# Apprenticing Master Black Belts

## OPTIONS FOR SELF-SUFFICIENCY: BUY, RENT, OR GROW?





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## Introduction

Imagine that you have been appointed as a Lean Six Sigma (LSS) Deployment Leader. Your organization is either at the beginning of the LSS journey or has experienced a floundering LSS deployment and you have been called to the rescue. Alternatively, the organization has deployed a successful LSS program but political and economic conditions are changing and your business must change as well. You have been appointed to elevate the organization's LSS program to new heights. Each of these three scenarios presents significant and unique challenges. What would you do? Which key factors will determine success? Is there a common denominator?

**Scenario 1: Start-up**

You, the deployment leader, started with a blank canvas for building the LSS program. From your research, you have identified lack of leadership support as the leading cause of LSS deployment failures. Other causes include results insufficient to justify investment, poor project selection, inadequate scoping & chartering, absence of finance involvement, inability to validate project savings, lack of mentoring program, project delays, ineffective training, inadequate communication strategies, projects misaligned with strategy, insufficient infrastructure and lack of incentives for process improvement teams. You asked yourself, "How can I cover all of these?" You are scared. How can you prevent each of these potential failure modes simultaneously?

In your case, you have the full support of top-level leadership but you need to develop a cadre of process improvement experts who will be well armed with the technical, soft and leadership skills to transform your organization. You need to achieve rapid, initial success and buy-in across the organization. It is equally critical to initiate actions that will facilitate progress towards self-sustainment early in the deployment. You know the LSS program is about achieving business results first but, to accomplish this goal, you need to increase your internal LSS knowledge fast. To enable knowledge transfer, a mentoring program that utilizes the services of experienced Master Black Belts (MBB) is needed. You have three choices to access MBB services: buy one, rent one or grow your own as detailed later in this paper.

**Scenario 2: Revitalization**

Occasionally, LSS programs need revitalization due to changing business needs, management changes or deployment problems. For example, it has been reported that during General Electric-Honeywell merger attempt, Honeywell's Six Sigma program "lost much of its energy and enthusiasm. As a result, Honeywell's program became disenfranchised, which left the employees with low morale." However, this situation led to the reinvigoration of Six Sigma once the merger attempt ended. Honeywell took leaders and gave them Black Belt skills [1].

Your organization has a floundering LSS program and you have been challenged to 'fix it'. Your first step will be to conduct a root cause analysis to understand what went wrong. You realize that lack of an effective mentoring program was one of the leading root causes.

To establish a new mentoring program within the established infrastructure will require creativity and compromise. It will be important to focus on identifying and revitalizing projects with strategic importance while renewing and rebuilding commitment from champions and other stakeholders. If internal resources do not exist, you will need to obtain professional mentoring support.

**Scenario 3: Excellence**
Your organization has a successful LSS deployment that met the initial objectives of your deployment. However, you recognize that business needs change continuously and operational excellence is a journey, not a destination. In order to achieve independence and sustainability, a formal mentoring program that balances knowledge transfer, innovation and project execution is essential.

Benchmark your program with others. You do not want to repeat the mistakes of others or to lose sight of what customers want. You cannot afford to forsake innovation and focus exclusively on one element of Continuous Process Improvement (CPI) / LSS. You note that Samsung trained more than 2000 employees in TRIZ (Theory of Inventive Problem Solving). How can you help your organization become more creative? You remember the long lines at Apple's Fifth Avenue store in New York when IPhone was first released. How could you assist your organization to make the leap in your product or service that would cause your customers to line up at your doorstep?

Your benchmarking reveals impressive increases in patient throughput using Theory of Constraints (TOC) tools in Israel and Singapore. Do you need to add the power of TOC tools to your CPI Toolkit? Constantly assess trends and innovations; quickly incorporate new ideas, and methods that meet your business needs. This will ensure that your CPI/LSS program remains current and agile.

