The Implementation Continuous Improvement Program: a Case Study for a Canadian Job Shop Manufacturer

by

Mohammad Nour Shaker

A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Master of Applied Science

in

Management Sciences

Waterloo, Ontario, Canada, 2020

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public

Abstract

The purpose of this thesis is to study and to understand the impact of implementing a Continuous Improvement (CI) program with employees. The study has covered ideas generated by employees, and their impact on the ideas' implementation progress, and also employees' evaluation of the CI program and its effectiveness after one year of its launch. Two studies were conducted: study one was done on the company's collected data stored in the CI log, and study two was based on employees' perception of the CI program as a separate survey for this thesis. Both quantitative and qualitative data were collected and analyzed. The result from study one indicated that, regardless of employees' intentions of the submitted ideas for improvement, management interpretation of the ideas influenced these ideas' implementation. It was found in study two that there were many shortcomings in the launching of the CI program that impacted how employees perceived and engaged in this program. Conceptually, Ashby's law of requisite variety was used to discuss these results and their impacts on the organization. Finally, a discussion is presented on the implications and the limitations of the study.

Acknowledgements

I would like to express my deepest gratitude to Professor Frank Safayeni for his continued support and mentoring as I worked on this thesis. The successful completion of this research could not have been possible without his advice and coaching.

To my pure source of inspiration, my parents: thank you for believing in me and always encouraging me to be my best.

To my caring, loving, and supportive wife: my sincerest gratitude. Your encouragement, when the times were tough, and deadlines were approaching, is greatly appreciated.

Table of Contents

List of Figures

List of Tables

Introduction

Although the management sciences literature provides a lot of knowledge about CI concepts and their development, implementing a program that embraces genuine CI culture has been a significant challenge to many organizations. In this thesis, I am studying the implementation experience of a CI program at a Canadian job shop manufacturer. This organization's leaders were motivated to implement the CI program to enhance employees' engagement. The thesis includes an introduction to the company's background and their current CI program structure in chapter one, then the literature review is summarized in chapter two. In chapter 3 two main studies are presented. In the first study I analyzed the company CI log and evaluated how management perceived and related to employees' ideas and the impact of this relations on ideas' progress status. The second study involved a survey to collect employees' feedback on the implementation of the CI program from all organizational levels. The survey inquired employees to give their opinions regarding the current implementation experience in addition to their participation level and their perception of how the program would and should evolve. The data from both studies were statistically evaluated and interpreted using Ashby's law or requisite variety. In chapter four, I concluded the thesis with final reflection on these studies finding and implications.

Chapter One: Company and Researcher Introduction

In chapter one, three main topics will be discussed: firstly, the company under study will be introduced, covering historical growth milestones. Secondly, a discussion will be found about the company's continuous improvement program, why it was started, and what the objectives were. And finally, the author's roles in this company will be explained, along with the author's contributions by means of this thesis.

1.1 Organization Background

Company Q, established more than 40 years ago and located in Southern Ontario, markets and builds engineering-to-order OEM (original equipment manufacturer) machines, offers service parts, and provides field maintenance. In its historical site, the company performs all operations for sales, R&D (research & development) application, design and process engineering, manufacturing of the subassembly, storage of components, final assembly, and logistics services. The company has relied on few local suppliers to fill in manufacturing capacity when backlog is beyond its in-house capacity.

Customers are distributed around the world, with a focus on Japan, the USA, and Germany. The company started as a privately owned entity, and has experienced multiple ownership transfers in the last 20 years. The most recent one was in 2008, when it was acquired by an American corporation well known for buying boutique manufacturing companies specializing in applied engineering. In 2015, the corporation decided to move the operations of another division, Company M, in the USA, to this Canadian site. Company M, established 38 years ago, specializes in designing machines that serve the same industry, but with different applications. Historically, Company M has been relying on suppliers to manufacture its subassemblies, and has kept final assembly as the only value-added in-house operation.

Upon making this move, the corporate headquarters decided to keep upstream functions (including design engineering, machines sales, and service parts sales) in the USA, closer to the division's clientele base, and for employment and tax implications. All of Company M's employees (both in the Canadian plant, and the US-based office) report to the same group president located in Canada. In 2016, the corporate decision makers decided to shut down operations of another division (Company F) in its existing USA site, and to move its operations completely to Canada. Company F is a 70-year-old engineering-to-order builder of machines serving the same customer base as Q and M, but with different applications; it was a loss-making division with huge operational/overhead costs and declining sales, and was manufacturing every single subassembly even if it was not profitable to do so. Upon integration, the US footprint was completely closed, and employees were given the option to move to Canada if they wanted to do so. Very few manufacturing associates moved north, on contracts of only a few years. However, the machine sales force, and a few experienced designers, were given the option to work remotely. In 2017, and to accommodate the site's infrastructure with this last integration, corporate headquarters authorized and funded a complete plant layout change to accommodate the expansion, and to support the rebranding of the site as Company FMQ, versus the individual brands of F, M, and Q.

The Canadian staff headcount rose from 42 employees (from which a good 40% had spent more than 20 years within the firm) in 2015, to 65 in 2016, and to 95 in 2017. By end of 2018, FMQ Canada was at 120 employees. Sales went up from USD 22m in 2012, to around USD 76m in 2018. (See Appendix for a current organizational chart showing the company's departments and their geographical location.)

1.2 Continuous Improvement Journey

FMQ has a very interesting demographic mix. When this author joined in early 2017, were one to have walked into the office or onto the factory floor, one would have found that most of the employees had worked in the organization for a very long time. Upon expansion, many new hires joined the company in all departments. For example, the inventory team, consisting of three inventory control specialists by 2016, had grown to eight employees by the end of 2019. Planning was another interesting department; the team size went from two people, who were performing the entire scheduling and dispatching function, to five planners in charge of planning and dispatching jobs on the floor.

The leadership team was not separate from all these changes; in the last three years, the site has seen three presidents with completely different leadership styles and backgrounds. The current president came from an international manufacturer of industrial products, where lean and continuous improvement was an integrated part of every initiative. However, the site has had very limited experience with continuous improvement and problem solving. A few years ago, the Human Resources (HR) department installed a suggestion box in the main lunchroom, with the box being sealed and only accessible by HR; the participation rate was very low. In fact, upon discussion with the HR department, it came to be known that a good percentage of the suggestions submitted could be classified as requests for retaliation from certain individuals, or that they had a nature of expressing frustration due to the integration's impact on the plant floor.

Every year, the corporate headquarters measures employees' engagement, in every division, by setting up a web-based confidential survey that is conducted by a third party. Areas measured in this survey include employees' engagement, and 11 other dimensions of the management's performance. Site leadership is not only measured against employees' feedback,

but also against the percentage rate of participation. Upon publishing the 2017 results, special attention was given from the corporate office to this site, due to the common symptoms of disengagement that were naturally expected to follow any integration process. The 2017 survey showed that FMQ employees felt that their ideas were not heard (the survey results showed that more than 60% of participants did not feel their ideas were heard by management), even when they were heard; that sometimes there was no feedback; and that they were not empowered or supported to make positive changes within their scope of work. The leadership team was expected to react on these results, and to put more focus on how to improve engagement on this site. Management took a decision to create a Continuous Improvement Idea generation and execution process in 2018. The goal was that the system would empower employees to come up with, and put into action, ideas that would improve processes and overall working conditions. All employees were encouraged to submit their continuous improvement ideas on an idea tag resembling the picture in Figure 1.

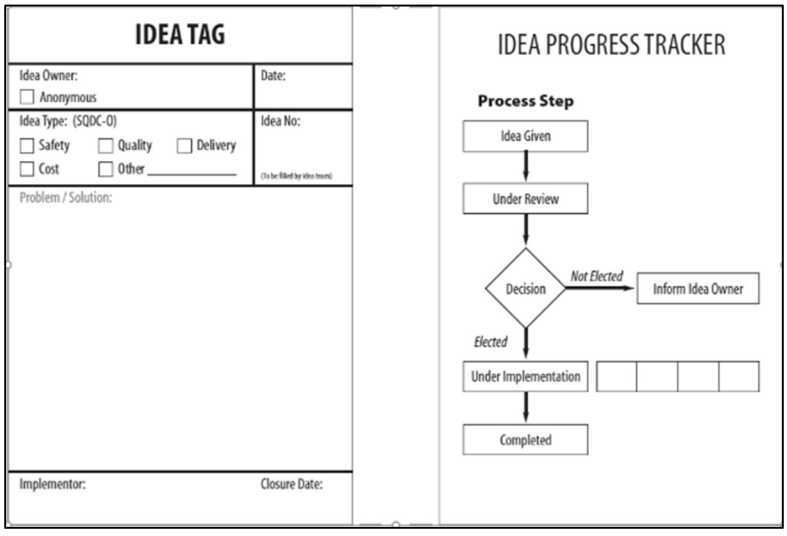


Figure 1: CI Tag (Front and Back Faces)

To drive engagement and awareness of the program, there was a competition to choose the logo of the program. Employees were asked to come up with a design to represent the

Continuous Improvement spirit. Seven employees submitted draft logos, and voting took place to choose one. The winner was presented a gift from HR to appreciate her effort. In fact, the winner was a student from a local community college doing her co-op term with the organization. Participation was limited to the office team, and no one participated from the shop floor. To fill in the CI program tag, employees had to complete sections according to the following protocols:

1. Their name(s), as an idea could have one submitter, or originate from a team (participants were also given the option not to disclose their name(s)).
2. Checking idea types: the focus was mainly on categories of Safety, Quality, Delivery, Cost, and Other. Employees could add a category under Other if they wished to do so.
3. Date of submission: this date was used to track implementation, and for the review process.
4. Employees were encouraged to explain the problem, and bring in a solution, or at least a suggestion as to how to solve the identified problem.

The tag was then placed in the "submitted idea" tray on the CI board, displayed in the main lunch room. The program display board, as presented in Figure 2, had five columns representing the idea types, and four rows that would reflect the ideas' progress (submitted idea;

Figure 2: CI Program Board Design

under review; under implementation; completed). Every morning, the senior leadership team

would meet with the key department leaders and managers to go over main business performance in the last 24 hours, in addition to problems that needed to be flagged cross-functionally. The meeting would take place in the main lunchroom, and was thus accessible to all employees who wanted to join and participate. After such a routine meeting, the senior leadership team, forming what was called the CI Committee (which included all functions of senior leadership) would gather around the CI board to review new ideas submitted in the last 24 hours. Each idea would be read and explained by the Operational Excellence team.

Based on the content of each idea, the CI committee would first classify the idea based on its impact (e.g. work related CI idea, or others) and then either approve it for implementation (the committee would assign an implementor), or put it to further review if a decision could not be reached (the committee would assign a reviewer), or simply not elect the idea for advancement. All ideas were logged into an Excel sheet with their details, status, and proposers. The management had a target to review all ideas within three weeks from their respective dates of submission. If the idea was good for implementation, it would be moved to the implementor based on the CI committee decision; if the idea was not selected, feedback would be given to the participant(s) with an explanation of why his/her/their idea was not selected. To improve consistency, the company defined main codes as to why an idea would not be selected for advancement; these are documented in Table 1, below:

Rejection Code	Example
1. Idea is out of the program scope.	Asking to hire/fire people.
2. Problem does not justify cost.	Cost of installing heated bars underneath the pavement between the two buildings to deal with snow and ice in winter.
3. Problem has been identified with an owner.	Idea to machines part differently; the ideas was assigned to an engineer to work on already.
4. System exists to capture this problem	Communicate to a certain vendor that supplied parts have quality issues.

5. Solution was not feasible/fair.	To deal with unplanned absenteeism, reward employees who do not call in sick during the year.
6. Idea already submitted.	Repeated idea.
7. Discipline issue.	No WHMIS labels on certain bottles on the floor: responsibility of the supervisor.
8. Near miss.	Clearing items from shipping stage.
9. Related to assigned responsibility.	Can we replenish coffee/milk? – Office administration duties.
10. Idea was withdrawn.	Participant decided to withdraw the idea.
11. Environmental concern.	Providing paper cups for employees instead of reusable coffee mugs.

Table 1 List of Ideas' Rejection Codes With Examples

Once an idea was implemented, the submitter would be rewarded with a silver coin that had the CI board logo and company brand on it. The coin could be kept as a recognition token, or redeemed for merchandise with company logos and brands. Items offered were high-end, and of good quality to motivate employees to participate in the program.

