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ROCHESTER INSTITUTE OF TECHNOLOGY
Rochester, NY

Research for ANSI accredited “Lean Six Sigma Green Belt
Certificate Program” in Packaging Science for
Undergraduate Students

A Project submitted in partial fulfillment of the
requirements for the degree of
MASTERS OF SCIENCE
in
PACKAGING SCIENCE

By

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Date Approved: May 17th, 2011

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Packaging Graduate Program Chair: Deanna Jacobs

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ABSTRACT

This research project is a result of a problem-solving proposal that was submitted to Program Chair Dr. Daniel Goodwin on June 28, 2010. The proposal recommends that RIT's Packaging Science Program establish a unique Lean Six Sigma Green Belt in Packaging Science Certificate program for undergraduate students. The proposal was developed as a result of receiving input from the RIT Packaging Industrial Advisory Board, from researching packaging job descriptions and from Professor Dr. Duane P. Beck's extensive Lean Six Sigma experience.

Students who are successful in receiving the certificate will be able to demonstrate problem-solving skills in the packaging industry. The proposal also identifies three RIT benefits as stated below:

“Green Belt Certificate Program Benefits:

- 1) With the Lean Six Sigma Green Belt Certificate, the student will stand above and beyond other graduating students from other colleges and universities.
- 2) It is our vision that the student will receive higher starting salary offers because of achieving higher standards in their chosen educational program.
- 3) According to an ANSI representative, “if we are successful in the development, coordination and sustainability of this innovative program, RIT will be the first one of its kind among universities and colleges in the nation.”

This Research Project

The certificate program will be designed according to ANSI accreditation guidelines and supported by quality assurance procedures. The procedures will enable the Packaging Science program to consistently meet ANSI accreditation guidelines under the ASTM certificate standards. It is not the immediate goal to seek ANSI

accreditation but to establish the program according to their guidelines. Both the procedures and ANSI guidelines bring reliability and creditability for administering, issuing and evaluating the certificates.

The research project focuses on performing research on setting up a Lean Six Sigma Green Belt program for undergraduate students at RIT and development of the quality assurance procedures in order to meet ANSI accreditation guidelines. The research will be on four primary areas:

- 1) Lean Six Sigma Green Belt;
- 2) Certificate Programs;
- 3) Accreditation Guidelines; and
- 4) Quality Assurance Procedures.

For the four areas the project will focus on identifying the gap of knowledge between what is currently offered in the packaging industry and what the Packaging Science certificate program needs to integrate for success and sustainable reasons.

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1.0 INTRODUCTION

The section in the research project will begin by providing a brief synopsis that includes a Lean Six Sigma Overview, the DMAIC, and the Different Belt Levels (e.g. Green Belt). The introduction will conclude by identifying the three main beneficiaries for establishing this unique certificate program. The three main recipients are: Hiring Corporations, Students and Packaging Science Program. Below a brief overview of the information is provided that will be further explored in the research project.

Lean Six Sigma Overview

Lean Six Sigma is a business management strategy, which seeks to improve the quality of process outputs by identifying and removing the causes of defects (errors) and removing wastes from manufacturing and business processes. Lean Manufacturing seeks to improve speed of the process while reducing non-value added costs and Six Sigma seeks to satisfy customer requirements by removing the defects. A six sigma process is one in which 99.99966% of the products manufactured are statistically expected to be free of defects (3.4 defects per million opportunities). It is not our goal that the students become experts in achieving Six Sigma, but it is our goal that students learn that Six Sigma means striving for perfection in their packaging careers. Furthermore, students will learn that the Green Belt signifies a process methodology for solving packaging problems.

Lean Six Sigma is also a natural fit within the Packaging Science curriculum. Many of our courses already include many of the Green Belt tools and skills. For instance, Packaging Regulations, Advanced Packaging Economics and Statistical

Process Control currently incorporate the use process flowcharting, the DMAIC (Define, Measure, Analysis, Improve and Control), cause and effect diagramming, and basic statistical methods as normal topics in the courses.

In the business environment, Lean Six Sigma creates an infrastructure of people within the organization ("Champions", "Black Belts", "Green Belts", etc.) who are the experts in these methods. Champions are responsible for spearheading a Lean Six Sigma implementation across the organization in an integrated manner. Champions can also act as mentors to Black Belts.

The DMAIC

The DMAIC is a problem solving methodology, which began within the manufacturing environment, but has expanded to other areas such as packaging, distribution, and logistics due to its many cost reduction tools. It is now a normal approach to success within the packaging industry. The students are furthermore introduced to the DMAIC through their cooperative/internship experiences. Briefly, the DMAIC consists of five phases.

- i. Define the problem, the voice of the customer, and the project goals, specifically.
- ii. Measure key aspects of the current process and collect relevant data.
- iii. Analyze the data to investigate and verify cause-and-effect relationships. Seek out root cause of the defect under investigation.
- iv. Improve or optimize the current process based upon data analysis using techniques such as design of experiments and standard work to create a new, future state process. Set up pilot runs to establish process capability.

- v. Control the process to ensure that any deviations from target are corrected before they result in defects. Implement control systems such as statistical process control, production boards, and visual workplaces, and continuously monitor the process.

Different Belt Levels

As previously stressed, the DMAIC requires several key personnel, identified by different belt levels working together for successful implementation.

- 1) Master Black Belts: Act as in-house coaches on Six Sigma. They assist champions and guide Black Belts and Green Belts. They spend their time on ensuring consistent application of Six Sigma across various functions and departments.
- 2) Black Belts: Operate under Master Black Belts to apply Six Sigma methodology to specific projects.
- 3) Green Belts: Employees who take up Six Sigma implementation along with their other job responsibilities, operating under the guidance of Black Belts.
- 4) Yellow Belts: These employees gain basic knowledge of the Lean Six Sigma terminology and actively function as a team under the Green Belt or Black Belt leadership.

The three main beneficiaries/recipients for establishing this unique certificate program are: Hiring Corporations, Students and Packaging Science Program. Below a brief review is provided:

Hiring Corporations

Corporations hiring students with Green Belt problem-solving skills will get more value for their investments and will improve their products and services in an effective

and efficient manner.

Problem solving skills are a priority in today's industry. Corporations are leaning more and more towards projects related to cost savings, optimization of processes etc. So in order to ensure success on these projects, problem-solving skills become very important. Below are several merits of having Lean Six Sigma Green Belt in Packaging Science knowledge in the new hires when working within a corporation:

- i. Better teamwork and coordination among different individuals within various departments and teams.
- ii. The new student hires would be able to work on a team involving quality problems experts like Master Black Belt, Black Belt, Green Belt and Yellow Belt.
- iii. Savings in terms of time, money and other resources because the corporations wouldn't have to provide as much training to the new hires.
- iv. For the new student hires it would shorten the learning curve in corporations & they would be able to apply their skills much sooner than others and brings benefits to the company.

Students

Students who possess Green Belt skills will make a problem solving impact in their current Packaging Science program, in their future interview process and after being hired by a packaging corporation.

Benefits to Students from earning a Green Belt in Lean Six Sigma:

- i. Students will use data to solve quality related problems.
- ii. They will work effectively on projected related to cost savings, optimization of

processes etc.

- iii. They will be able to identify and understand Customers and/or manufacturing needs and requirements and apply it to every solution.
- iv. They will be able to use the basic tools and skills, which are less complex than that of a Black Belt.
- v. Students will be able to identify them on their resumes, which will add a strong credential to their skills.
- vi. Students will be able to outshine other college graduates and will not need to return again at professional levels to understand the problem solving skills.

Packaging Science Program

RIT's Packaging Science program is a natural problem solving career builder. There are many benefits for adding a Green Belt Certificate program to the Packaging Science program:

- i. Packaging Science would be first program in the nation to have an undergraduate program in Lean Six Sigma Green Belt.
- ii. Since Packaging Science is a natural problem solving skill in it self then the Lean Six Sigma Green Belt requirements could be easily customized to Packaging Science and thus would add a very strong STEM value to the student knowledge.
- iii. Packaging Science with the inclusion of Lean Six Sigma would ensure consistent approach towards the goal of Long-term sustainability.
- iv. Addition of Lean Six Sigma Green Belt program would ensure consistent progressive advances in Packaging Science program with respect to today's corporate industry.

- v. With the infrastructure of a certificate program in place, Packaging Science can begin to generate capital from offering the program as a professional elective course.
- vi. A program can also begin to develop for industry packaging professionals who can also receive a Green Belt in Packaging Science certificate.
- vii. Hiring Corporations will look at the Packaging Science program as progressive, creative and innovative.

2.0 LITERATURE REVIEW

The literature review was performed on the following areas:

a) *The literature review in the research project searched on the articles, which show that there is a gap in Lean Six Sigma/Problem Solving knowledge in corporate world.*

1) “7 Reasons Why Six Sigma Benchmarking Efforts Fail”, By Tony Jacowski ArticleBase.com, 7/24/2008

In the article Tony Jacowski, explained about reasons for the failure of Lean Six Sigma projects.

- *Lack of understanding:* The failure to understand the needs of the customer, the outcomes of the processes and the performance of the process is responsible for efforts failing.
- *Lack of sponsorship:* Team leaders may not accept the improvements for lack of understanding.
- *Unfamiliar Teams:* If the members of the team are not familiar to the process or the area under consideration, they may not be able to understand the minute details of the process and its relevance to the success of the project.
- *Lack of commitment:* If managers are not well informed about the pros and cons of the projects, they will underestimate the effort, in terms of time and cost, needed for the successful completion of the project.

In addition to above stated reasons there are 3 more reasons that can result in failures.

The article shows that there is a need for proper initial training in Lean Six Sigma in the industry and as some companies are not able to provide those trainings, they expect the new hires to have that knowledge beforehand saving the company money and time.

2) “Six Sigma: What Went Wrong?” By Cristopher Del Angel, Joe Froelich, CRM magazine Nov 2008

Since Jack Welch, the former CEO of GE, popularized Six Sigma in the late 1990s, the business methodology has had a profound impact. Yet, amazingly, the majority of all corporate Six Sigma initiatives—60 percent—fail to yield the desired results.

This article states that although the methodology employs rigorous statistical analysis to identify defect areas, the correction of which produces better quality, lower costs, and increased efficiency but there are elements that are harder to control, such as employee behavior and innovation/ideation, which can hinder long-term success.

This article states that at Six Sigma locations, a sizable gap sometimes may exist like: Process improvements may perfectly achieve their objectives, but the workforce may not be prepared to accept them as part of their daily routines.

This shows that a behavior-focused approach makes change sustainable. It helps workers modify the way they feel and think about their jobs by aligning attitudes and behaviors with the system and process changes, as well as with the overall direction of the company which can be achieved proper understanding and training in Lean Six Sigma methodology but some companies do not want to invest money in these training hence expect new hires to have knowledge beforehand.

3) “Why Six Sigma Projects fail and how to prevent it” By Anne Hudson, Co-CEO Grouputer

While a lack of commitment and sponsorship is the leading cause of project short falls, other important reasons for project short falls, including:

- Lack of team cohesion and leadership
- Lack of effective tools to support projects and optimize the process
- Difficulty leading distributed teams
- Lack of sustained Management engagement

According to the paper the difference between a successful project and one that fails to meet expectations has more to do with people and how they work together than with quantitative analysis, important as it is. Tools and structured processes can make the difference between a good and excellent project.

Thus paper raises the issue that people should have proper skills and understanding of Lean Six Sigma so that they can work together more effectively and able to analyze the problems more efficiently.

4) “Shackled by Bad Six Sigma” By Fred Mullavey, Quality Digest 2006

This article looks at some of the most common reasons Six Sigma projects fail.

It states everyone wants to implement Six Sigma, but not everyone supplies the resources. Many Six Sigma projects fail because of insufficient people and expertise, poor participation among team members or both.

Six Sigma fails in many organizations due to a simple lack of recognition for its successes and the team members who achieve them. Failing to communicate Six Sigma's successes can lengthen the organization's maturing process, frustrating Six Sigma projects and participants.

The article raises an issue that there is a need for proper initial training in Lean Six Sigma in the industry and some companies expect the new hires to have that knowledge beforehand saving the company money and time also they should have proper skills and expertise to employ in their jobs.

b) The literature review in the research shows the importance of Accreditations as compared to Non Accreditation

“Accreditation vs. Non Accreditation”: www.onlinedegreecenter.com

This article provides information about Accreditation and its importance taking examples from institutional accreditation. So this article validates that if a program is accredited it is beneficial to employment, earning financial aids, earning a legitimate degree that is recognized.

c) The literature review in the research provides the information about the Quality Assurance procedures (QAP).

“10 tips to implement quality assurance procedures”:

www.totalqualityassuranceservices.com

This article mentions about the ways to implement Quality Assurance Procedures (QAP) in businesses. This helps understand the importance of QAP as a validated document, which helps people repeat procedures according to set standards

d) In the literature review, information was provided regarding the problem solving skills used or taught in RIT and information about the Quality assurance procedure with respect to RIT.

What certificate program does RIT provide on problem solving?

For problem solving approaches RIT has an established certificate program for Lean Six Sigma through the CQAS (Center for Quality and Applied Statistics) to outside professionals and graduate students but does not have a program to offer it to undergraduate students including Packaging Science.

Quality Assurance Procedures in a Certificate program with respect to RIT:

RIT does not have Quality Assurance Procedure (Manual) for any of its certified programs, making Lean Six Sigma Green Belt in Packaging Science the first in the history of the Institution to have these kinds of procedures.

e) In the literature the relevance of Green Belt in Lean Six Sigma in relation to Education and Training Perspective in Organizations is addressed.

Education and Training Perspective

Six Sigma (SS) is trademarked by the Motorola Corporation.

Green Belt education and training is currently offered through the following formats:

- *Private Corporations:* Motorola and Xerox have their own SS programs specifically designed for their industries.
- *Certification Organization:* Dr. John Hromi Center for Excellence within RIT offers a certification program for Black, Green and Yellow Belts in SS. American Society for Quality (ASQ) is another international certification agency. RIT graduate level students have enrolled in the Black Belt

Certification while completing Master's degree program.

- *Online Certification Program:* For instance, Villanova University offers many online Master Certificate Programs in Six Sigma at various belt levels.
- *Doctoral Dissertations:* Several universities including Ohio State and Missouri University Science and Technology at Rolla have enabled Ph.D. candidates to write their dissertations centered on SS.
- *Course Offering:* RIT offers an undergraduate course, called Introduction to Lean Six Sigma. In this course, students learn the history, context, and tools of Lean/Six Sigma through lectures and case studies, and begin to apply the process in a course project. However, the focus is on introducing the topic not on completing a project using Lean Six Sigma as a reengineering effort.
- *Health Care Industry:* The University of Rochester medical school is implementing a streamlined SS for improving their internal processes and systems within its hospitals and medical university. And Unity Health System offers their SS internal educational and training programs for immediate SS applicability within the hospital. The Joint Commission for Accredited Hospitals has stated that SS is one the positive efforts for making process and system improvements within hospitals.

3.0 METHODOLOGY

Since the early implementation, this certificate program is based on the meeting the packaging industry expectations, the project's methodology focused on two areas:

1. Develop a survey for the packaging industry and,
2. Document the research methodology for performing the researching. By documenting the methodology, future students who participate in sustaining the program will have a consistent approach to follow.