Apprenticing Master Black Belts is analogous to the transition from medical student to intern to resident to physician

Whether you are at the beginning of your journey, revitalizing an existing program or elevating your program to new heights, MBBs play a vital role to assist the deployment leader to ensure success and mitigate risks as change agents, technical experts, mentors and coaches.

The most successful training model for LSS mirrors the traditional apprentice-journeyman-master model. This is largely based on the recognition that true mastery cannot be gained through didactic learning alone. This approach is analogous to the transition from medical student to intern to resident to physician. After the student completes a predetermined amount of didactic learning, the intern begins to practice under the guidance of a mentor; then, based on readiness, the resident begins mentoring less experienced interns; and finally makes the transition to a fully independent practitioner. While not attempting to elevate the complexity or level of knowledge of an MBB to that of a fully qualified physician, the developmental path is similar.

## Standards

As the deployment leader, you are convinced of the importance of MBBs on your LSS team. However, there is no widely accepted industry standard regarding the development and certification of Master Black Belts. The American Society of Quality (ASQ) has a Black Belt certification program but it has not yet developed MBB certification requirements. A survey of industry and government practices for MBB certification shows no consensus regarding key

competency areas. For example, in the mentoring area, requirements range from no mentoring experience to mentoring at least 10 Black Belt projects. Recently, the International Society of Six Sigma Professionals (ISSSP) surveyed Six Sigma related roles and skill areas [2]. Based on the survey results, the ISSSP considers the following competencies as core organizational Six Sigma practitioner roles: Coach and Mentor, Methodology Expert, Change Agent, Instructor, Project Manager and Leader.

The US Department of Defense (DoD) recently issued a memorandum addressing CPI /LSS Program Office Practitioner Body of Knowledge and Certification Requirements [3]. These requirements have been developed to establish alignment and consistency of approach in training and certifying DoD CPI professionals. A common BoK and certification standards are necessary to properly align DoD CPI/LSS efforts, and form a baseline to establishing common training curricula.

DoD requirements for MBB certification include additional training, a proficiency exam, specific CPI experience, project leadership, and teaching experience. The proposed DoD Body of Knowledge for MBBs focuses on three key areas: Soft Skills, Management/Leadership and Technical Skills. Soft skills include coaching and mentoring as well as change management skills. Management/Leadership area includes project management focusing on project or event chartering, project planning and tracking as well as various aspects of leadership such as strategic planning, alignment and deployment. Finally, Technical Skills include methodology expertise, training, and financial skills as well as Lean, design and innovation skills.

**Would one size fit all?**

Although standardization has many advantages, it is important to recognize vast differences among different organizations in terms of their operations, environments, missions, and constraints. For example, training materials must speak the language of the practitioners. When explaining a CPI tool, using an aircraft maintenance example would not resonate well with a nurse working in a Navy hospital.

There are literally hundreds of CPI/LSS tools. Learning every single tool in depth is not cost-effective. Hence, it is prudent to customize the tools to be taught depending upon the unique needs of an organization. For example, in a highly variable demand environment, teaching Drum-Buffer-Rope tool in depth to a supply chain practitioner can reap greater benefits than teaching Kanbans due to their limited applicability in this type of environment [4]. Getting external guidance is recommended for customizations.

## People Side

**Who Are MBBs?**

The MBB is the most advanced of CPI/LSS practitioners. In general, MBB candidates are successful, certified Black Belts who have demonstrated exceptional leadership and technical skills, completed projects successfully, proven their ability to teach and to mentor CPI practitioners, exhibit the desire and aptitude to master advanced concepts and skills, and are strong candidates for future leadership roles in the business. The MBB demonstrates mastery level expertise in a variety of process improvement methodologies. An experienced MBB applies CPI tools and techniques to solve complex problems and to translate CPI philosophies and methods for understanding and application across the boundaries of position, function, profession, and industry. MBBs are proficient in designing and driving CPI deployment strategies, assessing the needs of the organization and monitoring progress toward strategic

objectives. The MBB is an evangelist for continuous improvement, committed to the organization's mission and vision, with a passion for excellence that motivates and energizes individuals and teams. They are also change agents with the business acumen, political savvy, and communication skills necessary to institutionalize CPI.

