

Six Sigma Deployment in Action

The Experiences of Four Companies

Getting Deployment Right to Get Six Sigma Right

A White Paper from Six Sigma Qualtec

It is almost a decade since the beginnings of Six Sigma as we know it today. Many companies have now been successfully using its methodology for five years or more. Some companies succeeded from the start, others did not. Still other companies, in order to get the full payback from their Six Sigma investments, have had to rethink and refocus their strategy.

What determines the difference between success and failure? From our experience of dealing with many companies worldwide and in many disparate industries, we have found that the level of success depends on how Six Sigma is deployed in the business. In short, get deployment right and you will get Six Sigma right. To illustrate, this paper offers best practice examples of four companies who have successfully deployed Six Sigma and continue to reap lasting strategic results. The aim here is not to give a blow by blow account of these four deployments, but rather to highlight critical factors that ensured the success of these Six Sigma initiatives. Taken together, these four instances of Six Sigma in action offer an instructive picture of the importance of effective deployment and, more importantly, how to achieve it.

Creating an Effective Six Sigma Infrastructure in a Global Civil Engineering and Project Management Company

One of the world's largest companies dedicated to managing major civil engineering projects throughout the world works on a massive scale. The company employs tens of thousands of people as well as thousands of specialist contractors. Individual contracts typically last up to two years, with a minimum value of \$500 million. The company is particularly noted for its ability to successfully manage large, multi-discipline projects within contracted timescales and budgets in an industry where project overruns and overspends are commonplace.

The company's encounter with Six Sigma began following the CEO's exposure to its concepts and methodology through conferences and conversations with other business practitioners. Realizing the potential for improving the business, he arranged Six Sigma awareness training for his executive team to facilitate their understanding and buy-in. With the help of SSQI, the company designed the necessary supporting infrastructure, which included deployment strategy, organization and systems, resources, and roles. In order to maintain a high level of management control and focus, a senior executive was appointed to coordinate global deployment and report directly to the CEO, with the role to be rotated annually among the senior executive team.

Involving Champions to Ensure Success

A critical success factor in the deployment was the involvement and support of Champions. A Six Sigma Champion is responsible for the logistical and business aspects of a Six Sigma project. Champions select and scope projects that are aligned with the corporate strategy, choose and mentor the right people for the project, and remove barriers to ensure the highest levels of success. Initially, Champion training was provided for selected vice presidents and managers, followed by the first wave of training for Black Belts (BBs) – the leaders of teams responsible for applying the Six Sigma process.

At the beginning of every training week, the BB candidates were required to give presentations of their projects to the training class and to the relevant managers and process owners. Champions were required to attend and join in the critique sessions. They were also expected to be involved in site support sessions between training weeks.

Selecting and Resourcing Projects

The Executive Team also carefully defined and structured the project selection process. Senior management strategically aligned business cases to business objectives and also targeted some low hanging fruit to secure some early wins in order to build momentum and enthusiasm. To achieve a balanced portfolio, the team classified projects by hard and soft savings, cost avoidance, commercial advantage, safety, and other criteria. The classifications also covered all organizational functions and disciplines from sales, finance and human resources through project management and site installation. Typical Black Belt projects yielded savings of several million dollars, and the return on investment for training waves was at least ten-fold.

In another key decision, the team resourced their Six Sigma projects with some of their best people. Black Belt candidates were high-caliber staff at the senior specialist or manager level and were selected through human resources screening and interviews with Champions and vice presidents. After the Black Belts were selected, they were given new full-time BB appointments with a minimum of two years' duration. In addition, their previous jobs were fully covered to ensure that ongoing contracts were not adversely impacted – another critical success factor in the deployment of human resources.

Training, Recognition, and Communication

The executive team recognized that Six Sigma could bring about significant changes in the business that, if not properly managed, could have adverse effects on employees and seriously disrupt ongoing contracts. Consequently, the team decided that Black Belts were to be trained and certified in behavioral skills as well as the concepts and tools of DMAIC (Six Sigma's Define, Measure, Analyze, Improve, Control approach to improvement). This key decision ensured that Black Belts were properly equipped for dealing with both people and technical issues.

