

Just the Facts

Quality professionals tend to struggle with selecting and prioritizing Six Sigma projects.

Recognizing the opportunity, the authors created a Six Sigma project portfolio management model to help quality professionals select appropriate projects and ensure their success.

The 18-step model isn't limited to any specific industry or program maturity level.



18 STEPS TO SIX SIGMA PROJECT SUCCESS

*Plan your route for
projects that deliver*

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Selection and prioritization of Six Sigma projects (SSP) is one of the most frequently discussed issues in Six Sigma literature. (“Six Sigma literature” refers to the references listed at the end of this article.) If an SSP is poorly selected, positive results are delayed and frustration may build throughout the organization. This is one of the main factors separating successful SSPs from other types of improvement projects.^{1,2}

To explore this research opportunity, the project portfolio management (PPM) theory was used to cover not only project selection, but also other important elements of an SSP, such as project prioritization, resource allocation, constant performance monitoring, risk management and project portfolio balancing.

The dynamism created by PPM is particularly important for Six Sigma. SSP selection must be a dynamic process,³ so it is useful to identify a fragment of PPM theory and use it—along with the Six Sigma literature that discusses criteria for project selection—to build a conceptual model for Six Sigma project portfolio management (SSPPM).

Proposed here is a framework for SSPPM that can be used by any Six Sigma practitioner aiming to maximize the chances of not only selecting the right projects, but also guaranteeing they are aligned with business strategy, properly progressing to deadlines and reaching the organization’s expected results.

SSPPM model

Many articles from Six Sigma literature were used as a starting point for the SSPPM model. However, it is important to reinforce that our collective practical experience also contributed significantly to designing this 18-step SSPPM framework.

Figure 1 (p. 20) presents the SSPPM conceptual model, which is structured in three phases: the main process (steps one through 12), auxiliary process one (steps 13 through 16) and auxiliary process two (steps 17 and 18). Table 1 depicts the connection between the main steps and components of the SSPPM model and the Six Sigma literature.

Main process. Step one of the main process is the potential SSP (PSSP) continuous screening. The Master Black Belt (MBB) or Six Sigma program leader must provide and coordinate different ways of identifying new continuous improvement initiatives to be evaluated as potential new improvement projects.⁴

The MBB should avoid portfolio biases by drawing on sources that are as varied as possible, from workers on the shop floor

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to the CEO’s staff.⁵ For example, MBBs should be sitting at the table with senior executives to properly understand their voices and translate them into significant projects, as well as walking the processes (*gemba* walk) to collect improvement opportunities straight from the shop floor.

Step two is focused on the MBB filtering out improvement initiatives that clearly have no link to the organization’s business strategy,⁶ such as those not associated with common and unknown causes,⁷ as well as immeasurable problems⁸ and problems better solved with a different method.

To illustrate this topic, let’s look at an example from a global automotive organization. The organization was facing a quality outbreak related to the diameter of copper cables in a wiring harness production line. The plant manager suggested opening a lean Six Sigma project to contain the problem. In this type of emergency, the recommendation is to act using a task force or immediate *kaizen* approach rather than the structured define, measure, analyze, improve, control method.

Step three is to classify the PSSPs. The most common categories are Green Belt (low-medium complexity) and Black Belt (medium-high complexity) projects.⁹ Any other justified form of categorization can be used, such as product line, customers affected or departments involved.¹⁰

If the organization has a Yellow Belt (YB) program, low-complexity projects can be conducted using the SSPPM method. Nielsen Media Research (Nielsen), the global market research organization, implemented this approach, and a YB wave recently took place in the organization: More than 20 associates were certified as YBs, and six projects brought significant improvement to the organization in terms of quality and cycle time.

Step four of the model must be carried out by the Belt who will lead the project. At this stage, the Belt should consider information related to the levels and behavior of the problem to be analyzed. At this step, the project manager also should estimate resources required to develop the project, as well as the baseline cost associated with not solving the problem.¹¹ At minimum, the size of the problem should be estimated or, in some cases, the baseline stability should be evaluated and the initial baseline sigma level should be estimated.