**What Do MBBs do?**
A unique blend of attributes and competencies is required to effectively fulfill the complex role of the MBB.

The MBB is a **technical leader** by virtue of their expertise and experience related to leading CPI methodologies. These methodologies include Lean, Six Sigma, Theory of Constraints and, depending upon the organization's philosophy, customer needs, and business model may include others such as Design for Six Sigma (DFSS), TRIZ (Theory of Inventive Problem Solving), and Systems Thinking. The MBB's depth and breadth of knowledge of CPI allows for the effective use of tools and methods to solve complex problems and achieve strategic objectives. This includes leading complex, especially high risk, and enterprise-level projects. The MBB's technical leadership is also critical to preserving the integrity of the methodology and ensuring the credibility of data, analyses, and conclusions.

The MBB is a **change agent**, an evangelist for quality and business results, whose passion for excellence motivates and energizes individuals and teams. The MBB employs interpersonal and change management skills to engage stakeholders at every level of the organization and forge partnerships with business leaders to remove barriers, minimize resistance to change, and resolve conflicts. The MBB builds and facilitates teams to complete CPI/LSS projects and accomplish program objectives and ensures that team success is recognized, rewarded, and celebrated.

The MBB is a **program leader**, defining and developing the processes and the people needed to achieve CPI program objectives. The MBB ensures that CPI endeavors are aligned with organizational strategy. Standard operating procedures, guidelines, templates, and toolkits are developed to maximize program effectiveness and efficiency. The MBB identifies and communicates opportunities for improvement and recognizes and disseminates best practices. The MBB is accountable to leadership for program performance, gathering and analyzing CPI program data and driving CPI metrics such as training effectiveness, belt certification and project completion rates, return on investment, project cycle time, and deployment maturity indicators.

The MBB is a **project manager**, maintaining the momentum of projects and events to achieve measurable business results within expected timeframes. CPI/LSS projects are monitored to ensure the integrity of methods and to sustain process improvements. The MBB assists Black Belts as needed to properly define and scope projects, estimate and validate project savings, evaluate the integrity of measurement systems, perform complex statistical analyses, establish project milestones and tollgate review schedules, and communicate results to key stakeholders.

The MBB is a **deployment leader**, assessing organizational needs, strengths, and weaknesses and designing the infrastructure and processes necessary to shape a successful deployment. The MBB provides counsel critical to leadership regarding the selection and development of the deployment's most valuable resources:, people. The deployment plan is continuously measured and monitored to identify performance gaps and mitigate root causes. Shifts in strategy and the influence of internal and external factors are constantly considered and the

**Key attributes of a Master Black Belt**

- Customer focus
- Technical expertise
- Curiosity
- Credibility
- Confidence
- Analytical acuity
- Creativity
- Business acumen
- Leadership

plan is adjusted as needed. The MBB partners with organizational leadership to prioritize, select, and charter high-impact projects and events that link to organizational strategy and drive business results.

The MBB is a **conduit for knowledge transfer**. As an educator, the MBB is responsible for curriculum and course development and for delivering and evaluating training in the classroom and other venues. As a coach, the MBB fosters the integration of generally existing skills into a new context. Coaching includes helping leaders adapt their skills to leading in a CPI-focused environment and may include change management or communications approaches. As a mentor, the MBB nurtures the development of new practitioners. This is generally accomplished within the context of CPI projects or events. The MBB evaluates the competencies and attributes of the individual, identifies and mitigates skill gaps, and creates opportunities for development specifically directed toward aiding and encouraging practitioners to achieve their full potential.

