Generic Lean Six Sigma project definitions in publishing

Henk de Koning
A.T. Kearney B.V., Amsterdam, The Netherlands

Ronald J.M.M. Does
Institute for Business and Industrial Statistics, University of Amsterdam, Amsterdam, The Netherlands

Arjan Groen
Ernst & Young, Amsterdam, The Netherlands, and

Benjamin P.H. Kemper
Institute for Business and Industrial Statistics, University of Amsterdam, Amsterdam, The Netherlands

Abstract

Purpose – Many companies in the publishing industry are facing the task of developing new business models and becoming more efficient and effective in execution. Lean Six Sigma (LSS) is a unified framework for systematically developing efficiency and quality improvements; it can help realize significant results and breakthrough improvements in the publishing industry, as demonstrated with many projects from a Dutch multinational publishing company. The purpose of this paper is to facilitate the process of defining LSS projects in publishing, because lack of a clear definition is an important cause for project failure.

Design/methodology/approach – The paper discusses and categorizes 49 project definitions based on two elements: the critical to quality flowdown and the corresponding set of operational definitions and shows how this simple categorization and subsequent standardization of approaches can help LSS teams simplify the definition phase.

Findings – The strategy presented in this paper provides seven standard LSS project definitions ("generic templates").

Originality/value – Project leaders can use the templates presented in this paper as an example and as a guide in the project definition phase. This helps them to formulate crystal-clear project definitions, which have explicitly stated goals and a solid business rationale.

Keywords Six sigma, Project management, Process efficiency, Innovation, Publishing, The Netherlands

Paper type Research paper

1. Introduction

The publishing industry faces strategic challenges. First, information availability has increased dramatically because of internet and online accessibility of information. As a consequence publishing companies worldwide are changing their business models. They have to drastically redefine the way in which they add value to customers. Second, many publishing companies are migrating from a traditional to an industrial way of working. This change has great impact on operational efficiency and effectiveness. The operational improvements are not just to create more profit; the publishers also need them to fuel growth in new (online) business. In brief: publishers are facing the task of developing new business models and becoming more efficient and effective in execution.

Lean Six Sigma (LSS) is a method that can help publishing companies to deal with some of these strategic challenges by improving its operational efficiency and effectiveness (George, 2003; Snee and Hoerl, 2004). These improvements are performed in a project-by-project fashion. The projects are managed strictly according to five phases called define-measure-analyze-improve-control (DMAIC). Each phase is completed only when specific milestones are reached (de Mast *et al.*, 2006).

Despite the structured DMAIC approach and all other merits of LSS, some of the projects fail. In the project management literature the clarity of the project definition is pinpointed as one of the most important factors for project failure (Morris and Hough, 1987; Pinto and Slevin, 1988; Partington, 1996; Lynch *et al.*, 2003).

LSS project definitions come in different levels of precision, ranging from crystal clear to poorly stated, vague, and lacking a business rationale. As a result it is common that as the project develops, project leaders and project owner have diverging views of what constitutes a successful project and what should be delivered by the project leader. Wasted effort, missed deadlines, and even preliminary project termination may be the consequence.

The purpose of this paper is to facilitate the process of defining LSS projects in publishing and thus to improve its effectiveness. Our strategy is twofold:

(1) Provide case examples of LSS projects applied in the publishing industry.

(2) Provide a number of standard project definitions ("generic templates"). Project leaders in publishing can use these templates as an example and a guide in the definition phase of their own projects.

In Section 1 of this paper, the research method to construct the generic templates will be explained. In Section 2, we present the resulting project definition templates. On top of this for each template a project case example is provided. Then we will show that the choice for a template is partly determined by the process one tries to improve. A decision tool will guide the project leaders' choice for a template. Section 5 provides conclusions.

2. Method

The starting point for the construction of the generic templates was a collection of descriptions of 49 LSS projects carried out in a multinational publishing company. This sample of 49 LSS projects represents a cross-section within this company. The projects vary along key dimensions, such as type of department (back-office, staff, or front-office), country (11 countries are present in the sample), and size (ranging from €20,000 to approximately €3,000,000 worth of benefits).

Part of the description of each project was a project definition, which included at least:

- A business case, specifying the business rationale for the project.

- A (macro level) process description.

- Selected measurable indicators of performance (called critical to quality (CTQ) in LSS terminology, see Harry, 1997).

- CTQ flowdown (indicating the relation between CTQs and the strategic goals of the company).

- An operational definition for each CTQ.

- A description of the measurement procedure for each CTQ.

Still, the information available per project varied: although the descriptions have more or less a uniform format (consisting of a CTQ flowdown), typically the terminology used varies a little. Therefore, the terminology in which the project definitions were captured has to be standardized first.

In each project a standard structure for two elements of project definitions is used, namely the CTQ flowdown and the operational definitions. The CTQ flowdown is a commonly used tool to translate strategic focal points into CTQs (de Koning and de Mast, 2007). High-level strategic focal points are related to project objectives. In their turn project objectives are linked to, and decomposed into CTQs, which are made operational in the form of measurements. This is done by providing operational definitions, which help to make CTQs measurable by specifying a measurement procedure. A generic template consists of a generic CTQ flowdown and generic operational definitions of each CTQ in the flowdown, see Figure 1.

For each of the 49 projects the CTQ flowdown and operational definitions were reviewed and the terms and concepts were harmonized. The resulting project definitions were compared and it was judged whether they were similar or not. This resulted in an initial grouping of projects with a similar structure. From the common denominator of each grouping of similar projects the generic CTQ flowdown templates were constructed. Then, after constructing the LSS CTQ flowdown templates, it was verified whether the resulting groups of projects covered a substantial amount of the individual projects. Finally, for each CTQ flowdown template operational definitions were made. It was checked for the projects in each group how the CTQs were operationalized and generic operational definitions were constructed.

