisms (see Malina and Selto (2001) and Malmi (2001)). This led us to develop an SSM-based implementation framework as SSM is more management-centered and has built in it constructive procedures to introducing innovative changes into the existing processes. Thus, we are not implementing the Balanced Scorecard as such but developing an alternative system for creating performance metrics.

3. Soft systems methodology (SSM) for performance management

SSM is a systems-based approach to problem structuring and taking action in ill-structured, complex situations which has been developed through engagement with real-world problem situations (Checkland, 1999; Checkland and Scholes, 1990; Checkland and Poulter, 2006), and is one of the most well-known practical systems methodologies (van der Water et al, 2007). Applications of SSM in strategy, as well as other systems methods, can be found in Mingers and White (2010).

SSM begins with the idea that organizations are systems of purposeful activity that continually bring about change or transformation. Actors undertake activities that produce some output, which could be a physical entity, a service, or information, for a notional customer. The system operates on behalf of an owner (and other stakeholders), who have the power to create or terminate the system, within an environment not under its control. SSM recognizes that different stakeholders may well have different views (*Weltanschauungen*) about the nature and purpose of a particular organization, or part of it, and so it builds models to reflect these varied viewpoints. These elements are known by the acronym CATWOE – Customer, Actors, Transformation, Weltanschauung, Owner, and Environment. These models consist of a “root definition” which is a concise description of what the system is, and an “activity model” (Figure 1 is an example), which is a conceptual model of the activities necessary to achieve the transformation specified in the root definition. These models are not intended to be models of the organization *as it actually is*, but rather models of the activities that would necessarily happen *if the system described in the root definition were to be brought into existence*. In other words, root definitions and conceptual models are notional systems, unless of course the decision is taken to actually bring them into being.

A root definition (RD) is a concise definition of a notional system based around three elements – *what* the system does, i.e., what output it produces via its transformation; *how* the system does it, i.e., what particular means does it use; and *why* the system does it, i.e., what is the contribution of the system to its owner or wider system. An RD is often written in the form of “A system to do P by Q in order to achieve R”. Once the RD has been agreed, possibly after debate and negotiation, the necessary activities can be specified in the form of an activity model. Each of these activities can then be further examined by developing a root definition and activity model for it at a higher level of resolution. This procedure can carry on to whatever level of detail is necessary for the particular situation which makes it ideal for the task of decomposing the activities of an organization. By “decomposing” we mean specifying the activities to a greater and greater level of detail. Examples will be given later. It is important to note that SSM is essentially participative – the models should be built through a process of open debate and discussion, based on constructive feedback.

One of the concepts of SSM that is important in this case, is the “monitoring and control” components that are built in to the conceptual models. SSM identifies three elements for successful performance (the “3E’s”) (Checkland, 1990):

- *Efficacy* (E1), i.e., that the system successfully produces the outputs that it is supposed to do (this relates to the “what” of the root definition)
- *Efficiency* (E2), i.e., that the system does not use resources extravagantly (relates to the “how” of the RD)
- *Effectiveness* (E3), i.e., that what the system does meets the goals and aspirations of the owner (relates to the “why” of the RD)

It is these elements that underlie the key performance indicators that are a major part of the performance management system. They form the basis of our “3E” methodology that was developed in an earlier project with a Chinese university (Liu, Chen et al, 2010) and is now applied to a private sector organization in this project. The overall approach is to construct, after debate and discussion, a top-level root definition and conceptual model for the primary activities of the organization. This is then decomposed into successive levels of detail down towards the lower level activities. At each level, the 3Es lead to the construction of key performance indicators which are developed with managers at each level. This produces a logical, coherent and consistent performance measurement system based on the specific objectives and activities of the organization.

Having described the SSM-based method in general, we will now move to the specific case study of Tonsan and describe our actual approach in more detail.

4. Tonsan: the company and its problems

Beijing Tonsan Adhesives Inc. was founded in 1993 and is located in Beijing. Tonsan is a private Chinese high-tech enterprise specializing in R&D, production, sales and service of engineering adhesives. It has 400-500 employees and around 50 managers. Tonsan has several hundred products covering 7 categories: cyanoacrylate, anaerobic, α -cyanoacrylate, epoxy, silicone, polyurethane, and modified neoprene. Tonsan has strong R&D teams and a marketing and service network extending to large and medium-sized cities in China. Tonsan Adhesives Inc. is now globalizing with tens of worldwide agents, and Tonsan’s products are widely used in China.

Tonsan is a privately-owned enterprise, established by four partners who equally hold all the shares. They are respectively the legal representative and chairman of the board, the CEO and president of the company responsible for operation and management, the vice president responsible for construction and R&D, and the director of the strategy committee (DSC). Tonsan's significant operation and management decisions are made through formal and (mainly) informal communication and discussion of the four shareholders. The president and the vice president are responsible for routine operations and management. Tonsan is divided into three systems and some units are directly controlled by the CEO.

4.1 Tonsan's existing performance management systems

To explain our approach clearly we will first introduce the existing performance management system. Tonsan employed a very simple performance management system until 2006. In 2007 they introduced a balanced scorecard (BSC) based performance management system. Tonsan adopted a style of crude management by objectives (Deming 1994) for its performance management. The performance of the company was mainly assessed and monitored via quantitative key performance indicators (KPIs) which were developed at three levels - the company, the department, and the individual - using a Balanced Scorecard framework on the basis of Tonsan's strategic targets:

- 1) Company-level target: break down Tonsan's overall target into four aspects in line with the four BSC perspectives;
- 2) Department-level target: either the breakdown of Tonsan's overall target to the department, or target and improvement desired for the departments;
- 3) Post target: sub-breakdowns of the above targets to an employee, and targets for self-improvement and development.

After the discussion and approval of the President and the directly responsible shareholders, the departmental preliminary targets become their ultimate targets for the year. Tonsan and the departments review and discuss their targets every half-year (there were more frequent informal reviews), and the board of directors adjust Tonsan's target in accordance to the circumstances inside and outside of the company. After the targets are set up, it was up to the managers to decide how to enforce and guide the subsequent work. In most cases, they waited for issues to emerge or, if successful, got results and then reacted. But in the current economic crisis they found this practice no long worked – they simply did not have enough time and energy to handle the large number of issues that emerged. The task indicators for departmental managers were based on the KPIs of their respective departments, with the weights approved by their direct supervisors; and their management performance included KPIs and appraisals of how they handled priority work. Performance appraisal was carried out annually with a face-to-face performance review in the middle of the year.