1.3 Contributor

While conducting this research thesis, the author was employed by the organization under study. Although being a member of the Operational Excellence team, the author was not involved in the design of the program; the Operational Excellence director had decided to copy this program structure from another sister company, despite inputs from different departments' leaders indicating that they should have had their own program that fit the organization's unique culture and CI journey. The author's involvement was limited to execution and evaluation of the program. This tasking included: facilitating the daily CI meetings with the committee; maintaining the log; documenting committee consensus on ideas' points of impact; and following up on stagnant ideas.

As discussed earlier, the committee (including all functional senior leaders and some of the department managers) would meet every morning, review new ideas, and decide whose ideas to reject or to implement. The maintained log would highlight ideas' type according to the submitter's classification (Safety, Quality, Delivery, Cost, and Others), in addition to the ideas'

points of impact, as classified by the CI committee upon reviewing the ideas (this aspect will be further explained in study 1). The data in this log was used as input for the first study, as will be seen later in this paper. Furthermore, after a year of implementation, and as part of this research paper, the author wanted to design and conduct a survey to evaluate employees' perception and feedback on the program's effectiveness, and its impact on engagement. The study was encouraged and supported by the site president, as an effort to understand and/or to bridge the gap between the program's intended and actual performance.

In the following content, Chapter Two will present a literature review in which a summary of research will be highlighted, that was performed on topics related to Continuous Improvement Programs and their impact on organizational performance. Later, in Chapter Three, discussion will be presented of the studies conducted in this research to explain trends examined and found during the analysis. The thesis will conclude with an overall discussion of the research outcomes, and how these studies could be used in industries and for future research.

Chapter Two: Literature Review

2.1 Continuous Improvement History

Although many academics and professionals make a connection between continuous improvement and the Japanese manufacturing sector, the initial inception of continuous improvement was established in the United State of America around the Second World War. Robinson & Schroeder (1993) noted that the creation of the formal concept of systematic incremental improvement was part of the "Training Within Industry" program, which was established from the need in the United States to increase productivity, to maintain quality, and to fast track the enrollment of unskilled workforce into the defense manufactory. This much needed program ensured that critical military and logistical supplies were flowing to the American troops and their allies with minimum or no interruption. The challenge was to create a manufacturing environment that could employ inexperienced operators, lead hands, and managers, to motivate and to empower them to turn into an effective workforce in the shortest time, and also could match the increasing demand for military equipment and supplies.

Robinson & Schroeder (ibid) further explained that this outcome was made possible by applying three modules of the "TWI" program. First was "Job Instruction", which trained supervisors to train operators on how to conduct the job while maintaining quality output; second was "Job Methods", which promoted step-by-step problem solving and methods improvement, to increase production and reduce waste in the processes; and finally "Job Relation", which managed human relations inside the factory.

This program, which led to exceptional production results in the United States, made the US occupational authority consider applying it in Japanese industry following the Second World

War. The need in Japan was more of a socio-economic drive, since Japanese industry was suffering, and running at less than 10% of its production capacity, with compromised quality and high running costs. People were unemployed, and undergoing devastating financial struggles. With the help of US expertise, the manufacturing sector was the first industry to adapt TWI, in which Job Instruction helped operators to adapt the "The One Best Way" of performing work, and Job Methods helped leaders and supervisors to recognize operators' need to improve work in a systematic and predictable way. While the Continuous Improvement program's momentum was spreading and strengthening in Japan, the concept and its benefits started to fade in the United States after the war, due to growing purchasing power and overall economic prosperity.

Since the Second World War, the Continuous Improvement paradigm has evolved into two main methodologies: lean manufacturing and Six Sigma. Lean manufacturing was rooted in the automotive sector by Henry Ford in the United States, and then developed further by Toyota, in Japan, in what was known as the Toyota Production System (TPS). Lean manufacturing is closely connected to the TWI Job Methods practice, in terms of identifying and eliminating waste in the work process. Womack & Daniel (2003) went further in defining lean thinking as a broader tool for all industries seeking to understand customer value, by defining the value stream and then making sure that such value flowed smoothly by removing obstacles (waste) at the customer pull rate (Takt time), while seeking perfection by continually improving work procedures.

Six sigma, on the other hand, was created in the 1980s in the USA, in the electronics industry. In their literature review, Bhuiyan & Baghel (2005) explained that the goal of this improvement methodology was to reduce process variations that had led to quality and product rejects. The methodology utilizes statistical models, and analyzes quality data in an existing

process. The authors have also identified the creation of a hybrid methodology called “Lean Six Sigma” which is a mix of both CI methodologies.

Research conducted recently in the Continuous Improvement field has been focusing on:

1. Discussions about development and application;
2. Developing conceptual frameworks; and
3. Conducting empirical studies:
    A) Conducting surveys across multiple companies, and
    B) Individual case studies.

The following section of the literature review will present a summary of each of these spheres.

2.2 Discussions about development and application

In addition to the historical background presented above, other scholars have pointed out that Continuous Improvement in its “Lean” version has recently received much attention in many organizations and in different industries. Continuous Improvement is seen as an effective tool to improve productivity and quality, reduce costs, predict delivery, enhance safety, and engage employees. Singh & Singh (2015) have explained that some companies have gone further, to adapt Lean or Continuous improvement in order to rationalize investment, optimize working capital by reducing inventory, manage the company’s production knowledge, and provide opportunities for employees to achieve career growth through training and problem solving.

Furthermore, Continuous Improvement in its Japanese version has not only paid off in terms of delivering tangible results, such as better productivity and quality, but also has played a significant role in engaging employees at all levels of the organization. In their review paper,

Singh & Singh (ibid) explained this CI business model by referring to its three core principles. The first principle states that continuous improvement should be process-focused, meaning that results cannot be improved sustainably without improving the process. This first principle promotes the need to invest in understanding work processes and standards, and not blaming people for short term results. The second principle states that Continuous Improvement is about small step improvement, which challenges the organization to maintain disciplined work standard as the baseline for each next expected improvement. This principle is linked to the Plan-Do-Check-Act problem solving methodology, which includes iterations of defining baselines, implementing improvement, reflecting on the results, and finally, acting and adjusting the plan to keep enhancing the work. The third and final principle is that Continuous Improvement is about involving people in the improvement process. The participation could take many forms; Haddas et al. (2014) have discussed different forms of CI program designs, including employees' individual suggestions; group participation in quality control circles; organic improvement by which employees improve their own work; and expert-led and supported rapid improvement projects.

In his discussion paper, Berger (1997) suggested that CI programs' forms and dynamics vary based on organizational design, process standardization, and product mix. The analysis explained that even the scope of improvement work could vary significantly based on the variables presented above. The author proposed that improvement focus could also be extended beyond manufacturing areas, to functions such as planning and administration, when product mix is high and process standardization is low.

Moreover, in their attempt to understand the differences between Continuous Improvement in Japanese culture and that in western countries, Macpherson et al. (2015)

suggested that the Japanese CI program is a method to create knowledge through real problem solving and hands-on training. The study's explanation was based on the position that Japanese culture focuses on "*authority, discipline, respect and reverence for the family, age and status. These in turn provide for stable social hierarchies that tolerate inequalities on one hand and social harmony and cooperation between social structures*" (ibid, p. 4); when blended with the need of people to be creative and to improve their workplace, the outcome is innovative, with tangible tools and improvement.

Also, Kornfeld & Kara, in their 2011 review of available decision analysis methods and their use in Continuous Improvement scope definition, concluded that companies usually struggle in defining the future state of their operations, generating CI project funnels, and finally determining the outcome value of these projects. These gaps do not only contribute to difficulty in aligning strategic goals to Continuous Improvement projects, but also make it challenging to define whether project scope has a Continuous Improvement nature, or whether it may be merely a discrete problem that requires a one-off solution.

2.3 Developing conceptual frameworks

Other scholars have developed conceptual frameworks to help practitioners and academics to evaluate CI program performance, and to understand its impact on different organizations. Sánchez-Ruiz et al. (2019) have claimed that Continuous Improvement can achieve the objective of identifying and reducing waste, by implementing multiple tools. According to the authors, some of these tools include: SMED (Single Minute Exchange of Die) to reduce wasted time due to changeover; TPM (Total Preventative Maintenance) to reduce waste due to machine downtime; Kanban: production and withdrawal signals to produce and move materials to avoid material starvation wait time, or to reduce costs associated with

overproduction; and VSM (Value Stream Mapping), used to highlight obstacles preventing the smooth flow of customer value. The authors have also highlighted that a lack of training, management commitment, and a companywide definition of CI, are collectively among many reasons why CI could fail. In their theoretical construct analysis and detailed structured interviews conducted with CI experts to identify CI enablers, the authors suggested that the top three enablers for successful CI programs, as identified by academics and practitioners, are: having a clear objective for the program; providing training to all employees to ensure that common understanding exists; and finally, giving the program the strategic attention and resources needed.

Lleo et al. (2017) carried out a concept mapping exercise to identify middle managers' and leaders' trustworthy behaviours that would encourage employees to participate in Continuous Improvement programs. The study, involving multiple iterations and phases of participants' statement analysis, suggested that middle managers and supervisors should demonstrate the following five groups of behaviour, in order to be perceived as trustworthy and to encourage employees to participate in CI programs. Managers and leaders are expected to be approachable and fair to their subordinates, to invest in coaching and training people, to manage CI project competently, to build and inspire their teams, and finally, to act as role models in setting stretched goals and targets.

Jurburg et al. (2017), in a three-round Delphi study with CI experts in Spain, suggested that having employees participating in the program is a key objective, and an important factor of program success. The model that the authors developed listed 11 variables that influence employee participation in the CI program, of which training and organizational support were the

most important two factors to motivate employees. Other critical factors included the CI program structure (ease of use), and companywide alignment on CI initiative.

In terms of CI program sustainability, Jurburg et al. (ibid) discussed that companies could be classified based on their CI journey maturity into three categories: leaders, followers, and laggards. Maturity was measured against four enablers: strategic scope alignment, CI program self-improvement, measuring CI program performance, and finally CI day-to-day integration. Organizations in leaders category were able to show more sustainable CI program implementation and employee engagement.

2.4 Researcher conducting empirical studies

In the following section, a summary is presented of empirical research, in which various authors studied CI program experiences for a group of organizations, or conducted a thorough analysis for individual companies.

2.4.1 Studies conducting analysis across multiple companies

Bessant et al. (2001) have suggested in their study, reviewing data from 103 companies, that implementing an effective CI program is a long-term journey to reach a "learning organization" in which continuous improvement is an integrated part of company growth. Best practices presented in this study indicated that this journey could take multiple phases, and requires time and training investment to pay off eventually. The authors have also mentioned that, when leaders insist on having short-term return, the chance of failure increases. It was noted that a CI program would usually impact the organization dynamics, in terms of finding problems and solving them, monitoring improvements and reinforcing them, and finally making the right

connections between strategy and continuous improvement initiatives. These developments in behaviours would set a structure on how to assess CI program effectiveness in any organization.

Stadnicka & Sakano (2017) conducted a comparative study between two companies (Japanese and Polish manufacturing facilities) sharing many characteristics such as industry, sales size, number of employees, and operating processes. The authors concluded that cultures have a significant impact on CI program performance. The study revealed that Japanese employees are more engaged and self-motivated to participate in improvement initiatives. Japanese employees considered proposing improvement as a small part of their overall performance, and they preferred prizes as rewards. By contrast, Polish employees were less engaged; their supervisors had to work very hard to motivate them. During annual appraisal reviews, Polish supervisors had to give significant credit for employees for their participation in the CI program. They also had to offer them cash rewards frequently for successfully implemented ideas to keep them motivated.

In their survey covering six French manufacturing companies that were applying Lean, and operating in different industries, Stimec & Grima (2019) found that having and applying a robust continuous improvement program could help reduce work-related stress in the respective organizations. On the other hand, the lack of CI culture, or poorly implemented CI programs, could increase the level of work-related stress. The study rated organizations in their CI program maturity on a spectrum of: missing CI at all, folkloric CI programs, passive CI programs, and finally dynamic CI programs. Work-related stress levels were found to be reduced as an organization became more mature and dynamic in their CI implementation.