TABLE 1

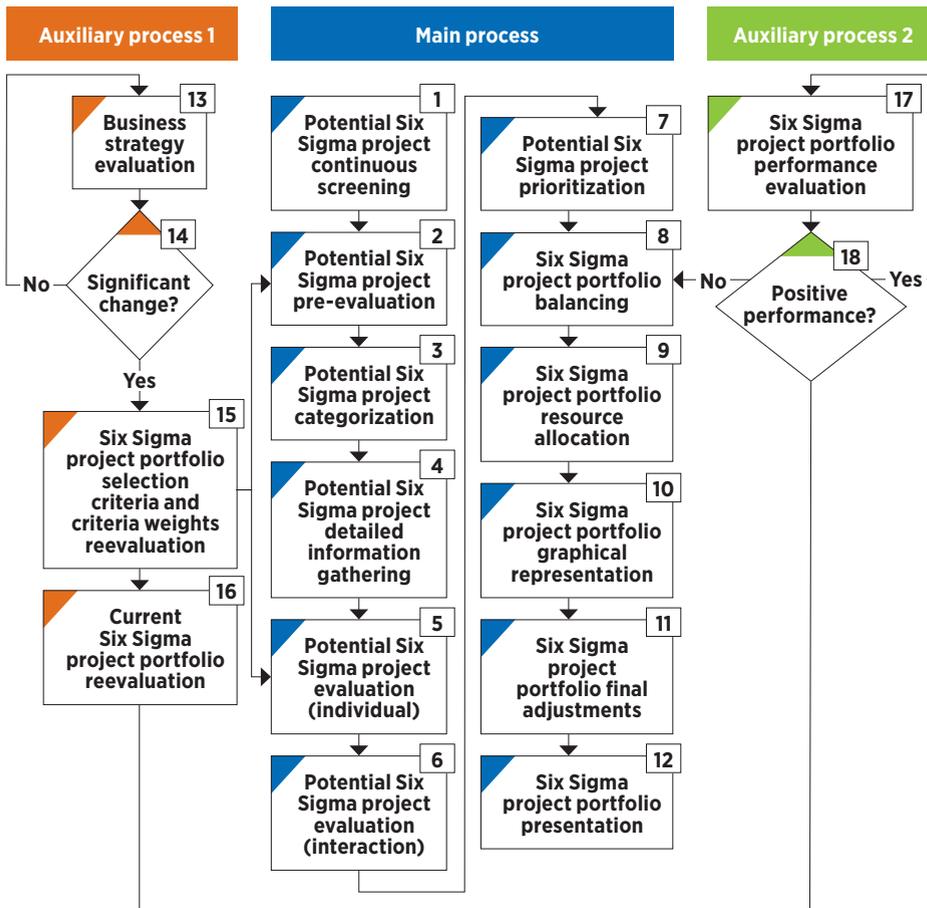
SSPPM literature review summary

SSPPM steps	Archer and Ghasemzadeh (1999)	Cooper (1994)	Project Management Institute (2008)	Bertels and Paterson (2003)	Cooper, Edgett and Kleinschmidt (1997)	Snee and Rodebaugh (2002)	Lynch, Bertolino and Cloutier (2003)	Coronado and Antony (2002)	Kumar, Antony and Cho (2009)	Goh and Xie (2004)	Smith, Blakeslee and Koonce (2002)	Harry and Schroeder (2000)	Bengt, Wiklund and Edgeman (2001)	Cheng (2009)	Tanik and Sen (2012)	Jones, Parast and Adams (2010)
Potential Six Sigma project continuous screening				X	X											
Potential Six Sigma project pre-evaluation				X		X	X									
Potential Six Sigma project categorization		X						X								
Potential Six Sigma project detailed information gathering	X															
Potential Six Sigma project evaluation (individual)						X			X	X	X	X	X			X
Potential Six Sigma project evaluation (interaction)	X															
Potential Six Sigma project prioritization		X														
Six Sigma project portfolio balancing					X											
Six Sigma project portfolio resource allocation			X													
Six Sigma project portfolio graphical representation					X											
Six Sigma project portfolio final adjustments		X														
Six Sigma project portfolio presentation			X													
Business strategy evaluation														X		
Significant change in business strategy evaluation														X		
Six Sigma project portfolio selection criteria (and criteria weights) reevaluation														X		
Current Six Sigma project portfolio reevaluation														X		
Six Sigma project portfolio performance evaluation	X	X													X	
Feedback on Six Sigma project portfolio according to its performance	X	X														