1) Survey

A Survey was conducted within the Industrial Advisory Board and Industry Partners to analyze their support for setting up a Lean Six Sigma Green Belt in Packaging Science Undergraduate program at RIT. The questions included in the survey:

- a) A Green Belt's Problem Solving Skills are essential in a Globalized Packaging Industry.
- b) Students who gain knowledge and can demonstrate skills as a Green Belt can ease the financial burden on hiring companies by reducing the time and resources on such areas as in training costs.
- c) The Packaging Science Cooperative Education experience can play a major role in developing the student's Green Belt knowledge, skills and attitude.
- d) Undergraduate students who can utilize the DMAIC approach will perform more effectively and efficiently on projects assigned to them as newly hired employees.
- e) A certificate program based on ANSI accreditation guidelines will provide credible evidence as an industry professional.
- f) A documented quality management system at RIT will allow the certificate program to maintain a continuum in ensuring good practices in education and sustainable development of Packaging Science program.
- g) It is a benefit to our organization if a student receives a "Green Belt in Packaging Science" certificate and can demonstrate the skills to match.
- h) As an industry professional, I would like to participate in the development of the Green Belt Project.
- i) As an alumni or industry partner it is exciting to think that the packaging science program would be the first in the nation to have such a program.

2) Research Methodology

1. Research the necessary information* according to appropriate clause specified within the ANSI guidelines. (*REFER TO SECTION 4.3*)

* The Necessary Information is further broken down below according to the sections:

- 3.1 Research and Collect information on Job Opportunities from different companies that require the students eligible for Application process to have knowledge on Lean Six Sigma, to validate that the Lean Six Sigma Green Belt Certificate program would help fulfill the requirements.
- 3.2 Research and collect information on existing Universities that offer degrees in Lean Six Sigma for drafting a layout of the certificate program in Green belt for Packaging.
- 3.3 Research and Collect information on institutes that offer Six Sigma Training and Certification that can help setting up the Lean Six Sigma Green Belt Certificate Program in Packaging Science.
- 3.4 Research and Collect information on the personnel job descriptions of the key personnel involved in the chain of administration process for the Lean Six Sigma Green Belt Certificate Program in Packaging Science. The job descriptions include: a) R&D, b) Advertising, c) Marketing, d) Sales, e) Customer Service, f) Accounting, g) Credit, h) Purchasing/Buyer, i) Quality Assurance, j) Warehousing, and k) Receiving

2. Collect the necessary information according to appropriate clause specified under the ANSI guidelines.

3. Document the procedural steps taken for conducting the research and for collecting the necessary information in a document.

3.1 COMPANY REQUIREMENTS

PROCEDURES

The following two steps are for reviewing the job descriptions from different companies that require eligible students to have Lean Six Sigma knowledge.

Step 1

1) Met Shauna Newcomb, Co-op Coordinator for Packaging Science Department at RIT for discussing various ways for searching Company job profiles on RIT Job Zone.

2) Logged in to RIT Job Zone website

<https://rit-csm.symplicity.com/students/index.php?s=home>

3) Opened the section of Jobs.

<https://ritcsm.symplicity.com/students/index.php?s=jobs&ss=jobs&mode=list>

4) Entered “*Packaging Science*” in “*Desired Major*” column. Started searching all the job descriptions; co-op/internship as well as full time. Main motive behind the search was to find the job profiles that require the student applicant to have Lean Six Sigma skills if possible Green Belt certification. This should be done if one wants to look for current job descriptions.

5) For previous years job descriptions, had to go to “Archived Jobs” section. This provided a brief idea about the need for Lean Six Sigma Skills in corporate world as well as the packaging industry since several years.

Step 2

- Retrieved the job profiles using the RIT Job Zone
- Attached are the several job descriptions that were found on Job Zone.

3.1.1 EVERY DENNISON

Packaging Sales Engineer

Description

- Providing expertise in package design to customers that address key consumer and customer needs in the retail environment.
- Developing smart and sustainable retail packaging solutions. Partnering with, Customers, Sales, Operations, Sourcing, Suppliers Merchants and Vendors to develop packaging specifications for an initial proof of concept of an item.

Desired Major(s)

- Packaging Science/IPKG Packaging Science (MS), Packaging Science

Qualifications

- B.S. Degree in the Science of Package Engineering
- Strong grasp of retail packaging needs in regards to appearance, sustainability and protectiveness of packaging.
- Working knowledge of package testing protocols
- Understanding of common shipping, storage and handling methods

Desired Requirements

- 3 to 5 years experience in product retail and distribution.
- Experience with Consumer Product Goods packaging
- Exposure to international product manufacturing, packaging and shipping
- Strong understanding of relationships between packaging materials, packaging equipment, product, and people, including packaging security attributes.
- Demonstrated ability to work independently as well as collaborative with others on projects
- Demonstrated leadership and initiative
- ***Six Sigma certification preferred***

3.1.2 BAUSCH & LOMB

Packaging Manager

Description

- Provide technical and project leadership / oversight and lead the definition and budgeting requests of packaging project requirements both externally and internally.
- Develop, manage and sustain documentation of new package designs to ensure high level accuracy and consistency including technical and compliance oversight to protocol generation, report closeouts and technical packages.
- Provide technical support for the RFQ process and vendor selection decision process.
- Develop new printed components and leverage synergy with labeling operations department.
- Establish new procedures & systems as needed.
- Provide functional management leadership to a team of packaging professionals:
 - Partner with Program Managers on project execution
 - **Grow department for DFSS and Six Sigma capabilities**
 - Define metrics and pursue continuous improvement programs
 - Create and manage department budget.

Desired Major(s)

- Packaging Science

Qualifications

- Proven track record of leading projects and delivering to objectives.
- Strong knowledge GMP standards and packaging regulatory requirements.
- A thorough understanding in the selection and identification of primary and secondary package components, materials, and delivery systems.
- Ability to be successful within a matrix-reporting environment.
- Familiar with Product & Process Development Phase/Gate Methodology.

3.1.3 COOPERVISION INC

Packaging Supervisor

Description

Provide leadership for the Packaging staff with emphasis on maintaining quality, improving cost effectiveness, and process improvements that leads to customer satisfaction. This position will direct and coordinate the activities of the Packaging department to convert Silver Stock into boxed finished goods through an adherence to SOP's and company policies and procedures.

Job specific Responsibilities

- Supervise up to 35+ employees in the packaging environment.
- Coordinate daily priorities with Planning and OP departments. Approve and manage overtime of associates when required.
- ***Accountable for supervising staff in a manner that will ensure adherence to Good Manufacturing Practices, Standard Operating Procedures and ISO 9000 requirements.***

Direct equipment changeover process to ensure maximum efficiencies and meet or exceed established standards.

Desired Major(s)

- Packaging Science

Qualifications

- Bachelor's degree preferred. Associates degree required or related experience or equivalent combination of education and experience required.

3.1.4 CORNING LIFE SCIENCES

Packaging Co-op

Description

Corning Incorporated is the world leader in specialty glass and ceramics. Corning creates and makes keystone components that enable high-technology systems for consumer electronics, mobile emissions control, telecommunications and life sciences.

Life Sciences Division data:

In the race to bring new drugs to market, researchers rely on innovative tools that compress costs and timelines. Corning's leading-edge scientific laboratory products improve productivity, enabling the development of breakthrough pharmaceutical discoveries.

Job duties

- Majority of work will center around working on corrective actions to improve packaging based on voice of the customer (customer complaints)
- ***Using LEAN techniques to reduce waste in packaging and material consumption***

Skills needed:

- Analytical skills
- Oral and written communication skills
- Ability to find root causes and fix packaging problems

Desired Major(s)

- Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt

Qualifications

- Previous co-op experiences a plus (preferred experience in food or medical/pharmaceutical manufacturing).

3.1.5 DUPONT PACKAGING

Packaging - China R&D Center

Description

- Drive new applications/new projects tailored to regional needs via intimate customer interactions & technical analysis in close collaboration with sales and marketing as well as global technical team
- Support customers' needs on Tyvek® in compliance with global/country-specific medical packaging standards/regulations;
- Develop in-depth understanding on competitive product performance in medical packaging applications
- Deliver customer-tailored product & application training; Educate customers on how to use Tyvek®
- Resolve trade issues timely

Desired Major(s)

- Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt, Packaging Science/IPKP Packaging Science - Printing Option

Qualifications

- Bachelor's degree or higher in packaging engineering, material science/engineering, or related field;
- Self motivated with strong desire to learn and to address customer issues;
- ***Six sigma green-belt certification a plus***

3.1.6 GLOBAL PACKAGING INC

Packaging Solutions Coordinator

Description

GLOBAL PACKAGING, Inc. is a leader in the field of Flexographic Printing for the private label and branded markets of diapers, sanitary products, towel, tissue and napkins as well as frozen food packaging and baked goods. We offer high end printing in up to 10 colors as well as laminations and bag converting. We are well known in the industry for the quality and service we provide to our customers. We seek employees who strive for excellence and understand the need for high quality and superior service.

The packaging solutions coordinator will:

- Provide innovative solutions to complex problems associated with package design/production
- Work with customers, suppliers and internal departments to produce high quality flexible bags, laminations and pouches
- Recommend modifications to existing products, processes to meet customer needs
- Develop specific plans to improve manufacturing processes
- Assist in process/product start-ups
- Write process and/or system specifications as needed

Desired Major(s)

Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt, Packaging Science/IPKP Packaging Science - Printing Option, Packaging Science/IPKT Packaging Sci-Technology

Requirements

- B.S. degree in Packaging, Engineering, Printing or equivalent field
- 2+ years experience in packaging, preferably in flexible packaging. Ideal candidate will have experience in food, confectionary or personal care product industries.
- ***Experience with ISO or AIB standards desired.***

3.1.7 GOJO INDUSTRIES INC

Packaging Engineer

Description

GOJO Industries, Inc. is a manufacturer and international marketer and distributor of hand hygiene and skin care products for away-from-home settings. Overview

Primary Responsibilities/Accountabilities

- Employs thorough, accurate, and timely engineering practices for development and commercialization of new packaging systems and technologies.
- Evaluates, optimizes and implements technologies, materials and/or processes with a goal to improve overall business.

Desired Major(s)

Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt

Education and Experience Required

- Candidate will be responsible for focusing on new development in primary packaging.
- Familiarity with blow molding, injection molding, and film extrusion is preferred.
- ***LEAN and/or Six Sigma experience is also preferred.***

Additional General/Technical Skills Required

- Adaptation of innovative ideas to leverage supplier technology
- Creates and/or supports development of innovative solutions for new and improved products, innovative ideas and/or processes

3.1.8 KEN'S FOODS

Production Team Leader

We are looking for a motivated individual to join our team. This position will manage the 2nd shift-packaging department. The qualified individual **MUST** have previous experience in high-speed packaging or in multiline high speed bottling, preferably in the food or beverage industry.

Responsibilities

- Maintain targeted production efficiency for the production lines and contributions to the total plant efficiency is a primary responsibility.
- Solidify open communication with employees and support departments
- Implement Ken's Foods organizational and operational principals
- Conduct regular communication meetings with Team Leaders and production team to recognize successes, reviews action plans to resolve open issues

Requirements

- High speed packaging/bottling experience
- Bachelor's degree (B. S.) from four-year College or university
- Excellent verbal and written communication skills
- ***Experience with Lean Manufacturing, (Kaizen, 5S Six Sigma) practices is strongly encouraged.***

Education and/or Experience

- Bachelor's degree from four-year College or university; or one to two years' related experience and/or training; or equivalent combination of education and experience.

3.1.9 MEDTRONIC INC

Packaging Engineer Intern

Description

- Assists with the design, development and testing of packages, packaging materials, packaging systems, transportation, and handling systems for medical devices.
- Ensures that packaging, labeling layouts and processes are error-free, operator-friendly

Position Responsibilities

- Assist with development and implementation of improved packaging for existing medical devices with focus on performance and cost effectiveness.
- Help in evaluation of materials, design, and configuration of primary, secondary, and other packaging to optimize customer benefit and supply chain requirements.
- Develop/revise packaging specifications.

Basic Qualifications

- Bachelor's degree (or near degree completion) in packaging or other related engineering, discipline (plastics engineering, mechanical engineering, biomedical engineering, etc.)
- PC skills, word processing, spreadsheets, etc. Computer Aided Design (CAD) knowledge and experience (AutoCAD/Solid works).
- Effective verbal and written communication, analytical, influencing and interpersonal skills. Must be able to communicate at all levels.

Desired/Preferred Qualifications

- Interest in developing knowledge of packaging and labeling design, test methods, verification/validation, various statistical tools, and protocol/report preparation.
- Any previous engineering experience in a GMP, disposable medical device environment.
- Knowledge of single uses and terminally sterilized medical devices.
- ***Able to incorporate LEAN-manufacturing concepts.***

3.1.10 NORTH AMERICAN BREWERIES

Sustainability Intern

Description

RIT School of Engineering Technology and/or Packaging Science: Internship opportunities at the Genesee Brewing Company in Rochester, New York

the Genesee Brewing Company has been in business since 1878. We currently produce a wide array of beers and flavored malt beverages for our own proprietary brands as well as for our contract partners.

Position Summary

The Operations Team, and North American Breweries as a whole, is committed to becoming a more responsible corporate citizen by developing a Sustainability Plan consistent with the goals established by other like-minded industries. The deliverable of this position will be to provide a Sustainability Plan and Sustainability Report incorporating three business goals:

1. Reduce our operating costs,
2. Reduce our carbon footprint by identifying, consolidating and eliminating waste streams, and
3. Doing the right thing on behalf of our people and our community.

Qualifications

- Enrollment in bachelors or masters program in Engineering, Packaging Science, or Environmental studies
- Knowledge of statistical analysis methods
- Strong computer skills
- Excellent written/oral communication skills
- ***Basic understanding of Lean Manufacturing and problem solving skills***

Desired Major(s)

- Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt

3.1.11 SCHIFF NUTRITIONAL INTERNATIONAL

Packaging Engineer

Description

- Optimize packaging operations to minimize defects and maximize line efficiency.
- Manage projects related to packaging production operations such as line set-ups, equipment installs, and improving line efficiencies.
- Manage, provide, and define technical principles for overall equipment efficiency standards.

Duties and Responsibilities

- Work closely with plant maintenance and manufacturing departments to monitor and improve plant efficiencies.
- Implement measures to identify and reduce bottlenecks and high reject areas.
- Provide technical assistance and leadership to the Sourcing Group regarding supplier selection, material specification, and vendor technical competence.
- Provide leadership on large cross-functional packaging developments and commercialization's.

Desired Major(s)

- Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt

Knowledge and Skills

- In depth knowledge of packaging equipment, materials and testing methods.
- A demonstrated skill to anticipate and identify problems and develop methods and strategies to solve them.
- ***Understanding of manufacturing optimization principles such as TQM, SPC, Lean.***

3.1.12 SMITH & NEPHEW INC

Packaging Development Engineer

Description

- As Packaging Development Engineer you will develop and coordinate packaging projects, including product packaging design, package testing, definition of product labeling, and specification of materials to ensure proper configuration requirements.
- Responsible for ensuring that packaging for assigned product lines is functional, cost effective, and promotes the desired company image.
- Maintain an awareness of current packaging and sterilization advances and technologies relative to medical devices and/or other heal care products. This position reports to the Manager, Packaging Development.

Required Skills

- Bachelor's degree in Packaging Engineering/Science or related technical discipline.
- As a Packaging Development Engineer II, you will need a minimum of two years experience in packaging engineering/manufacturing of medical devices or healthcare product packaging; or no years experience with a Masters Degree.
- ***Lean manufacturing and/or Six Sigma methodology experience preferred.***

Desired Major(s)

- Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt.