3. Templates for generic LSS projects

Our analysis resulted in eight generic project definitions. The categories focus on revenue improvement (one), cost reduction (three), working capital improvement (one), earnings before interest and tax (EBIT) improvement (one), or some combination of these (two). In this section, we give an in-depth discussion of the generic project definition categories, but first we give an overview of the categories:
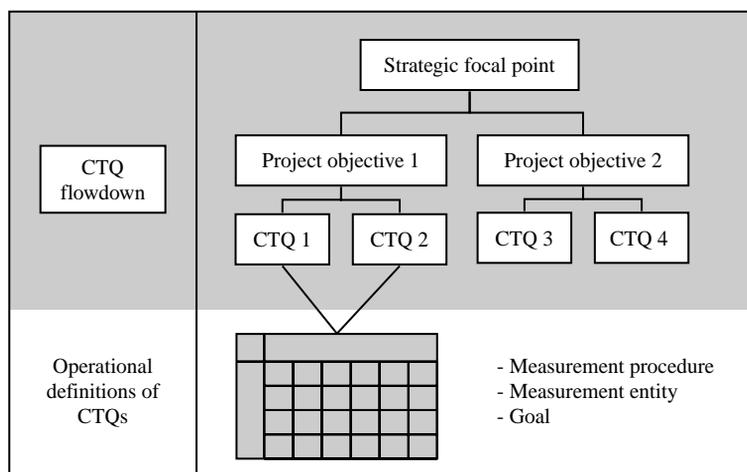

Figure 1.
The two elements of LSS project definitions: CTQ flowdown and operational definitions

(1) Revenue improvement by servicing more customers.

(2) Cost reduction by improving efficiency of processes.

(3) Improvement of customer satisfaction and processing efficiency.

(4) EBIT improvement by reducing discounts and cost of sales channel.

(5) Cost reduction by improving efficiency of internal processes and sourcing most effective suppliers.

(6) Cost reduction by improving forecasting.

(7) Working capital reduction by improving cash management and fast delivery.

(8) Marketing effectiveness improvement.

Based on Figure 2 we can see that the Category (1) accounts for 22 percent of all projects, followed by Category (2) accounting for 18 percent, Category (3) accounting for 10 percent, Category (4) accounting for 10 percent and Category (5) accounting for 10 percent. Cumulatively these five-project definition categories account for more than 70 percent of all the projects we encountered. The three smallest categories, Categories (6)-(8), account for another 20 percent. Only 8 percent of the projects in the sample could not be assigned to one of the templates (shown in Figure 2 as "other"). Because these are all stand-alone cases, they did not justify adding new categories. Note that Category (8) has been based on only two projects and will not be discussed in the sequel.

Hence, we present seven generic project definition categories in terms of the CTQ flowdown and operational definition of the CTQs. For each generic category we also provide an example.

Project category 1: revenue improvement by servicing more customers
The Category (1) consists of projects that aim to improve the revenue of the company. Three possible ways to improve revenue are shown in the CTQ flowdown (Figure 3):
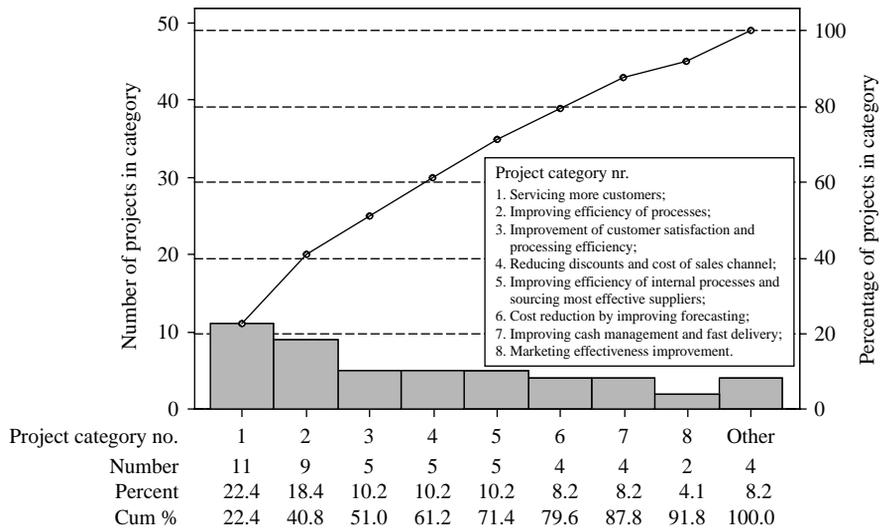

Project category no.	1	2	3	4	5	6	7	8	Other
Number	11	9	5	5	5	4	4	2	4
Percent	22.4	18.4	10.2	10.2	10.2	8.2	8.2	4.1	8.2
Cum %	22.4	40.8	51.0	61.2	71.4	79.6	87.8	91.8	100.0