**Where do MBBs come from?**

To advance to MBB, a Black Belt completes advanced training and demonstrates mastery of technical, management, and leadership skills. Some common requirements for advancement include course development, training and mentoring Green Belts and Black Belts, leading enterprise or business-level CPI/LSS events and projects, and deployment support activities such as the development of templates, reports, and dashboards. The MBB candidate must also refine essential 'soft' skills including change management, networking and influencing, coaching and mentoring, and conflict resolution. Much of the MBB's development is achieved through experiential learning. It requires an average of three to five years to accomplish the developmental milestones necessary to become an MBB.

The best means of obtaining and utilizing this valuable resource depends upon the goals and objectives of the deployment and the organization's strategy and capacity to achieve them. If the objective is to change the DNA of the organization and establish a world-class, enterprise-wide CPI/LSS program, the best solution will likely include the development of MBBs from within. This requires commitment and capacity, in terms of time, people, and other resources, to achieve such an ambitious target. An organization whose objective is to utilize selected CPI tools and methods to execute a specific strategy or solve a discrete set of problems may not have a sufficiently compelling business case or the near-term capacity or commitment to make such an investment.

In the absence of sufficient organic knowledge of CPI/LSS methodologies and deployment strategies, the experience and expertise of a consultant MBB is indispensable. This is especially true during the early phases of a deployment. Critical decisions related to policy and infrastructure, roles and responsibilities, training and certification requirements, reward and recognition structures, and program measurement and management must be made. The MBB has the expertise and the experience necessary to assess the needs of the organization and to design a deployment strategy to meet those needs.

As described above, an MBB is neither born nor created but must be developed. This requires time and conditions conducive to experiential learning. As discussed, the apprentice-journeyman-master model works well. A step-wise approach to learning has been proven effective: see one, apply one, teach one. A newly graduated medical doctor has a good understanding of anatomy and physiology but does not become a surgeon without first completing internship and residency. There are three options for MBB services as described below.

**Key competencies of a Master Black Belt**

- Technical
- Coaching and Mentoring
- Communication
- Change management
- Project management
- Program management
- Teaching/training

## Option #1: Rent One

During the start-up phase of a deployment, most successful deployments utilize the services of an external MBB consultant. If the organization's strategy is to achieve LSS self-sufficiency, a consultant will work closely with you to design a deployment with this goal in mind. After the initial deployment, there are advantages and disadvantages associated with using consultants. The advantage is the immediate availability of their expertise and experience in the short-term. The disadvantage is that even the most customer-focused MBB is not a part of the organizational culture. While imperative during the initial phases of the deployment, their outside-in view may negatively impact or slow the organic growth of a CPI culture. Employee perception that the company is not investing in its own people may, in time, hinder deployment efforts and stunt cultural transformation. For small organizations with less than 100 employees, renting an MBB is usually the most cost effective option.

## Option #2: Buy One

On the surface, it might appear that hiring MBBs to 'kick start' a CPI/LSS deployment at the outset would save time and money. This does not take into consideration the time, expense, and risk involved in recruiting and hiring any new employee. As discussed above, standards for MBB development and certification vary broadly. The MBB is a product of his/her training and experience. This may or may not match your deployment objectives. If there are any key competency gaps that need to be closed, training for the new employee would require a considerable investment 'up front.'

**You don't know what you don't know.**

If the decision is made to hire MBB resources, it is imperative that the position requirements be specific, comprehensive, and clearly defined. Hiring managers who interview MBB candidates will need to know the appropriate questions to ask candidates and the correct answers to those questions. Recruiting and hiring MBBs without organic knowledge of requisite competencies and attributes can result in hiring the wrong person for the role or incorrectly defining the role to be filled.

Even if the new hire possesses all the competencies and attributes of an MBB, orientation of any new employee takes time and costs money. The advantages of internal MBBs include ownership and knowledge of internal culture. It would take some time before a newly hired MBB could achieve this level of assimilation into the organization. This would be especially difficult for the newly hired MBB expected to fulfill the role of change agent. Hiring an MBB does nothing to mitigate the many risks associated with contracting MBB expertise. Therefore, many utilize the services of contracted MBB consultants through the initial phases of the deployment.