For staff with managerial duties their KPIs were assigned by their managers. In appraising those staff, the managers also assessed their managerial performances with a certain weight; appraisals were conducted annually with a face-to-face performance review in the middle of the year. Ordinary staff were assessed annually with a face-to-face service review in the middle of the year. This very mechanistic approach was one of the problems with their existing system.

At the company level, the Strategy & Planning Committee was responsible for drawing up and tracking the implementation the KPIs; the Office for the Board Chairman was responsible for data collection and statistics; the CEO would check and approve the data and the statistics; and

the Board Chairman would preside over a board meeting to review the progress.

At the employee level, the immediate supervisor was responsible for breaking down the target to employees and drawing up performance targets. The Human Resources Department would take part in these activities. The staff in charge of data collection and statistics was responsible for collecting the performance targets data and handing them to the supervisor who would regularly check the progress (monthly, or seasonally). The department manager was responsible for these activities.

The main problems with Tonsan's performance system will be described next.

4.2 Analysis of Tonsan's existing performance management system

The consulting team conducted on-site investigations, extensive discussions and interviews, and in-depth analysis of Tonsan's current performance system. To achieve the requested objectives of the project the consulting team decided to focus on the following five problematic areas:

- 1) Tonsan's performance management regulations were incomplete
Tonsan had its regulations for performance management, but they were not systematic or comprehensive. This state often led to improper rewards or penalties. The incomplete performance management regulation was closely related to Tonsan's previous management structure —the low hierarchy of the previous management structure enabled the shareholders to keep in constant touch and frequently communicate with department managers and even the employees, and thus the decision-making process was direct. Building a complete performance management system was now of great urgency as the scope of management and the degree of hierarchy had greatly increased with Tonsan's development. The previous management style of handling the management affairs personally was now unrealistic.
- 2) The process of decomposing strategies and performance appraisal
First, Tonsan directly fitted the four perspectives of BSC into the operational processes of each department to decompose the overall target into department targets, thus setting up the current KPI system. But the core values, the key processes and key experiences of the company were not emphasized as shown later. Furthermore, key management processes that should enable the KPI to be achieved were not identified during the decomposition, and this made it difficult to build effective performance follow-up procedures for Tonsan. In its performance appraisal, excessive stress was put on the result-oriented lagging indicators like sales and amount of production, while the process-oriented leading indicators were not paid due attention.
- 3) An effective bi-directional communication mechanism was not in place, and the managers did not give their subordinates adequate guidance
Some of Tonsan's executives did not pay adequate attention to guiding their subordinates in the process of carrying out performance management. Managers did not communicate sufficiently with the employees, and did not anticipate the problems that might arise for the employees in the process of completing their tasks. In many cases, managers would mete out punishment, e.g., humiliation or loss of pay, after problem arose which doubtless hurt the morale of the employees. This is mainly because Tonsan lacked relevant tools and effective follow-up assessment procedures.
- 4) Some of the work processes need to be further optimized
The internal processes in the production plants and the linkage process for the R&D Department and the Sales Department needed further improvement to meet the needs of

Tonsan's development. The production process needed overhauling in its entirety, and there was an urgent need for a monitoring and guidance system for the production process to be put in place. As it was, senior staff worked with a number of junior staff but with no formal training for the juniors and no monitoring of the seniors.

- 5) Middle-level managers and frontline employees lacked the initiative and the awareness to participate in performance management

Tonsan did not offer systematic performance management training to its employees. An effective communication mechanism between the managers and the employees was not in place although there was an informal one. Consequently the frontline employees lacked the awareness to participate in the performance management and thus played a rather passive role in executing their work plans.

Area 1 was dealt with by editing a comprehensive handbook of performance management as described later. Area 5 was improved by first training the top and middle managers by the consulting team and then training frontline employees by the managers. Areas 2-4 were where our approach was developed. *The central idea was to identify and enhance the key management processes during the decomposition of the strategy down to lower levels.*

5. The 3E methodology applied in Tonsan

5.1 The general approach

Our overall approach is illustrated by the following (Figure 1) conceptual model (Qi 2010), a type of modeling approach used within SSM.

Figure 1 about here

The main steps that we will focus on in this paper are stages 2 and 3 where it is necessary to decompose an organization's activities according to the organizational strategies and business processes, so that key activities and key performance indicators can be correctly identified level by level.

The key task of building Tonsan's new system is to first decompose Tonsan's objectives while identifying the key operations and management processes (KPs) to ensure that the objectives are achieved. These processes are then monitored and measured by KPIs, and assigned to different department and managers at different levels. The relationship between KPs and KPIs is that KPIs are ways of measuring of performance of the KPs. These key processes are used to build an effective bi-directional communication mechanism later.

The core of the method employed with Tonsan was to continuously ask and answer the questions: *What to do? Why do it? and How should it be done?* with all the relevant stakeholders, following a carefully structured and constructive procedure as developed in previous projects with public sector organizations (Mingers et al 2009; Liu et al, 2010). Thus, the principles of SSM were used even though the language was not because it was felt that this would confuse the participants. However, in some applications, including this one, it is not considered feasible to implement major changes to the whole business and so one may have to just follow the existing business processes although with different management structures. Additionally, in this situation it was

considered necessary to identify the key stakeholders and their interests in each level of the organization which had not been done in the previous 3E projects. This led to a revised procedure that is summarised in the following five steps:

1. Determine the overall objectives of the organization (or part of it). This may already be agreed and available, or it may need a process of discussion and debate among a variety of stakeholders to reach a consensus or accommodation. Resulting from this, the primary activities of the organization need to be agreed. In this stage, it is often useful to employ a Strategy Map as was done in this case.
2. For each key activity a definition of *what* is to be done (and *why* it is to be done in terms of higher level systems) is produced. Often it should connect to the “what to do” question in the higher level activities. Furthermore the key stakeholders and their interests are identified.
3. The activity is then broken down into a set of sub-activities or actions which together should logically ensure that the overall purpose of the activity is achieved (the *how*). They may or may not be the same as the current practices in the organization. Consensus, or at least agreements, needs to be reached among the relevant stakeholders for any changes. Often it is helpful to use one of the existing frameworks (like BSC (Kaplan and Norton 1996) or BEM (Bell and Elkins, 2004)) to guide this decomposition. Also the inter-connections with other key activities should be considered. At this point the performance criteria are specified together with their measures or indicators and appropriate standards or levels.
4. It is often the case that the activity needs to be further decomposed. When this happens steps 2) and 3) should be repeated for any sub-activity for which this is felt necessary. Then 4) is repeated recursively until all necessary activities are clearly seen.
5. A complete set of key processes and related indicators can then be produced from the activity models for all necessary levels of activities.