SSPPM = Six Sigma project portfolio management
 This list of authors and their works can be found in this article's list of references.

FIGURE 1

Conceptual model for SSPPM



SSPPM = Six Sigma project portfolio management

Management can rebalance a new portfolio based on how well current projects are performing.

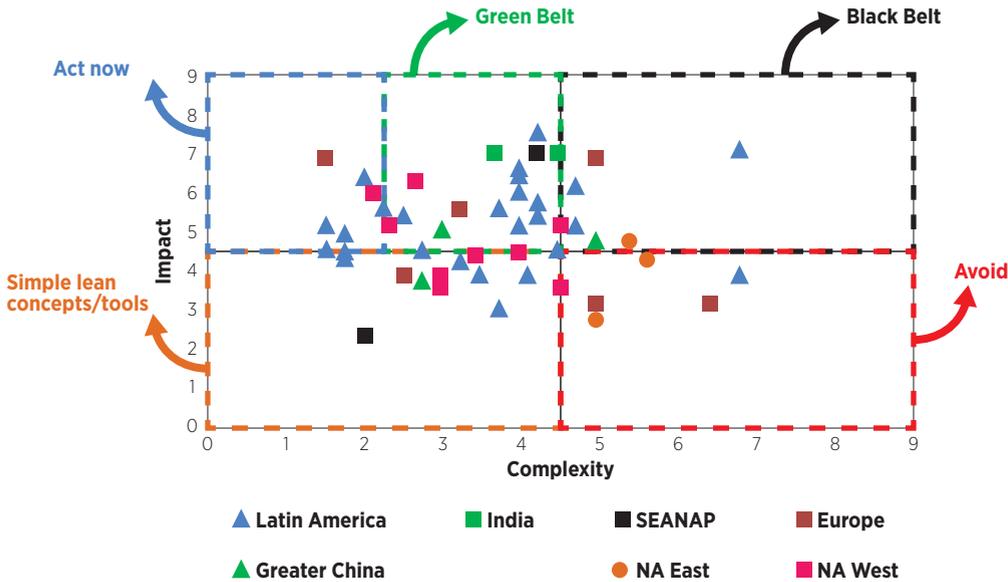
Step five is an individual evaluation of each PSSP, which should be performed by the MBB.¹² The individual evaluation is based on criteria found in the Six Sigma literature: link to customer requirements,¹³ link to business strategy,¹⁴ potential financial return,^{15,16} available resources considering the project scope¹⁷ and potential for ending in a short period of time.¹⁸

Step six involves evaluating PSSP interactions by investigating interdependences among PSSPs. This step, emphasized by authors Norman Archer and Fereidoun Ghasemzadeh,¹⁹ outlines the possibility to present a project that, on its own merit, has low priority but enables another initiative. Ultimately, it is a project that will significantly contribute to a high-priority project. For steps five and six, a multicriteria matrix similar to the classic Pugh matrix is used to prepare the initial or preliminary list of SSPs. At this point, any tools reviewers can use to clearly check the effect of each project (individually and collectively) are welcomed.

Step seven consists of prioritizing PSSPs and creating a list of all initiatives that includes information related to the criteria used in steps one through six. This is an important task in supporting portfolio balancing.²⁰ It is important that proper visibility is given to the list of projects. Nielsen is now using Google Suite (docs, slides and sheets) instead

FIGURE 2

Nielsen Six Sigma project portfolio



NA = North America SEANAP = South East Asia, North Asia and Pacific
 Note: This model was adapted from Nielsen Media Research.

of Microsoft Office, so the fact that files can be easily shared with other associates increases the chance of proper awareness on the first version of the Six Sigma project portfolio (SSPP).