3.1.13 SYNTHES USA

Packaging Engineer

Description

- Direct efforts to automate Packaging Department.
- Research and present programs that will eliminate human error.
- Revise integrated systems that assure complete lot control of product through packaging department.
- Provides day-to-day support to packaging department including packaging equipment, vision systems, line flow, label system and other computer-integrated systems.
- Engineer will also support the integration of inspection into packaging.

Responsibilities

- Will be the key individual in supporting the packaging environment in the Elmira facility and continuous improvements in the daily operation.
- Will interface with the Packaging Technology Group at corporate on the design and process for new and exiting packaging.
- Designs tooling for same and is key liaison between development personnel at corporate and manufacturing personnel in Elmira.

Desired Major(s)

- Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt.

Qualifications

- Five to ten years engineering experience with knowledge of product packaging and automation in a medical manufacturing environment.
- Previous experience with designing of automated loading systems is required.
- Must be a self-starter with demonstrated project and organizational skills and a sound foundation in FDA/GMP regulations.
- ***Previous working experience in Lean Manufacturing, Value Stream Mapping and Six Sigma required.***

3.1.14 TEVA PHARMACEUTICALS

Packaging Engineer

Overview

Teva Pharmaceuticals USA is the leading global generic pharmaceutical company employing 26,000 people worldwide. The company's aggressive growth strategy has positioned Teva as a top 20 global pharmaceutical company with plans to be Top 10 in the coming years. Teva is the largest manufacturer and distributor of pharmaceuticals in the world.

Responsibilities

- Responsible for designing, developing and testing a wide variety of equipment and packaging used for protection, display and handling of products.
- Demonstrates advanced knowledge of package Engineering principles and techniques
- Demonstrates advanced knowledge of legal requirements and documents
- Independently designs, prototypes and qualifies moderately-complex new packaging concepts

Qualifications

- Bachelors degree in related field required
- Ability to train and coach others from technical expertise
- Experience in managing multiple projects on a schedule
- Working knowledge of all forms and applications of Pharmaceutical packaging
- Working knowledge of ISTA, ASTM test procedures as related to Pharmaceutical packaging
- Knowledge of Serialization and anti counterfeiting guidelines and implementation
- ***Working knowledge and expertise with ISO, FDA, and international requirements applicable to Oral solid dose bottle and blister packaging***
- ***Green or black belt Knowledge of lean packaging***

Desired Major(s)

- Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt

3.1.15 DANNON COMPANY

Packaging Engineer

Description

The Packaging Engineer will manage Packaging projects from concept phase through commissioning. This person will interact with plant teams, Packaging equipment, packaging vendors and R&D. This individual will participate in requisition and management of capital authorization requests and is accountable for project spending and provide technical and management expertise on engineering projects as assigned by the Plant Engineer.

Position Summary

- Coordinate and direct the activities of the necessary resources within the plant, outside the maintenance and engineering department for the completion of projects through the necessary plant management and supervisory personnel.

Qualifications

- Bachelor of Science/ Engineering (Mechanical, Packaging)
- Strong financial and analytical skills
- Basic skills in AutoCAD, MS Project, and other business software
- Ability to lead multiple projects simultaneously, to establish and react to changing priorities
- **6 Sigma knowledge**

Desired Major(s)

- Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt.

3.1.16 YOH HARRIS CORP.

Packaging Engineer

Description

- Responsible for working on a variety of package engineering projects in order to drive cost savings and development efficiency, in a fast paced growing business. Projects to include: Cost savings redesign of current packages, development of packaging solutions for new products and driving efficiencies of incoming component packaging.
- Packaging solutions to be accredited using relevant testing procedures and documented with industry standard part specifications.

Qualifications

- BS in Packaging Science
- Experience with Commercial/Industrial equipment package engineering
- Experience with multiple packaging materials including: corrugated, engineered foams and distribution packaging
- Strong knowledge of shock and vibration theory, product fragility and package testing
- Knowledge of latest sustainability trends and practices
- Military standards and packaging regulation experience a plus

In addition the individual should have exposure in:

- Product development
- ***Lean six sigma (at least green belt level)***
- Project management
- Proficient at MS office, CAD and shipping utilization SW (CAPE, TOPPS)

Desired Major(s)

- Packaging Science/IPKG Packaging Science (MS), Packaging Science/IPKM Packaging Sci-Mgmt.

3.2 UNIVERSITIES

PROCEDURES

The following three steps are for reviewing the existing Universities that offer Six Sigma Training and Certification that can help in research for the Lean Six Sigma Green Belt Certificate Program.

Step 1

- Enter the following descriptions in a search engine (i.e. Google)
- Start research using www.google.com.
- First search on Google for “lean six sigma universities”. This provided an idea about what universities can be looked into.

Step 2

- Retrieve the information about the courses
- Start researching on websites of various universities about the courses & certifications the universities provide.

Step 3

Review the following universities for Six Sigma Certification and Training

- 1) Boston University
- 2) MoreSteam University
- 3) University of Michigan
- 4) Villanova University
- 5) NC State University
- 6) Rutgers University
- 7) Motorola University
- 8) University Of Houston
- 9) Rochester Institute of Technology

3.2.1 BOSTON UNIVERSITY

Six Sigma Green Belt Training

Course description

The purpose of the 3-week Lean Six Sigma DMAIC Green Belt training is to help team leaders and team members successfully complete DMAIC and LEAN DMAIC projects. Our 3-week Lean Six Sigma Green Belt training (for service) is pulled directly from the first three weeks of our 5-week Lean Six Sigma Black Belt training (for service). This design allows you to develop Green Belts and Black Belts side-by-side, which can improve team leader and team member effectiveness and help to reduce training costs in your organization.

Who should attend?

Quality professionals and managers in a service or transactional environment, process engineers and analysts, Master Black Belts, Black Belts, and Green Belts, and any manager or professional who wants to improve the efficiency of services, processes, and the organization.

What will be achieved?

- Our unique approach to the integration of Lean and Six Sigma takes full advantage of the power of both philosophies and makes it easier for Green Belts to know what tool to use when. Based on our experience working with a variety of clients over many years, we recognize that there are two types of DMAIC projects: Typical Six Sigma DMAIC projects and Lean DMAIC projects.

Typical Six Sigma DMAIC projects are characterized by the following:

- The detailed solution is unknown
- You have tried to solve this problem before using a different method
- More advanced statistics are required
- Typically conducted in a project fashion
- Example: Reduce defects when the cause is unknown.

LEAN DMAIC projects (often call kaizen events) are characterized by the following:

- The detailed solution is unknown
- The problem can be solved by applying a known Lean approach (such as 5Ss or Just-In-Time)
- Less rigor in data collection and analysis is required
- The facilitator usually conducts the project in a blitz fashion
- Example: Reduce lead times and balance the workload

Course Outline

- WEEK 1
Cover the details of Lean and the Lean approaches Voice of the Customer (VOC)
- WEEK 2 & 3
Cover the Define, Measure, Analyze, Improve, and Control steps as well as leadership, facilitation, and change management skills

3.2.2 MORESTEAM UNIVERSITY

Lean Six Sigma Green Belt Certification

The Requirements for Green Belt Certification

- Complete the online Lean Six Sigma Green Belt Course,
- Achieve a passing score (80%) on the Green Belt final examination, and
- Complete one successful Lean Six Sigma improvement project

The Green Belt Certification Process

- **Taking the Green Belt Final Exam**

This is an online exam based on the Lean Six Sigma Green Belt Body of Knowledge.

- **Completing a Successful Project**

MoreSteam requires successful completion of one improvement project that demonstrates effective application of what you learned in your course. The project must follow the DMAIC framework and must yield improvement in a performance metric that is important to your organization's mission.

- **Starting Your Lean Six Sigma Certification**

You can start your certification at any time, although MoreSteam certification is only for students in MoreSteam's belt training courses. We recommend selecting the project during Course Sessions Two and Three on Define, and then working through your project as you progress through the course.

- **Completing Your Green Belt Certification**

Green Belt certification will take 12 months to complete (includes your training). Please note: there is no guarantee of certification. We will deny certification if you fail to pass the Green Belt exam and complete the required project work.

3.2.3 UNIVERSITY OF MICHIGAN

ONLINE SIX SIGMA GREEN BELT CERTIFICATION

Green Belt focuses on the core concepts and methods of applying the methodology within new product development process.

PROGRAM MODULES

Each module consists of one to two hours of online instruction, with an accompanying exercise. Exercises are a combination of multiple choice and data analysis problem sets. The examples used throughout the course are based on real world Six Sigma Green Belt-level projects.

1. Six Sigma Overview
2. DEFINE: Six Sigma Project
3. Six Sigma DMAIC Problem Solving Model
4. Process Mapping
5. Voice of the Customer—Collecting Data
6. MEASURE: Current State of a Process
7. Creating Check Sheets
8. Pareto Analysis
9. ANALYZE: Qualitative Process Analysis (5 Ms, P-Diagram)
10. Cause-and-Effect Diagram
11. Descriptive Statistics
12. Stratification Analysis
13. Exploring Data Patterns: Frequency, Histogram
14. Measurement Systems Analysis
15. Process Capability Analysis
16. Two Variable Analysis: Scatter Plot/Regression
17. Correlation Analysis
18. Customer Survey Analysis
19. Statistical Process Control Overview
20. Throughput Analysis
21. Improve and Control Phase
22. Applying Six Sigma Methodology—Case Study

PROGRAM PRE-REQUISITES

A basic understanding of statistical analysis methods is recommended (e.g., Six Sigma Green Belt or equivalent) and basic Microsoft Excel skills.

3.2.4 VILLANOVA UNIVERSITY

Master Green Belt Certificate in Six Sigma & Six Sigma – Healthcare

Villanova University is the world's leading provider of dynamic, online professional certificate programs in high-demand disciplines like Six Sigma. Each online certificate program provides participants critical Six Sigma and Lean skills to increase customer satisfaction, reduce variation and enhance process optimization.

This program teaches on how the unique problems in the healthcare industry can be solved using Six Sigma techniques. This proven methodology eliminates non value-added steps and reduces defects and variation; resulting in more efficient processes, better patient care and a stronger bottom line. Professionals discover how Six Sigma and Lean strategies fit into a larger management system and how to apply techniques to solve and prevent critical healthcare process issues.

Take course on Six Sigma Green Belt & earn a Master Certificate in Six Sigma – Healthcare.

Courses include:

- Six Sigma Green Belt – Healthcare
- Six Sigma Green Belt

Certification

Earn industry-recognized certifications through the worldwide leader in Six Sigma online education Villanova University.

Study

a) Theory of Six Sigma

- What is Six Sigma
- The History of Six Sigma and the Prominent People in Six Sigma
- DMAIC Methodology Overview

b) Data Collection Plans

- The Project Scope of a Team and Team Dynamics
- Teams - Paradigm Shifts
- Determining Customer Needs and Requirements
- Quality Function Deployment and the House of Quality
- Critical to Quality Tree and Kano Model

c) Data Collection Plans Part, II, III

- Calculating the Baseline Sigma
- Quincunx Process Analysis

d) Root Cause Analysis

- Basic Data Analysis and Basic Process Analysis

- The Big Picture
- Root Cause Analysis and Hypothesis Testing

e) 7M

- Measures of Central Tendency and Standard Deviation
- Determining Project Solutions
- Prioritization Matrix
- Affinity Diagrams
- Metrics and 7M Tools

f) Control Charts

- \bar{X} -R
- Maintaining Solutions
- Introduction to Control Charts and Their Construction
- \bar{X} -R Chart and Pre-Control
- Attribute Charts - p Charts

g) Process Capability

- Process Capability
- Distributions and Reliability
- Weibull Distribution, Chi Square Distribution and Multi Variables
- Point and Interval Estimation
- FMEA and DOE

h) Other Tools and Techniques

- Design of Experiments
- Building Charts

3.2.5 NC STATE UNIVERSITY

Lean Six Sigma Green Belt

NC State University offers training and certification for Green Belts, Black Belts and Master Black Belts. Each belt level has several requirements for certification.

About

Lean Six Sigma Green Belt training will introduce you to the Lean Six Sigma philosophy and terminology and give you the tools you need to complete your Green Belt certification project. This course uses a combination of lectures, presentations and hands-on lab exercises to provide you with a strong foundation in Lean Six Sigma.

This two-week course comprises the entire Green Belt training program, and serves as the first two weeks of Black Belt training. This format allows Green Belts and Black Belts to train together, creating atmosphere similar to the work environment, where Green and Black Belts work together on Lean Six Sigma project teams.

You Will

- Understand why organizations benefit from Six Sigma
- Understand the Green Belt's role and responsibility in Lean Six Sigma efforts
- Learn the DMAIC problem solving method
- Learn the tools needed for project completion
- Learn how to use JMP™ as a statistical tool in conjunction with Lean Six Sigma

A certificate will be awarded to each person who completes the training and passes the test given on the last day of the course. Certification requires the completion of a project, which takes place in your company.

Green Belt Certification Requirements

- Complete 2-week training course
- Pass course examination
- Complete a Lean Six Sigma project at your organization
- Submit an Application for Certification
- Submit your project and presentation for review
- Members of the Six Sigma Team and management at your Organization will review your project. Once the review process is complete, you will be awarded your Green Belt certification

3.2.6 RUTGERS UNIVERSITY

Lean & Six Sigma Green Belt Training

Program Overview

The Rutgers-Lockheed Martin Green Belt course is representative of a week long Kaizen Event. Participants actively learn the tools of process improvement and are provided the opportunity to put these skills to use in a dynamic real-time environment. Participants also engage in role playing in various capacities and team building exercises to further solidify their knowledge and the applicability of Lean & Six Sigma processes.

Green Belt Curriculum

- Basic Statistical Tools
- Integration of Six Sigma and Lean Enterprise
- Effective Project Selection and Sizing
- Methodology, Strategy and Infrastructure for Deployment of LSS
- Identifying Customer Wants, Needs, and Desires Process Flowcharting and Mapping
- Process Capability and Process Performance
- Lean & Six Sigma Quality Levels and Metrics
- 8 Step Path to Operating Excellence
- Roles & Responsibilities of Key Players
- Kaizen Event Management
- Cycle Time, Delay Time, Queue Time, Lead Time
- Root Cause Analysis (5 Why's and Fishbone) and Mistake Proofing

Lean & Six Sigma Green Belt Certification

To become a “Certified” Lean & Six Sigma Green Belt professional, candidates must:

- Complete the Rutgers - Lockheed Martin Six Sigma Green Belt training course.
- Execute an Agreement with the candidate’s supervisor or project sponsor.
- Demonstrate knowledge of the Lean & Six Sigma methodology and tools by passing the Green Belt Certification exam (based on the Rutgers/Lockheed Martin Green Belt training).
- Apply Lean & Six Sigma tools and methodology via the timely and successful completion of one project with measureable outcomes.
- Submit to the Rutgers Certification Board the candidate’s Lean & Six Sigma Notebook which includes:
 - a. documentation on the tangible and measurable results achieved on the project
 - b. demonstration of the ability to analyze and problem-solve while conducting the project
 - c. demonstration of the appropriate use Lean & Six Sigma tools in project
 - d. demonstration of the appropriate use of facts and data to guide decisions and actions
 - e. demonstration of change management and project leadership skills throughout the project team
 - f. the use of appropriate sustainability methods to the project for turnover to the organization.
- Present a 30-minute overview of the project to the Certification Board and supervision.
- The Candidate must submit the project Notebook to the Certification Board no later than

8 months after beginning the Rutgers' Green Belt certification process.