These steps have been illustrated in the following flow chart (Figure 2):

Figure 2 about here

Some guidelines in using this method:

1. In Step 3) one can use the 3E framework for developing performance indicators (Liu et al, 2010). Then, in the end we will have key process (KP) and key performance indicators (KPI) for all departments, sub-groups and even individuals.
2. How far should the decomposition go? This often depends on customer’s requirements. For instance, in many companies we are only required to develop a PM system up to the middle managers. In such a case, the decomposition stops when KP and KPI for these middle managers become clear.
3. From our experience with traditional, for-profit companies, the easiest way is to start with a Strategy Map to present their objectives and strategies within the BSC framework.

5.2 Development of the new system

The construction of the new performance management system took several phases to complete:

Phase I: Developing the strategic objectives

In this step, we, as the commissioned external consultants, tried to collect much information and data for a clear picture of Tonsan, and helped to establish the performance management promotion team, which consisted of us and Tonsan's key stakeholders. We interviewed Tonsan's decision-makers, discussing Tonsan's mission, its main long-term targets, and its development strategies in full detail. It was clear that Tonsan's values: honesty and responsibility, continual innovation, high-quality products and services need to be emphasised throughout the new performance management system. These core values were developed explicitly within the SSM models, see for example Table 1.

Tonsan has operated in its industry for years with impressive growth so it clearly has particular strengths. We edited and depicted Tonsan's development strategies after achieving a consensus with Tonsan's top and middle-level executives. These are Tonsan's long term objectives:

- Being No.1 in sales with professional and honest sales management;
- Supporting the customers with fast and friendly technical services;
- Guiding Tonsan's development with market research for accurate segmentation;
- Bolstering Tonsan with customer-oriented product research and development;
- Guaranteeing Tonsan's development with timely delivery of quality products;
- Basing Tonsan on the corporate culture of learning, innovation, honesty, and diligence.

The objectives listed above also served us as the basis for the formulation of Tonsan's strategy map, and were used to guide SSM decomposition in the next phase.

The process of interviewing the top and the middle-level executives also served as a training for them in modern performance management concepts. We also had communications with some blue-collar employees in functional units and the production frontline in order to obtain different views and to confirm what had been learnt from the managers.

Phase II: Strategy decomposition

In this phase the promotion team decomposed the strategy on the organizational objectives, the development strategy and the core operational processes. In terms of the company-level strategy, we first drew up Tonsan's BSC strategy supporting map in line with Tonsan's organizational structure, shown in Figure 3, after achieving a consensus with Tonsan's top executives.

Figure 3 about here

It basically says that at the top level there are financial targets of increasing turnover and profitability which will be realized through cost-cutting and raising sales income. This in turn rests on three strategic priorities: VIP (i.e., large) customers, the foundation for Tonsan's survival; new products, the basic guarantee for Tonsan's sustainability; and new markets, the prerequisite for Tonsan's expansion in order to achieve the top-level financial target. The training and learning perspective promotes highly efficient internal operation. As well as this, it emphasizes more Tonsan's corporate culture of diligence and ambition, frugality and honesty, and learning and innovation should be practiced throughout the operations of the company.

The breakdown of the second-level strategy is important and detailed below. Previously, Tonsan had directly decomposed the targets into various departments like sale sub-centres, and in so doing the core values, the key processes and key experiences of the company were not emphasized in the decomposition. We suggested that SSM be exploited to break down the strategy so that, in distinction from the classic BSC, the improved processes and organization structure could be more conducive to Tonsan's development, and the key management and operation processes could be clearly derived. SSM provides a rigorous and logical procedure for constructing more and more detailed models of necessary activities with an aim of improvement and innovation. However, if the strategy breakdown was carried out by using SSM from the top level all the way to the bottom, the process would be rather complicated with an infeasible workload. As Tonsan was in an urgent need to improve its current performance management system, we utilized SSM to break each element on the above strategy map one level down only. The breakdown of the further level was still implemented in line with the current organization structure and the existing operation processes.

The first strategic priority in the customer perspective is keeping and developing "VIP" customers. We constructed SSM conceptual models, following the five step procedure shown in Fig 2, as the key processes (KPs) of the 2nd level. These key processes will also be used to build the performance planning system later. These models were not traditional SSM conceptual models as they were not developed in diagrammatic form, but they are but task sets based on the concepts of innovation and optimization of SSM, which were guided by the six long term objectives above and approved by Tonsan's top executives after repeated discussions (see below).

The relevant main tasks supporting the strategic objective of VIP customer support split by functional area are shown in Table 1:

Table 1 about here

The second strategic priority in the customer perspective is developing new markets, and the respective 2nd level tasks were also developed as we did above (many of them were shared with VIP customer tasks). As well as these, the cost control management, receivables management and other aspects at the internal operation level of the strategic supporting map were also discussed.

The above conceptual models were constructed as a result of the discussions of the promotion team and the top and middle-level executives after reaching the consensus with the stakeholders. It is necessary to emphasize the importance of discussion and feedback in developing these decomposed models. This is important both to generate ideas and inputs from all levels, and to generate a much greater commitment to the final results.

During discussions and feedback, comparing the conceptual models with the current situation, the promotion team summarized the suggestions for improvement, which included some changes to the former organizational structure and management methods (see Table 2).

Table 2 about here

Let us explain the first one in more detail. The idea was to solve the problem of the poor linkage between the R&D Department and the Sales Department (the mutual ignorance of the respective capabilities of the two departments) by trying to find a manager who not only has intimate understanding of the market, but is also proficient in product research and development to lead the combined departments.

After our discussion with the executives about the feasibility of process optimization and the management approach adjustment, we needed to further break down the tasks listed in the second level conceptual models in Table 1. As discussed above, at this level we broke down the tasks directly through Tonsan's existing business processes. After determining the existing support processes, which achieve the priority tasks listed in the conceptual models, we decomposed the KPs and develop the indicators in line with the existing support processes, and linked the indicators to various functional units and departments. As an example, the supporting process decomposition is shown in Table 3 for dealing with VIP customers. In this Table, the procedures in column 3 were derived above, and those in columns 4 and 6 were obtained from direct decompositions to the existing business processes.

Table 3 about here

In the table we can see that in breaking down the strategy we have included both the operational processes and the relevant management processes. As well as this, where particular processes were seen to have room for optimization, consideration was given to changes and improvements.