Step eight is related to portfolio balancing. It helps the MBB decide which projects will receive the organization’s financial resources, per category.²¹ It primarily considers the organization’s strategic needs. This is the point at which the word “potential” is dropped and the project is referred to thereafter as an SSP. Indeed, this step is where the first version of the portfolio is presented to the organization.

Step nine refers to resource allocation to develop SSPs. The resources to be allocated should not only be human but also any other important resources,²² such as machines, labs and special materials. It also means that, conceptually, the resources initially allocated to conduct SSPs should not be displaced during project development to conduct day-to-day activities. It is important

to reinforce that portfolio management is dynamic, so at any time, additional resources can be added or reduced according to the portfolio’s performance.

Step 10 is the graphical representation of the SSPP. The objective is to offer the best view of the project’s characteristics, scope, risk and potential benefits. Often, it takes the format of a bubble chart, with each project represented with bubbles in a two-dimensional scenario. The axes can be complexity and effect (potential gains), for example. The size and color of the bubble also may have meaning, such as region, development time or resources involved.²³ Figure 2 is a sample SSPP bubble chart adopted from Nielsen. It uses different shapes and colors to refer to different regions around the world.

Step 11 lays out the adjustments to the portfolio. After defining the initial version, risk analysis and graphical representation, the MBB can, if necessary, adjust the portfolio to optimize the final figure before

officially presenting it to the executive team.²⁴

Step 12 is the SSPP presentation and the final step in this phase of the model. It represents the portfolio’s formalization to everyone involved,²⁵ including the Belts, project team members, sponsors, champions and stakeholders.

After steps 11 and 12, the proper potential changes must be implemented in the bubble chart.

According to the Six Sigma literature, SSPPM is dynamic in many ways. For example, it:

- + Continuously evaluates improvement initiatives.
- + Allows for terminating or halting current projects.
- + Alters criteria or how criteria are weighed according to changes in business strategy.

Management can rebalance a new portfolio based on how well current projects are performing. Therefore, portfolio communication should not be the last step in the main process. Rather, it is a task that should be performed whenever the portfolio undergoes a modification. Indeed, if someone changes a portfolio’s structure without giving proper notice to everyone involved, the expectations of the project team and stakeholders may diverge, resulting in a poor contribution to project development from champions and sponsors.

Auxiliary process one.

In **steps 13 to 16**, all quality initiatives must be linked to the business strategy.²⁶ It is up to the MBB to understand and regularly monitor the

organization's business strategy and identify any significant changes that could affect the SSPP in any way. If there is significant change in the business strategy, the criteria and criteria weight must be reevaluated and, consequently, the SSPP must be reevaluated.²⁷ This is just one more reason why MBBs should be seated at the table with senior leadership: The further apart they are, the more likely the SSPs will become irrelevant.

Auxiliary process two. In **steps 17 and 18**, the MBB must assess the performance of the SSPP. The objective of this phase is to collect information to support decisions related to a new portfolio balancing, as well as to exclude or continue projects, or place them on hold.²⁸⁻³⁰

Nielsen, for example, implemented three regular gate reviews, a project charter at the beginning of the Six Sigma journey, a mid-project review to analyze causes and potential solutions, and a final review to evaluate whether projects were ready for certification.

A successful SSP

This 18-step SSPPM model serves as a guide for all Six Sigma practitioners who want to guarantee their SSPs are properly aligned to business strategy and properly progressing toward their goals. It is intended to be applied by MBBs and the Six Sigma program leader.

It is important to note that this topic is equally critical for organizations that don't have a robust Six Sigma or lean Six Sigma program in place. It is a great method for building the program using Philip Crosby's mentality of doing things right the first time. It also can be applied for individual project selection, guaranteeing that resources will be well-spent on things that converge to the final business strategy.

The model isn't limited to any specific industry, and can be piloted and applied to manufacturing and service organizations. **QD**

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