In parallel with Black Belt training, several groups of Yellow Belts were trained to provide team support for each project. Yellow Belts obtain a working familiarity with Six Sigma tools and methods, provide the hands-on implementation of solutions developed by Black Belts and Green Belts, and identify immediate, obvious problems in work processes under their immediate control. A key success factor here was the decision to give Yellow Belts their own projects during training, which were used as the foundation for the Black Belt projects. To achieve certification as Yellow Belts, candidates had to complete the Define phase of the DMAIC approach and the data collection component of the Measure phase. As a result, Black Belts were able to begin their projects right away and concentrate their skills on the MAIC phases. As a result, project cycle times and BB certification were reduced to six months.

Already possessing a history of excellent communication with employees, the company used its intranet system for project tracking and deployment communication, taking special care to report successes. Regional steering groups also helped maintain local focus and ensure that adequate resources were made available to support projects.

Candidate and team recognition also contributed to the success of the deployment. During training, candidates were invited to special dinner events for informal, highly interactive sessions with company executives, many of whom they otherwise would not have met. Following certification, Black Belts and Yellow Belts were invited to attend prestigious award ceremonies.

Global Civil Engineering Company

The successful deployment of Six Sigma enabled the company to:

- ❑ *Develop a permanent cadre of people with improvement expertise*
- ❑ *Accrue more than \$1 billion in savings in three years*
- ❑ *Integrate Six Sigma, Design for Six Sigma, and Lean to maximize operational improvements*
- ❑ *Dramatically reduce improvement project cycle time*

After the first two waves of Black Belt training, some of the more successful BBs were trained as Master Black Belts (MBB) to act as teachers and mentors of Black Belts and provide support, review projects, and undertake larger-scale projects. These highly successful BBs were then given regional MBB coordinator roles. In addition, all of the certified Black Belts were provided with a career development plan, which ensured that their new skills would be best utilized when they finished their Six Sigma assignments and reduced the risk of their being lured away to other companies.

Reaping the Rewards

The company's deployment of Six Sigma is mature and self-sufficient, and it continues to be successful. At any one time, some 15 MBBs and approximately 200 BBs and hundreds of YBs are actively engaged on projects. Further, the CEO and the executive team continue to drive the deployment and remain actively involved in its success. Six Sigma is now embedded in the business and it is part of a blend of business improvement initiatives that include behavioral skills, Lean, and Design for Six Sigma (DFSS). By the end of the third year of the program, the company had accrued over \$1 billion savings from Six Sigma projects, results that have their roots in the team's careful and effective deployment of the program.

Deploying Six Sigma in the Volatile Telecommunications Sector to Drive Down Costs and Increase Productivity

A company that designs and manufactures wireless communications products and specialist network and infrastructure equipment for the telecommunications market has continued to expand its global manufacturing base since its founding in 1991. Today it has fifteen plants around the world and by 2005 had annual sales of more than 4 billion. Despite the pressure and challenges of new technology and ever changing market demands, the company has continued to grow and now employs nearly 19,000 people across five continents.

The roots of the company's involvement with Six Sigma lie in their participation in one of their customer's Black Belt training programs conducted by SSQI. Following some early project successes, the company's Executive Management Team decided to proceed with a Six Sigma deployment of their own. In a highly competitive and ever changing market sector, they were particularly concerned about expanding new product development capabilities, increasing production output, and driving down costs. They saw Six Sigma as an opportunity for helping them set up efficient and cost-effective processes that would support their changing and rapidly expanding business.

Launching Six Sigma Globally and Multi-Culturally

Deciding to launch Six Sigma globally, they appointed a senior director to coordinate the deployment and chair the management steering team. One of the team's most important initial decisions was to set up the first training waves with participants from all of their global bases in the same classes in order to encourage networking and knowledge-sharing and ensure that all languages and cultures were involved from the start.

Champion training began with senior managers from each of the major plants participating. Immediately following this training, the company set up a project selection process and began to fill a pipeline of potential business cases that could be screened and focused. While recognizing that there was a pressing need to focus on major strategic issues, they selected the first round of projects to ensure some quick wins on production lines to accelerate the training and communication of successes and encourage buy-in. Subsequently, the groups involved with later Champion training sessions shifted the focus of projects toward transactional issues. Cost of Poor Quality (CPQ) data showed that more than 80% of defects and waste was being generated from non-manufacturing areas of the business.

For the first three multi-cultural Black Belt waves, each of the DMAIC classes was held at a different location to foster global awareness. Candidates were either senior specialist staff, supervisors, or junior managers and were selected on the basis of their business experience, leadership and communication skills, enthusiasm, and availability. Most were full-time; but because of resources limitations in some areas caused by rapid growth, some had dedicated part-time assignments. The risk with part time BBs was recognized and Champions were made accountable for ensuring that they were carefully managed to avoid resource conflicts.