Phase III: specifying targets and performance indicators

In this phase, the promotion team had shaped a set of targets and tasks for the middle-level departments, which stemmed from the above strategy decomposition from top to the middle level management. The promotion team chose to measure the performance of these targets and tasks by using the 3E performance indicator methodology (see Liu, Chen et al, 2010 for the details) to create a performance indicator system, which derives and classifies the indicators of the tasks into three: E1 – *efficacy*, the extent to which the system produces the outputs that it is supposed to; E2 - *efficiency*, the extent to which it produces the outputs efficiently and economically; and E3 – *effectiveness*, the extent to which the outputs contribute to the objectives of the wider system. Then, after discussing with the department managers about the indicators, the promotion team selected the most needed and feasible indicators to form the Key Performance Indicators (KPIs) and Key Processes (KPs) for each department and its managers. We continue the example (Table 3) to illustrate this process, the results of which are shown in Table 4. The columns of “Relevant Department” and “Internal Support Processes of Relevant Department” follow the contents shown in Table 3.

Table 4 about here

Table 4 shows, from the left to the right, first the relevant departments linked to Tonsan's third-level processes and the 4th-level processes linked to the 3rd-level processes in relevant departments. Generally, the indicators developed with the 3E indicator system for each 4th-level processes are quite varied, but most of them will not be used as KPIs, but as monitoring

indicators giving supplementary information in staff appraisal. The promotion team needed to discuss the KPIs developed by 3E theory with the relevant department's managers several times. Finally the KPIs for the department managers were agreed and the KPs were determined simultaneously. Starting from this point, the department managers will then break down their own KPIs and KPs to the employees at the level next to the manager.

KPIs are often result-oriented indicators, while KPs mainly reflect the processes which achieve the KPIs. KPs and KPIs are the basis of the entire performance management cycle. Often many routine works need to be assessed besides the KPI. For this, we added the non-KPI appraising factors into the new appraisal. The KPI appraisal (including KP appraisal) and the non-KPI appraisal complement each other, and account for different weights of the complete performance appraisal in different departments.

Phase IV: Planning and communication

Phase IV is for the design of performance planning based on the above KPs and KPIs. For better performance management, the performance planning system must enable the supervisors and the subordinates in the hierarchical structure to communicate and negotiate formally and informally. The performance planning system aims to help planning go through the management structure both top-down and then bottom-up, iteratively several times and then finally reach a consensus on a performance plan. Also, the performance planning system will be employed to monitor the key performance processes (KPs) and the key performance indicators (KPIs), and then integrate the data collected. More often than not, performance planning is reduced to a mere formality due to the difficulty in preparing the specific contents of the communication and discussion in performance planning. However our performance planning system is based on the KPs and KPIs which had been developed in the previous phase, and thus the contents for the communication and discussion are quite specific and systematic. Consequently, the performance planning system gained the approval of Tonsan's management.

The start of our performance plan is to analyze what specific tasks must be carried out for the KPs that support the KPIs so that the KPIs can be fulfilled. Next, after sufficient communication between the supervisors and the subordinates, consensus can be achieved on the specific methods and procedures. This will include: when, in what order, for what purpose and what task must be fulfilled? What aid from the supervisor and what resources are needed? When the supervisor and the subordinate will have the next face-to-face communication on the circumstances of the fulfillment of the task? And, how adjustments in the target, the method and the procedures can be made, in accordance with changes in the circumstances. Then the whole process needed to fulfill the KPIs is segmented into smaller ones that are tracked, and proper help is provided at the right time. Thus the supervisor is well aware of the difficulties that the subordinate encounters in the progression of their work. The promotion team developed the specific contents (see as examples Tables 4 and 5) for the performance plan of each department and unit at various levels in accordance with the KPs derived in the third phase, and called upon the managers, at various levels, to implement performance plans agreed upon by both managers themselves and their subordinates; track their subordinates' progress; provide proper guidance; and keep records of their tracking and guidance.

This is a practical management planning approach. It ensures the supervisors should promote, through proper planning, the idea of sufficient communication between the supervisor and the subordinate; should ensure that they have full knowledge of the subordinate's tasks and their progress; and that the subordinate is clear about the supervisors' possible support and guidance. This approach contributes to fulfillment of effective collective performance driven by individual

performance.

The manager's above mentioned work should be recorded in the '*KP Adjustment and Tracking Record*'. The following table (Table 5) is a sample in which the manager kept the record of his face-to-face communication for adjustment and tracking of the tasks his subordinate:

Table 5 about here

At the completion of the project, Tonsan's Performance Management System, which is a set of performance management documents, was handed over to Tonsan's top executives. The general provisions of Tonsan's Performance Management System include:

- 1) Purposes, concepts and principles of Tonsan's performance management; the effects, essentials, meanings and principles of performance management.
- 2) Organizational relationship and functional unit division for Tonsan's performance management, i.e., the performance management responsibilities of shareholders' meeting, Tonsan's 4-level management, CEO, the chief officers of the functional systems, and the departmental managers.
- 3) Tonsan's performance management process, i.e., the six steps: 1) Architecture of the performance appraisal indicator system; 2) Performance planning set up; 3) Performance tracking and guidance; 4) Performance appraisal; 5) Appraisal result feedback; and 6) Uses and requirements of appraisal results;
- 4) Definitions, functions, and principles of Tonsan's performance appraisal.
- 5) Application objects, indicator categories, appraisal indicators for employees at various levels and their breakdown methods, application ranges, appraisal characteristics, methods, and period of Tonsan's performance appraisal.
- 6) Target values and weights of Tonsan's performance appraisal indicators.
- 7) Procedures and specific rules of Tonsan's performance management appraisal.
- 8) Meanings, conditions, forms and handling procedures of complaints about Tonsan's performance appraisal.
- 9) Uses and maintenance, and access to, the documents of Tonsan's performance appraisal.

In due time the results of performance appraisal are used for performance feedback or organizational response: reward or penalty according to the established regulations. Generally, these tasks are executed by the Human Resources Department.

Discussions and conclusions

In this paper we present a Chinese case study to illustrate a way how a company could fight with the economic downturn by overhauling its performance management and operation system in a short time. We offered a flexible framework and some tools to design and implement the performance management system. One of the main aims of the system is to make managers and staff all plan pro-actively how to achieve their targets, and to anticipate the possible problems in a constructive way. On the other hand this management system calls for higher quality and managerial skills on the part of managers. Our designed performance plans will burden the supervisors with more pressure in the planning and implementing, but this can improve the messy state of the management work later. Indeed, Tonsan had to spend at least two weeks to establish the initial performance plans for the staff from top to bottom and then bottom to top iteratively, and many managers complained about the "extra" work from the new system. Thanks to the mounting pressure from the economic downturn, they made a great effort and understood

the new system in a short time. After they were used to it, they started to like it and used it successfully.