While interviewing CI program managers in 14 tier-one automotive suppliers operating globally, but located in Spain, Garcia-Sabater et al. (2012) found that CI program enablers and inhibitors varied based on stage of CI program implementation. Common enablers between all implementation levels included communication and training, and common inhibitors between all levels included change management, and employee-leader or functional misalignment.

2.4.2 Individual case studies

Very few recent detailed studies were found covering CI program implementation experiences for individual companies. The studies summarized below were conducted among organizations operating in the sectors of financial service, health care, automotive, and other repetitive manufacturing environments. The companies under analysis were located in Europe, the UK, and USA.

In their case study covering a European financial institution over a period of 2.5 years, Hirzel et al. (2017) found that employees' empowerment was increased with the implementation of CI programs; this empowerment was sustainable in the longer term if the CI program was implemented correctly, but this positive impact would take time to appear after the CI program's initial roll-out.

Another longitudinal case study of a food manufacturer in Spain (Marin-Garcia, Pardo del Val, & Martı´n, 2008) found that, in order for the Continuous Improvement program to generate economic benefit and enhance worker engagement, the program might go through phases of re-launching and enhancements. Areas in which management should continually revisit and improve included encouraging employees to participate, providing transparent assessment for ideas, and investing in people training.

In another case study covering a health care provider in the USA, Lam et al. (2015) built on previous studies, in that employees' engagement was considered a critical factor for successful implementation of the CI program. The study, surveying 248 health professionals, found that investing in better relationships between supervisors and employees would lead to higher participation. The study also listed behaviours such as "collaboration, consultation, ingratiation, inspirational appeals, and rational persuasion" as proactive strategies that managers have to practise, in order to enhance their relationships with employees to improve their participation in the CI program.

Kerrin & Oliver (2002) evaluated the impact of the reward system on CI program implementation, culture, and team dynamics in an organization while studying a UK factory making automotive components. The authors presented that Toyoda, in 1988, Imai, in 1986, and Fucini and Fucini, in 1990, had mentioned that the rewards for CI activities in the Japanese business arena (Toyota and Mazda) were integrated in the future continuity of the business, and that there was no additional reward for improving the workplace. Both Japanese employees and employers expected improvement events as part of the job. The authors presented many other studies supporting the notion that having a solid reward system motivates employees to participate and to be more committed to the CI program. However, the authors highlighted the challenges in defining the best reward system (financial versus non-financial, large versus small rewards, private versus public recognition, regular versus occasional rewards, and finally individual versus collective rewards). The study found that companies were better off having one clear system of rewarding employees, and that using multiple reward systems was not effective, and had even led to missing many improvement ideas.

2.5 This thesis's contribution

This thesis is aimed toward expanding the current knowledge of Continuous Improvement by conducting a case study on the CI program implementation in one organization. The significance of this paper's contribution is based upon two factors.

Firstly, the company under study has unique characteristics as compared to other studies available in the literature. It is a job-shop manufacturer that builds customized machines, has expanded its operations through recent multiple acquisitions, and is located within the biggest manufacturing cluster in southern Ontario, Canada. The company has also established the CI program as a tool to enhance employees' engagement. A Continuous Improvement program was never formally introduced into this organization before, and is considered a new variable in its changing culture. This study covers a statistical analysis of the company's CI ideas log, and is further expanded to include a survey conducted to collect employees' feedback on the performance of the program at its first anniversary. The author's relationship with the company has helped in providing insight, and objective understanding of the organization's dynamic since the introduction of the CI program. This feature is made possible, as the company's name has not been disclosed, and the author has managed to provide unbiased academic input about the program, while still working for the company in the capacity of an individual contributor.

Secondly, the study evaluates the CI program from a different perspective by considering the program as new variety introduced into the organization using Ashby's law of requisite variety. Ashby (1958) explained that only variety can destroy variety. In organizations, as dynamic systems, a new addition or program (like the CI program) is considered a variation. The organization can deal with these varieties either by reducing them (by creating regulator) or by

enhancing its capacity to handle these varieties. This approach helps to interpret and understand the studies' findings from an organizational behavioural perspective.

Chapter Three: Studies Performed

3.1 Study types and employees' participants groups

In this chapter, two different studies are reported. The first study was based on analyzing the company-provided data stored in company's CI ideas log. This log maintains details of ideas, and tracks their implementation status as they progress from one stage to another. The purpose of the first study was to understand how the organization dealt with the CI program during its first year, it included the study of the content of ideas generated, employees' and management's classification of the ideas, and how they differed. The statistical relationship between idea classifications and progress status was also examined. In the second study, a company-wide survey was conducted to collect and study employees' feedback on program performance after one year of deployment. The survey covered areas including employees' understandings of the program goals, the program's impact, engagement, personal contribution, and managerial commitment.

Both studies classified the employees in the organization according to the following four participants' groups:

(SLT) Senior Leadership Team: included the company president and the departments directors;

(MM) Middle Managers' Group: included all departments' managers, who reported to the directors in the SLT;

(LH) Lead Hands' Group: included technical leaders on the shop floor, who reported to the MM;

(EM) Office and Production Employees: this category included other employees not listed in the above groups. They were either office employees who reported to middle managers, or production employees who reported to the lead hands. Figure 3 (below) presents the structure of the four groups targeted in the study.

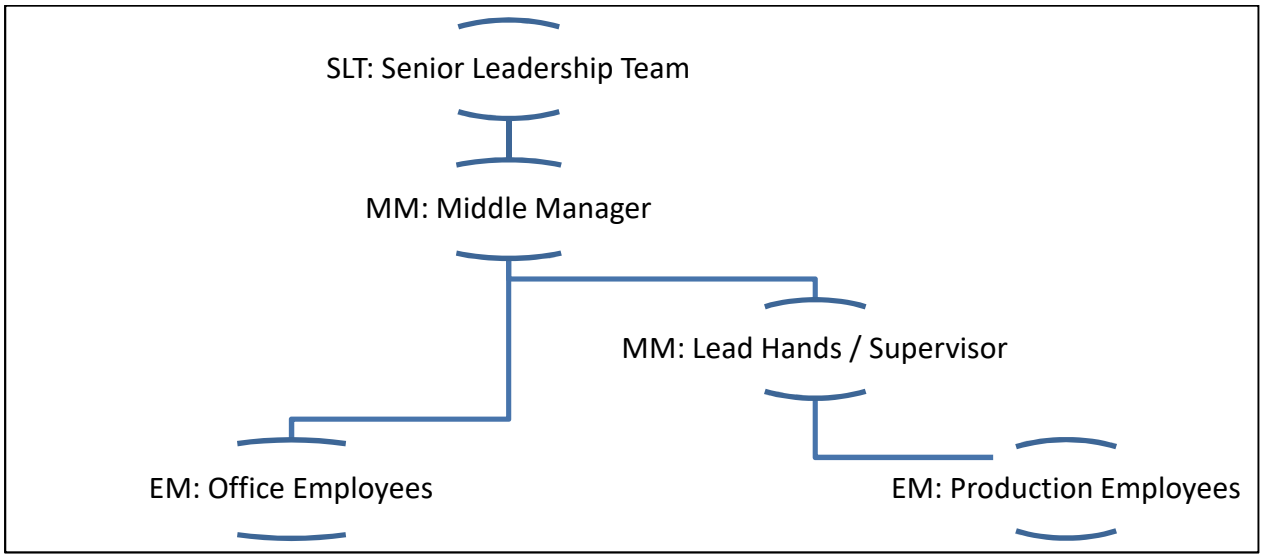


Figure 3: Participants' Group Hierarchy in the Organization

3.2 Study 1: Company's Continuous Improvement Log

3.2.1 Methodology

The company CI ideas log was studied and analyzed to understand the nature of these ideas, and the relationship between different CI ideas' data fields.

The company has maintained a log of all submitted ideas in an Excel spreadsheet. For every idea, the following information was recorded: participant's name; her/his department; committee representative (senior leader); submission date; idea type (there were five options available, as previously indicated, for employees to choose from: safety, delivery, quality, cost and other); idea narrative (problem and solution); status; reviewer; implementer; expected implementation date; comments and feedback; and code for rejection, if applicable. Also, the log contained information as to how the CI committee had evaluated the idea and determined its point of impact (covered in detail later in this thesis). The CI log dataset allowed for group submission. If an idea was submitted by more than one person, it was counted as one idea, but the log had the option to list multiple participants' names, in order to reward all participants fairly without overestimating the number of ideas submitted. A list of all fields stored in the Continuous Improvement log, and maintained by the company, is presented in the appendices.

Furthermore, while the log data was copied and extracted for the purpose of this study upon completion of one year of the CI program, the original dataset has been maintained live by the organization. Idea statuses were evaluated based on that point of time.

Finally, management generated simple tables and figures to track the number of ideas, and who was responsible for their review and implementation. These tables were not used in this study, as they are reproduced every month, and only the latest version is kept for management review.

3.2.2 Data Categorization by the CI committee

It is important to highlight that an idea's point of impact, as defined by the CI committee upon review, is different from the idea's type, as defined by a submitter upon submission. This categorization of the impact of ideas was performed daily during the CI meeting, when new ideas were read and reviewed by the CI committee. The first step of this classification process was to evaluate if each idea was a genuinely work-related Continuous Improvement item or not. Management simply defined work related improvement as any incremental change in the process or the product that could reduce or eliminate one of the seven types of waste that might exist in any process (defect, overproduction, waiting, transportation, inventory, motion, and finally, excessive processing), or that could enhance employees' empowerment and capability to perform their jobs. A second filter was then applied to the submitted idea to distinguish between ideas submitted to improve processes within the submitter's function boundaries, and improvement of ideas that called for changes beyond the submitter's functional responsibility and scope; these other functions could be suppliers' functions or customers' functions tied to the submitters' departments. This filtration process aimed to help management understand the nature of the ideas submitted throughout the program.

If the idea was not classified as work-related, it would typically fall into one of the other three categories: facility maintenance, "treat me better", or improvement of CI program administration. In what follows, each category will be defined with an example.

"Facility Maintenance" ideas were those related to building maintenance in general. For example, an employee submitted an idea to replace stair runners as they started to tear off, or to call for a contractor to fix a leak in the roof structure.

The “treat me better” category contained ideas through which employees were asking for additional benefits or work perks. The link between the problem and solution for ideas classified in the “treat me better” category could be a rich subject for argument and discussion. For example, an employee submitted an idea suggesting that, in order to solve the problem of absenteeism, management should give extra pay for those employees who did not take sick leave. Another employee suggested that the company would increase productivity by providing healthy snacks every Friday. Some of these ideas were easy to implement, and others could have had complex implications with labour law and other regulations.

The final category was “CI program improvement”; a few ideas were submitted suggesting certain changes to the CI program itself. Management has identified those as a separate category of which to keep track.

With this filtration process, every idea was identified by its type, based on submitter input, and its point of impact, based on CI committee decisions.

3.2.3 Results

The Company CI log was studied according to the following patterns:

1. idea demographic and trends;
2. idea type by submitter;
3. idea’s point of impact by the CI committee;
4. idea type versus idea’s point of impact;
5. idea’s point of impact versus progress status;
6. idea type versus progress status;
7. rejected ideas, by reason code, idea type, and point of impact.

The following results were reported.

3.2.3.1 Idea demographic and trends

The study covered 296 ideas submitted by 75 different employees, 41 shop floor participants, 33 employees from the office, in addition to anonymous participants. Table 2 (below) shows the participants' groups with their idea submission rates, based on the total number of headcounts in every group and collective totals:

Participant group →	**SLT**	**MM**	**LH**	**EM**	**Total**
Office employees →	4	2	-	27	33
Production employees →	-	-	2	39	41
Anonymous →	-	-	-	-	1
Total number of submitters →	***4***	***2***	***2***	***66***	***75***
Total headcount →	8	10	5	70	93
Total participation rate →	50%	20%	40%	94%	80%

Table 2: Participants' Groups With Their Idea Submission Rates

It was found that 50% of the senior leaders, 20% of the middle managers, and 40% of lead hands participated at least once in the program. Also, 94% of office and production employees had submitted one idea or more during the first year of the program. The idea submission rate was 80% company wide.