Figure 2.
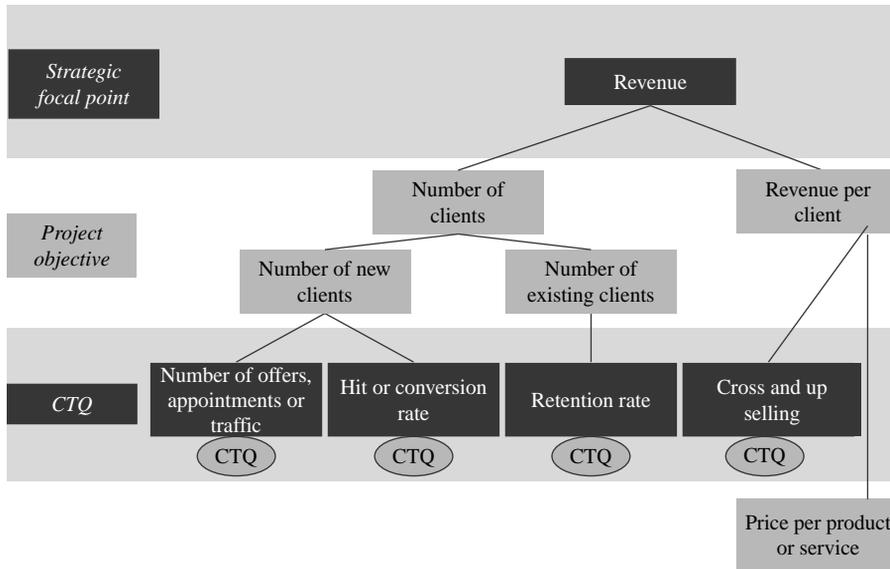Pareto chart of LSS publishing project definitions

Figure 3.
CTQ flowdown
for projects improving
revenue by servicing more
customers

(1) *New sales.* Increasing the number of new clients, by:
  - identifying more prospect clients; or
  - improving the conversion rate from prospect to contract, which is called the hit or conversion rate.

(2) *Renewal sales.* Keeping existing customers by improving the retention rate.

(3) *Cross and up sales.* Selling more products, services or additional features of products to existing customers.

These relations and the four CTQs are shown in Figure 3. Note that price is not included as CTQ, because pricing strategies are beyond the scope of these LSS projects.

The operational definitions needed to measure the CTQs are shown in Table I.

Table I shows that the operational definition of a CTQ consists of three elements. First, one specifies per which entity the CTQ is measured. This entity is called the (experimental) unit. The number of offers, appointments or traffic (in a web shop) is measured per week or per month. Similarly, retention rate (for existing customers renewing) and hit or

CTQ	Number of offers, appointments, or traffic	Hit or conversion rate	Retention rate	Cross and up selling
Unit	Per week, per month	Per week, per month	Per week, per month	Per customer
Measurement procedure	Via the CRM database	Via the CRM database	Via the CRM database	Via the CRM database
Goal	As much as possible	A large as possible	A large as possible	As large as possible

Table I.
Operational definitions
for projects improving
revenue by servicing
more customers

conversion rate (for new customers) are measured per week or per month. Cross and up selling are measured per customer. Second, a measurement procedure for the CTQs is specified. Most of the mentioned information can be extracted from a customer relationship management (CRM) database. In the case we deal with a web shop environment one needs marker-based measurements to track traffic on the web site and to measure conversion.

Example 1. One of the projects in this category was executed in the UK. In the process to be improved services are offered to SMEs. Services offered are mostly consultancy services and include for instance setting-up health and safety monitoring and control systems, risk assessment and auditing, litigation insurance (including tribunal representation) and telephone advice for employment, safety and general business support. Services are contracted for, typically, three-year periods. The black belt decided to select retention rate in both value and volume terms as a CTQ. She measured these CTQs by taking a sample of 190 renewals (due in October 2006). The raw measurement data consisted of scanned images of original sales orders and accompanying information.

Project category 2: cost reduction by improving efficiency of processes
In Category (2), the aim of the project is to decrease operational cost by improving efficiency of processes. In the publishing industry – like other service industries – in most processes personnel cost are the dominant contributor to the operational cost, so the project objective in these project is to reduce the headcount. The headcount is composed of:

(1) Total processing time (PT), which is divided into:
  • net PT; and
  • additional PT due to rework.
(2) Work volume.
(3) Number of productive hours an employee works in the process, which is determined by the time spent on value adding activities. Figure 4 shows these relations and the four CTQs of this category.

The total PT is usually split up in the PTs per process step. This provides more information to diagnose the problem in the analyze phase. Rework can originate internally, but also externally. If, for instance, an author changes a manuscript during a proofreading cycle, this typically causes an additional processing loop. The operational definitions needed to measure the CTQs are shown in Table II.

Example 2. In the project that serves as an example a typical production process of publishers was improved. From all kind of sources (for instance authors) content is edited and made-up. The total PT consists of editing time and make-up time. Work volume (number of manuscripts) was considered as a given here. Moreover, it was not measured to what extent editors spend their time on value adding activities.

Project category 3: improvement of customer satisfaction and processing efficiency
A number of projects in the sample have a structure like the ones in Category (2), but have an additional strategic focal point (revenue). For the CTQs already covered under Category (2) the CTQ flowdown looks the same, as well as the operational definitions of the CTQs. The revenue part has the following logic. Customer
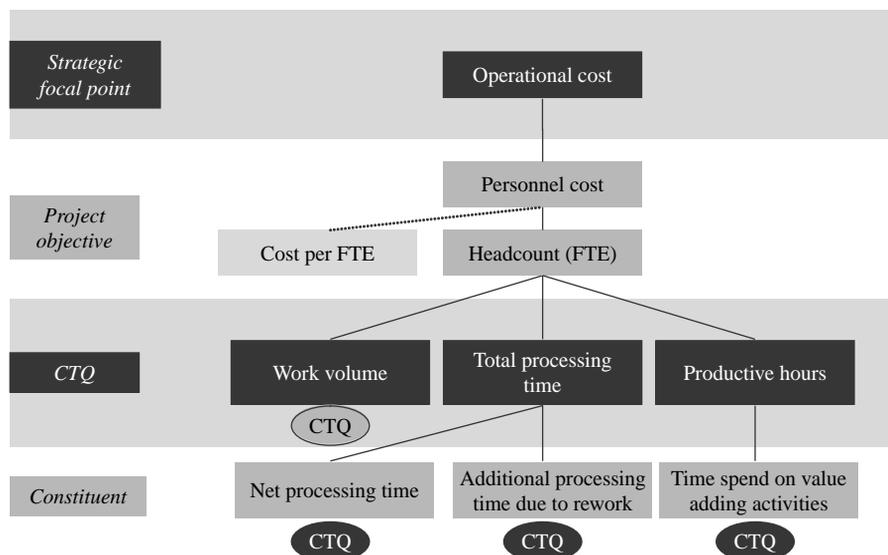
Figure 4.
CTQ flowdown
for projects decreasing
operational cost by
improving processing
efficiency