The key feature of our methodology was the decomposition process from strategic goals right down to KPIs at low levels of activity. These decompositions are based on SSM and discussed in Phase II: Strategy decomposition. This results in KPs for all departments, which are the base of Phase IV: Planning and communication - our performance planning system is based on the KPs and KPIs which had been developed in the previous phase, and thus the contents for the communication and discussion are quite specific and systematic. This ensures the supervisors should promote, through proper planning, the idea of sufficient communication between the supervisor and subordinate.

In brief, in comparison with other performance management systems described in the literature, our approach had significant advantages:

- It is more all-inclusive, going all the way from strategic objectives, through process improvement and activity decomposition, to developing performance indicators and targets for them.
- It has a rigorous and well-tested underpinning methodology (SSM) which provides constructive methods for doing these activity decompositions.
- It has built into it the 3E model for developing performance indicators.
- It is flexible and open in that it can easily be combined with other tools, e.g., the balanced scorecard, and it can be applied across the full range of organizations, including public sector ones with very different type of objectives.
- It is inherently participative, encouraging debate and discussion and thereby generating greater buy-in and commitment.

References

- Agle, B., Donaldson, T., Freeman, R. E., Jensen, M., Mitchell, R. and Wood, D. 2008. 'Dialogue: Toward superior stakeholder theory', *Business Ethics Quarterly*, 18, pp. 153-190
- Ahn, H. 2001. 'Applying the Balanced Scorecard concept: an experience report', *Long Range Planning*, August, pp. 441-461.
- Amado, C., and Dyson, R. G., 2008. On comparing the performance of primary care providers. *European Journal of Operational Research* 18,5 3., 915-932.
- Andersen, H.V., Lawrie, G. and Shulver, M. 2000. 'The balanced scorecard vs the EFQM business excellence model – which is the better strategic management tool?', 2GC Working Paper, Berkshire UK: 2GC Ltd, www.2gc.co.uk.
- Armstrong, M. 2006. *Performance Management: Key Strategies and Practical Guidelines*, 3rd edition, London, Kogan Page
- Bell, R. and Elkins, S., 2004, A Balanced Scorecard for Leaders: Implications of the Malcolm Baldrige National Quality Award Criteria, *SAM Advanced Management Journal*, 69, 1, pp. 12-17
- Bititci, U., Carrie, S. and McDevitt, L. 1997. 'Integrated performance measurement systems: a development guide', *International Journal of Operations & Production Management*, 17, pp. 522-534.
- Bradley, P., 1996., A performance measurement approach to the reengineering of manufacturing enterprises, CIMRU, NUI Galway, Ireland: Ph.D. Thesis.
- Brewer, P. 2002. 'Putting strategy into the Balanced Scorecard'. *Strategic Finance Magazine* 83, pp. 44-52.
- Checkland, P. 1999. *Systems Thinking, Systems Practice: Includes a 30-Year Retrospective*, Chichester: Wiley
- Checkland, P., Forbes, P., and Martin, S. 1990. 'Techniques in soft systems practice part 3: monitoring and control in conceptual models and evaluation studies'. *Journal Applied Systems Analysis*, 17, pp. 29-37.
- Checkland, P., and Poulter, J. 2006. *Learning for Action*, Chichester: Wiley
- Checkland, P., and Scholes, J. 1990. *Soft Systems Methodology in Action*, Chichester: Wiley.
- Cokins, G. 2004. *Performance Management: Finding the Missing Pieces to Close the Intelligence Gap*. New York: Wiley
- Davenport. T. and Short, J. 1990. 'The New Industrial Engineering: Information Technology and Business Process Redesign', *Sloan Management Review*, Summer, pp.11-27
- Deming, W. E. 1992. *Out of the Crisis*, Massachusetts: The MIT Press
- Fernandes K.J. Rajab V. and Whalleyc A. 2006. 'Lessons from implementing the balanced scorecard in a small and medium size manufacturing organization'. *Technovation*, 26, pp.623-634.
- Ferreira, A. and Otley, D. 2009. 'The design and use of performance management systems: An extended framework for analysis', *Management Accounting Research*, 20, pp. 263-282
- Fitzgerald, L., Johnson, R., Brignall, S., Silvestro, R., Voss, C., 1991., *Performance Measurement in Service Business*, London: CIMA.
- Folan, P., and Browne, Jim., 2005., 'A review of performance measurement: Towards performance management', *Computers in Industry*, 56, pp. 663-680.
- Gilman, M. and Raby, S. 2008. 'High Performance Work Systems in SMEs: Do they really exist?', Working Paper, Centre for Employment, Competitiveness and Growth, Kent Business School, <http://www.ecg-kent.com/uploads/BAM%20paper.pdf>
- Hammer, M. 1990. 'Reengineering Work: Don't automate, obliterate', *Harvard Business Review*, Jul/Aug, pp 104-112