Pre-Requisites

- Prior completion of the Rutgers - Lockheed Green Belt Training Program; within one year
- Employment in a position of responsibility that allows for the participation/leadership in a lean project
- Support from your direct supervisor

3.2.7 MOTOROLA UNIVERSITY

GREEN BELT PROGRAM

The Green Belt program is a five-day program for developing Six Sigma practitioners in the DMAIC framework.

Green Belt – GB

The GB Program provides participants with an overview of Six Sigma as well as key concepts associated with effective project teams. In this Six Sigma program, Green Belts receive a subset of the more comprehensive Black Belt curriculum.

Green Belts learn

- A structured problem-solving methodology for addressing business improvement projects
- Intermediate-level quality tools within that methodology
- How to generate bottom-line financial results
- Use Sigma XL to enhance analysis for process improvement projects

The program focuses on the DMAIC model for process improvement and the relevant intermediate-level statistical and graphical tools within that model.

Green Belt Certification

Formal Six Sigma certification has become a valuable credential in the marketplace. Certification illustrates that candidates have done more than merely complete the training - it means they have truly demonstrated comprehension and application of the Six Sigma methodology, tools, and techniques.

3.2.8 UNIVERSITY OF HOUSTON

Six Sigma Green Belt Training

Those responsible for leading their own quality improvement projects or assisting others (such as Black Belts) with larger projects.

Course Description

This course provides training on how to use the Six Sigma DMAIC (Define, Measure, Analyze, Improve, and Control) process for projects within your organization. Lecture topics include many proven Six Sigma problem-solving methods and basic statistical tools, which are reinforced through hands-on learning exercises. As part of the training course, participants are required to complete a quality improvement project.

Topics Covered

- Six Sigma overview
- Defining problems
- Cost of quality
- Process mapping
- Cause and effect diagramming
- Data collection
- Check sheets
- Pareto charts
- Run charts
- Histograms
- Introduction to MINITAB®
- Graphical analysis
- Basic statistics (box plots, scatter diagrams, stratification and variation)
- Introduction to design of experiments, SPC and trends

Certification

A certificate will be awarded to each participant who completes the training and passes the test given on the last day of the course. Full certification requires the completion of a project, which takes place in your company. After the completion of your project, a project review can be scheduled in which Six Sigma Program instructors travel to your location to validate your work.

3.2.9 ROCHESTER INSTITUTE OF TECHNOLOGY

Lean Six Sigma Greenbelt Certification Program

Participants will gain in-depth exposure to each topic through classroom assignments and structured exercises within team environments.

Green Belt Training Program

- Lean and Six Sigma overview
- Management's responsibility
- Selecting key projects with leadership support
- Estimating project value to organization, timing to complete and the resources required
- Assigning accountability
- Selecting training participants
- Managing the projects

Green Belt Training

The Green Belt training program is presented one day a week for consecutive twelve weeks. This program is led by a Lean Six Sigma expert instructor and will involve participants in extensive interactive training.

Green Belt Project

Each Green Belt training program participant is required to complete a project of significant value to their organization. These projects require the completion of a Project Charter that describes the project, details the objectives, lists the project's team members, and includes an estimate of all project costs and a comprehensive project timeline.

Program Benefits to Corporations – Green Belt Efficiency Experts Provide Increased Knowledge of Quality Improvement Systems

The main benefits of implementing the RIT CQAS Green Belt training program include the elimination of waste, profit improvement, profit development cycle reduction and overall process improvement.

The RIT CQAS Green Belt program provides in-depth data analysis tools and processes to fully implement the Lean Six Sigma problem solving process that generates superior data driven solutions, productive yield and dramatically improved bottom-line results.

3.3 INSTITUTES

PROCEDURES

The following three steps are for reviewing Institutes that offer Six Sigma Training and Certification that can help in research for the Lean Six Sigma Green Belt Certificate Program.

Step 1

Entered the following descriptions in a search engine (i.e. Google)

- Started research using www.google.com.
- First search on Google was for “*lean six sigma certification*”. This provided an idea about what institutes can be looked into.
- Second search was for “*lean six sigma institutes*”.

Step 2

- Retrieved the information about the institutes
- Started researching on websites of various institutes about the courses & certifications they provide.

Step 3

Review the following institutes for Six Sigma Certification and Training

- 1) Aveta Business Institute
- 2) ASQ
- 3) Six Sigma. US
- 4) Acuity Institute
- 5) BMG University (BMGI)

3.3.1 AVETA BUSINESS INSTITUTE

Six Sigma Green Belt Training

Six Sigma Green Belt Training curriculum rivals that of the American Society for Quality (ASQ) standard of certification for Green Belts. As a Six Sigma Online Green Belt training graduate, you will not only improve your career, but change all aspects of your life.

Overview

Six Sigma Green Belt training provides participants with enhanced problem-solving skills, with an emphasis on the DMAIC (Define, Measure, Analyze, Improve and Control) model. Six Sigma Green Belt certification helps the employee serve as a trained team member within his or her function-specific area of the organization. This focus allows the Green Belt to work on small, carefully defined Six Sigma projects, requiring less than a Black Belt's full-time commitment to Six Sigma throughout the organization.

The Green Belt has two primary tasks: first, to help successfully deploy Six Sigma techniques, and second, to lead small-scale improvement projects within their respective areas. As a support population, Green Belts can do much of the legwork in gathering data and executing experiments in support of a Black Belt project. During the Six Sigma Green Belt Training you will learn how to use many of the Six Sigma problem-solving methods and statistical tools to contribute to the success of your organization.

Six Sigma Green Belt Training is ideal for anyone looking to get the most out of their career. Students will learn how to apply statistical methods for business process improvements like:

- Communicating a business strategy across the organization
- Integrating with Lean Manufacturing, TOC, & other improvement methods
- Applying the DMAIC improvement process
- Selecting successful Six Sigma projects and project teams
- Planning and executing projects
- Significantly increasing profitability through Six Sigma projects

Green Belt Certification Requirements

- Successful passing of 8 online exams with a 70% or higher
- Program completion within 1 year (extensions available free of charge, upon request)

3.3.2 ASQ

Six Sigma Green Belt Certification

The Six Sigma Green Belt operates in support of or under the supervision of a Six Sigma Black Belt, analyzes and solves quality problems and is involved in quality improvement projects. A Green Belt is someone with at least three years of work experience who wants to demonstrate his or her knowledge of Six Sigma tools and processes.

Required Experience

The Six Sigma Green Belt requires three years of work experience in one or more areas of the Six Sigma Green Belt Body of Knowledge.

Minimum Expectations for a Certified Six Sigma Green Belt

- Operates in support of or under the supervision of a Six Sigma Black Belt
- Analyzes and solves quality problems
- Involved in quality improvement projects
- Participated in a project, but has not led a project
- Has at least three years of work experience
- Has ability to demonstrate their knowledge of Six Sigma tools and processes

Examination

- Each certification candidate is required to pass a written examination.
- Local ASQ sections and international organizations conduct examinations twice a year, in June and December. All examinations are open-book.
- Each participant must bring his or her own reference materials. Use of reference materials and calculators is explained in the seating letter provided to applicants.

3.3.3 SIX SIGMA.US

Six Sigma Certification & Training

6 Sigma.us offers online, onsite and open enrollment six sigma training and six sigma certification in Green Belt, Black Belt, Master Black Belt, Champion and Lean Agent Certification.

Six Sigma

Six Sigma is a proven disciplined approach for improving measurable results for any organization. Six Sigma project success stories exist from organizations including manufacturing, service, non-profit, government, research and healthcare. The key to Six Sigma is the completion of leadership-sponsored projects. Six Sigma Certification requires completing an actual Six Sigma project.

SixSigma.us offers both live and online programs.

Lean Transformation

Lean Transformation: Lean, Lean Production, Lean Manufacturing or Kaizen. Lean is one of the most tangible and dramatic systems for achieving quick breakthrough improvements.

If you want to reduce your product or service lead time by 50% - 90% or if you want to recover valuable floor space for Customer Value Added activities you should contact us for your Cost Effective Lean training and Project Consulting needs (read more about Lean and Lean Benefits here).

Design for Lean Six Sigma (DFSS)

DFSS (Design for Six Sigma) is about developing a new product or service that is defect free. DFSS combines many of the tools that are used to improve existing products or services and integrates voice of the customer and simulation methods to predict new process and product performance.

3.3.4 ACUITY INSTITUTE

Lean Six Sigma Green Belt Certification

Acuity Institute's Lean Six Sigma Green Belt online training course is the standard for online training and certification for individuals looking to achieve Lean Six Sigma success as a Green Belt.

Course Description

Students are trained and tested on their understanding and ability to apply the tools and techniques of all elements of the Lean Six Sigma methodology. Part of the DMAIC methodology, students are taught how to integrate Lean Six Sigma into an overall approach to process improvement.

Certification

Acuity has two different Lean Six Sigma Green Belt certification options: Standard and Advanced.

- **Standard Certification - Part 1: Certification Exam** Acuity Institute's Lean Six Sigma Green Belt Certification Exam is the standard for Green Belt Certification. Upon completing Lean Six Sigma training, students will be required to achieve a passing mark of 80% or higher on the exam
- **Standard Certification - Part 2: Simulated Project** In addition to passing the Certification Exam, the successful submission of an adequately completed Simulation Project will earn students Standard Lean Six Sigma Green Belt Certification.
- **Advanced Certification:** In addition to the requirements from the Standard Certification Program, Acuity's Advanced Certification Program provides Green Belt candidates with the opportunity to demonstrate their Lean Six Sigma expertise by completing a Lean Six Sigma Green Belt project in their organization. Upon completion of their project, Green Belt candidates will submit the required documentation for Project Certification.

Key Outcomes

- Understand Lean Six Sigma and the DMAIC methodology
- Learn and apply skills in project management, process management, lean, change management, and statistical analysis
- Understand their role in a successful Lean Six Sigma deployment
- Properly scope, define and lead Lean Six Sigma projects
- Apply statistical analysis to determine the relationship between key inputs and process.

3.3.5 BMG UNIVERSITY (BMGI)

Lean Six Sigma Green Belt Training

Green Belts are a vital component to any successful Lean Six Sigma program. In addition to supporting projects and Black Belts, Lean Six Sigma Green Belts can lead their own projects, thereby boosting the financial success of the entire Lean Six Sigma program. With the addition of Lean to the Six Sigma Program, Green Belts are now, more than ever, able to contribute by leading their own Lean Six Sigma projects, as well as providing assistance to Black Belts and Lean Masters.

What you will learn

- Your role as Green Belt and how it fits within the Lean Six Sigma community.
- How to use the DMAIC methodology to scope, define and lead projects.
- How to apply Lean concepts such as 5S, waste reduction, process mapping, Value Stream Mapping and mistake proofing.
- Basic statistical analysis to determine the relationship between key inputs and process outputs.
- How to effectively manage team dynamics when working on projects.

Course Includes

- 1-year access to BMG University's online support portal (The Wizard) to access project templates and tools, view interactive lectures and take quizzes to test your knowledge.
- Access to BMGI's new series of Innovation eLearning.
- Certification exams.
- BMGI is authorized by IACET to offer 7.2 CEUs for this program.

Certification

Students achieve certification after completing a project and passing the Lean Six Sigma Green Belt exam.

3.4 PERSONNEL JOB DESCRIPTIONS

PROCEDURES

The following three steps are for reviewing and using the job descriptions in the administration process of the Lean Six Sigma Green Belt Certificate Program

Step 1

- Enter the following job descriptions in a search engine (i.e. Google) or visit website: <http://www.samplejobdescriptions.org/>
 - 1) R&D
 - 2) Advertising
 - 3) Marketing
 - 4) Sales
 - 5) Customer Service
 - 6) Accounting
 - 7) Credit
 - 8) Purchasing/Buyer
 - 9) Quality Assurance
 - 10) Warehousing
 - 11) Receiving

Step 2

- Retrieve the job descriptions from the website or Google (search engine).

Step 3

- Organize the job profiles according to the program needs and requirements.
- Attached are the various job descriptions

3.4.1 RESEARCH & DEVELOPMENT

1) Research & Development Chair

A research development manager is a person responsible for all the scientific aspects of the Lean Six Sigma Green Belt undergraduate program at RIT. He/She is also responsible for coordinating the program with the business and strategic goals of the RIT.

Duties and Responsibilities

- The research development manager has to be fully aware of whatever is happening on the scientific front of the program he/she is handling like what kind of projects should be part of the curriculum or what areas that can be considered for research in the program and ensures the research areas meet the standards of Lean Six Sigma.
- He/She has to constantly coordinate with faculties of other departments other than Packaging Sc to make sure that the research areas meet the strategic and business goals of RIT.
- He/she should be capable enough to provide relevant guidance to students in their respective researches.
- He/She is responsible for gathering information from students on their research projects on regular basis be keep himself/herself updated on the timelines for their projects.
- He/She may have to involve himself/herself in qualifying the research projects selected by students according to their relevance towards Lean Six Sigma and categorize them according to 4-credit project/8 credits thesis.
- He/she has to be regular in attending meetings with the faculties and Program Chair.

Skills and Specifications

- He/She has to be ready to work in great levels of work pressure.
- He should be a good manager and advisor.
- He has to be a good listener and a guide to students.
- He/She needs to possess strong leadership skills and sound Lean Six Sigma/Other problem-Solving Skills.

Education and Qualifications

- Bachelors and Master's degree in Packaging Science or related field.
- 7+ years Experience in Lean Manufacturing/Lean Six Sigma related projects/researches

2) Market Research Analyst

Market researcher would be responsible for collecting information about the institutes /universities that provide training on Lean Six Sigma Green Belts and companies that recruit students from Packaging Science/Lean Six Sigma Green Belt undergraduate program from RIT.

Duties and Responsibilities

- A market research analyst should conduct surveys at regular intervals for RIT students, Recruiting Companies and other Departments to benchmark the level of support for the program in the university as well as the Industry.
- He/She has to collect feedback about the program from the Industry and present it in front of the Department.
- He/She has to involve himself/herself in finding out the reasons for improper student/industry support if any.
- He/She has to do market research on the curriculum of other institutes/universities that provide training on Lean Six Sigma Green Belt to understand their strategies and ways by which it can help in improving the program in RIT.
- He/She would be responsible to gather information on the Lean Six Sigma research projects being worked on by the students and should help the students understand the relevance of their research to the industry.
- He/She has to present the market research reports to the senior management in the department.
- He/She has to attend meetings with the business development, marketing and advertising teams of the department and participate in discussions regarding what areas of research in Lean Six Sigma are currently preferred in the industry.
- He/She would be working to ensure how the improvements in the program should be initiated in order to ensure the alignment of the program with the Packaging Industry requirements and RIT goals and objectives.

Skills and Specifications

- A market researcher needs to possess excellent communication skills, both verbal and written, to be successful in this profession.
- He/She has to possess very high interpersonal skills.

Education and Qualifications

- A Bachelor's degree in Packaging Science is the minimum requirement for being a market researcher. An additional degree in marketing or research would also prove to be helpful.
- 3+ years experience in Lean Six Sigma related projects/researches

3.4.2 ADVERTISING

Advertising and Promotions Manager

This job profile entails planning and directing advertising programs and policies, producing collateral materials like posters, leaflets, conducting promotional contests/workshops at events in RIT like Imagine-RIT, New student Orientations etc and other educational events in order to create an extra interest in the Lean Six Sigma Green Belt program at RIT amongst students, Corporate Industry and other departments in RIT.