CTQ	Net PT /additional PT due to rework	Work volume	Time spend on value adding activities
Unit	Per job (request, file, complaint, payment, etc.)	Per day, per week	Per day, per week
Measurement procedure	Track a sample of jobs (time stamps), job tracking system	ERP, job tracking system	Time sheets
Goal	As short as possible	As little non-value adding work as possible	As little non-value adding work as possible

Table II.
Operational definitions
for projects decreasing
operational cost by
improving processing
efficiency

satisfaction is seen as a driver of revenue, either because it affects market share, or because it reduces price sensitivity. To this end, projects seek to improve service delivery processes in order to improve service quality. Following the studied projects, service quality can be decomposed into the following underlying dimensions:

(1) External iterations.

(2) Throughput time, which can be decomposed into:
  • net waiting time (WT);
  • additional WT due to (internal and external) rework;
  • net PT; and
  • additional PT due to (internal and external) rework.

(3) Perceived quality.

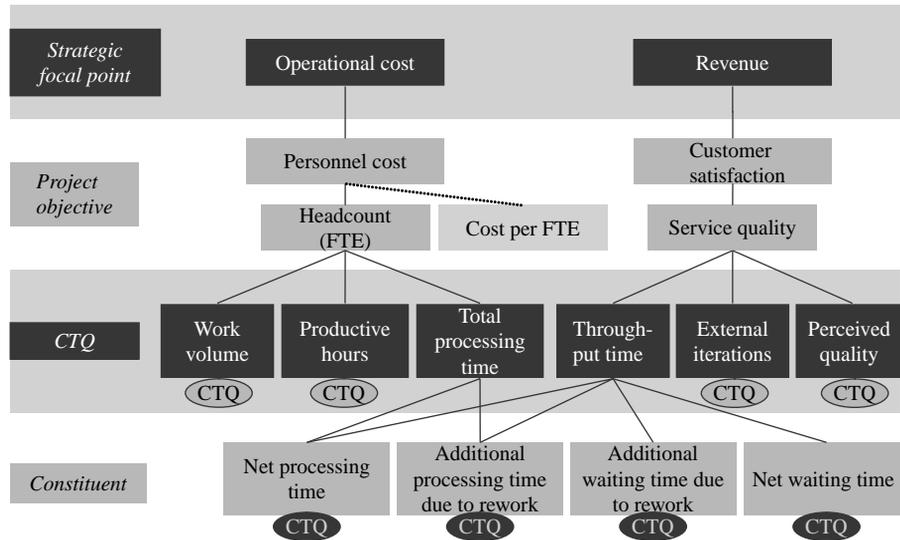These relations combined with the ones mentioned in Category (2) are shown in Figure 5.

Figure 5.
CTQ flowdown
for projects increasing
customer satisfaction and
improving processing
efficiency

To relate net WT, additional WT due to rework, net PT, additional PT due to rework, number of external iterations, and perceived quality to specific measurements, we need operational definitions. They are provided in Table III.

Measuring external iterations and the underlying components of throughput time are straightforward. External iterations (errors or proofs) are either measured automatically in case an ERP or other logging system is in place. Otherwise it is best to sample a number of jobs and measure the percentage that contains errors, proofreading cycles or iterates for another reason. In the case of throughput time sometimes the number of rework loops instead of additional processing and WT due to rework is measured.

About the measurement of the CTQ "perceived quality" less agreement exists. In some of the LSS projects in the sample "perceived quality" is measured by asking it directly to the customer (using a customer survey), whereas in others it is hypothesized to be related to the underlying dimensions. These underlying dimensions are highly project specific.

Example 3. In this example the black belt aimed to improve the process of bulk sales of reprints of articles from scientific and non-scientific pharmaceutical journals. Assessment of the value chain for reprints and the cost base for this business line suggested that both process time to process a reprint and the throughput time of delivery

CTQ	PT/WT/additional PT due to rework/additional WT due to rework	External iterations	Perceived quality
Unit	Per job (a request, file, complaint, payment, etc.)	Per day, per week	Per customer
Measurement procedure	Track a sample of jobs (time stamps), job tracking system	Counting based on a sample of jobs, or from an ERP or other logging system	Quality rating based on a survey of customers
Goal	As small as possible	As small as possible	As large as possible

Table III.
Operational definitions
for projects increasing
customer satisfaction and
improving processing
efficiency

of the reprint could be improved dramatically. Therefore, total PT and total throughput time were selected as CTQs. Moreover, a distinction was made between non-translated and translated reprints, because translated reprints are considerably more complicated.

Project category 4: EBIT improvement by reducing discounts and cost of sales channel
In the publishing industry several channels are used to generate sales. Cost of sales channel and well as discounts affect the amount of revenue generated, but also vary substantially across sales channels. The LSS projects in this category are focused on reducing cost of sales channel or discounts given. The CTQ flowdown (Figure 6) shows the following logic:

(1) EBIT is the overall goal, which is composed of the key performance indicators cost and sales (measured per book title or product).

(2) The sales is determined by:
   • the sales volume; and
   • the effective price which is the list price with discounts subtracted.

(3) The cost is determined by a lot of factors. The one considered here is cost of sales channel paid to for instance resellers or agents.