During training, every attempt was made to encourage team spirit and to promote networking among the global candidates. For example, “wine-tasting” evenings were arranged at the end of each BB training week. Each candidate brought a local drink and, before each tasting round began, described its origins and the customs associated with it. The events were simple, effective in promoting cross-cultural understanding, and enjoyable for the participants.

Initially, all training was conducted in English. But in a crucial next step, regional MBBs were trained to cover the different languages and cultures and to act as local deployment coordinators. Each MBB had to be capable of teaching and mentoring local BBs and also of running major projects of their own. They also set up local training programs for Green Belts (members of project teams) and Yellow Belts. As the focus of projects began to shift from manufacturing to transactions, some of the existing BBs were given additional training in transactional DMAIC. Also, as more strategic emphasis was needed on new product introduction, DFSS training was provided for Design Center BBs and specialists

Re-energizing the Six Sigma Program

For almost three years the deployment was very successful, but near the end of the third year it began to suffer from conflicts caused by rapid business expansion and changing market pressures. Greater priority was being given to other pressing business issues such as setting up new plants and introducing new products. Through feedback from the steering team and information provided by deployment reviews, the executive team quickly recognized that the Six Sigma deployment needed to be refocused. In particular, trained BBs needed more dedicated project time and Champions and stakeholders needed to get more involved. As a result, a global executive meeting was organized and a re-engagement action plan was developed. Since then, the company’s Six Sigma program has become more strategically aligned with the business and project ROI has continued to increase. The key success factors in this re-energizing of the program were the continued feedback from deployment reviews and the executive team’s willingness to change deployment strategy and direction when needed.

To date, the company has employed its intranet system for tracking deployment performance and communication. However, having recognized that this does not provide the level of control and knowledge-sharing needed for today’s global deployment, the company is now planning to install a proprietary business intelligence system. The company’s Six Sigma deployment is now mature and has seven Master Black Belts, 150 trained Black Belts, and hundreds of Champions, Green Belts, and Yellow Belts. The company is also introducing Business Process Management (BPM) and a Balanced Scorecard system to improve strategic alignment. More emphasis is being directed towards DFSS and Lean projects and regular deployment reviews continue to keep business improvement activities on track. ROI for typical training waves has been up to 8 to 1, and the overall deployment payback is now more than 12 times the overall investment.

Wireless Communications Manufacturer

A carefully structured Six Sigma deployment helped the company:

- ❑ *Expand new product introduction capabilities*
- ❑ *Increase production output and drive down costs*
- ❑ *Develop processes for supporting a rapidly changing and expanding business*
- ❑ *Achieve ROI of up to 8 to 1 on Six Sigma training*
- ❑ *Achieve overall deployment payback of 12 to 1*

Aligning Six Sigma with Strategy to Increase Profitability in Business Process Outsourcing

A company specializing in taking over and improving other companies' internal business processes now employs more than 4,000 people in nearly 30 business centers across the UK. Over the past five years, the company has grown up to 30% per year, mainly through business acquisitions and by breaking into new markets. By 2005, revenues had increased to £220 million. Until 2003, revenues had continued to increase but pressure on profitability was beginning to become an issue due to growing competition. This prompted the CEO to search for new ways to improve his business. At this stage he recognized that up-front planning and investment would be necessary for success.

After learning about Six Sigma successes in other businesses, the CEO became convinced that it could provide a way of extracting more value from his company. He first introduced the idea to his Executive Team at their mid-year conference in order to secure their buy-in. The team then decided to define a Six Sigma deployment strategy based on their established business DNA, which included client success, sustainable growth, breakthrough innovation, continuous improvement, and dynamic talent. This initial planning was a major factor in their subsequent success. They then decided to recruit externally an experienced Master Black Belt with proven success to drive the deployment. A Master Black Belt was recruited and appointed as Business Improvement Director. Financial goals for the deployment were set to at least break even by the end of the first year and add £2 million to net profit during the second year.