## Option #3: Grow One

A long-term solution is to internalize MBB expertise by developing this critical resource from within. Growing MBB talent from within begins with selecting the right people to become Black Belts. This requires dedication of the best and brightest to CPI/LSS. Filling Black Belt positions with the "expired and expendable" is a sure path to CPI/LSS failure. Without the strong foundation of Black Belts, internal development is all but impossible. MBB selection criteria defined during the development phases of the deployment include characteristics predictive of success. Measures to attract and engage people who exhibit these characteristics include competitive compensation, recognition, and opportunities for learning, growth, and career advancement.

**Candidate Selection**

While organizations should carefully select their Black Belt Cadre, not all highly skilled and successful Black Belts will be candidates for Master Black Belt development. From the "Best of the Best" experienced Black Belts you need to select those who have exhibited the highest:

- Leadership potential
- Problem solving ability
- Passion for excellence
- Communication skills
- Aptitude for teaching/mentoring

Another critical consideration is the candidate's desire to continue working outside their original career paths. Black belts generally appointed for a specified period of time and then are reintegrated into the general workforce. Selection as a CPI/LSS practitioner should never be perceived as either a dead end or as a detour on one's career path. The deployment plan should define, in specific and quantifiable terms, the developmental milestones and requirements for advancement for CPI/LSS practitioners and how their success will be measured and rewarded. This may include alternative pathways such as training for exceptional teachers, technical for those who excel in advanced statistics, and leadership tracks for future business leaders.

It is extremely important that the developing MBBs embrace potential changes in career path. Jack Welch credited career planning and incentives with much of the success of the Six Sigma program at General Electric. As a key part of GE's deployment strategy, 40% of annual bonuses were related to Six Sigma activities and Green Belt certification was required for promotion.

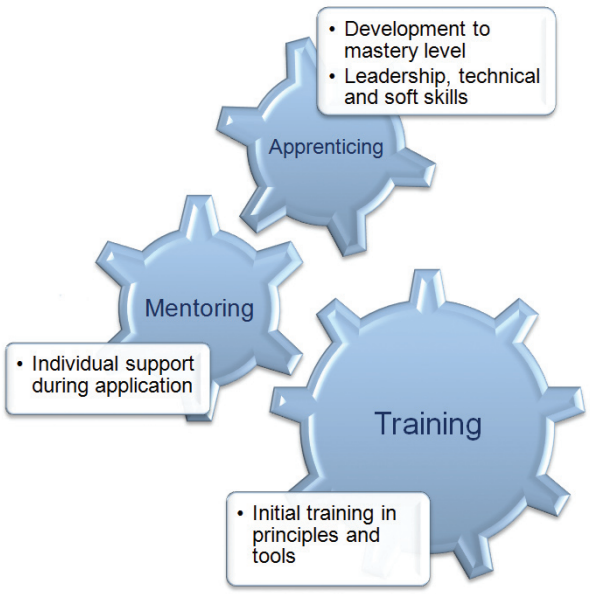
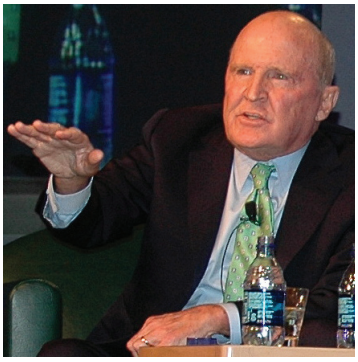



Figure 1: Master Black Belt development path

**Master Black Belt Development Plan**

The development of MBBs cannot be left to chance. A well structured apprenticeship plan is needed to ensure the exposure, skills, and experience necessary to contribute at the MBB level. A planned effort needs to be put in place that will meet the needs of the organization.