The CTQs selected in these projects are:
   • discount per product (measured as a percentage); and
   • cost of sales channel (measured as a percentage per channel per reseller or agent).

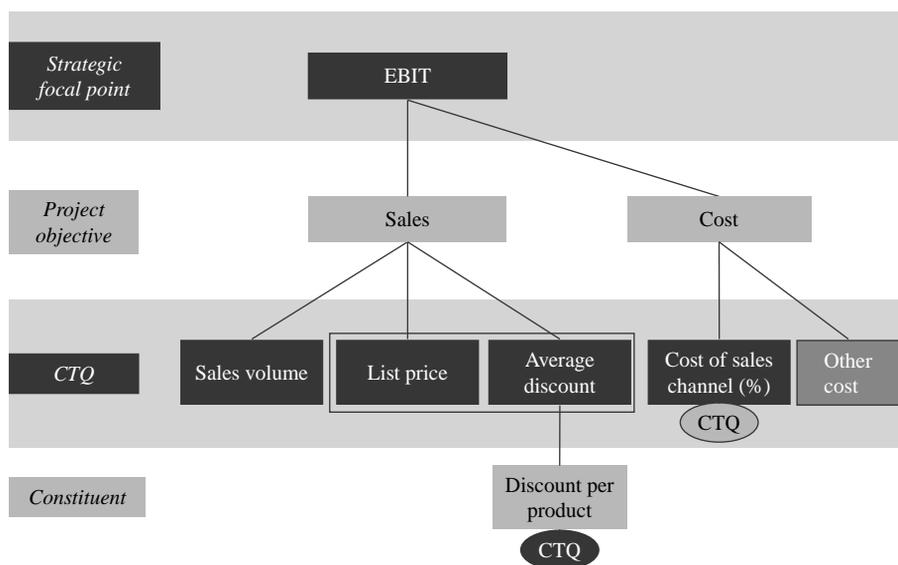The operational definitions for discount per product and cost of sales channel are shown in Table IV.

Figure 6.
CTQ flowdown
for projects improving
EBIT by reducing
discounts and cost of
sales channel

Example 4. In one of the operational companies of a large multinational the practice of giving discounts was not satisfying. In the various sales processed (field sales of new products and renewal sales, but also in sales or larger deals) it was not transparent who is authorized to give discounts in what situation. The CTQ selected was the amount of discounts given per product, both as percentage and as value. In the measurement procedure a number of influence factors were included, such as the reason for giving a discount, the sales person, the product category, the business unit, etc. Furthermore, sales volume and conversion rate were taken along as boundary conditions. The discount given should only be decreased to the extent that it does not harm sales.

Project category 5: cost reduction by improving efficiency of internal processes and sourcing most effective suppliers
Projects in Category (5) are similar in structure to projects in Category (2) ("cost reduction by improving efficiency of processes"), because they also aim to decrease operational cost by improving efficiency of processes (Figure 7). However, in these projects also external costs incurred to produce products are included. For the internal cost part the CTQ flowdown is identical to Category (2). For external cost three extra CTQs are distinguished:

Table IV.
Operational definitions for projects improving EBIT by reducing discounts and cost of sales channel

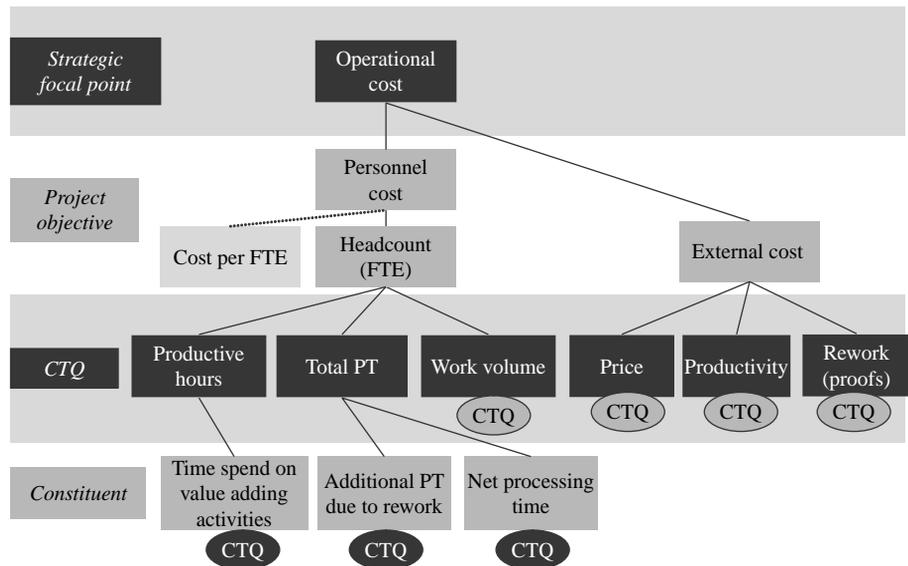| CTQ	Discount	Cost of sales channel (%)
Unit	Per product, per title	Per outlet or per agent
Measurement procedure	Via the CRM database	Via the CRM database
Goal	As small as possible	A small as possible

Figure 7.
CTQ flowdown for projects reducing cost by improving efficiency of internal processes and sourcing most effective suppliers

(1) price (measured per unit, or per page);

(2) productiveness (how many units or pages are produced per hour); and

(3) how much rework is done by the external supplier?

Operational definitions are provided in Table V.

Both price and productivity are measured by looking in financial systems, in contracts or looking at invoices. In printing books the price is measured per page or per hour. Productivity is also determined per hour. Rework is harder to measure. Typically a sample of invoices is screened to see how much rework is charged.