Laying a Solid Foundation for Project Selection

Next, SSQI was selected as an external Six Sigma provider and partner to help the company design a detailed deployment model. Final deployment planning and strategy was developed at an Executive Workshop. Business Process Management (BPM) concepts were used to identify the "Voice of the Customer" (VOC) – customers' requirements, expectations, levels of satisfaction, and areas of concern, all of which are key data for the project selection process. BPM was also used to identify another key basis for project selection – the "Voice of the Business" (VOB) requirements, which include the mission, goals, and business objectives of an organization and how the business intends to accomplish them. The team also defined critical success factors, core business processes, and metrics. This meticulous approach to deployment planning laid the foundation for an extremely effective and strategically aligned project selection system. Business cases for the first round of projects were selected to target the gaps between critical success metrics and core process performance metrics for each business group.

Deploying and Managing Talent

The effective use and development of "Dynamic Talent" also constituted one of the business-critical success factors for the deployment. In order to get maximum payback from the deployment and strengthen the staff development program, the Executive Team decided that Black Belts should be of the highest caliber. To prevent putting excessive strain on resources, the team agreed to select half of the first-wave candidates from the business groups and recruit the other half from outside. All candidates were screened and selected by interviews against a defined position description and set of competencies. From among 30 screened BB applicants, the first training wave of 12 full-time candidates was selected. To keep the focus on business improvement, the Executive Team decided to call BBs "Performance Improvement Leaders."

The senior management teams from each business group were required to attend Champion training. During the two-day workshop they were tasked with scoping the strategic business cases into practical project charters for the Black Belts. Terms of engagement for the Champions were also clearly spelled out, including their accountability for the success of projects. Another significant decision was to invite all the

Black Belt candidates to meet the Champions and the CEO at the end of the workshop to learn more about the deployment and the importance of their projects in achieving strategic business goals. This exchange clearly demonstrated to the BBs the strategic significance of their new roles and that they were not undertaking just another training course.

In order to track deployment progress and performance, the Performance Improvement Director set up a key performance indicator (KPI), dashboard, and scorecard process. Recognizing the need to communicate effectively at all levels in the business, the CEO then decided to install a proprietary business intelligence system to integrate reporting on all improvement projects and initiatives.

Black belt training included dedicated support and mentoring sessions between each DMAIC class, which Champions and process owners attended. Training in soft skills such as facilitation, team leadership, and change management was also provided to help the BB candidates deal with people issues. In addition, Yellow Belts were trained to provide support teams for each business group. Train-the-trainer sessions were also provided by SSQI for some of the BBs so that they could then quickly internalize future team member training. As a result of the selection of high-caliber, full-time BB candidates, strategically aligned business cases, and proactive Champion involvement, all BB projects achieved their business targets and all candidates achieved certification within eight months.

The first wave of projects more than broke even, with £1 million hard savings as well as work efficiency gains, cost avoidance, and resulting contract renewals and new business opportunities. The deployment is now reaching maturity, having integrated DMAIC, DFSS, BPM and Process Management System concepts and tools into a structured and strategically aligned business improvement system.

Business Process Outsourcing Company

The company's Six Sigma deployment enabled the company to:

- ❑ *Achieve more than £1 million in savings in the first wave of Six Sigma projects alone*
- ❑ *Achieve significant gains in efficiency and cost avoidance*
- ❑ *Increase contract renewals and expand new business opportunities*
- ❑ *Create an ongoing integrated, structured business improvement capability*

A Manufacturer of Advanced Materials Makes Six Sigma a Way of Life throughout the Company

A major international manufacturer of advanced materials used in the automotive and general building industries faced market pressures, litigation issues, changing technologies, and strong competition. Faced with these challenges, the company's Executive Team wanted to refocus the company's business improvement strategy. Following assessment of Six Sigma and discussions with other successful Six Sigma companies in the U.S., the company decided to implement Six Sigma across its global operations. They established a Corporate Steering Team and engaged SSQI to help define the deployment.

At the same time, the company recruited an experienced and proven Master Black Belt to coordinate the Six Sigma implementation. Their first key task was to agree on the deployment strategy, organization and supporting systems, and roles and resources. Their prime objective was to introduce a common language and understanding for driving business improvement that would ultimately make Six Sigma a way of life for all employees. They therefore recognized that the deployment strategy would need to be regularly reviewed to assess performance and progress to keep it on track.

Aligning Six Sigma with Strategy

The team then identified five critical business focus areas aligned to the business strategy and high-level metrics that would be targeted by all future business improvement initiatives. This important step laid the foundation for their project selection methodology. For each focus area, opportunities were identified; and for each opportunity, projects were then scoped and selected. This provided a disciplined and structured approach that ensured that each Six Sigma improvement project was aligned to a specific business success factor and metric. Each project was given priority based on its ability to close performance gaps and its impact on the customer and the business.