- Jackson, M. 2006. 'Creative holism: A critical systems approach to complex problem situations'. *Systems Research and Behavioural Science* 23, pp. 647-657
- Jain, S., Triantafyllidis, K., and Liu, S., 2011. Manufacturing performance measurement and target setting: A data envelopment analysis approach. *European Journal of Operational Research*. DOI: 10.1016/j.ejor.2011.05.028
- Jawahar, I. and McLaughlin, G. 2001. 'Towards a descriptive stakeholder theory: An organizational lifecycle approach', *Academy of Management Review*, 26, pp. 397-414
- Kaplan, R.S., and Norton, D.P., 1996., 'Using the Balanced Scorecard as a strategic management system', *Harvard Business Review*, January/February, pp. 75-85.
- Kaplan, R.S., Norton, D.P. 2001a. *The Strategy-Focused Organization*. Cambridge: Harvard Business School Press.
- Kaplan, R.S., Norton, D.P. 2001b. 'Transforming the Balanced Scorecard from performance measurement to strategic management', *Accounting Horizons* 15, pp. 87–104.
- Kaplan, R.S., and Norton, D.P., 2008. *The Execution Premium*, Cambridge: Harvard Business School Press
- Kaydos, W., 1991., *Measuring, Managing and Maximizing Performance*, Cambridge, MA: Productivity Press, Cambridge, MA, USA.
- Letza, S.R. 1996. 'The design and implementation of the balanced business scorecard: an analysis of three companies in practice'. *Business Process Re-engineering & Management Journal*, 2, pp. 54–76.
- Ko, R. 2009. 'A computer scientist's introductory guide to business process management BPM.', *ACM Crossroads*, 15, pp. 11-18
- Liu, W., Chen, Z., Mingers, J., Li, Q. and Meng, W. 2010.. 'The 3E methodology for developing performance indicators for public sector organisations', *Public Money and Management*, 30, pp. 305-312
- Lockamy III, A., 1991.,. *A study of operational and strategic performance measurement systems in selected world class manufacturing firms: an examination of linkages for competitive advantage*, University of Georgia: Ph.D. Thesis.
- Lohman, C., Fortuin, L. and Wouters, M. 2004. 'Designing a performance measurement system: a case study'. *European Journal of Operational Research*, 156, pp. 267–286.
- Lynch, R., and Cross, K., 1991. *Measure Up—The Essential Guide to Measuring Business Performance*, London: Mandarin.
- Malina, M.A., Selto, F.H. 2001. 'Communicating and controlling strategy: an empirical study of the effectiveness of the Balanced Scorecard'. *Management Accounting Research*, 13, pp.47–90.
- Malmi, T., 2001. 'Balanced Scorecards in Finnish companies'. *Management Accounting Research*, 12, pp.207–220.
- Meyer, M.W., 2002., *Rethinking Performance Measurement: Beyond the Balanced Scorecard*, Cambridge, UK: Cambridge University Press.
- Mingers, J., Liu, W., and Meng, W. 2009. 'Using SSM to structure the identification of inputs and outputs in DEA', *Journal Operational Research Society*, 60, pp. 168-179
- Mingers, J., and White, L. 2010. 'A review of the recent contribution of systems thinking to operational research and management science'. *European Journal of Operational Research*, 207, pp. 1147-1161.
- Mitchell, R., Agle, B. and Wood, D. 1997. 'Towards a theory of stakeholder identification and salience: Defining the principle of who and what really counts', *Academy of Management Review*, 22, pp. 853-886
- Neely, A., Adams, C. and Crowe, P. 2001. 'The performance prism in practice', *Measuring Business Excellence*, 5, pp. 6-12.
- Otley, D., 1999., 'Performance management: a framework for management control systems

- research', *Management Accounting Research*, 10, pp. 363-382.
- Paauwe, J. 2004. *HRM and Performance: Achieving Long Term Viability*. Oxford: Oxford University Press.
- Papalexandris, A., Ioannou, G., Prastacos, G., and Soderquist, K.E. 2005. 'An integrated methodology for putting the balanced scorecard into action'. *European Management Journal*, 23, pp.214-227.
- Patel, B., Chausalet, T., and Millard, P., 2008. Balancing the NHS balanced scorecard! *European Journal of Operational Research* 185 3., 905-914.
- Phillips, R., Freeman, R. E. and Wicks, A, 2003. 'What stakeholder theory is not', *Business Ethics Quarterly*, 13, pp. 479-502
- Pyzdek, T. and Paul A. K. 2009. *The Six Sigma Handbook Third Edition*. New York: McGraw-Hill
- Qi, L 2010. *Studies of strategic performance management: theory and practice*. University of Kent, UK, Ph.D thesis
- Rampersad, H. K., 2002. *Total Performance Scorecard: Redefining Management to Achieve Performance with Integrity*, London: Butterworth-Heinemann.
- Rouse, P., and Putterill, M., 2003., 'Aan integral framework for performance measurement', *Management Decision*, 41, pp. 791-805.
- Sink, D., and Tuttle, T., 1989. 'Planning and Measurement in your Organization of the Future', Norcross, USA : Industrial Engineering and Management Press.
- Smart, P., Maddern, H. and Maull, R. 2009. 'Understanding business process management: Implications for theory and practice', *British Journal of Management*, 20, pp. 491-507
- Smith, P. and Goddard, 2002. 'Performance management and operational research: a marriage made in heaven?', *Journal of the Operational Research Society*, 53, pp. 247-255
- Speckbacher G., Bischof J. and Pfeiffer T. 2003. 'A descriptive analysis on the implementation of Balanced Scorecards in German-speaking countries'. *Management Accounting Research*, 14, pp.361-387
- Tapinos, E., Dyson, R. and Meadows, M. 2011. 'Does the Balanced Scorecard make a difference to the strategy development process?', *Journal Operational Research Society* 62, 888-899
- Taylor, Gerald 2008. *Lean Six Sigma Service Excellence: A Guide to Green Belt Certification and Bottom Line Improvement*. New York: J. Ross Publishing.
- van der Water, H., Schinkel, M., and Rozier, R. 2007. 'Fields of application of SSM: a categorization of publications', *Journal Operational Research Society*, 58, pp. 271-287.
- Wisner, J., and Fawcett, S., 1991., 'Linking firm strategy to operating decisions through performance measurement', *Production and Inventory Management Journal*, 32, pp. 5-11.
- Wisniewski, M. and Dickson, A. 2001. 'Measuring performance in Dumfries and Galloway constabulary with the Balanced Scorecard', *Journal Operational Research Society*, 52, pp. 1057-1066
- Yeniyurt, S., 2003., 'A literature review and integrative performance measurement framework for multinational companies', *Marketing Intelligence and Planning*, 21, pp. 134-142.
- Yogesh, M. 1998. 'Business Process Redesign: An Overview', *IEEE Engineering Management Review*, 26, pp. 27-31