There were 296 ideas, and 312 names associated with those ideas. Because employees from any given group may have participated more than once, the percentages of ideas submitted by each group (relative to the total numbers of ideas submitted) were calculated and presented (Figure 4, below):

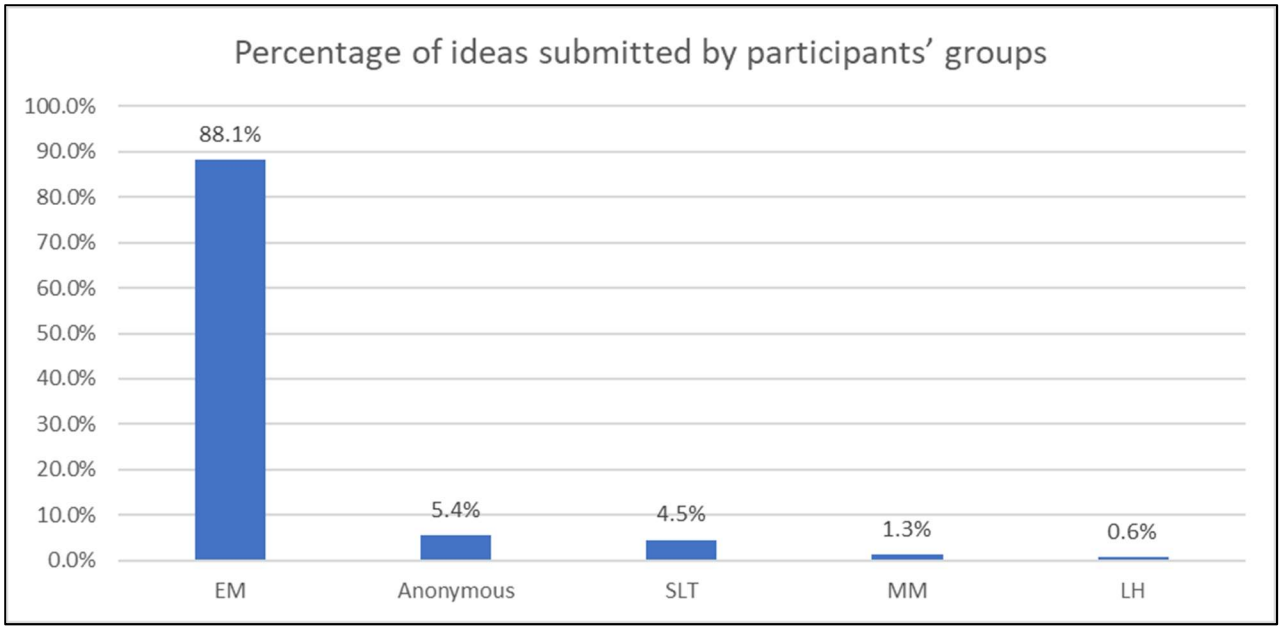


Figure 4: Percentage of Ideas by Participants' Groups

It was found that 88% of ideas submitted were by office and production employees, while around 5% of the ideas were submitted by senior leaders, and a similar proportion by employees who chose not to disclose their names. Both middle managers and lead hands contributed to less than 2% of ideas submitted.

By running the monthly numbers of ideas submitted, it was found that, on average, the program received 25 ideas per month (or approximately one idea every day), and that, although the numbers varied from one month to another, the monthly trend decreased over time. This data is presented in Figure 5 (below):

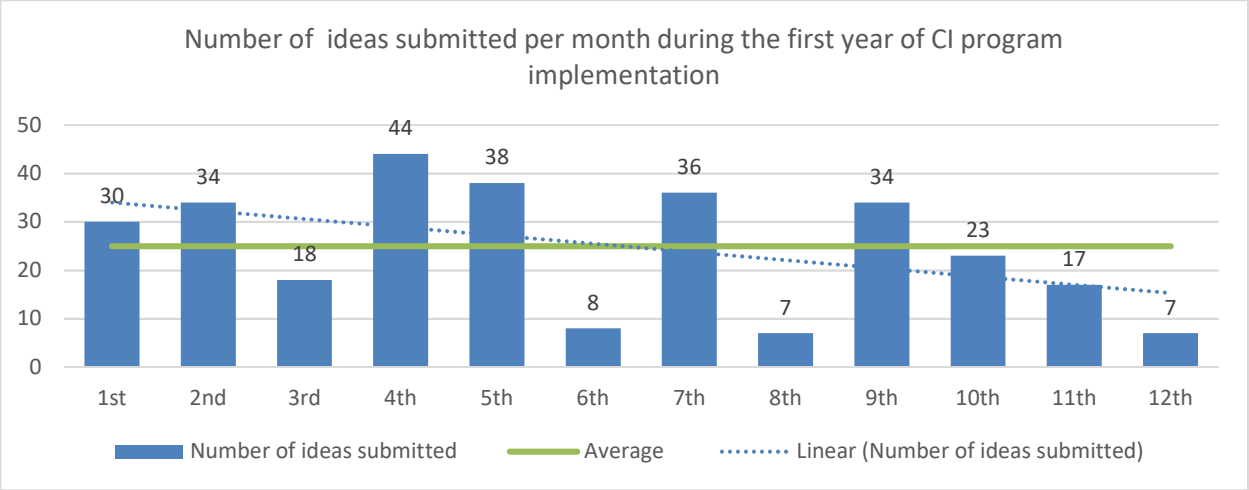


Figure 5: Numbers of Ideas Submitted per Month

3.2.3.2 Idea type by submitter

During the first year of its implementation, the program received 296 ideas from 75 different employees. When the employees submitted an idea, they would choose their idea type as previously illustrated on the idea tag. Idea type could be related to Safety, Quality, Delivery, Cost, and Other. If an employee chose more than one type, the CI administration picked the one based on where the employee had chosen to place the tag on the board. For example: an employee may have thought that her idea could be related to Quality and Cost; however, she inserted her idea in the Quality tray, and thus the log would classify this idea type under Quality. Figure 6 (below) presents the distribution of idea types, during the first year, based on submitters' classifications.

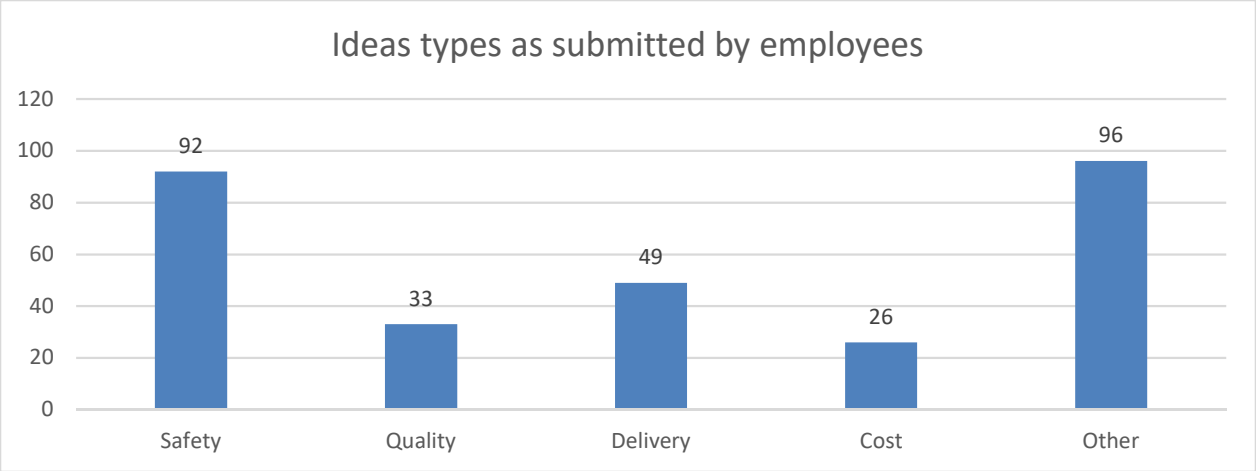


Figure 6: Idea Types as Submitted by Employees

The "Other" category had the highest number of ideas, followed by "Safety" and "Delivery".

3.2.3.3 Idea's point of impact classified by the CI committee

As highlighted earlier, upon reviewing the ideas and investigating their target impact, the CI Committee would classify the ideas based on their interpreted impact. This aspect was particularly meaningful when it came to ideas classified by the submitter as "Safety" and "Other" as these two categories were very general, and accounted for more than 63% of total ideas (being

188 out of 296). Figure 7 presents idea impact as classified by the CI committee:

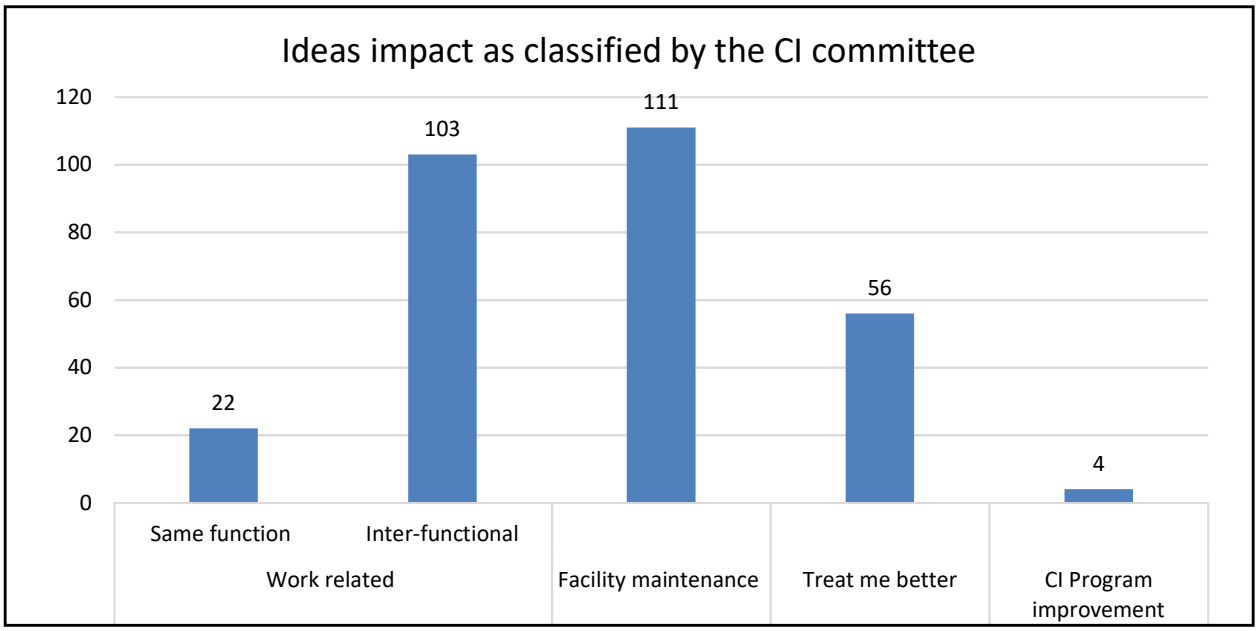


Figure 7: Ideas Impact as Classified by the CI Committee

From Figure 7, it was found that:

1. Total work-related ideas comprised the highest number of ideas (125 out 269 total ideas). However, ideas submitted to improve work within the same department were significantly fewer than those ideas targeting inter-functional work. (22 improvement ideas were within the same function, as compared to 103 inter-functional ideas.)
2. The number of "Facility maintenance" ideas was the highest single category, with 111 ideas submitted.