Example 5. In this project the process of producing books and journal was examined. Part of the process, editing, is done internally, whereas composition and printing is done externally. For both composition and printing the black belt decided to measure the average time spent per page and the hourly production rate (pages per hour) for 220 books produced (all in 2008). Information was extracted by hand from invoices sent by external suppliers.

Project category 6: cost reduction by improving forecasting
In book (and other print) production a significant part of the total cost are production cost. One of the risks in book production is that companies tend to overproduce with respect to sales, because fixed cost are high and variable cost are relatively small. This results in large stocks and large book volumes that have to be liquidated at the end of book's lifecycle.

The strategic focal point in this category is decomposed in:

· cost of capital; and

· the variable part of production cost.

Cost of capital is determined by the CTQ "inventory level." Second, the variable part of production cost is determined by sales volume. The CTQ selected is, however, excess production volume, i.e. the produced volume that is unsold at the end of the lifecycle of the product. The CTQ flowdown is shown in Figure 8.

The operational definitions of inventory level and excess production are shown in Table VI.

Usually, both inventory level and excess production can be found in a production database. If not then the alternative is to take a sample of products reflecting the whole product range and to literally count from the sample the inventory level for a number of weeks.

Example 6. In Italy it is quite common to sell books via agents. Each agent gets a certain amount of books for presentation and for sale (for each book title). They are,

CTQ	Price	Productivity	Rework
Unit	Per type of activity (production or editing) per supplier	Per hour (per page)	Per title
Measurement procedure	Check in the financial system or in contracts	Check in the financial system or in contracts	Check in the financial system or on invoices
Goal	As small as possible	As large as possible	As small as possible

Table V.
Operational definitions for projects reducing cost by improving efficiency of internal processes and sourcing most effective suppliers
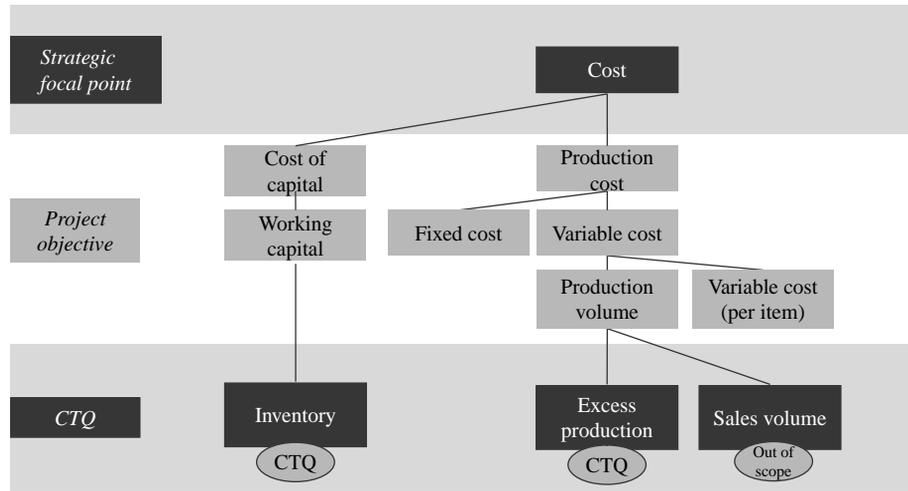
Figure 8.
CTQ flowdown
for projects decreasing
cost by improving
forecasting

CTQ	Inventory	Excess production
Unit	Per title (of a book, leaflet, journal, etc.) per month	Per title (of a book, leaflet, journal, etc.)
Measurement procedure	Production system. Measured during life cycle of title	Production system. Measured at end of life cycle of title
Goal	As small as possible, but sufficient for sales	As small as possible, but sufficient for sales

Table VI.
Operational definitions
for projects decreasing
cost by improving
forecasting

however, not equally successful in selling these books, resulting in books being sent back to the publishing company. The black belt decided to select the CTQ "number of unsold books." He focused on sales of fiscal books (used by accountants and the like) and on the sales channel of agents, which is the main one. The idea was that other types of books and other sales channels would be improved later.

Project category 7: working capital reduction by improving cash management and fast delivery
A number of projects were focused on improving the cash position of the publishing company. The strategic focal point related to cash position is cost of capital. This is determined by the amount of working capital a company needs to fund its business. Working capital consists of three elements:

(1) *Outstanding order value*. Before products and services enter the market, cost has to be paid in advance. This is one source for the need of working capital.

(2) *Accounts receivable*. It takes time before a customer pays his invoice. Typically, a customer has 30-60 days to pay the bill. Sometimes it takes even longer. The value of all unpaid bills by customers is called accounts receivable.

(3) *Accounts payable*. The company on the other hand also has leeway to pay bills within 30-60 days.

The projects in this category focus on two sources of working capital, outstanding order value and accounts receivable. Both sources can be decomposed into two elements:

(1) a value (per invoice or order); and

(2) a throughput time (per invoice or order).

For both sources the value is seen as a given and the throughput time is selected as CTQ (Figure 9).

The operational definitions for the CTQs are shown in Table VII.

For both CTQs the measurement is typically quite straightforward as long as it is recorded in a (financial) database. The throughput time from sales order to delivery sometimes has to be measured by hand via a travel sheet.

Example 7. One of the projects in this category comes from a black belt in Italy. She was responsible to optimize the monthly installment's collection from customers. The agent's contract envisages a commission on installments collected. Therefore, every month, agents go to the customers to cash expiring installments. Throughput time of the invoice to the payment was the main CTQ in this project.