Duties and Responsibilities

- Preparing budgets and submitting estimates for event costs as part of development of plan.
- Identifying and developing contacts in the industry and departments for promotional campaigns.
- Work with sales department, department staff, industry contacts, program students and advertising agencies to estimate a roadmap for the campaigns.
- Inspecting advertising copy and layouts and edit scripts, video and audio tapes, and any other promotional material that support program.
- Gathering and organizing information for advertising campaign strategies. Selecting student volunteers for promotional strategies.
- Planning and preparing advertising and promotional presentations for various RIT technical and educational events.

Skills and Specifications

- Effectively perform administrative activities.
- Ability to convey information to others effectively.
- Critical thinking ability and financial resources management skills.
- Ability to persuade others towards importance of Lean Six Sigma for students' better understanding.

Education and Qualifications

- Bachelor's degree from an accredited institution. 3+ years experience in Lean Six Sigma /problem solving skills.
- Degree in business, marketing, economics, computing, or mathematics.

3.4.3 MARKETING

Marketing Manager

This job involves developing, establishing and maintaining marketing strategies to achieve the objectives of Lean Six Sigma Packaging Science department as well as RIT. The key role is to manage effectively the advertising, promotional and marketing activities of the program. He would evaluate the market conditions, customer research, competitor data and implements the changes in marketing plan as required.

Duties and Responsibilities

- Develop price strategies upon balancing student, stakeholders and industrial partners' satisfaction and RIT's objectives.
- Evaluate financial aspects of establishing/running the program like expenditures, budget, return-on investment and profit-loss projections, and developing and research appropriations.
- Identifying, developing, evaluating marketing strategic plans, based on knowledge of the Program, Packaging Science department and RIT's objectives, cost markup factors and market characteristics.
- Formulating, directing and coordinating marketing policies and activities to promote the program within the Packaging industry as well as among the students by working with promotion and advertising managers.
- Directing the training, hiring and performance evaluation programs of sales and marketing staff and supervise their day-to-day activities.
- Coordinate and participate in trade shows like Pack Expo etc and other promotional activities, work with faculty, advertisers, and students to market the program in the industry.
- Support the department by advising on international, national, and local factors that affect the student enrollment and industrial participation in the program.
- Initiating market research cases and analyzing their findings.

Skills and Specifications

- Extensive knowledge in every aspect of marketing strategies to achieve program, department and RIT's objectives.
- Strong understanding of market dynamics, customer and requirements.
- Willingness to travel anytime and operate in a team of professionals.
- Proven ability to create, develop, and implement strategic programs and tactics.
- Superior oral, writing communication skills with highly acquired interpersonal skills.
- Ability to grasp complex technical concepts quickly.
- Proven knowledge in market and customer research.

Education and Qualifications

- Bachelor's degree in business or marketing related field from an accredited institution.
- 5+ years in Lean Six Sigma projects.

3.4.4 SALES

Sales Manager

The job involves supervising a sales team, which introduces students and industry partners to the Lean Six Sigma Green Belt program, thereby helping the RIT and the department register good student enrollment as well as good industrial reputation and make its business more successful.

Duties and Responsibilities

- Identifying and establishing contact with prospective students and industry partners proactively.
- Maintaining contact with new and existing industry partners to advertise the program benefits to their respective organizations.
- Responding to inquiries from new and existing students as well as industry partners about any type of information related to the program.
- Consulting the senior management at RIT, Packaging Science and Lean Six Sigma Packaging Science departments and set up objectives and goals, and a plan of action about how to achieve them.
- Must be in touch with the industry partners and also build new relations with potential partners.
- Work closely with other departments, especially the marketing and account department, to figure out an effective sales strategy that will boost sales through the program.
- Set a budget and ensure that all the work takes place without exceeding the budget.
- Deliver presentations on the Lean Six Sigma Green Belt program at conferences, Partners sites and exhibitions like Pack Expo.
- Monitoring and reporting the potential industry partners and competitor activities and identifying business threats and opportunities.

Skills and Specifications

- Have exceptional communication and interpersonal skills.
- Must be persuasive, well mannered and have good negotiation skills.
- Able to motivate his team and must be a good leader.
- Have a sound knowledge on Lean Six Sigma Green Belt.

Education and Qualifications

- Needs to have a commerce background.
- Master's degree in business management with specialization in sales and marketing.
- 5+ years experience in Lean Six Sigma Green Belt Projects.

3.4.5 CUSTOMER SERVICE

Department Service Manager

It is a highly focused position to ensure that the department understands and satisfies students', RIT, and industrial requirements. He/she would help in developing customer service policies and procedures for the department and handle face-to face complex/general inquiries from students, RIT as well as Industrial partners if needed.

Duties and Responsibilities

- Communicating politely with the people by email, letter, face to face, and telephone.
- Handle all student, industrial partners' enquiries or complaints regarding the program.
- Conducting workshops for students to provide them with one-to-one service to answer any queries or getting their feedback on the program.
- Providing advice and help students understand the basic overview of Lean Six Sigma Green Belt in Packaging Science program.
- Maintaining accurate and timely records of correspondence or discussions with the students, faculties, Industrial Partners etc.
- Training department service student employees as well as staff to deliver excellent customer service.

Skills and Specifications

- Politeness, confidence, tact, patience, politeness, and diplomacy while dealing with complex problems.
- Motivational, listening, and problem-solving skills.
- Ability to produce creative ideas to ameliorate customer service standards.

Education and Qualifications

- Degree in Consumer studies, Business studies, or Management studies related field from an accredited institution. Experience in customer service management related activities.
- 4+ years experience in Lean Six Sigma related projects/researches.

3.4.6 ACCOUNTING

Accounting Specialist

The Accounting Specialist will provide accounting support to major financial accounting areas, including the accounts payable desk, general ledger accounting, and account reconciliation.

Duties & Responsibilities:

- Provide timely and accurate payment processing by processing accounts payable checks bi-weekly.
- Input credit and debits to the accounting system in support of the payables work.
- Develop and maintain reports and files on the Accounts Payable processing.
- Input general ledger entries for account changes.
- Develop and maintain reports and files on asset and liability account balances.
- Develop and maintain regular reports via the department's and RIT accounting system.
- Compiles and sorts documents, such as: invoices, work orders, checks, vouchers, and substantiates business transactions.
- Verifies and posts details of business transactions, such as: funds received and disbursed; totals accounts to ledgers or computer spreadsheets and databases.
- Investigates problems that vendors or purchasing agents have with obtaining payment for bills.
- Prepares vouchers, invoices, checks, account statements, reports, and general ledger accounts with various registers; extracts general ledger information; compiles cost revenue reports, and balance sheets; reconciles bank statements.
- Coordinates for ordering periodic and as needed inventory of office equipment and supplies; generates purchase orders for new equipment or arranges for surplus equipment to be removed from premises.
- Complies with all State and University policies.

Skills and Qualifications

- Bachelor's degree in Finance/Accounting.
- 3-5 years related experience and training.
- Able to write routine reports and correspondence.
- Able to speak effectively before department or RIT finance department officials.
- Able to add, subtract, multiply, and divide in all units of measure, using whole numbers, common fractions, and decimals.
- Able to compute rate, ratio, and percent.
- Able to apply common sense understanding to carry out instructions furnished in written, oral, or diagram form.

3.4.7 CREDIT

1) Credit Specialist

The core function of this role would provide a wide range of credit sales support services to assigned team of Credit Advisors for the department.

Duties and Responsibilities

- Assists in the financial analysis, credit underwriting and approval process on the department.
- Identifies cross sell opportunities, prepares credit approval packages, annual reviews, renewals of credit, credit proposals and coordination of document preparation and closings with the RIT finance department.
- Coordinates credit and loan portfolio administration support such as monitoring past dues, document exceptions, collateral value monitoring, and covenant compliance for the Lean Six Sigma Green Belt Packaging Science Department.

Skills & Specifications

- Bachelor's Degree in Accounting, Finance or Business major preferred.
- Strong consumer credit knowledge and basic advisory credit knowledge
- Strong knowledge of traditional bank products and services including deposits, credit cards, mortgages, etc.
- Strong computer skills.
- Flexible; readily adapts to change and new systems or methods.
- Strong oral and written communication skills, Word, Excel and Power Point.

2) Credit Manager

To be selected, the successful applicant must demonstrate an aptitude for managing and sustaining client relationships. Accounting firm, law firm or consulting industry experience preferred. CE area experience is a plus.

Duties and Responsibilities

- The Credit Manager will be responsible for all aspects of credit and accounts receivable including:
 - I. Credit analysis & reports
 - II. Leadership & ownership & full responsibility
 - III. Establishing credit lines & monitoring
 - IV. Maintaining credit insurance & strong negotiation skills
 - V. Clear report to top managers on a timely manner
 - VI. Collections & strategy planning of control
- Skillful communication with sales team & RIT finance department.
- Deduction tracking & reconciliation.
- Enforces credit policy and assure adherence to accepted standards.

Requirements

- Bachelors Degree in Finance, Accounting, or Business Management.
- Energetic, detailed oriented, able to adhere deadlines on a timely manner.
- Strong communication skills for negotiation & reconciliation.
- Leadership & control work policy.
- Microsoft Excel and Word proficiency required, SAP plus.
- 6+ years of relevant credit/collections experience.
- Preferred candidate must have background in corporate credit/collections, banking, or finance as well as a history of accomplishments in the field from strong negotiation skills with detailed reconciliation result.

3.4.8 PURCHASING/BUYER

Purchasing Manager

Directs and coordinates activities engaged in purchasing and distributing office supplies, lab equipment, apparatus, PC's, machines, and other supplies within the department through direct reports.

Duties and Responsibilities

- Representing the department in RIT purchasing department, negotiating contracts and formulating policies with suppliers.
- Manage procurement for the department and relationship with RIT purchasing and finance department.
- Direct and coordinate activities of personnel engaged in buying, selling, and distributing materials, equipment, machinery, and supplies.
- Locate vendors of materials, equipment or supplies, and interview them to determine product availability and terms of sales.
- Prepare and process requisitions and purchase orders for supplies and equipment.
- Develop and implement purchasing and contract management instructions, policies, and procedures.
- Maintain records of goods and supplies ordered and received.
- Analyze market and delivery systems to assess present and future supplies availability.
- Resolve vendor or contractor grievances, and claims against suppliers.
- Accountable for business metrics (safety, quality, delivery, and cost)
- Creates Standard Operating Procedures.

Impact

- Oversee purchasing/material budget.
- Ensure cost containment levels are maintained.
- Design processes for streamlining work.
- Analyze potential areas for savings or efficiencies in supplies/equipment/machinery.

Analysis/Problem Solving

- Able to read, analyze, and interpret common scientific and technical journals, financial reports, and legal documents, including department requirements, blue prints, and technical procedures.

- Ability to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists.
- Ability to incorporate Lean principles in job duties.

Skills/Technical Skills

- Ability to apply basic algebra and geometry when calculating figures and amounts for discounts, interest, commissions, proportions, percentages, area, circumference, and volume.
- Strong Communication Skills
- Strong Negotiation/Relationship building skills
- Working knowledge of MRP and ISO standards.
- Working knowledge of traditional PC based software such as Microsoft Office.

Education

- Bachelors Degree (B.A.) in marketing, management from a four-year college or university.
- Basic understanding of Lean principles preferred.

Work Experience

- 5+ years related experience

3.4.9 QUALITY ASSURANCE

Quality Control (QC) Supervisor

QC Supervisor is responsible for validating various procedures involved in setting up and running a quality controlled Lean Six Sigma Green Belt certificate program and documenting the procedures involved during the validation.

Duties and Responsibilities

- Understands and use quality assurance specifications, standard test procedures, blueprints/drawings and other engineering specifications during the course of program.
- Performs audits in the department and document their results to analyze potential issue within the program and what can be done to remove them
- Helps the program attain quality certifications like ISO / ANSI and ensure all the quality standards of the program are in line with ISO / ANSI guidelines.
- Communicates audit findings with the department staff, program chair and faculties.
- Gets involved in setting up, use and maintaining lab equipment and apparatus– ensure timely calibration, proper maintenance etc to ensure good working condition.
- Ensures Good practices in Education are being followed in the program including curriculum, maintaining documents and student records.

Qualifications

- Bachelor's degree in Packaging Science or related field
- 3+ years experience in ISO standards or Total Quality Management.
- Experience in Lean Six Sigma / Problem-Solving skills.
- Understanding of Microsoft office applications, including Excel and Word.
- Must have good communication skills, both written and verbal.

3.4.10 WAREHOUSING

Inventory Associate

Inventory assistants are accountable for managing the inventory for the department. This profile also requires the candidate to assist in the stocktaking, monitoring inventory and keeping record of the department inventory.

Duties and Responsibilities

- Planning and implementing stocktaking and enlisting activities.
- Compiling inventory report and lists for review and records.
- Maintaining department merchandise.
- Maintaining necessary files and documents related to department.
- Inputting inventory data into computer programs for maintaining organized records and archives.
- Making checklists for assistance in checking received and shipped goods.
- Assisting in packaging and shipping of inventory in the department.
- Reporting any discrepancies or damage in stocks to the inventory manager.
- Making reports and analysis and recommending suggestion for improving efficiency.

Skills and Specifications

- Knowledge of cataloguing inventory techniques and packaging of goods.
- Ability to effectively manage time and meet necessary targets.
- Should possess basic technological knowledge and the ability to operate a PC.
- Ability to work independently and coordinate with other departments of the organization.

Education and Qualifications

- Certification or diploma in the field of accounting, bookkeeping, invoicing or data processing.
- 2+ years work experience in inventory management activities.

3.4.11 RECEIVING

Receiving Supervisor

A **Receiving Supervisor** in the department would control the department's storehouse and allocation and office supplies. This role is typically that of administration and organization and overseeing the smooth functionality of all activities and the compliance of norms related to the same.

Duties and Responsibilities

- Coordinate with suppliers on delivery of apparatus needed for labs.
- Maintaining and overseeing the records of all received packages and office supplies.
- Organizing the shifts and delegating work to subordinates.
- Verifying received materials with the invoice orders.
- Ensuring the compliance of safety norms in the department.
- Synchronizing with RIT Mail Department on the subject of shipments and delivery of orders.
- Ensuring the compliance of all legal and completion of necessary paper work for the receipt of office supplies, mails and packages.
- Coordinating activities with the purchase department of RIT.

Skills and Specifications

- Should have strong communication skills and the ability to use a PC.
- Strong interpersonal skills and the ability to efficiently network and coordinate processes with suppliers.
- Ability to coordinate well with administrative departments of RIT as well as Mail Department.
- Good decision-making abilities and leadership and motivational skills.

Education and Qualifications

- Bachelor's degree in logistics, warehousing, supply chain management etc.

4.0 DATA ANALYSIS

In the Data Analysis section of the research project, analysis will be performed on three important areas:

- 4.1 The survey results from the Industrial Advisory Board and Packaging Companies will be analyzed to speculate the industrial support to this certificate program “Green Belt in Lean Six Sigma in Packaging Science.”
- 4.3 A Failure Modes and Effects Analysis (FMEA) will be done to evaluate the difference between a certificate program, which follows accreditation guidelines and QAP (Quality Assurance Procedures), and a certificate program with no accreditation guidelines and no QAP.
- 4.3 The documented research methodology will be analyzed for researching, collecting and documenting the information with corresponding to the appropriate clauses specified in ANSI (American National Standards Institute Inc.) guidelines in order to earn accreditation in the future for the certificate program.

4.1 SURVEY ANALYSIS

In order to perform the analysis on the Survey Results, Bloom's Taxonomy would be used. Data Analysis will be performed for each question followed by the Total Analysis of the results.

BLOOM'S TAXONOMY

It is a classification of learning objectives within education. It refers to a classification of the learning objectives that educators set for students.