3.2.3.4 Idea type versus idea's point of impact

To show how these two classifications overlapped, Figure 8 (below) was created to quantify the relationship between how employees classified their ideas, and how the CI committee interpreted their ideas' points of impact:

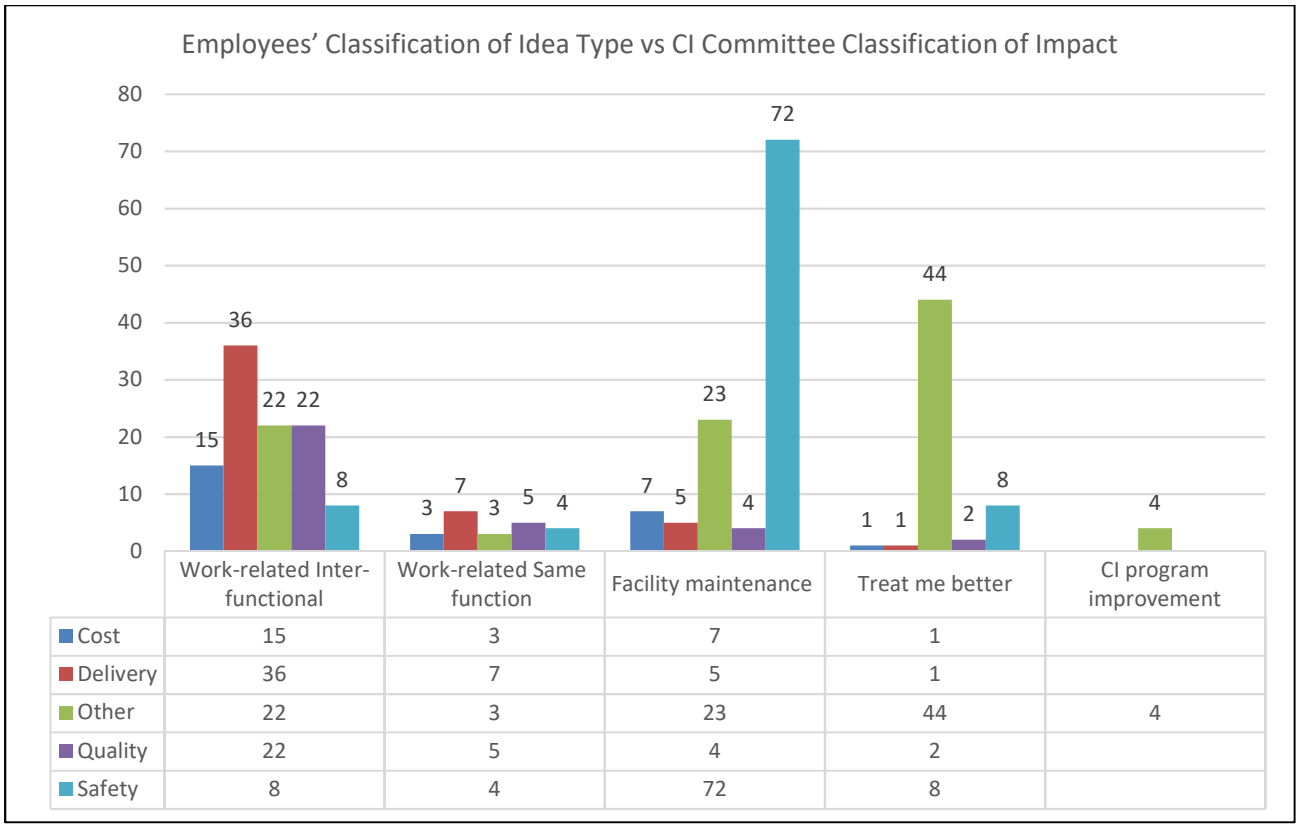


Figure 8: Employee Classification of Idea Type vs CI Committee Classification of Idea Impact

Table 3 presents the totals for idea types and impact:

Idea Impact / Idea type	Work-related		Facility Maintenance	Treat me better	CI program Improvement	Total
	Inter-functional	Same function				
Cost	15	3	7	1		26
Delivery	36	7	5	1		49
Other	22	3	23	44	4	96
Quality	22	5	4	2		33
Safety	8	4	72	8		92
Total	103	22	111	56	4	296

Table 3: Number of Ideas by Type and Impact

From the table above, employees' ideas were classified by the CI committee as follows:

1. 15 ideas out of 22 "Cost" related ideas, which comprised 68%, were interpreted by the CI committee as falling within the "inter-functional work-related improvement" category.

2. The majority of the ideas intended to improve delivery and quality were interpreted as work related CI ideas, suggesting improvement changes between functions. 36 out 49 "Delivery" ideas, which comprised 74%, were classified as inter-functional work-related improvement. Similarly, 22 out of 33 "Quality" ideas, which was 67%, were classified as inter-functional work-related improvements.
3. 44 out of 96 "Other" ideas, which comprised 46%, were interpreted by the CI committee as belonging under the "treat me better" category.
4. The majority of the safety ideas submitted were considered under facility maintenance, such that 72 out of 92 total "Safety" ideas, or 78%, were interpreted as facility maintenance.

It was also found that the categories of idea impact were associated with the following idea types (as submitted by the employees):

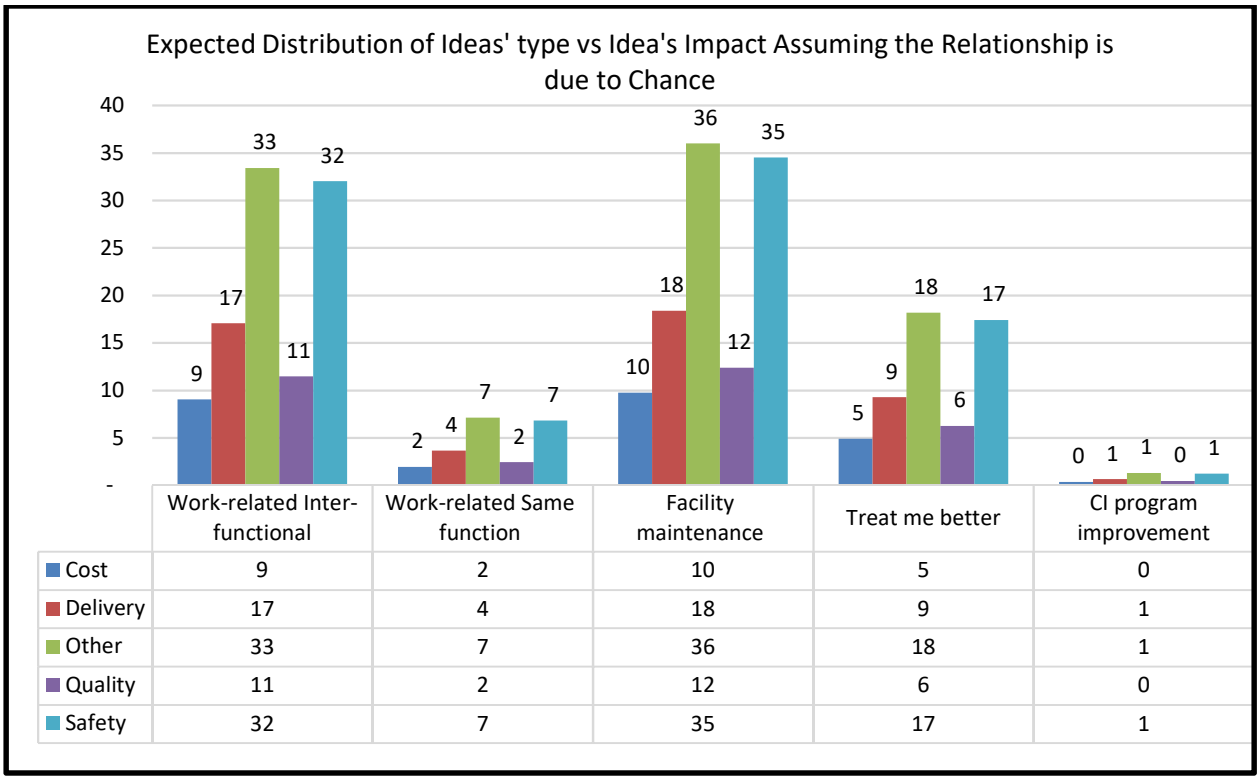
1. 58 out of a total of 103 "inter-functional work-related" improvement ideas, which is equal to 56%, were found to be related to "Delivery" and "Quality".
2. 44 out of a total of 56 "treat me better" ideas, which is equal to 79%, were submitted by employees as "Other" ideas.
3. The highest single category of idea type interpreted by CI committee to be "inter-functional work related" improvements was the "Delivery" related ideas. This constituted 36 ideas out 103 total work-related ideas, at 35%.

A chi-square test was performed to validate the likelihood that the above presented relationships, between submitters classification of ideas' type and how the CI committee interpreted the ideas' impact, might be due to chance, and to help in the evaluation of the

statistical relationships between the idea types, as indicated by submitters, and the ideas' points of impact, as classified by the CI committee. Details of the test are included in the appendices.

At the $p < 0.001$ level, the conclusion was drawn that the relationships between submitters' classifications of idea type and CI committee interpretation of idea impact was not due to chance.

Figure 9 shows the expected distribution of employees' classifications of idea type versus CI committee classification of impact, assuming that the relationship had not been statistically significant.



	Work-related Inter-functional	Work-related Same function	Facility maintenance	Treat me better	CI program improvement
Cost	9	2	10	5	0
Delivery	17	4	18	9	1
Other	33	7	36	18	1
Quality	11	2	12	6	0
Safety	32	7	35	17	1

Figure 9: Expected Distribution of Ideas' Type vs Idea's Impact Assuming the Relationship is due to Chance

Figure 9 demonstrates that, if a significant relationship does not exist, that more “delivery” and "quality” ideas will be interpreted as falling under the “facility maintenance” and “treat me better” categories. “Safety” and “Other” ideas would also have had a higher chance of being interpreted as “work related” ideas by the CI committee, than being classified as “facility maintenance” and “treat me better” categories respectively.

3.2.3.5 Idea’s point of impact versus an idea’s progress status

Once an idea was submitted, it was reviewed by the CI committee, and could then pertain to one of the following status categories:

1. Implemented: idea completed, and the employee awarded a CI program coin.
2. Under implementation: idea approved for implementation, but not yet done.
3. On hold pending another review: the idea required a cross-functional review and more detailed evaluation.
4. Under review with an assignee: idea given to the lead hands/middle managers/subject matter expert to review.
5. Rejected and communicated: idea not selected for implementation, and the submitter was informed as to why.

Figure 10 presents idea status by point of impact:

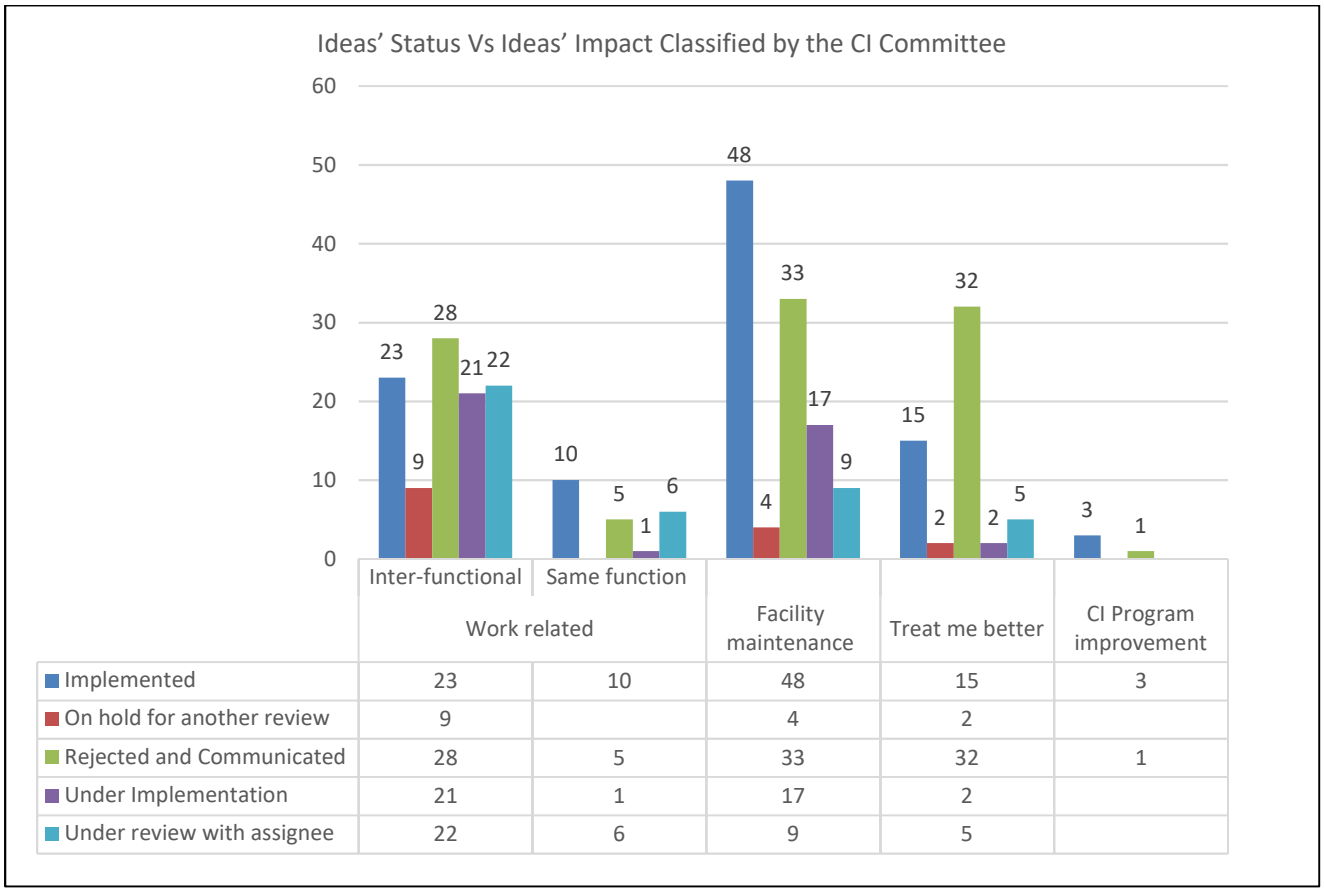


Figure 10: Ideas' Status Vs Ideas' Impact Classified by the CI Committee

Table 4 presents the total number of ideas per idea progress status and ideas' impact:

Idea's impact / Idea's Status	Work-related		Facility Maintenance	Treat me better	CI program	Total
	Inter-functional	same function				
Implemented	23	10	48	15	3	99
On hold for another review	9	0	4	2	0	15
Rejected and Communicated	28	5	33	32	1	99
Under Implementation	21	1	17	2	0	41
Under review with assignee	22	6	9	5	0	42
Total	103	22	111	56	4	296

Table 4: Total Number of Ideas by Ideas' Status and Idea Impact

Ideas related to the administration of the program have been redacted from this discussion due to their small numbers. Based on CI committee classification of idea impact, the following observations were noted:

1. Rejected status had the highest number of ideas within the "inter-functional work related" improvement ideas category, with 28 out of 103 (27%) of such ideas to improve work between departments being rejected.
2. Most of the same-department work-related improvement ideas were implemented, with 10 out of 22 (or 45%) of such ideas within this category completed. This is the highest rate of implementation among all impact categories. The implementation rates among impact categories were: 22% for "inter-functional improvement", 43% for "facility maintenance", and 27% for "treat me better".
3. The "facility maintenance" category had the highest proportion of ideas implemented among all other category statuses, with 48 out of 111 (or 43%) of such ideas, classified to improve the facility, being implemented.
4. Rejected status had the highest number of ideas among all other status in "treat me better" category, with 32 out of 56 (which is 57%) rejected.

From the perspective of idea status, the following observations were noted:

1. The total number of implemented ideas was 99 out of 296, or 33%.
2. The total number of rejected ideas was also 99 out of 296, again 33%.
3. It is worth mentioning that 48 ideas out of the 99 implemented ideas (which is more than 48% of the implemented ideas) were those classified by management under the "facility maintenance" category.

4. Rejected ideas were almost evenly distributed among the “inter-functional”, “facility maintenance” and “treat me better” categories, with 28, 33, and 32 ideas being rejected, respectively, from a total of 99 rejected idea, averaging to 31% of the total rejected ideas from each category.
5. The highest percentage of ideas with “on hold for another review” status fell under inter-functional work improvements. Nine out of the 15 (or 60%) of ideas put on hold for further review were classified as having an impact on work cross-functionality.

A chi-squared test was run to validate the likelihood that the above presented relationships between CI committee classification of the ideas’ impact and ideas’ future , were due to chance. This approach was intended to help evaluate the statistical relationship between the ideas’ impact, as interpreted by the CI committee, and the ideas’ progress status. Details of the test are included in appendices.

At $p < 0.001$, the conclusion was drawn that the relationships discussed, between the CI committee interpretation of ideas’ impact, and the ideas’ progress status, was not due to chance.

3.2.3.6 Idea’s type versus Idea’s progress status

In this section, the relationship between idea type and progress status is examined. Idea type represents the submitter-designated classification of an idea based on his/her perception of its most relevant category from among “Safety, Quality, Delivery, Cost, and Other”. Although these ideas had to be reviewed and reclassified as required by the CI committee before they were processed further, the relationship between idea’s type and its progress status was examined in this section to evaluate the relationship between how submitters defined their idea types, and

how the organization would process the ideas. Figure 11 presents idea status by idea type regardless of CI committee classifications:

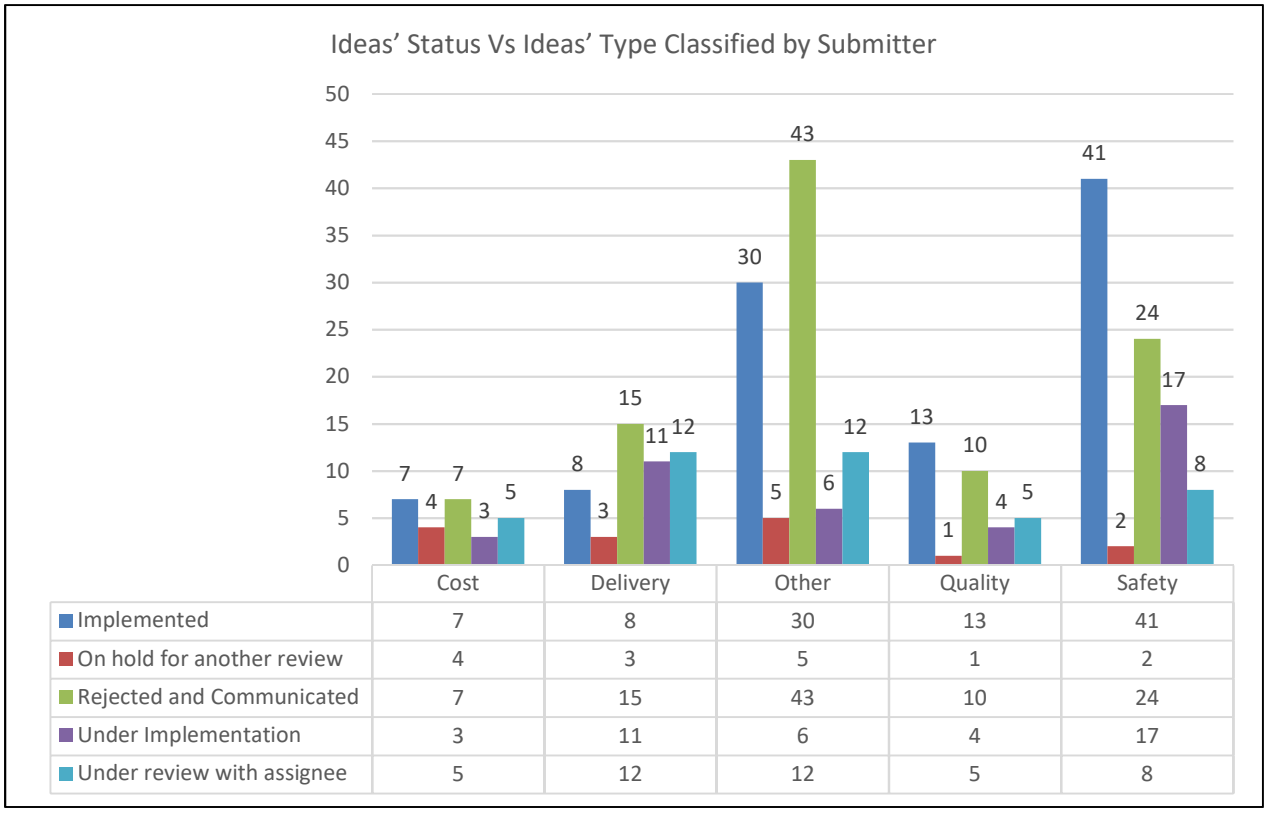


Figure 11: Ideas' Status Vs Ideas' Type Classified by Submitter

Table 5 presents the total numbers for idea type and status:

Idea status \ Idea type	Safety	Quality	Delivery	Cost	Other	Total
Implemented	41	13	8	7	30	99
On hold for another review	2	1	3	4	5	15
Rejected and Communicated	24	10	15	7	43	99
Under Implementation	17	4	11	3	6	41
Under review with assignee	8	5	12	5	12	42
	92	33	49	26	96	296

Table 5: Total Number of Ideas by Ideas' Type and Ideas' Status

Based on submitter classification of CI ideas, the following observations were revealed:

1. “Implemented” status had the highest number of ideas submitted under “Safety”, “Quality”, and “Cost” categories; 41, 13, and 7 ideas were implemented from among 92, 33, and 26 respectively, which comprised 42%, 39% and 27%.
2. “Rejected and communicated” status had the highest number of ideas among all other statuses for improvement ideas submitted under the “Delivery”, “Cost”, and “Other” categories, with 15, 7, and 43 ideas rejected out of 45, 26 and 96, making 31%, 27%, and 45% respectively.

From the idea status perspective, the above table (Table 5) revealed the following observations:

1. The category with highest percentage rate for “implemented” and “under implementation” was Safety, with 41 implemented ideas and 17 ideas under implementation, from totals of 99 and 41 each, making 41% on average.
2. The category with highest percentage rate for “rejected and communicated” and “on hold for another review” was “Other”. 43 rejected ideas and 5 ideas on hold for another review, out of 99 and 15, equated to 43% and 33% respectively.
3. The categories with the highest percentage rates for “under review with an assignee” were “Delivery” and “Other”. 12 ideas were considered under review with an assignee, for each of the “Delivery” and “Other” categories, out of a total of 42, which made 29% for each category individually.

A chi-square test was run to validate how likely it was that the above presented relationships, between submitters classification of ideas’ type and ideas’ progress status, were due to chance. This method helped evaluate the statistical relationship between the idea type, as

defined by the submitters, and ideas' progress status. Details of the test are included in appendices.

The conclusion was made that the relationships discussed between idea type and idea progress status was due to chance.

3.2.3.7 Rejected ideas by reason code, idea type, and idea point of impact

Management rejected 33% of the ideas. For every idea rejected, a code was generated to capture the reason for the rejection.

As part of this study, Table 6 (below) was generated from the Continuous Improvement log. It shows ideas rejected and sorted by rejection code, idea's impact, and idea's type:

Ideas' impact by rejection code		Idea Type					Total by	Total by
Code for rejection	CI Committee Idea type	Safety	Quality	Delivery	Cost	Other	Idea's	Rejection code
Idea is out of the program scope	CI program					1	1	25
	Facility Maint.					1	1	
	Treat me better	1	1	1	1	11	15	
	Work related - Inter-functional			3	1	4	8	
Problem does not justify cost	Facility Maint.	3	1	1		2	7	23
	Treat me better	3				6	9	
	Work related - Inter-functional			4		1	5	
	Work related - same-function	1		1			2	
Problem has been identified with an owner	Facility Maint.	3			1	3	7	17
	Treat me better					1	1	
	Work related - Inter-functional		1	4		3	8	
	Work related - same-function				1		1	
System Exists to capture this problem	Facility Maint.	1				1	2	9
	Treat me better		1			2	3	
	Work related - Inter-functional		3				3	
	Work related - same-function				1		1	
Idea already submitted	Facility Maint.	3				1	4	7
	Work related - Inter-functional		1	1	1		3	
Solution was not feasible	Facility Maint.	3	1		1		5	7
	Treat me better					1	1	
	Work related - Inter-functional		1				1	
Discipline issue	Facility Maint.	2				2	4	4
Near Miss	Facility Maint.	1				1	2	3
	Work related - Inter-functional	1					1	
Related to assigned responsibility	Treat me better					2	2	2
Environmental concern	Treat me better	1					1	1
Idea was withdrawn	Facility Maint.	1					1	1
Total by Idea type		24	10	15	7	43	99	99
Total Ideas submitted		92	33	49	26	96	296	
Rejection rate by Idea's type		26%	30%	31%	27%	45%	33%	

Table 6: Ideas Rejected and Sorted by Rejection Code, Idea's Impact, and Idea's Type

From the above table, the following observations were noted:

1. The top reason for rejection was ascribed to the reasoning "ideas are out of the program scope", with 25% of all ideas rejected coded accordingly. This code was also heavily used in the "treat me better" and "inter-functional" impact categories.
2. The top three codes ("ideas' scope", "problem does not justify cost" and "problem has been identified with an owner") accounted for more than 65% of those used to explain rejected ideas.
3. It was found (Table 6) that 8 out of the total 28 rejected ideas had been classified as "inter-functional", which is around 29% of the total ideas rejected in this category (total rejected inter-functional ideas were presented in Table 4, in the previous chapter) and which were coded as "problem has been identified with an owner". This code was used if the idea addressed a known problem, and management has assigned someone to solve it, but it was not yet solved.