Following further executive education, plant and business unit management teams were given Champion training so that they were prepared for local Six Sigma implementation. Roles were also clearly spelled out: Champions were made accountable for delivering results against opportunities and Black Belts were made responsible for project execution.

A Comprehensive Approach to Training

The next key step was to define what education and training would be needed to provide a balanced global approach for all of the company's employees. Taking a long-term, holistic approach that would allow for future development of curricula and materials, the company's goal was to ensure that all employees would receive appropriate levels of Six Sigma education. This was not to be training for training's sake. The aim was to provide knowledge and application of the methodology that would eventually lead to a global culture change. The team also wanted to include other important business improvement tools and concepts. Over the next five years the training plan and curriculum evolved into a comprehensive blend of DMAIC, DFSS, Lean, and process simulation tools that covered both manufacturing and transactional processes.

Each plant and business unit manager selected Black Belt and Green Belt candidates for training, most of whom were initially specialists or junior managers. A critical decision by the Steering Team was to leave the candidates' job titles unchanged and to assign them part-time to their Six Sigma projects so that Six Sigma would become a normal way of working rather than being seen to be the job of a group of "elite" BBs and GBs. This was a gamble, which needed the proactive support of plant managers and Champions to work effectively. Subsequent results have proved this unusual approach to work largely because, in this case, the company's emphasis has been on culture change. It also succeeded because all employees

received education on Six Sigma and business improvement and clearly understood the deployment strategy. To further promote a structured problem-solving approach and promote Six Sigma culture across the business, it was agreed that all senior technical staff and plant leaders would receive Green Belt training.

The Importance of Feedback

Performance scorecards have been used to communicate performance to the workforce at each plant, and Six Sigma storyboards have also been used to provide local updates on projects. To date, the company intranet website has been used to communicate Six Sigma progress and performance, but the Steering Team is now looking for a proprietary business intelligence system to integrate communication of all global improvement strategies and project activities.

Feedback from regular deployment reviews has enabled the Steering Team to continue to effectively refine and refocus its business improvement strategy. At the beginning of 2005 the Steering Team realized that they were attempting to support too many new initiatives and projects across the company at one time. Resulting resource conflicts and the increasing level of change were slowing down business improvement overall. The team decided to redefine key areas where medium-term improvement was needed and draw up from all existing projects a priority shortlist on which to concentrate resources for the remainder of the year.

The deployment is now mature and has contributed tens of millions of dollars to the bottom line. The Corporate Executive Team continues to maintain strategic focus and has recently reconfirmed five key areas where performance needs to be improved in the business: alignment to customer needs, waste elimination, talent of people, financial performance, and environmental issues. Waste elimination is now a key business objective for which DMAIC, DFSS, and Lean tools are being used.

Manufacturer of Advanced Materials

The company's Six Sigma deployment followed these best practices:

- ❑ *Aligned Six Sigma with the strategic objectives of the enterprise*
- ❑ *Provided comprehensive training to lay the groundwork for culture change*
- ❑ *Established feedback mechanisms to keep improvement on track*
- ❑ *Made Six Sigma, and its focus on continuous improvement, a way of life throughout the company*

Some Common Threads of Success

Some common threads of success run through all four of the cases presented here. In each case, the company carefully determined how to focus and deploy its Six Sigma efforts so that they were aligned with key business priorities and the company's strategy. Each developed an effective Six Sigma infrastructure of Champions, Master Black Belts, Black Belts, and Green Belts to learn, apply, and disseminate Six Sigma methodology. This infrastructure, in turn, formed a solid foundation for the project selection process, helping ensure that improvement would be directed toward creating the most value and advancing the company's objectives. Most importantly, all of these Six Sigma programs enjoyed the full support and active involvement of the top management teams, thus demonstrating the importance to all employees of the improvement efforts.

Equally important, all of these Six Sigma programs depended for their ultimate success on the quality and scope of the training that their people received at all levels. Through comprehensive curricula, designed to maximize knowledge transfer, diffuse knowledge through the organization, provide hands-on application of tools, and address such people issues as motivation and multi-cultural understanding, these companies have developed a cadre of improvement experts who not only generated substantial returns on the investment initially but who are in place to generate even more value in the future.



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