4. Process relationship to the templates
The classification of project definitions in eight categories (Figure 2) helps black belts a great deal in creating a crystal clear project definition, and making sense from a
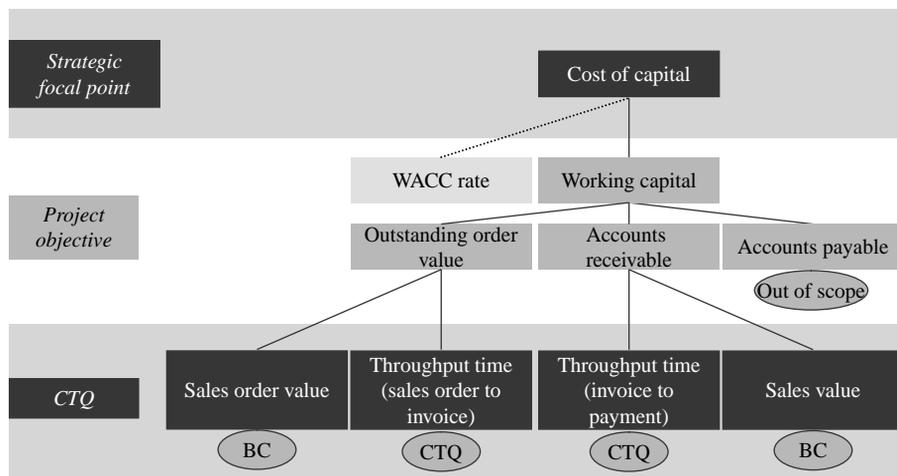
Note: Boundary constraint (BC) refers to a CTQ that is assumed as fixed in the project

Figure 9.
CTQ flowdown
for projects improving
working capital by
improving cash
management and fast
delivery

CTQ	Throughput time (sales order to invoice)	Throughput time (invoice to payment)
Unit	Per sales order	Per invoice
Measurement procedure	Track a sample of sales orders (time stamps), sales order database	Track a sample of invoices, ERP or other logging system
Goal	As small as possible	As small as possible

Table VII.
Operational definition
for projects improving
working capital by
improving cash
management and fast
delivery

business perspective. The current approach can be strengthened if we do not only use the information that a black belt wants to do an LSS project, but also include the kind of process he wants to improve. Looking at the LSS project portfolio from a process angle can also help the program manager. The program manager stimulates to run projects in the most promising areas. Promising areas are the areas in which the cost is high and many customers are reached.

How can black belts benefit from a relationship between a project and the underlying process? This can be illustrated with an example from a publishing company (the same one at which the 49 projects from the sample were executed). In this company, the following main processes are identified:

- production;
- marketing and sales;
- product development;
- technology (infrastructure);
- facilities;
- customer services;
- distribution;
- finance;
- management and other;
- hire-to-retire (HR); and
- procure-to-pay.

At this company LSS projects have been done in production, marketing and sales, product development, customer service, HR, and finance. Evidently, not all templates were used in every process. Table VIII shows a cross tabulation of process versus template.

The pattern shown in Table VIII might not be universal and is probably not exhaustive. However, it inspires a handy decision tool for black belts to decide on which kind of project definition they can choose. If they know which process they want to improve the matrix of Table IX (an adaptation of Table VIII) shows the black belt which template he might use.

A second use of looking to the LSS projects from a process angle is to review the project portfolio. In the publishing company under study the LSS program manager determined per process how much cost is imposed. This information was combined with the number of LSS projects done in that area (Figure 10). Most projects focus on the main processes production and marketing and sales, since these processes are among the largest cost contributors. It is clear that processes such as facilities, infrastructure (IT) and to a less extent product development have been a blind spot so far.

5. Conclusions
The account above unravels the generic elements of an LSS project definition in publishing. The analysis and research on generic LSS project definition allows us to construct a generic template for two elements of the project definition template, namely

Template	Marketing and sales	Processes Production	Finance	Customer services	HR	Product development
1. Revenue improvement by servicing more customers	11					
2. Cost reduction by improving efficiency of processes		4	4	1		
3. Cost reduction by improving efficiency and effective sourcing		5				
4. EBIT improvement by reducing discounts and cost of sales channel	5					
5 Improvement of customer satisfaction and processing efficiency		3	1	1		
6. Cost reduction by improving forecasting		4				
7. Working capital reduction by improving cash management and delivery		1	3			
8. Marketing effectiveness improvement	2					
Other		1			2	1

Table VIII.
Template-process matrix

Template	Marketing and sales	Processes Production	Finance	Customer services	HR	Product development
1. Revenue improvement by servicing more customers	X					
2. Cost reduction by improving efficiency of processes	X	X	X	X	X	
3. Cost reduction by improving efficiency and effective sourcing		X				
4. EBIT improvement by reducing discounts and cost of sales channel	X		X			
5. Improvement of customer satisfaction and processing efficiency		X	X	X		
6. Cost reduction by improving forecasting		X				
7. Working capital reduction by improving cash management and delivery		X	X			
8. Marketing effectiveness improvement	X					
Other	X	X	X	X	X	X

Table IX.
Adapted
template-process matrix

Cost contribution

LSS projects contribution

	Cost contribution	LSS projects contribution
Production process		
Marketing and Sales		
Product development		
Technology (infrastructure)		
Facilities		
Customer services		
Distribution		
Finance		
Management and other		
Hire-to-retire		
Procure-to-pay		