2.3.4 Discussion for Study 1

Study 1 focuses on the content of the CI program, and topics reviewed included: the number of ideas, who participated, how idea submitters classified their ideas, how the CI committee (which was highly influenced by the senior leaders) reclassified those ideas based on their perceived impact, and finally, how idea classification of type or impact influenced the ideas' future progress.

As presented in Table 2, 39 production employees submitted ideas via the program, representing around 53% of all employees who participated in the program. This fact is an indication that the program was able to attract not only office employees, but also employees working on the shop floor. Total participation rate was 80%, which means that 80% of all of the organization's employees submitted at least one idea during the program's first year. Although

the program received an average of 25 new ideas every month, as presented in Figure 5, the monthly number of ideas submitted showed a downward trend indicating that more ideas were received during the first six months of the program as compared to the second six months of the year. This trend may be related to the fact that employees wanted to try this new program early during its launch and see how their ideas were treated, before they continued submitting more ideas, or that the decrease in the number of ideas in the second half of the year could supposedly have been brought about because employees had submitted most of their ideas to the program early, and then tapered off their submission pace due to a lack of new ideas. There was even evidence that the ideas started to show up multiple times in the CI program; Table 6 shows that seven out of 99 ideas rejected were due to previous submission of the same ideas by other employees. Study 2 will shed light on the impact of the program on the employees' appetite to participate in the program, from the employee and management perspective.

From Figure 6, it was found that 92 and 96 out of 296, which is equal to 32% and 31%, of ideas submitted were identified (by submitters) under the "Other" and "Safety" categories. Although these high percentages emphasize the importance of implementing safety improvement for employees, it also highlights the fact that almost a third of the ideas submitted were not clearly defined by the submitters, and were classified under "Other". The program intention of having the "Other" category was for those one-off ideas that were not related to Safety, Quality, Delivery or Cost. This happening eventuates when employees are not sure about an idea's scope, and where it fits in the program and within the organization's focus. Although chi-square tests showed that any relationship between ideas' types and their status was due to chance, it was observed from Table 6 that the "Other" category did not only have 45% rejection rate, which was

the highest among all other categories, but also was most frequently coded to "idea scope" being the problem.

Even more interestingly was the relationship between an idea's type, as defined by the submitter, and the idea's impact, as defined by the CI committee. It was found that how employees classified their ideas had an influence on how the CI committee would reclassify the same ideas. Although each classification had its own name, general trends persisted. For example, a high percentage of inter-functional work-related ideas were fed by what submitters considered "Delivery" and "Quality" related ideas. Also, a high percentage of "treat me better" ideas came from what submitters considered "Other" ideas. These consistent findings seemed to indicate that there was a systematic gap between submitters' and CI committees' methods of classifying improvement. Individual submitters classified ideas based on what they thought they should improve; this position could be very subjective and different from one person to another.

This ambiguity in how employees and management viewed idea scope and focus could potentially cause the introduction of huge variations into the organization, according to Ashby's Law of Requisite Variety. Employees do not have a clear direction on what to channel through the CI program which means that their ideas will keep introducing new variety that management is not ready to deal with. However, management classified ideas based on how the ideas would be solved, or by who would be implementing it. Although the CI committee called its classification as under "ideas' impact", the findings show that such classification is a good representation of management's capability to deal with ideas, which in turn reflects on the organization's ability to implement these ideas which what Ashby's law calls "variety handling capability" . For example, what was considered as a "Quality" improvement by employees was mostly interpreted as inter-functional improvement by the CI committee. Management expected

improvements in quality to require cross-functional work. Moreover, what was considered "Safety" by employees was largely interpreted as being facility maintenance by management, since they were going to hire someone to do it, and did not require internal resources.

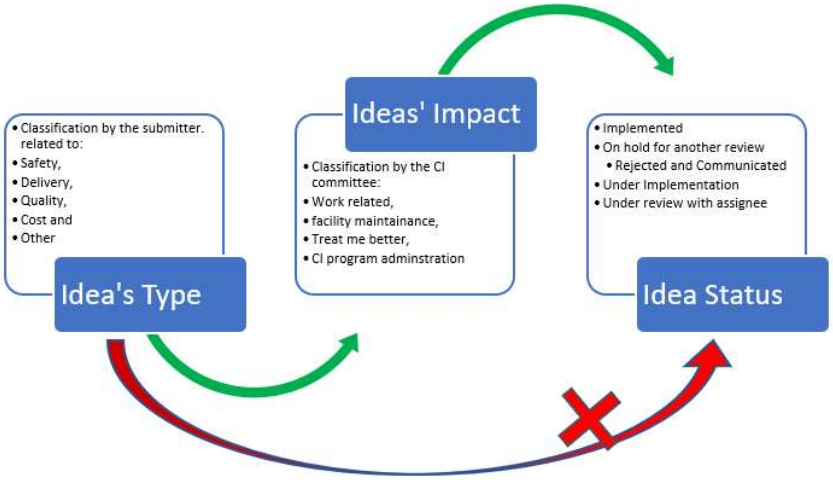
Further findings from study 1 showed that, once management reclassified an idea, that classification would have an impact on the idea's progress. For example, Table 4 shows that ideas classified as inter-functional work-related improvement would tend to have the lowest implementation rate (22%) among all ideas' impact categories. Also, ideas classified by management to be in the "treat me better" class would have a high chance of being rejected (more than 57%). On the other side, ideas interpreted as being same-function, work-related improvement, and/or facility maintenance would have a high implementation rate, at 45% and 43% respectively. This high implementation rate is attributed to the fact that these two categories of idea impact did not demand extra organizational resources.

Classification by management, and its relationships to rejection and implementation rates, indicate together that the CI committee was acting as a regulator: filtering ideas based on management view of their impact; classifying ideas according to the efforts/resources required to achieve them; and therefore determining their future progress. However, submitters are not part of this thought process at all. The statistical analysis showed no dependency between idea type and progress, which highlights a very important gap in how the content of the CI program is dealt with from the submitters' (mainly office and production employees) perspective. The

findings revealed that there was no evidence to support that ideas' type defined by submitters could influence or impact future idea progress.

Figure 12: Influence Relationships Between Ideas' Type, Ideas' Impact and Ideas' Progress

These relationships are presented in Figure 12: Based on the chi square testes conducted above, Green arrows represent that a relationship is not due to chance, whereas a red arrow represents a relationship that is due to chance. This schematic means that submitter perspective cannot be a reliable predictor or influencer of whether an idea will be implemented or rejected; instead, it is how management classifies the idea, which is based on what would it take to process it and whether they have resource to deal with, that influence the idea's progress.



Therefore, it would be difficult for employees to understand the feedback regarding the status of an idea. To clarify this aspect, the progress of "Delivery" improvement ideas will be discussed. Delivering on time is considered a main objective and goal for this organization, and employees are encouraged to submit ideas to improve on-time delivery.

Table 3 shows that 43 out of 49 idea submitted by employees as delivery ideas, which is equal to 88%, were classified by the CI committee as work-related improvements. This finding indicates that management defined them as genuine improvement ideas that should be examined

carefully. This categorization went further into classifying these 43 ideas into 36 cross-functional, and seven same-function improvement ideas. Ideas classified as same-function require the least amount of effort, as the employees can usually implement them easily within their own departments. It also explains why same-function improvement ideas have the highest implementation rate of 45%. Furthermore, ideas classified as cross-functional are harder to process and require cross-functional resources to work together, because "delivering on time" is not one department's responsibility, and cannot be within one function's control. These inter-functional ideas represent varieties that demand new forms of collaboration and resource commitment.

In summary, it was found that the submitter's area of intended improvement had little to no impact on how management read, perceived, and handled the idea. This trend indicates an existing gap between what submitters want to achieve, and what the management, represented by the CI committee, wants and to what they are able to make a commitment. Study 2 will be based on input from different groups of employees in the organization, regarding their individual experience with the CI program during its first year of implementation.

3.3 Study 2: Evaluation of the Continuous Improvement Program

In this study, a survey was conducted to evaluate the performance of the Continuous Improvement program at its first anniversary. The data were collected by using questionnaires targeting four different participants' groups. Each questionnaire was designed to capture employees' feedback based on their current roles in the organization. Employees in supervisory positions were asked additional questions to better understand their involvement in the CI program. Then individual questions' results were summarized, followed by a discussion about the study's overall findings.

3.3.1 Methodology

Participants who had access to company email were each sent a specific link to access the survey. Paper copies of the survey were distributed to all production employees in person; extra copies were left in the cafeteria. Production employees were asked to complete the paper survey and drop it in a specific box in the CI office. Samples of the letters sent to the different groups are attached in the appendix, along with the surveys' questions; questions that were unique to certain groups are highlighted in different colours.

In general, all participants were asked to:

- Explain what they expected from a good CI program;
- Describe the company's current CI program;
- Name three things they liked the most in the current program;
- Name three things they liked the least in the current program;
- Describe their contribution to the program;
- Indicate their CI background and training; and

- Rate 12 aspects of the program on a scale from 1 (being not very good) to 7 (being very good). Participants were given the option to select "I am not sure", or to skip rating a certain aspect. These aspects are listed in Table 7:

#	CI Aspect
1	Clarity of ownership to move ideas forward
2	Employee appetite to participate
3	Feedback process
4	Idea's impact
5	Idea's quality
6	Implementation speed
7	Middle management commitment
8	Overall CI culture at the site
9	Reviewing speed
10	Reward program
11	Senior leadership commitment
12	Your team's CI skills

Table 7: CI Aspects to be Rated by Participants

Additional comments on the survey's design included:

1. Senior leaders/middle managers were asked to indicate if their subordinates (middle manager, lead hands, and office employees) had included "supporting the Continuous Improvement Program" in their annual performance objective. They were also asked to explain their answers.
2. Middle managers, lead hands, and office/production employees were asked to indicate how many informal improvement ideas their department was implementing that were not captured through the formal CI Program. They were asked to give an estimate for these numbers (per week), and to explain why these ideas were not being captured through the program.
3. Lead hands, who managed production employees, were asked the question "how do they define/measure their team's CI expectation and performance (What is exceeding? What is meeting? And what is not meeting expectations)".

4. It is worth mentioning that, as per the company policy, lead hands evaluate the production employees annually based on "continuous improvement initiatives" in addition to another eight points, including areas like job knowledge, safety adherence, skills flexibility, and others. This question was included to understand how lead hands evaluated their teams when it came to CI initiatives.
5. All employees were told that their inputs would be treated confidentially, and that they did not have to include their names.

3.3.2 Results

3.3.2.1 Introduction

Participation rate varied among groups, and was influenced by how many follow-up attempts performed. For example:

1. Three follow-up emails were sent to the supervisory groups (SLT, MM, and LH). After these three follow-up reminders, participation rates were assessed at 70% from middle managers (MM), 80% from lead hands (LH), and only 50% from the Senior Leadership Team (SLT). Given the low participation rate from the top leaders' level, the company president sent a request to the SLT group to complete the survey. After the fourth attempt, the participation rate for the SLT group went up to 88%. The president took this initiative without any request from the author.
2. For office employees, two reminders via email were sent. For production employees, paper copies of surveys were distributed to every employee individually on the floor, on two different days of the week. There was no request through any managerial communication asking office or production employees to complete the survey, to ensure that people did not

feel pressured to complete the survey. For the EM group, the participation rate was 31% of all office and production employees.

3. Total participation rate for all employees across all groups was 43%.

Table 8 (below) shows the total number of employees in each group and how many responses were received from each.