*With Six Sigma permeating much of what we do, it will be unthinkable to hire, promote, or tolerate those who cannot, or will not, commit to this way of work.*

***- Jack Welch,***
*CEO, General Electric*
*(USA Today, February 1998)*



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Many, highly successful Black Belts are never exposed to issues relating to managing the deployment such as strategy development, practitioner selection, and project selection. Additionally, many Black Belts may not participate in delivering formal training.

MBB candidates should be enrolled in a well-defined developmental plan. The plan should be based on a BoK that is inclusive of the skills required to drive towards a successful deployment within the organization. The plan should require active participation in certain activities that increase their skills, facilitate their growth and validate readiness to perform at the level delineated in the BoK. Each MBB candidate should be assigned a mentor who advises and prepares the candidate to successfully complete these experiential elements.

**Accelerated Master Black Belt Development**

As discussed above, it is widely acknowledged that the three years is a minimum for MBB development. In today's fast-paced business environment, does the organization have three years? While there is no short-cut to experience, there are measures that can be taken to maximize the acceleration toward MBB self-sufficiency. The paramount consideration in initiating an accelerated MBB development program is candidate selection. Once the candidate is selected, the development plan should be followed. There are risks in any MBB development program, but each risk is exacerbated by the shortened timeline. Examples of the risks (assuming alignment with the BoK) include:

- Time to participate in material development
- Participation in deployment support activities
- Availability of enterprise or other complex projects to lead/participate in
- Availability of active projects to mentor
- Ability to actively participate in training
- Retention
- Diluted methodology

Development at an accelerated pace requires that candidates be "thrown in the deep end of the pool". It is through the total immersion experience that the requisite skills are developed. The candidate must be totally immersed in the MBB role. This is analogous to learning a foreign language on a fast track where you are prohibited from communicating by any means other than the language you are learning. This involves some risk for both the candidate as well as the organization.

The organization must ensure that there is a life preserver handy. The candidate needs to take risks, but they also need to understand that there are calculated risks. The organization needs to mitigate their own risk by ensuring that there is sufficient oversight to ensure recovery from errors.

While an accelerated approach to developing organic MBBs leads to faster results, it requires a much higher level of commitment by the deploying organization than other developmental paths.

## Summary

All successful CPI/LSS deployments have MBBs embedded in the organization. In order to have MBB capability, you have three options: rent one, buy one and grow one. Developing highly skilled process improvement practitioners at any level requires time and effort. Developing practitioners at the MBB level requires the highest degree of organizational commitment. Special attention must be given to practitioner selection. In addition to assessing skills necessary for success as a Black Belt, consideration should be given to early identification of potential MBBs.

The skills transferred during mentoring sessions such interpersonal skills, knowledge transfer, driving to closure, and contribution to organizational goals and strategies are the same skills necessary for long term success as an MBB. In addition to developing Black Belts, organizational leaders need develop a long term plan that should address the following:

- Developments required skill sets rapidly within MBB candidates
- Incentives for the best and brightest to become MBB candidates
- Rewarding MBB candidates who meet performance expectations
- Providing a career path for MBB candidates, who meet performance expectations.

Strong leadership is required for any process improvement effort to succeed. Investing in MBB development is essential to establish a self-sufficient CPI/LSS program. Recognize that early on and plan for their development and the organization will realize the benefits.

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## Who We Are

NOVACES is a premier implementer of today's most powerful process improvement methodologies that strengthen operational capabilities and financial performance. We deliver Lean, Six Sigma and Theory of Constraints consulting and training to clients in the defense, healthcare, manufacturing, maritime and service industries. We are dedicated to advancing the science of process improvement and leveraging research to provide the most effective solutions in the market. For more information about our consulting and training services, visit www.novaces.com.

*"Mentoring is the key capacity constraint and the primary enabler of success…"*

***- Joel Eissinger,***

*USMC CPI PM*





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