Legend:
▫ >30%
▨ 10% < x < 30%
▦ <10%

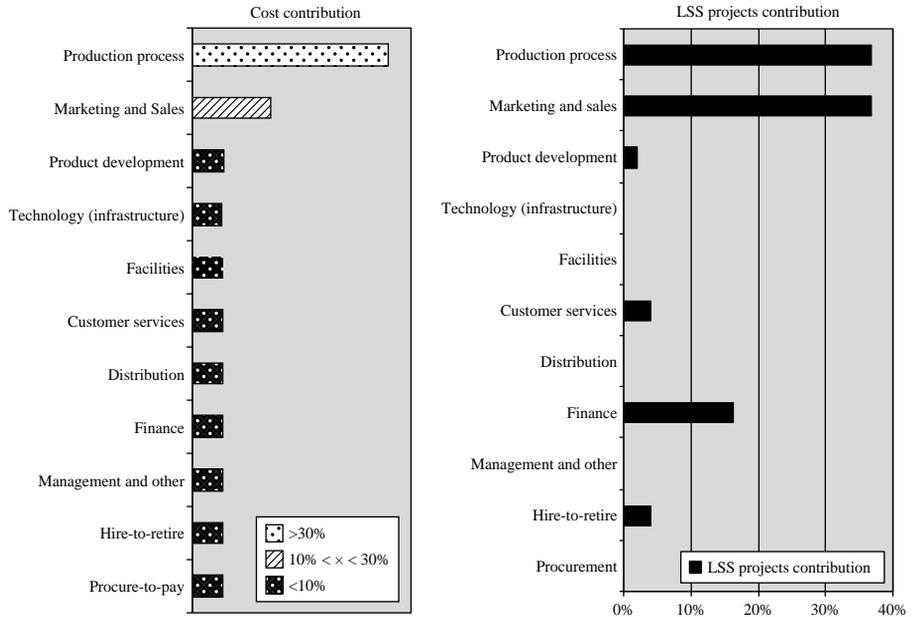■ LSS projects contribution

0%   10%   20%   30%   40%

Figure 10.
Cost and number of LSS
project per main process

the CTQ flowdown and the operational definitions. A generic template, consisting of these two elements, not only facilitates communication about the project; it facilitates crystal clear project definitions, with a solid business rationale.

We present eight LSS project categories. A large majority of more than 70 percent of LSS projects in publishing fall in one of five generic categories as shown in Figure 2. The project categories all focus on revenue improvement, cost reduction, working capital improvement, EBIT improvement, or a combination of these. Therefore, generic templates categories have a clear rationale from a business point of view. Most are directly related to drivers of operational cost, whereas some are related to revenue and effective business decision making.

Apart from these conclusions some limitations can be pinpointed:

(1) The relative size of each category still has to be determined. The sample size and representativeness of the sample is insufficient to determine this precisely.

(2) The project definition categories need to be validated in other circumstances and contexts as well. The current sample contains projects carried out in one company, with black belts trained by one training institution.

(3) The project definition categories need to be validated theoretically, to check whether all important strategic focal points relevant to publishing companies are covered.

An attempt has been made to relate the templates with the underlying processes. Further research is needed to give a real conclusion. The three points mentioned above can serve as guidance, and an aid to start up this research.

References

de Koning, H. and J. (2007), "The CTQ flowdown as a conceptual model of project objectives", *Quality Management Journal*, Vol. 14 No. 2, pp. 19-28.

de Mast, J., Does, R.J.M.M. and de Koning, H. (2006), *Lean Six Sigma for Service and Healthcare*, Beaumont Quality, Alphen aan den Rijn.

George, M.L. (2003), *Lean Six Sigma for Services*, McGraw-Hill, New York, NY.

Harry, M. (1997), *The Vision of Six Sigma*, Tri Star, Phoenix, AZ.

Lynch, D., Berolono, S. and Cloutier, E. (2003), "How to scope DMAIC projects?", *Quality Progress*, Vol. 36 No. 1, pp. 37-41.

Morris, P.W.G. and Hough, G. (1987), *The Anatomy of Major Projects: A Study of the Reality of Project Management*, Wiley, Chichester.

Partington, D. (1996), "The project management of organizational change", *International Journal of Project Management*, Vol. 14 No. 1, pp. 13-21.

Pinto, J.K. and Slevin, D.P. (1988), "Critical success factors in effective project implementation", in Cleland, D.I. and King, W.R. (Eds), *Project Management Handbook*, Van Nostrand Reinhold, New York, NY, pp. 479-512.

Snee, R.D. and Hoerl, R.W. (2004), *Six Sigma Beyond the Factory Floor*, Pearson Prentice-Hall, Upper Saddle River, NJ.

About the authors

Henk de Koning holds degrees in Psychology and Physics from the University of Utrecht, The Netherlands. In 2007, he defended his PhD thesis successfully at the University of Amsterdam, The Netherlands. His PhD thesis presented the results of a scientific study of LSS methodology. Currently he is an Associate Consultant at A.T. Kearney.

Ronald J.M.M. Does is Professor in Industrial Statistics at the Department of Quantitative Economics and Managing Director of the Institute for Business and Industrial Statistics of the University of Amsterdam. He received his MSc and PhD at the University of Leiden. His areas of specialty are quality management, mathematics, quality engineering, psychometrics, and statistics. He has implemented LSS in industry, service industry and healthcare. Ronald J.M.M. Does is the corresponding author and can be contacted at: r.j.m.m.does@uva.nl

Arjan Groen holds a degree in Law from the University of Leiden (The Netherlands) and has completed executive education at INSEAD (France), IMD (Switzerland), Stanford University (USA), and the University of Amsterdam. He has 20 years' managerial experience in operations and finance. His managerial experience includes integration management, corporate finance, mergers and acquisitions, operational excellence, sourcing, and supply chain management. As one of his responsibilities he has led the European roll-out of LSS in Wolters Kluwer during 2006-2009. Currently he is a partner at Ernst & Young.

Benjamin P.H. Kemper holds a degree in Econometrics and Operations Research (OR) from the University of Amsterdam, The Netherlands. In 2007, he started his PhD project "Optimization of response times in service networks" at the University of Amsterdam, The Netherlands. His PhD thesis will present the results of OR applications in LSS methodology. He is also a consultant and trainer in LSS at the Institute for Business and Industrial Statistics.