It divides educational objectives into three "domains":

- **Cognitive:** Skills around knowledge, comprehension, and critical thinking of a topic.
- **Affective:** Skills around the awareness and growth in attitudes, emotion, and feelings.
- **Psychomotor:** Skills around the change and/or development in behavior and/or skills

In the research project while analyzing the Survey results, Cognitive domain would be used.

There are six levels in the Cognitive domain:

- **Factual Information (Knowledge):** It involves providing information by recalling facts, terms, basic concepts and answers in terms of terminology, specific facts, criteria, categories, classifications etc

Taking an example from the Survey Results

For Q1: A Green Belt's problem solving skills are essential in the Globalized Packaging Industry

Factual Information: *of the people who completed the survey in Industrial Advisory Board (IAB) and Industry Partners*

IAB: Agree + Strongly Agree: 92% approx: Number of Respondents: 11 out of 12

- **Comprehension:** It involves demonstrating the understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas when analyzing results.

Taking an example from the Survey Results

For Q1: A Green Belt's problem solving skills are essential in the Globalized Packaging Industry

Comprehension: *It means that the packaging industry is observing the fact that Green Belt problem solving skills are essential to the packaging industry and for global competition.*

- **Application:** It involves using new knowledge to solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.

Taking an example from the Survey Results

For Q1: A Green Belt's problem solving skills are essential in the Globalized Packaging Industry

Application: *It is evident from the charts that majority of the IAB members and Industry Partners support Green Belt problem solving skills as an essential to the packaging industry and thus can help the packaging industry grow in terms of optimization of operations, manufacturing, elimination of waste, in a global economy.*

- **Analysis:** It involves examining and breaking information into parts by identifying motives or causes. Also making inferences and finding evidence to support generalizations.

Taking an example from the Survey Results

For Q1: A Green Belt's problem solving skills are essential in the Globalized Packaging Industry

Analysis: *The variability in the results between the IAB and Industrial partners can be attributed to the fact that the industry survey has not gone just to the packaging people but also to the people from departments like Marketing, Procurement, HR etc who may not think Green Belt as an essential part of the industry may be due to lack of knowledge or may be due to the fact that it is not that important in their field of expertise.*

Conclusion

The above mentioned four levels of Cognitive Domain can help analyze the Industrial Support to the Lean Six Sigma Green Belt undergraduate program in a better way so that the Data Analysis delivers the required information.

- **Create (Synthesis):** It involves compiling information together in a different way by combining elements in a new pattern or proposing alternative solutions like derivation o a set of abstract relations
- **Evaluation:** It involves presenting and defending opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria
 - Judgments in terms of internal evidence
 - Judgments in terms of external criteria

While analyzing the survey results the first four levels will be concentrated upon. The last two levels (Create & Evaluation) would be analyzed in the total analysis section of the data analysis.

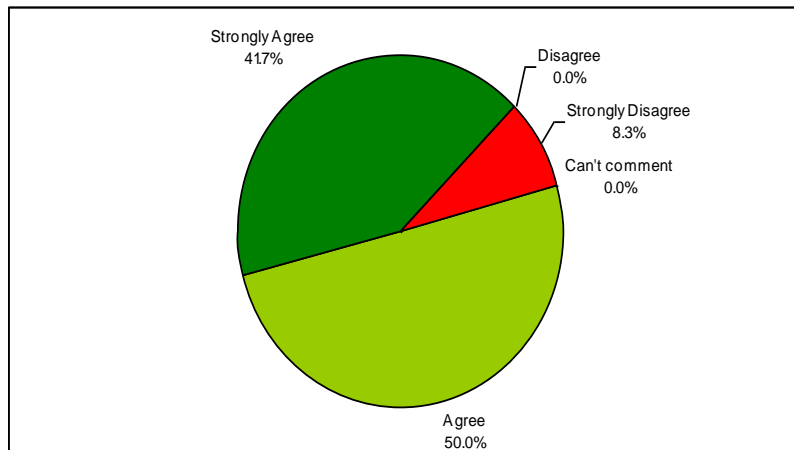
Q1) *A Green Belt's Problem Solving Skills are essential in a Globalized Packaging Industry.*

ANALYSIS

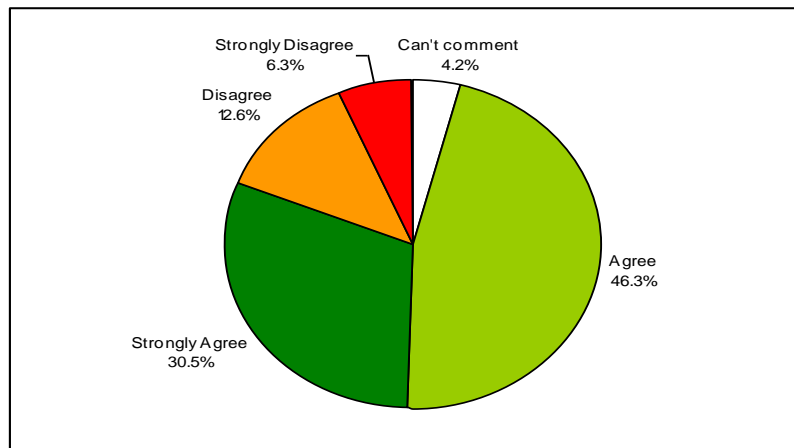
a) Factual Information

Of the people who completed the survey in Industrial Advisory Board (IAB) and Industry Partners

- **IAB:** Agree + Strongly Agree: ~ 92%: Number of Respondents: 11 out of 12



- **Industry Partners:** Agree + Strongly Agree: ~ 77%: Number of Respondents: 73 out of 95



b) Comprehension

It means that the packaging industry is observing the fact that Green Belt problem solving skills are essential to the packaging industry and for global competition.

c) Application of Information

It is evident from the charts that majority of the IAB members and Industry Partners support Green Belt problem solving skills as an essential to the packaging industry and thus can help the packaging industry grow in terms of optimization of operations, manufacturing, elimination of waste, in a global economy.

d) Analysis

The variability in the results between the IAB and Industrial partners can be attributed to the facts:

- The industry survey has not gone just to the packaging people but also to the people from departments like Marketing, Procurement, HR etc who may not think Green Belt as an essential part of the industry may be due to lack of knowledge or may be due to the fact that it is not that important in their field of expertise.
- But IAB on the other hand consists of the people with credible packaging knowledge and expertise thus they provide a clearer picture of the packaging industry.

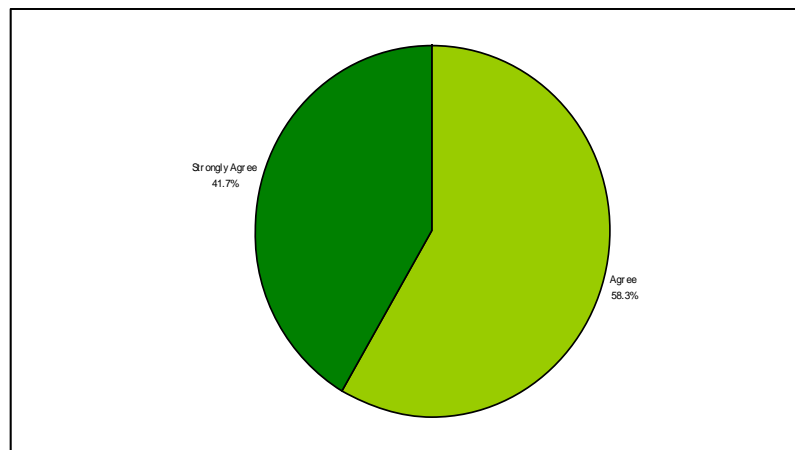
Q2) *Students who gain knowledge and can demonstrate skills as a Green Belt can ease the financial burden on hiring companies by reducing the time and resources on such areas as in training costs.*

ANALYSIS

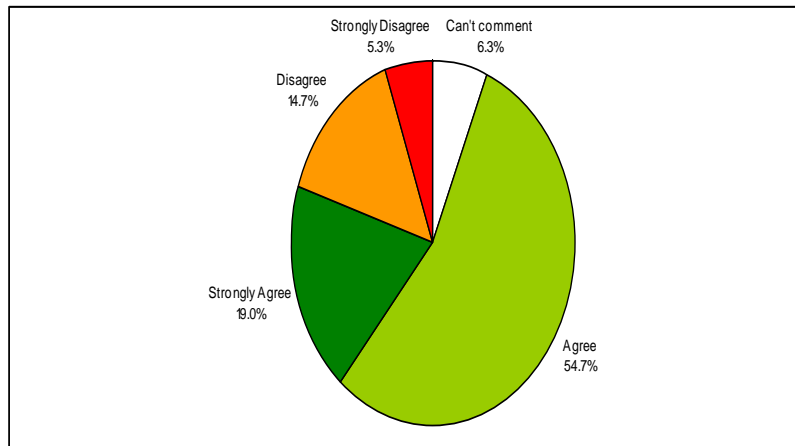
a) Factual Information

Of the people who completed the survey in Industrial Advisory Board (IAB) and Industry Partners

- **IAB:** Agree + Strongly Agree: 100%: Number of Respondents: 12 out of 12



- **Industry Partners:** Agree + Strongly Agree: ~ 74%: Number of Respondents: 70 out of 95



b) Comprehension

It means that the packaging industry supports the fact that companies hiring students with the Green Belt problem solving skills and knowledge can potentially reduce investment capital in training for the students again thus easing a financial burden on the hiring companies.

c) Application of Information

It is evident from the charts that IAB members and majority of Industry Partners agree with the fact that students who have knowledge and can demonstrate problem solving skills can ease the financial burden on hiring companies also including the time savings in terms of application of the new Green Belt skills.

d) Analysis

The variability in the results between the IAB and Industrial partners can be attributed to the facts:

- The Industry survey has gone to several industry partners who may think that they still have to incur training costs even though student has the skills because of the company's protocols or several companies may not provide training to the newly hired people at all as it is not required.
- The survey has not gone just to the packaging people within the industry partners but also to the people from departments like Marketing, Procurement, and HR etc.
- But IAB consists of the people with a credible packaging knowledge and expertise thus they provide a clearer picture of the packaging industry.

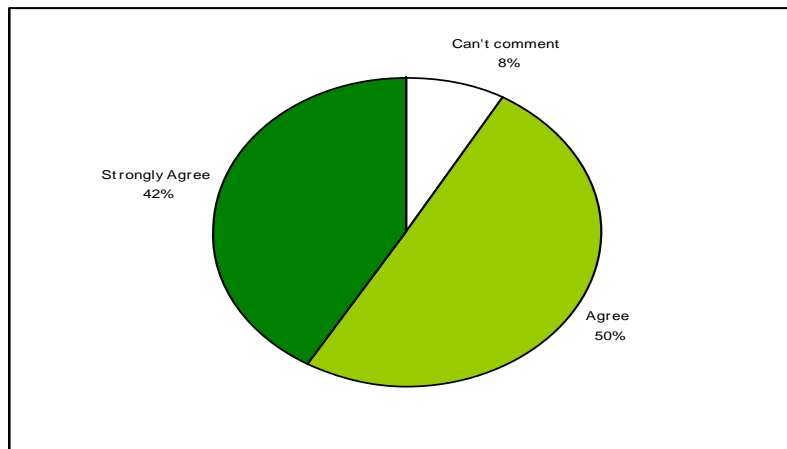
Q3) *The Packaging Science Cooperative Education experience can play a major role in developing the student's Green Belt knowledge, skills and attitude.*

ANALYSIS

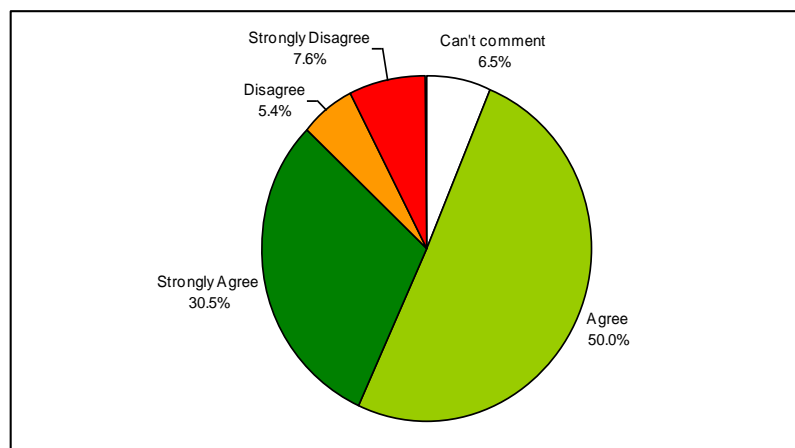
a) Factual Information

Of the people who completed the survey in Industrial Advisory Board (IAB) and Industry Partners

- **IAB:** Agree + Strongly Agree: ~ 92%: Number of Respondents: 11 out of 12



- **Industry Partners:** Agree + Strongly Agree: ~ 81%: Number of Respondents: 74 out of 92



b) Comprehension

It means that the packaging industry supports the fact that Co-op/internships play a major role in developing the student's Green Belt knowledge, skills and attitude.

c) Application of the information

It is evident from the charts that majority of Industry Partners and IAB members agree with the fact that co-ops/internship experiences acts a strong catalyst for developing Green Belt knowledge skills and attitudes among the packaging students and thus play a major role.

d) Analysis

The variability in the results between the IAB and Industrial partners can be attributed to the facts:

- The Industry survey has gone to several industry partners who may think that co-ops/internships are not much of importance to student's problem solving skills as during some of the internship experiences students may not be exposed to the projects that require application of problem solving skills or even if they are exposed, the students may just act as supports in the projects thus not impacting much on the problem solving skills.
- The survey has not gone just to the packaging people within the industry partners but also to the people from departments like Marketing, Procurement, HR etc thus may these other departments don't require application/usage of problem solving skills by the students thus those experiences not play a very important role in developing the Green Belt knowledge/skills among the students.
- But IAB consists of people with a credible packaging knowledge and expertise thus they provide a clearer picture of the packaging industry.

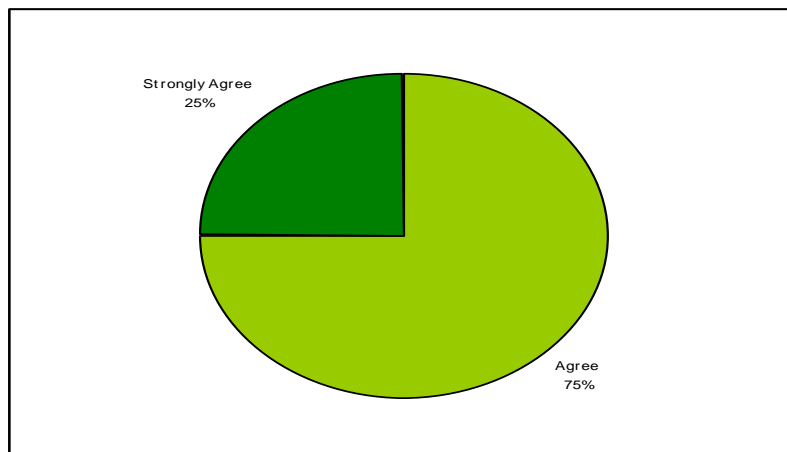
Q4) Undergraduate students who can utilize the DMAIC approach will perform more effectively and efficiently on projects assigned to them as newly hired employees.