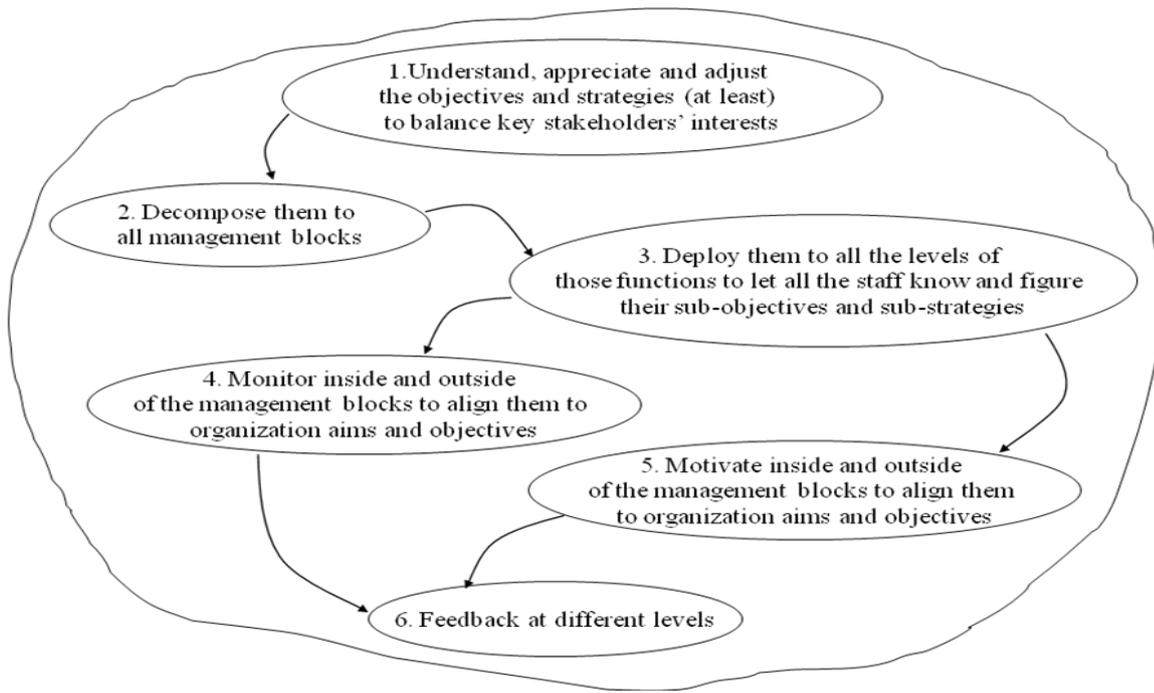


Figure 1: A conceptual model of performance management

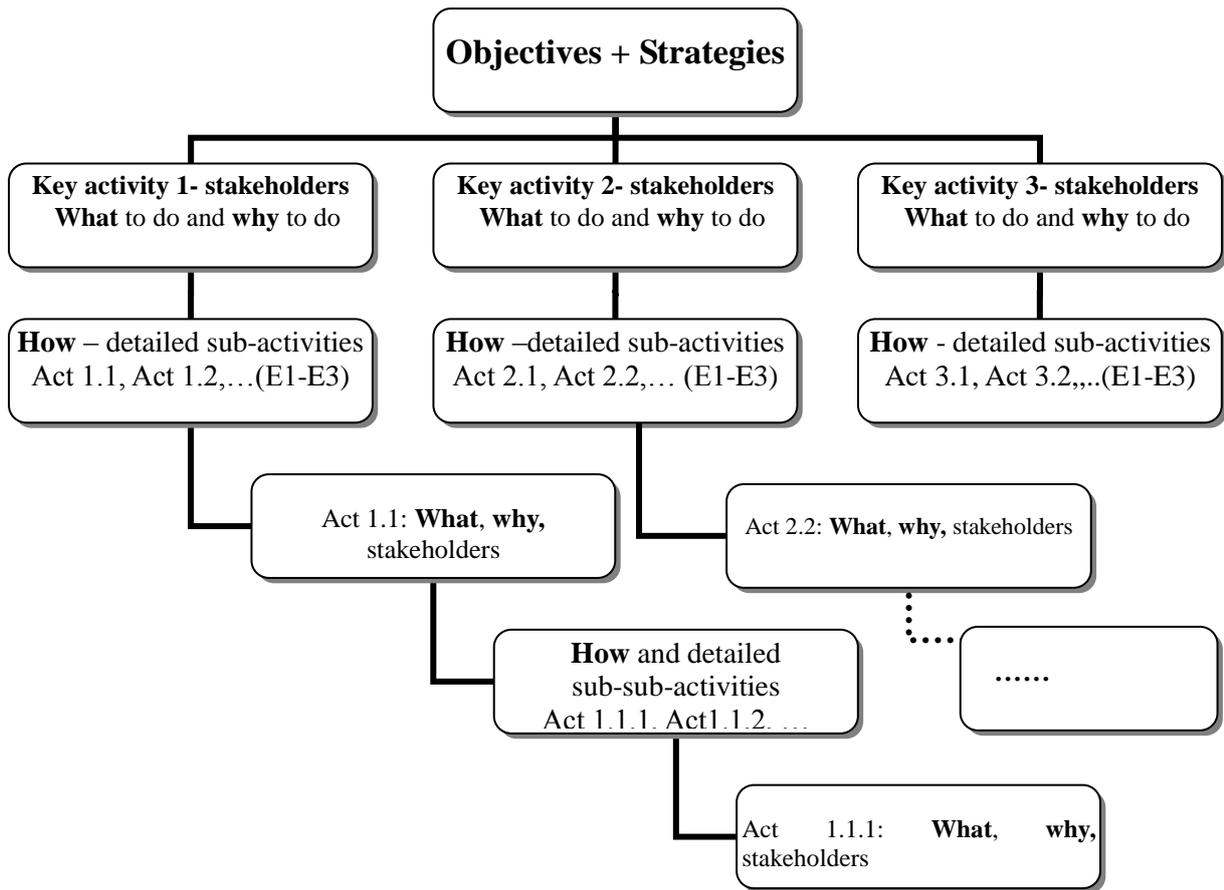


Figure 2: The main steps to decompose objectives and strategies (developed from Liu et al, 2010)

