**PROPOSAL FOR ZERO CREDIT HOUR COURSE CERTIFICATE: SIX SIGMA PROJECT IMPLMENTATION**

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**Background**

Six Sigma is no longer just about process improvements. Over time it has evolved into a much more general paradigm. Six Sigma now can be defined as an investigative protocol for any situation that adheres to an inductive, performance measurement regime. This means that the investigation starts with a bottoms-up, facts-first, non-judgmental, all-encompassing view of the situation. The key idea is to avoid jumping to recommendations based on false assumptions, a very common and difficult-to-avoid occurrence. The investigation then elicits cause-and-effect hypotheses, and then whittles down the scope of the investigation so that only the most critical causal drivers are evaluated further. Once these key drivers are identified, the investigation then shifts from a purely descriptive mode to a normative one. Creative solutions to the problems identified are generated and evaluated with regards to the cause-effect relationships established. Finally, implementation of the solutions occurs, and a before-after isolation of the quantitative performance impact of the solution culminates the project.

This Six Sigma approach has been successfully applied on a variety of industry-sponsored WSU-TC projects for MBA students under the guidance of a faculty member (to date, only Tim Baker) as a component of completing their capstone BA 702 requirement. For instance, over $750,000 was saved at Washington Hanford Closure in a two-month period due to eliminating non-value-adding activities in the collection and evaluation of field samples for health physicists (2011). An inventory reduction valued at $76,000 was achieved for two months of work at Areva (Richland, WA), a nuclear fuel rod manufacturer (2008). At Sandvik Specialty Metals (Finley, WA), a 25% reduction in throughput variability was achieved in their pilgering process for titanium rods (2011). These rods are shipped to customers in aerospace, heat exchanger, and recreation industries. Due to the need for quick reaction times to highly-variable customer orders, this reduction in delivery time uncertainty has been a major boost to Sandvik’s customer service. The time to process credit card fraud claims was proven to be able to be cut in half at Gesa Federal Credit Union (Richland, WA) (2009). Add-on software to Areva’s enterprise resource planning system (SAP) was written and demonstrated to save $218,000 per year on inventory costs (2010). An obsolete spare parts handling protocol was developed for Areva that should yield returns approximately 27 times the cost of managing the protocol (2011). Patient flow time through Grace Medical Clinics’s (Kennewick, WA) facility was reduced by 17% through (a) a reorganization of facility work processes to take advantage of parallel activities, and (b) the procurement of better patient management software.

Note that these projects encompass both the traditional process improvement activities and also product design and general consulting.

In addition to the WSU MBA 702 course requirements, a Six Sigma belt has been awarded if the project team successfully followed the above protocol and implemented the work that results in a client-verified quantitative performance improvement of significance. This final verification happened at one hour oral examinations attended by (1) a Promontory Management Group (PMG) consultant, (2) the senior member of the sponsoring client, and (3) the student’s program chair (Tim Baker). PMG is an international Six Sigma consultancy, based in Salt Lake City, Utah. PMG provides the QuikSigma software that greatly facilitates the project. A green belt is the default award. If the project utilizes quantitative methods for benefit determination, such as ANOVA, regression, experimental design, statistical process control, and/or measurement systems analysis, then a black belt is awarded. Each belt takes about 100-150 hours of project work per student with the client. Students often work in pairs.

Tim Baker has developed an eight credit hour curriculum to support these projects. MgtOp 589 (seminar) is a new three-hour course that gives students all of the tools for both green and black belt projects: experimental design, measurement systems analysis, advanced process control, and the development of soft skills in the crucial project definition phases. This course was based on the industry training courses taught by PMG. A significant amount of theoretical background was added to this baseline course to make it fit the educational mission of a research university. Once 589 has been completed, students then take three credit hours of BA 546 (702 prep course) to work on the project, then finally two credit hours of MgtOp 702 to integrate the project’s results within the business strategy 702 rubric.

Tim Baker’s responsibilities include (1) securing funding for the QuikSigma project management software and PMG’s visitations, through paid consulting and mini-grants, (2) circulating through the local business community to secure projects via pro bono consulting, (3) mentoring students on the projects, and (4) developing, improving, and teaching the in-class course, MgtOp 589.

Here is the list of belt recipients, client, project, client contact, and date:

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| --- | --- | --- | --- | --- |
| **Belt recipient(s)** | **Client** | **Project** | **Client Contact** | **Date completed** |
| Corey Short (green), Joe Silveira (green) | Areva (Richland, WA) | Inventory reduction | Stan Kuick, lean programs manager | 2008 |
| Kevin Ince (green), Mike Shaw (green) | Areva (Richland, WA) | SAP software add-on development | Stan Kuick, lean programs manager | 2009 |
| Joel Evans (green) | Gesa (Ricland, WA) | Reduction in fraud detection time | Jerry Sims, vice-president | 2009 |
| Matt Carter (black), Ken Idler (black) | Sandvik Specialty Metals (Finley, WA) | Reduction in delivery time variability | Orjan Blom, president | 2011 |
| Albania Davis (green), Peter Mikkelsen (green) | Areva (Richland, WA) | Improve disposition of obsolete spare parts | Stan Kuick, lean programs manager | 2011 |
| Lindsay Mahony (black), Paul Nissley (black) | Washington Hanford Closure (Richland, WA) | Reduce time for health physicist sample collections | Sam Bennikuty, IH manager | 2011 |
| Ram Devanathan (green) | WSU Tri-Cities business program (Richland, WA) | Reduce administrative assistant workload | Wanda Walters, administrative assistant | 2011 |
| Alisa Bonham (green), Curtis Dabb (green) | Grace Medical Clinic (Kennewick, WA) | Improve patient flow time through the clinic | Jean Murrow, Director | 2014 |

**Proposal**

A zero credit hour certificate from WSU will be awarded to a student (or a team of students) upon completion of a Six Sigma project if these criteria are met: (1) in the case of a process improvement project—the client at the outset is not certain what the solution should be to their fundamental problems; in the case of a design project—the client is not clear on what functionality the product/software should have; (2) the student follows the Define—Measure—Analyze—Improve—Control project management protocol in the conduct of the investigation and subsequent action item implementation; this protocol is a standard for Six Sigma projects—its documentation can be found, for instance, in *Bramwell, D., QuikSigma, University Edition (2011), Promontory Management Group (Layton, UT)*; (3) in the case of a process improvement project—the recommended changes get implemented; in the case of a design project—the product/software developed gets used; (4) some benefits of implementing the process change/utilizing the new product are quantified to the satisfaction of the client; (5) (1)-(4) will be verified by a WSU faculty member and the client sponsor at a final oral presentation.