ANALYSIS

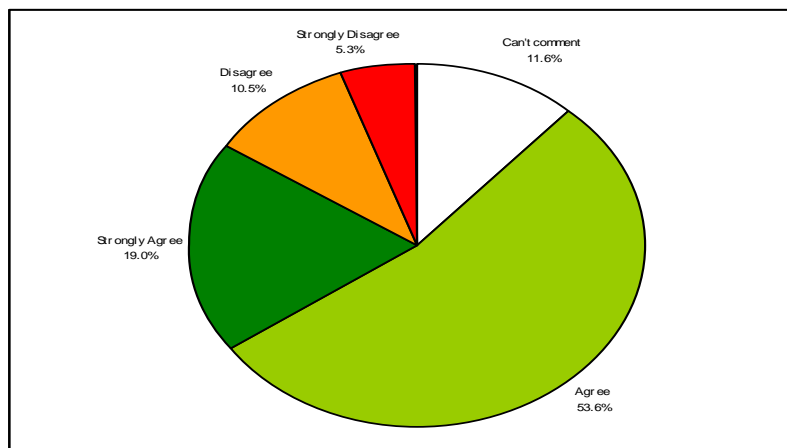
a) Factual Information

Of the people who completed the survey in Industrial Advisory Board (IAB) and Industry Partners

- **IAB:** Agree + Strongly Agree: 100%: Number of Respondents: 12 out of 12



- **Industry Partners:** Agree + Strongly Agree: ~ 73%: Number of Respondents: 69 out of 95



b) Comprehension

It means that the packaging industry observes the fact that the undergraduate students who can use DMAIC approach will perform more effectively to the projects assigned to them as new employees.

c) Application of Information

It is evident from the charts that the IAB members and majority of Industry partners support the fact that undergraduate students should be encouraged to have and use DMAIC approaches in their projects or workplace when hired as new employees.

As nowadays only the professional and graduate students are given the knowledge on problem solving skills hence undergraduate students should also be taught to understand and develop DMAIC like problem solving skills.

d) Analysis

The variability in the results between the IAB and Industrial partners can be attributed to the facts

- The Industry survey has gone to several industry partners who may think that undergraduate students not necessarily should have knowledge of DMAIC approach in order to perform on projects effectively and efficiently.
- Also they may think that having the knowledge of DMAIC approach may not fit well within the company's goals and objectives like some packaging companies don't use methodologies like Lean manufacturing, Six Sigma etc to solve the problems hence may not require new hired employees to use DMAIC approaches in their operations.
- The survey has not gone just to the packaging people within the industry partners but also to the people from departments like Marketing, Procurement, and HR etc.
- But IAB consists of people with a credible packaging knowledge and expertise thus they provide a clearer picture of the packaging industry.

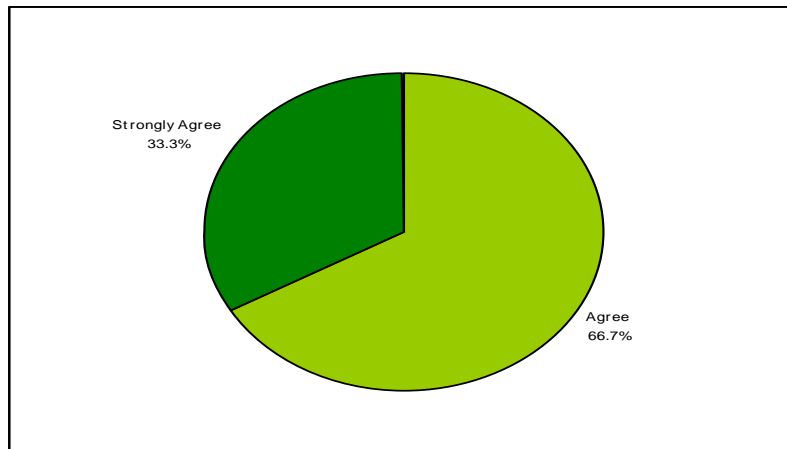
Q5) A certificate program based on ANSI accreditation guidelines will provide credible evidence as an industry professional.

ANALYSIS

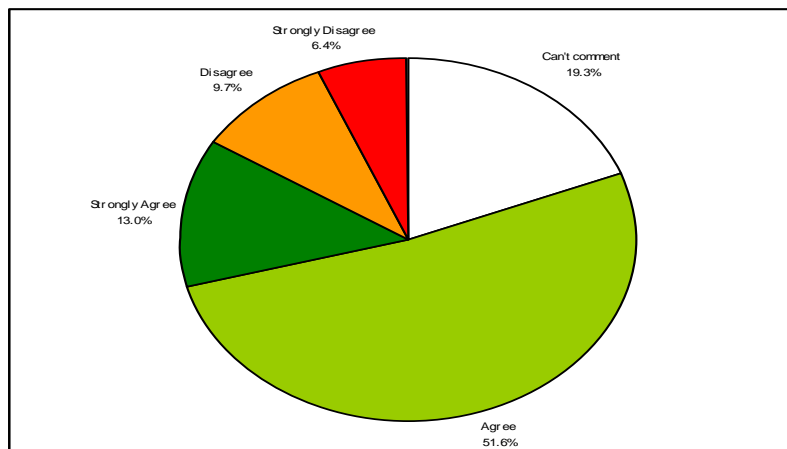
a) Factual Information

Of the people who completed the survey in Industrial Advisory Board (IAB) and Industry Partners

- **IAB:** Agree + Strongly Agree: 100%: Number of Respondents: 12 out of 12



- **Industry Partners:** Agree + Strongly Agree: ~ 65%: Number of Respondents: 60 out of 93



b) Comprehension

It means that the packaging industry observes that a certificate program based on ANSI guidelines will provide credible evidence as an industry professional because ANSI is a renowned society that helps ensuring an organization to achieve and maintain quality standards in any field and thus can be considered a credible evidence of the strong certificate program.

c) Application of information

It is evident from the charts that the IAB members and majority of Industry partners agree with the fact that a certificate program accredited from a renowned society like ANSI is a credible evidence of the sound basis of the Green Belt Packaging Science program and therefore, should be encouraged.

d) Analysis

The variability in the results between the IAB and Industrial partners can be attributed to the facts:

- The Industry survey has gone to several industry partners who may not have knowledge about the value of ANSI and the accreditation it provides. They may think that this accreditation can't be considered a credible evidence of a strong basis to a program for an industry professional.
- The survey has not gone just to the packaging people within the industry partners but also to the people from departments like Marketing, Procurement, and HR etc who may not see ANSI accreditation as an evidence of a strong credible program.
- But IAB consists of people with a credible packaging knowledge and expertise thus they provide a clearer picture of the packaging industry.

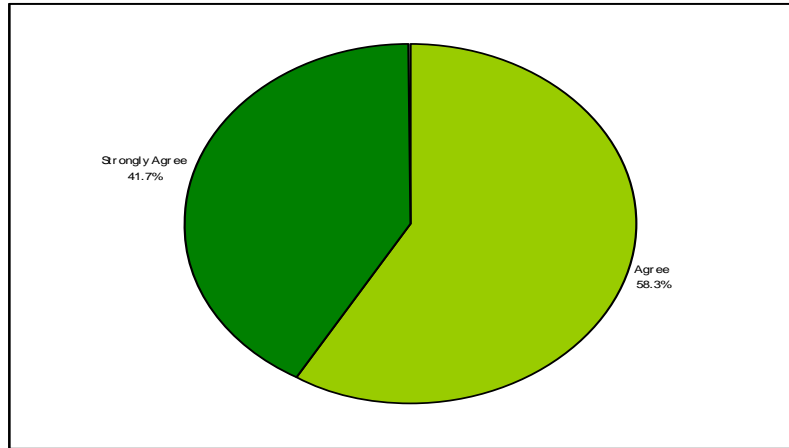
Q6) *A documented quality management system at RIT will allow the certificate program to maintain a continuum in ensuring good practices in education and sustainable development of Packaging Science program.*

ANALYSIS

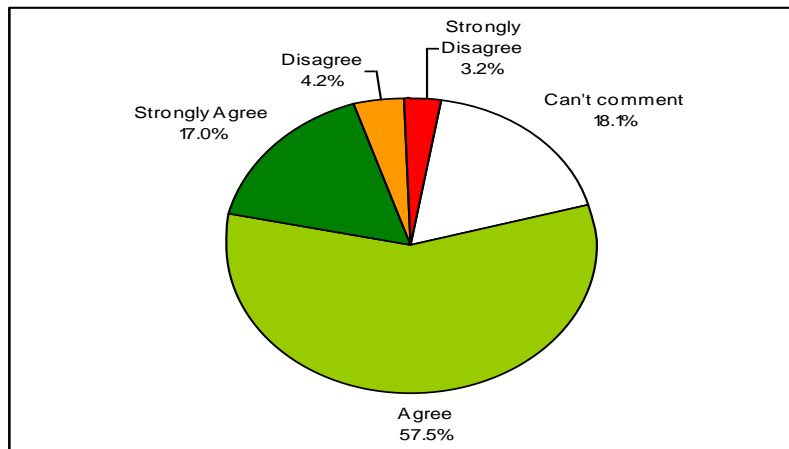
a) Factual Information

Of the people who completed the survey in Industrial Advisory Board (IAB) and Industry Partners

- **IAB:** Agree + Strongly Agree: 100%: Number of Respondents: 12 out of 12



- **Industry Partners:** Agree + Strongly Agree: ~ 75%: Number of Respondents: 70 out of 94



b) Comprehension

It means that the packaging industry supports the fact that a documented quality management system will allow the certificate program to ensure sustainable development of packaging science program.

c) Application of Information

It is evident from the charts that the IAB members and majority of Industry Partners support a documented quality management system because with having a quality management system one of the benefits can be i.e. consistency and sustainability results.

d) Analysis

The variability in the results between the IAB and Industrial partners can be attributed to the facts:

- The Industry survey has gone to several industry partners who may not support the documentation of the management system for setting up a certificate program. This may be due to the fact that those partners may have little/no knowledge about the quality management system in which a series of quality assurance procedures are documented and followed to set up a program.
- Also this system is important more to RIT itself because RIT has to ensure that they follow good practices in education and allow sustainable development of the Packaging Science program for which a quality management system can prove to be an integral step.
- The survey has not gone just to the packaging people within the industry partners but also to the people from departments like Marketing, Procurement, and HR etc who may not see Quality Management system as important in the certificate program at RIT.
- But IAB consists of people with a credible packaging knowledge and expertise and also including some members from RIT thus they provide a clearer picture of the packaging industry.

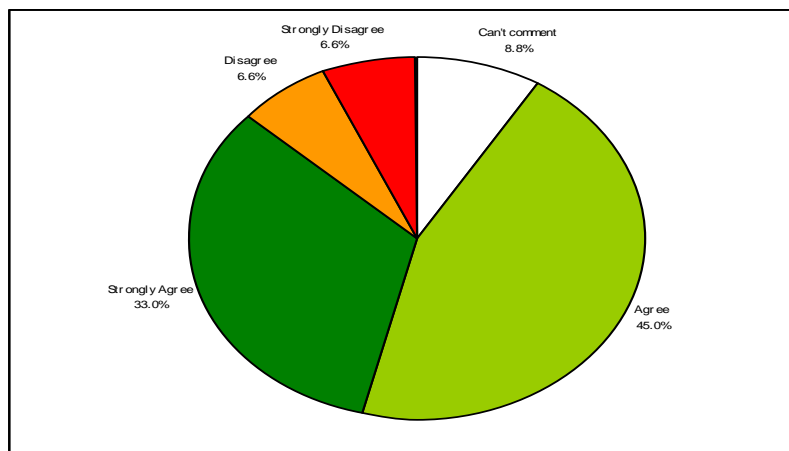
Q7) *It is a benefit to our organization if a student receives a “Green Belt in Packaging Science” certificate and can demonstrate the skills to match.*

ANALYSIS

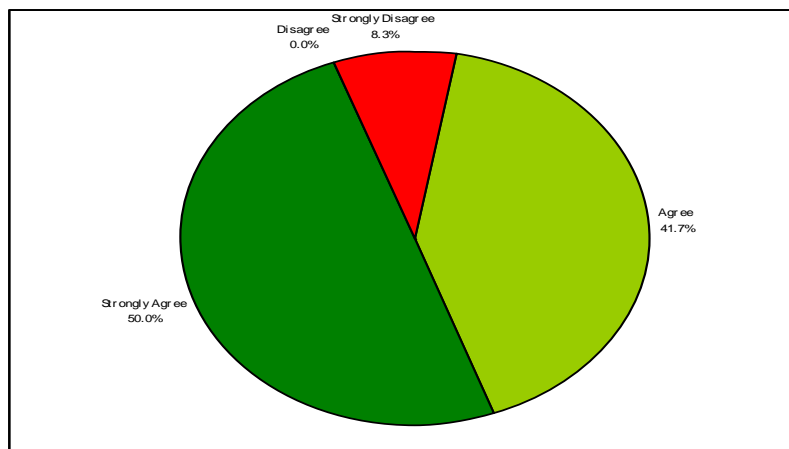
a) Factual Information

Of the people who completed the survey in Industrial Advisory Board (IAB) and Industry Partners

- **IAB:** Agree + Strongly Agree: ~ 92%: Number of Respondents: 11 out of 12



- **Industry Partners:** Agree + Strongly Agree: ~ 78%: Number of Respondents: 71 out of 91



b) Comprehension

It means that the packaging industry supports the fact that it is a benefit to their respective organization if a student receives a Green Belt in Packaging Science and can demonstrate the skills to match.

c) Application of Information

It is evident from the charts that the IAB members and majority of Industry Partners support a that it is benefit to their respective organizations if the student earns a Green Belt in Packaging Science and can demonstrate the skills to match because it will save the company from investing in trainings and time delay in application of knowledge to the real life situations by the new hired employees.

d) Analysis

The variability in the results between the IAB and Industrial partners can be attributed to the facts:

- The Industry survey has gone to several industry partners who may not require knowledge of Green Belt problem solving skills in their work place because of less applications/exposure to projects related to cost reduction, process optimizations, lean manufacturing, elimination of waste etc.
- The survey has not gone just to the packaging people within the industry partners but also to the people from departments like Marketing, Procurement, and HR etc who may not see the application of Green Belt knowledge as a sound approach in their work environment.
- But IAB consists of people with a credible packaging knowledge and expertise thus they provide a clearer picture of the packaging industry.