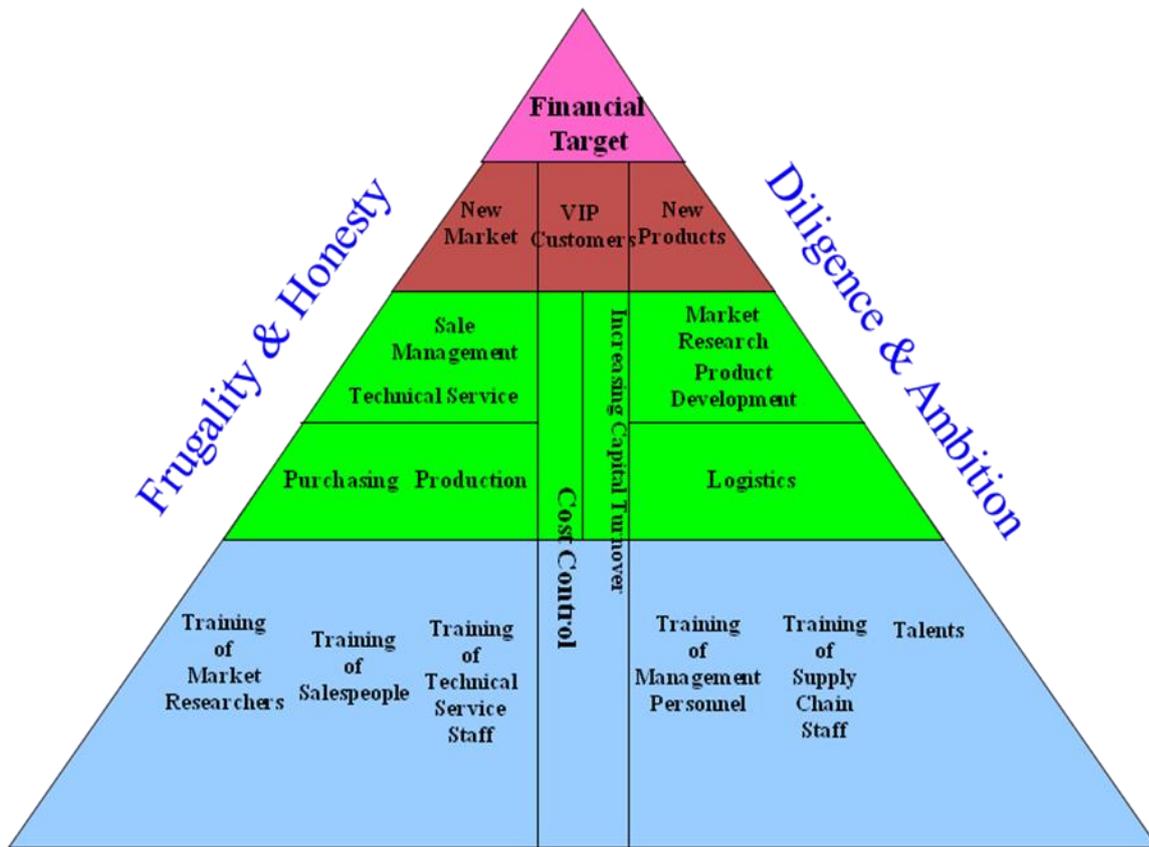


Figure 3: Tonsan's BSC strategic supporting map

Table 1 Conceptual models in support of 1st strategic objective developed through an SSM approach

Tasks supporting the strategic objective of VIP customer support			
Sales Management	Technical Services	Supply Chain Management	Market Research and Development
Building a professional sales force	Understanding customer needs and providing technical solutions to their problems in a timely manner	Achieving comparatively higher production quality than in the industry through employee training, and process control;	Cultivating talents and raising the professional level;
Cultivating integrity and honesty	Providing all-round and professional technical solution to customers	Optimizing and standardizing of production processes	Improving production techniques, and raising product quality and productivity;
Understanding customers' needs	Assisting VIP customers to innovate their techniques, persuading them to use more Tonsan's adhesives to raise the productivity of VIP customers	Increasing productivity and the efficiency of logistics	Satisfying VIP customers' practical needs;
Developing new VIP customers; and	Solving problems in collaboration with relevant internal units	Delivering goods timely	Speeding the development of the products VIP customers demand; and
Managing sales channels	Developing training programs for customers and relevant internal units		Inducing VIP customers to try Tonsan's new products.

Table 2 Examples of summarized the suggestions for improvement.

1. Combining Sales Department and R&D Department.
2. Setting up Sales Channel Management Division in the Center for Marketing
3. Establishing Warehousing & Logistics Department.
4. Defining new market and new product
5. Linking R&D staff's performance to sales revenue
6. Overhaul production processes and enforce quality checking on sit
7. Making team heads half-time managers dealing with management issues directly in production activities

Table 3 The supporting processes decomposition

Customer perspective	Internal operation perspective	Tasks in conceptual model (2nd level processes)	Existing support process (3rd level processes)	Relevant departments	Internal support process of relevant departments (4th level processes)
VIP customer	Sales Management	Build professional sales force	Process of recurring and training of sales force	Sales Department	Training of sale teams
				Product Management Department	Training of product technology
				Marketing Department	Training of product promotion
				Human Resources Department	Recurring and training of regulations
			Process of introducing market management executives	Human Resources Department	Recruiting top market management talents
		Cultivate integrity and honesty	Sales force management process	Sales Department	Implementing and training of sales management regulations
		Understand customers' needs	Sales force management process	Sales Department	Getting information about VIP customers' needs
		Develop new VIP customers	Sales management process	Sales Department	Visiting new VIP customers, analyzing rivals and mastering external environment analysis methods
		Manage sales channels	Dealers management process	Sales Department	Training of dealers
				Channel Management Department	Relationship building, Training dealers
			Process of training of dealers	Sales Department	Training of dealers
				Channel Management Department	Training of dealers
				Product Management Department	Training of dealers
		Technology support to dealers		Product Management Department	Product technology support

Table 4: Examples of Key Processes & Key Performance Indicators

Relevant department	Internal support process of relevant departments (4th level process)	KPIs for relevant departments	KPs for relevant departments
Sales Department	Operationalizing sales training programs	<ul style="list-style-type: none"> • Number of sales people in service (E1); • Passing rate for sales expertise assessment of sales people (E3); • Sales Department unit (region or individual): fulfillment rate of sales target (E3); • Satisfaction rate of sales people in service with training of sales skills (E3) 	Sales force management regulation implementation; Sales training implementation
Product Management Department	Operationalizing training programs of product technologies	<ul style="list-style-type: none"> • Number of sales people in service (E1); • Passing rate for product technology assessment of sales people (E3); • Satisfaction rate of sales people in service with training of product technologies (E3) 	The implementation of training of product technologies
Marketing Department	Operationalizing training programs of product promotion skills	<ul style="list-style-type: none"> • Number of sales people in service (E1); • Passing rate for product promotion skill assessment of sales people (E3); • Satisfaction rate of sales people in service with training of product promotion skills (E3) 	The implementation of training of product promotion skills
Human Resources Department	Operationalizing training programs of regulations	<ul style="list-style-type: none"> • Number of cases of salesmen's violating regulations in the first three months after induction (E3) 	The implementation of human resources management regulations and norms

Table 5 Key Process adjustment and tracking record

Department	Quality Assurance	Time	M__D__, Y_____
Appraisee	Liu **	Title	Packaging inspector
Appraiser	Li **	Title	Manager, QA
Record of main results of KP communication and tracking and plan for next period:			
<ol style="list-style-type: none"> 1. KP1 System management work: twice company-wide inspections per month; 2. KP2 Sorting out and optimizing Tonsan's processes: add a new procedure change document, and other documents systematically modified to comply with the new procedure change; 3. KP3 Tonsan's business process: the third quarter mainly for maintenance of routine processes; 4. KP4 Lab management: take care of lab tools; 5. KP5 6. 			
Supervisor's review of and reply to appraisee's KP report:			
Agreed KP tracking and adjustment results (determined via discussion):			
<ol style="list-style-type: none"> 1. Continuing sorting out Tonsan's processes; 2. Timely spotting the problems of in its operation, and adjusting in the organizational structure change; 3. 4. 			
Confirmation of the results of this time communication:			
Appraisee: Liu ** (signature)		Supervisor: Li ** (signature)	
Time: M__D__, Y_____		Time: M__D__, Y_____	