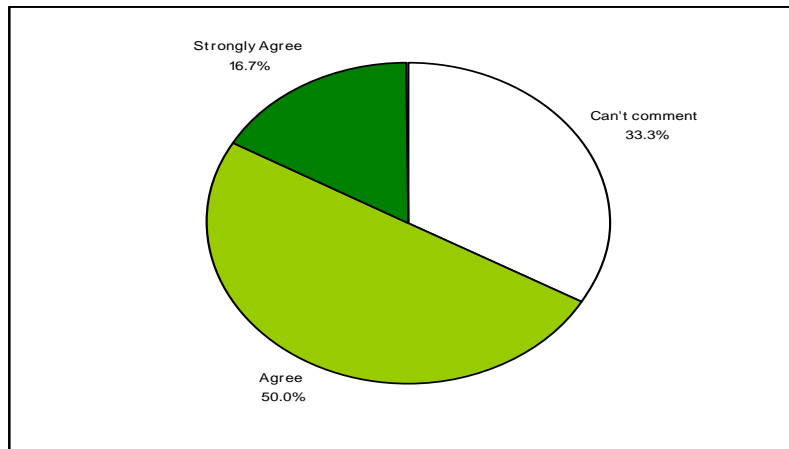
Q8) *As an industry professional, I would like to participate in the development of the Green Belt Project.*

ANALYSIS

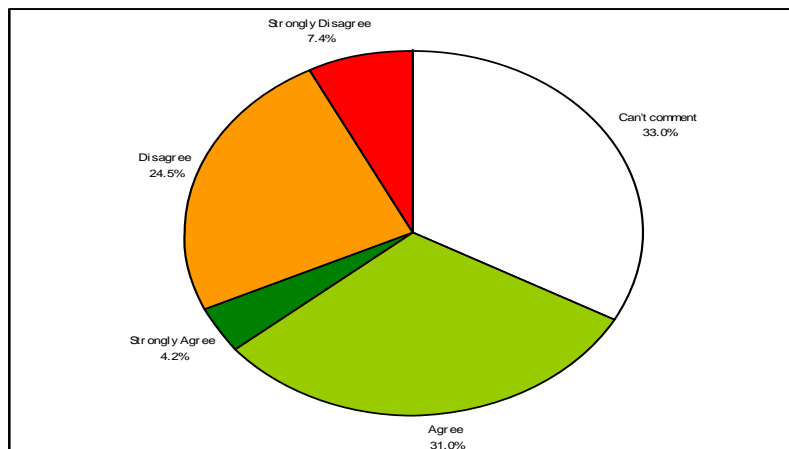
a) Factual Information

Of the people who completed the survey in Industrial Advisory Board (IAB) and Industry Partners

- **IAB:** Agree + Strongly Agree: ~ 67%: Number of Respondents: 8 out of 12



- **Industry Partners:** Agree + Strongly Agree: ~ 35%: Number of Respondents: 33 out of 94



b) Comprehension

It means that the packaging industry although supports the fact that an undergraduate certificate program should be setup for earning a Green Belt in Packaging Science at RIT but would not be able to support the development due to financial restraints or it not being applicable to the professional approached in the survey.

c) Application of Information

It is evident from the charts that IAB members and Industry Partners although support the program but not much interested in participation in its development owing to their busy schedules, work environment etc.

d) Analysis

The results from the IAB and Industrial partners demonstrate that although the industry people and IAB support the setup of the certificate program, not many of the professionals want to participate in development of the program.

- This may be due to:
 - Busy schedules,
 - Fast changing work environment,
 - Not able to analyze on how they could the help participate in the development of the program etc.
- The survey has not gone just to the packaging people within the industry partners but also to the people from departments like Marketing, Procurement, and HR etc who may not be interested or see the benefits of their participation in the development of the program.
- But IAB consists of people with a credible packaging knowledge and expertise and also including some members from RIT thus they provide a clearer picture of the packaging industry.

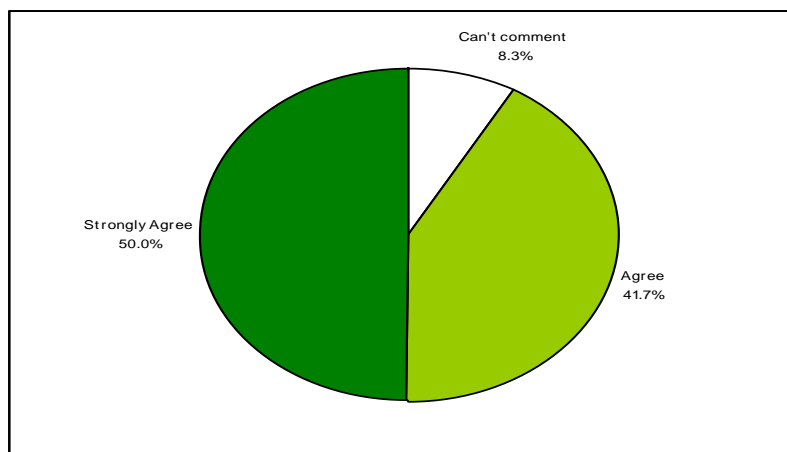
Q9) As an alumni or industry partner it is exciting to think that the packaging science program would be the first in the nation to have such a program.

ANALYSIS

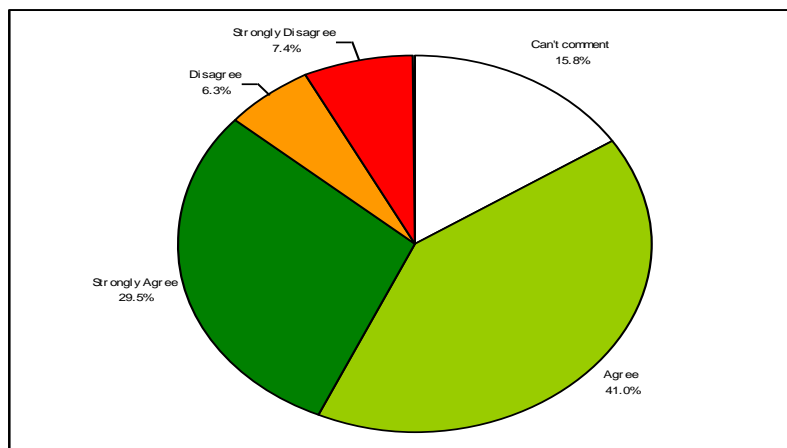
a) Factual Information

Of the people who completed the survey in Industrial Advisory Board (IAB) and Industry Partners

- **IAB:** Agree + Strongly Agree: ~ 92%: Number of Respondents: 11 out of 12



- **Industry Partners:** Agree + Strongly Agree: ~ 70%: Number of Respondents: 77 out of 95



b) Comprehension

It means that the packaging industry is excited about the fact that the Packaging Science program would be first in the nation to have a Green Belt program taking RIT Packaging Science a step ahead of other packaging schools within the nation.

c) Application of Information

From charts it is evident that the majority of IAB members and Industry Partners are excited about RIT Packaging Science would be the first in the nation to have such a program.

d) Analysis

The variability in the results between the IAB and Industrial partners can be attributed to the facts:

- The Industry survey has gone to several industry partners who may not be excited about this fact because they may be alumnus to other packaging schools like Michigan State University, Clemson University etc thus would not be excited about RIT gaining a step ahead of their respective schools.
- The survey has not gone just to the packaging people within the industry partners but also to the people from departments like Marketing, Procurement, and HR etc who may not see it as a very strong achievement with respect to their majors.
- But IAB consists of people with a credible packaging knowledge and expertise and also including some members from RIT thus they provide a clearer picture of the packaging industry.

4.1.1 TOTAL ANALYSIS

For performing the Total Analysis of the survey results, all six levels of Bloom's Taxonomy's Cognitive domain will be used.

- **Factual Information (Knowledge)**

- The survey results show that Packaging Industry as well as the Industrial Advisory Board actively participated in the survey and the responses from them was very knowledgeable and conclusive.

- **Comprehension**

- The survey results show that Packaging Industry as well as the Industrial Advisory Board understands the importance of having Green Belt problem solving skills for the undergraduate packaging science students.

- **Application**

- The survey results show that both Industrial Advisory Board and the Industry Partners support the fact that they can see the application of undergraduate students having Lean Six Sigma Green Belt problem solving skills within the program as well as the hiring companies.

- **Analysis**

The variability in the survey results between the Industrial Advisory Board and Industrial partners can be attributed to the facts:

- The industry survey has not gone just to the packaging people but also to the people from departments like Marketing, Procurement, HR etc who may not think Green Belt as an essential part of the industry may be due to lack of knowledge or may be due to the fact that it is not that important in their field of expertise.
- But IAB on the other hand consists of the people with credible packaging knowledge and expertise thus they provide a clearer picture of the packaging industry.

- **Create (Synthesis)**

- Based on the survey results the Green Belt problem solving skills and the Lean Six Sigma Green Belt in Packaging Science will allow RIT Packaging Science department to create new opportunities for students, new opportunities for Packaging Science program as well as new benefits

to packaging industry in terms of optimizing processes, reducing costs, increased customer satisfaction etc.

- **Evaluation**

- Since it was not a part of the study, having guidelines and a Quality Management System will be an effective tool to evaluate students, the program and the industrial partners.

4.2 FAILURE MODES AND EFFECTS ANALYSIS (BASIC FMEA)

AREA	FAILURE MODES	EFFECTS	CAUSES	RECOMMENDATIONS
Student's Career	Earning a degree from a non accredited certificate program and no QAP	<p>1) Academic Standards:</p> <ul style="list-style-type: none"> • No quality education • Less knowledge in the major <p>2) Cost of Program: A non accredited certificate program doesn't offer financial aids, grants or scholarships</p> <p>3) Transferability of credits: Students can not expect to transfer credits from a non accredited certificate program to an accredited certificate program</p> <p>4) Licensure/Certification: Most states will insist on successful completion of an accredited program before taking any State level or National level exams.</p> <p>5) Job Opportunities: Employers do take the accreditation of the program into consideration before</p>	Earning degree from a non accredited certificate program with no Quality Assurance System	<p>To ensure:</p> <ol style="list-style-type: none"> 1) Good Academic Standards in education 2) Financial Aids, Grants/Scholarships 3) Ability to transfer credits 4) Ability to take any National/State level exams 5) Numerous Job Opportunities. 6) Good Reputability of the degree earned. 7) Ensuring Sustainable practices in Education and program development. <p>For all the above results, An accredited certificate program with Quality Assurance System /Procedures is highly important.</p>

		<p>students can apply for the job, thus it may result in students losing job opportunities.</p> <p>6) Reputability: The degree earned from a non-accredited program is not recognized anywhere. Thus would be not be worth more than a printed paper.</p> <p>7) Sustainable Educational Practices: Without a quality assurance/ management system, an institute can not ensure good practices and sustainable development in the certificate program</p>		
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4.3 ANSI CLAUSE REFERENCES

This part of the research project recognizes the various sections within the research project that would relate to the clauses in the ANSI Guidelines ASTM E2659-09 (Public Form CAP-FR-304).

Section	References	Clause Number
3.4	Job Descriptions	5.2.1.2, 5.2.2, 5.2.2.1, 5.2.2.2, 6.1.2, 6.2.5.1 (Q3), 6.2.7.1(Q3), 6.2.6.1(Q3)
3.4.9	Quality Assurance job description	5.4.1, 5.4.2.1
3.4.10	Warehousing job description	5.4.2.1
Project Proposal	Research proposal	6.2.1
3.0	Methodology	6.2.2, 6.2.2.1
4.0	Data Analysis	6.2.2, 6.2.2.1
3.1	Company Requirements (references)	6.2.2, 6.2.2.1
3.2	Universities Reference	6.2.2, 6.2.2.1
3.3	Institutes Reference	6.2.2, 6.2.2.1

Taking an example:

Section 3.4 in the research project: Job Descriptions

Clause 5.2.2 in the ANSI Guidelines: Provide an organizational chart identifying the key personnel involved in the certificate program

Thus Section 3.4 of the Research Project => Clause 5.2.2

Similarly, for other sections refer to the above table for their respective clauses in the ANSI guidelines.

5.0 CONCLUSION

This section in the research project will provide a conclusion to the research project. This project began by providing a brief synopsis that included a Lean Six Sigma Overview, the DMAIC, and the Different Belt Levels (e.g. Green Belt).

The Introduction section identified the three main beneficiaries for establishing this unique certificate program.

The three main recipients are:

- a) Hiring Corporations,
- b) Undergraduate Students and,
- c) Packaging Science Program.

The DMAIC approach will be used to provide a brief summary and conclusion to the research project.

A. Define

The research project focused on performing research on setting up a Lean Six Sigma Green Belt program for undergraduate students at RIT and development of the quality assurance procedures in order to meet ANSI accreditation guidelines. The research was done on four primary areas:

1. Lean Six Sigma Green Belt;
2. Certificate Programs;
3. Accreditation Guidelines; and
4. Quality Assurance Procedures.

For the four areas the project focused on identifying the gap of knowledge between what is currently offered in the packaging industry and what the

Packaging Science certificate program needs to integrate for success and sustainable reasons.

B. Measure

For the measurement phase, to analyze the issues relating to Lean Six Sigma projects within the corporate world and the need of Green Belt problem-solving skills following was done:

I. Through the literature review section of the research project:

- a) Searched on the articles, which show that there is a gap in Lean Six Sigma/Problem Solving knowledge in corporate world.
- b) Showed the importance of Accreditations as compared to Non Accreditation
- c) Provided the information about the Quality Assurance procedures (QAP).
- d) Provided information regarding the problem solving skills used or taught in RIT and information about the Quality assurance procedure with respect to RIT.
- e) Addressed the relevance of Green Belt in Lean Six Sigma in relation to Education and Training Perspective in Organizations.

II. Developing a Survey:

A Survey was developed and conducted within the Industrial Advisory Board and Industry Partners to analyze their support for setting up a Lean Six Sigma Green Belt in Packaging Science Undergraduate program at RIT.

III. Research Methodology

- Researching information on Job Opportunities from different companies that require the students eligible for Application process to have knowledge on Lean Six Sigma
- Researching information on existing Universities that offer degrees in Lean Six Sigma.
- Researching information on institutes that offer Six Sigma Training and Certification.
- Drafting the job descriptions of the key personnel involved in the chain of administration process for the program

C. Analysis

Following analysis was conducted:

- **Analysis of the survey results was performed which shows:**
 - Packaging Industry as well as the Industrial Advisory Board understands the importance of having Green Belt problem solving skills for the undergraduate packaging science students.

- They support the fact that having Green Belt Problem solving skills would enable the newly hired students to perform well in projects related to optimization of processes and resources as well as cost reduction.
- **Analysis of the job descriptions from RIT Packaging Science Job Zone shows:**
 - There is a need of Lean Six Sigma Skills within the packaging industry.
 - More and more companies want the newly hired to possess these problem solving skills so that they do not have to spend time and resources on such trainings.
- **Analysis of the research on Universities and Institutes outside of RIT that provide accredited certification for Lean Six Sigma Green Belt shows:**
 - There presently is no undergraduate program in Lean Six Sigma Green Belt in any outside university or institutes because it is only for Returning Professionals or Graduates.
 - Thus, RIT would be first in the nation to have a Lean Six Sigma Green Belt Packaging Science for undergraduate students.
- **Various job profiles of the personnel that would be involved in setting and running the Lean Six Sigma Green Belt in Packaging Science undergraduate program have been developed.**
- **A Failure Modes and Effects Analysis (FMEA) showed that having an accredited certificate program with a Quality Management System (Quality Assurance Procedures) benefits the students and the University in terms of:**
 - Academic Standards
 - Cost of Program
 - Transferability of Credits
 - Licensure/Certification
 - Job Opportunities
 - Reputability
 - Sustainable Education Practices
- **All the data that was collected and analyzed was incorporated according to clauses in the ANSI guidelines.**

D. Improve

In order to ensure the efficient working of the Lean Six Sigma Green Belt in Packaging Science program, a pilot program should be started at RIT before the actual program, in order to analyze if the program would be able to fulfill the expectations of students, RIT Packaging Science Department, Industry Partners and RIT as a whole.

Once all the necessary steps have been taken to optimize the program according to the needs of required everyone, a full-fledged certificate program with accreditation from ANSI should be setup.

E. Control

For establishing a sustainable certificate program, a Quality Management System with all the Quality Assurance Procedures should be incorporated within the program. This would help the program to follow Good Practices in Education as well as Sustainable development of the Packaging Science at RIT.

Conclusion

The research shows that there is a need for having Green Belt problem solving skills within the industry as more and more projects lean towards cost savings, optimization of processes and it would be beneficial to those industries if the students have pre-acquired Lean Six Sigma skills.

The Industry and Industrial Advisory Board support the development of an ANSI accredited Green Belt in Lean Six Sigma Certificate program in Packaging Science for undergraduate students.