	Group	Sent	Returned	Rate
SLT	Senior Leadership Team	8	7	88%
MM	Middle Management	10	7	70%
LH	Lead Hands	5	4	80%
EM	Office/Production Employees on site	70	22	31%
	Overall	93	40	43%

Table 8: Number of Responses by Participants' Groups

The survey asked employees to express their views, and to rate different aspects of the CI program, resulting in multiple sets of qualitative data. These qualitative comments were broken down into individual statements, then compiled in an Excel spreadsheet along with their sources (participants' groups). These comments were further classified in one of the following seven categories, each representing an element of the CI program structure. Table 9 shows each category and what it meant within this study environment to illustrate these categories further:

Category	Associated with comments containing the following thoughts:
Implementation	"Implementation speed", "effectiveness" and "change sustainability".
Leader support	"Accountability", "consistent leaders support" and "a cross functional support".
Engagement	"More ideas", "motivation to submit", "ease of use" and "a platform to be heard".
Feedback	"Feedback speed", "quality of follow up", "communication" and "transparency".
Idea Scope	"Defined goal", "key area of the process", "idea's impact" and "value for the business".
Reward	"Appreciation", "meaningful tangible reward" and "link to profit sharing program".
General	General comments that cannot be classified

Table 9: CI Categories Representing Elements of the CI Program.

To verify the reliability of this categorization exercise, a sample of classified responses from questions 1 and 2 was given to an independent employee within the organization, who was then asked to perform the same exercise. The outcome of this independent review for the sample data matched the author's categorization outputs at a rate of greater than 80%. This high matching rate provided significant confidence over the qualitative data categorization process. Questions 1 and 2 were selected because they had substantial qualitative details that could set the foundation for the rest of the analysis. It is worth mentioning that this independent employee was not involved in administration of the CI program; however, he was knowledgeable about the program processes, and attended idea meetings and discussions on a regular basis.

Additional tables showing data for every question, and how they were interpreted, are attached in the appendices.

In the following section, questions results have been reported individually. Following the presentation of findings, reflections on the overall results are provided in the discussion section.

3.3.2.2 Question 1: "What would you expect from a good Continuous Improvement Program?"

Responses for this question varied between and within groups, based on participants' perceptions and understanding of the purpose and the impact of a good Continuous Improvement program. Table 10 below shows the categorized count of employees' comments by participants' groups and by CI program element. For example, there were 18 comments from office and production employees, one comment from lead hands, and two comments from the senior leaders that mentioned implementation being a critical part of a good CI program.

CI Program Category	EM	LH	MM	SLT	Total
Implementation	18	1	0	2	21

Leader Support	8	2	5	3	18
Engagement	4	1	3	10	18
Feedback	5	5	5	0	15
Idea Scope	10	1	2	2	15
Reward	2	1	2	0	5
Total	47	11	17	17	92

Table 10: Number of Comments Received by Participants' Groups for Question 1.

Participants' groups had different perspectives on which categories were key ones for a good CI program; the table was analyzed vertically to highlight how each participants' group defined a good CI program:

1. Office and production employees' comments emphasized "idea scope" and "implementation". 28 out 47 of comments (59%) put the emphasis on a good CI program having clear and meaningful improvement goals ("idea scope") and making sure that the ideas' implementation was fast and sustainable ("implementation").
2. Senior leaders believed that a good CI program should improve "engagement" in the organization. 10 out 17 of their comments (59%) associated high numbers of employees' ideas with a good CI program.
3. Responses from lead hands and middle managers indicated that having "leader supports" and a good "feedback" system were essential for a good CI program. 17 of 28 of their comments (61%) talked about the importance of "leader support" and transparent "feedback" in the structure of a good CI program.

To evaluate how a certain category was perceived by different participants' groups, the numbers of comments were normalized to reflect the weight of sample size from every group against the total number of responses received. Table 11 (below) shows normalized percentages of comments given by each group for each element of the CI program:

CI Program Category	EM	LH	MM	SLT	Total

Implementation	60%	18%	0%	21%	100%
Leader Support	18%	25%	36%	21%	100%
Engagement	8%	11%	19%	62%	100%
Feedback	10%	57%	33%	0%	100%
Idea Scope	36%	20%	22%	22%	100%
Reward	15%	40%	46%	0%	100%

Table 11: Normalized Percentages of Comments by Participants' Groups.

This horizontal view of the data highlights which participants' groups nominated any certain category as being the most important one in defining a good CI program, and it is noted that:

1. 60% of the comments nominating "Implementation" came from office and production employees.
2. 61% of the comments nominating "Leader Support" came from lead hands and middle managers.
3. 62% of the comments nominating "Engagement" came from the senior leadership team.
4. 90% of the comments nominating "Feedback" came from lead hands and middle managers
5. Although all participant groups profoundly nominated "idea scope", 36% of these comments came from office and production employees.
6. 84% of the comments nominating "Reward" came from lead hands and middle managers.

3.3.2.3 Question 2: "How would you describe the company current continuous improvement program?"

Participants' responses for Question 2 were categorized based on the previously identified seven categories of the CI program (mentioned in Question 1, above). Since employees' comments around these categories defined their perception of the current CI program, another variable was added to participants' comments to indicate if the comment represented an optimistic view (indicated by a "+" sign) or a pessimistic view (indicated by a "-"

sign) within that specific category. For example, a comment indicating that the program was engaging employees and motivating them to bring in new ideas would be classified as an engagement comment that was optimistic. Furthermore, general comments were treated similarly.

Table 12 (below) shows employees' comments from raw data as classified by three variables: participants' groups, category of CI program, and nature of the comment (optimistic or pessimistic) and sorted by total number of comments in descending order:

		EM		LH		MM		SLT		Total	
	Total comments	35		10		15		13		73	
	Category↓ Nature →	+	-	+	-	+	-	+	-	+	-
1	**Engagement**	1	5	1	1	1	5	1	4	4	15
2	**Idea Scope**		6		1		3		4		14
3	**General ***	17	3	2	2	5		1	1	25	6
4	**Feedback**		1		2		1				4
5	**Implementation**	1			1				2	1	3
6	**Reward**	1								1	
7	**Leader support**										
	Total	20	15	3	7	6	9	2	11	31	42
	* very general statement: e.g. "the program is good/not good"										

Table 12: Number of Employees' Comments Classified by Participants' Groups, Category of CI Program and Nature of Comments

73 comments were received from all employees, 42 of them being pessimistic and 31 optimistic.

Since the number of comments correlated to the number of responses from every participant group, to be able to compare perception across participants' groups', data were normalized vertically by calculating the "pessimism index", which was the number of pessimistic comments within each participant group divided by number of optimistic comments for that group. If the index value was less than one, the group was generally optimistic about the current CI program; higher values reflected higher degrees of pessimism. Figure 13 represents "pessimism index" values for all of the four participants' groups.

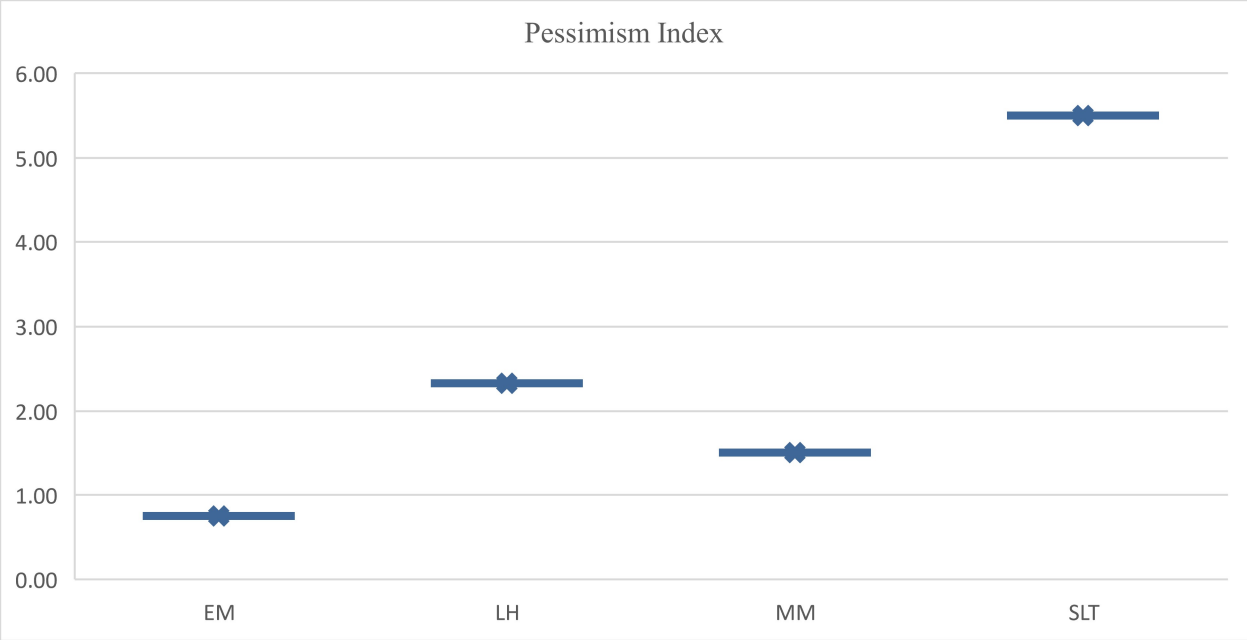


Figure 13: Pessimism Index Values by Participants' Groups

It was found that the only participants' group with overall optimistic viewpoint was that of the office and production employees.

All members of supervisory groups were generally more pessimistic. The senior leadership team (SLT) had the highest index value of 5.5; the lead hands' index value was 2.3; and middle managers had a value of 1.5 for their pessimism index.

Table 13 (below) shows the normalized percentages of comments by CI program category, participants' groups, and future views. This table was produced to understand which CI category was considered and mentioned by participants when asked about the current CI program, and to be able to compare perception across participants' groups, the numbers of comments were normalized to reflect the weight of participants' group sizes. Subsequently, for every participants' group, the percentages of optimistic and pessimistic comments to the total comments received were calculated for every category.

CI Program Category	Future View	EM	LH	MM	SLT	Total	Percentage of normalized total comments
Engagement	Optimistic	1%	3%	2%	1%	7%	29%
	Pessimistic	3%	3%	9%	7%	22%	
Idea Scope	Optimistic	0%	0%	0%	0%	0%	18%
	Pessimistic	3%	3%	5%	7%	18%	
General *	Optimistic	9%	6%	9%	1%	25%	35%
	Pessimistic	2%	6%	0%	2%	10%	
Feedback	Optimistic	0%	0%	0%	0%	0%	9%
	Pessimistic	1%	6%	2%	0%	9%	
Implementation	Optimistic	1%	0%	0%	0%	1%	8%
	Pessimistic	0%	3%	0%	4%	7%	
Reward	Optimistic	1%	0%	0%	0%	1%	1%
	Pessimistic	0%	0%	0%	0%	0%	
		20%	31%	26%	23%	100%	100%

Table 13: Normalized Percentages of Comments by Participants' Groups, CI Program Categories, and Future Views

The following findings were noted.

1. Participants highlighted "Engagement" and "Idea Scope" the most when it came to evaluating the current CI program. 29% and 18% of the total comments, respectively, were about these two categories. However, participants' views were mostly pessimistic for "engagement" and completely pessimistic for "idea scope". This pessimistic view was mainly driven by middle managers and senior leaders. 55% (16%/22%) and 67% (12%/18%) of the pessimistic comments for "Engagement" and "Idea Scope" came from these two participants' groups respectively.
2. Participants talked about the program in "general" in 35% of their total comments. The majority of these comments were optimistic and driven by middle managers, lead hands, and office and production employees. 24% of the total comments came from these three groups with a generally optimistic view on the program.
3. Participants mentioned the program's "Feedback" in 9% of their total comments. All these comments were pessimistic, and driven mainly by lead hands. No optimistic commentary was received about the program's "feedback" from any participants' group.

4. Participants mentioned the program's "Implementation" in 7% of their total comments. Most of these comments were pessimistic, and driven mainly by senior leaders and lead hands on the shop floor.
5. Participants did not give much attention to the "Reward" category of the program. Only 1% of their total comments were about the program rewards, and it was all optimistic.
6. "Leader Support" was not included in participants' responses at all.

3.3.2.4 Questions 3 and 4: "Name 3 things you like the most in the current program" and "Name 3 things you like the least in the current program".

Following the same categorization process presented in Questions 1 and 2, it was found that participants provided 145 comments in total: 79 comments about things that they liked "the most", and 66 comments about things they liked "the least".

Table 14 (below) illustrates how many comments participants provided about each category through these two questions, and whether the comments were classified among the categories that were liked "the most" or "the least"; NA (Not Applicable) means that participants did not mention the category at all.

Classification	Category	Employees' Groups				
		EM	**LH**	**MM**	**SLT**	**Total**
Liked least	Engagement	1	2	3	5	11
Liked Most	Engagement	11	2	6	8	27
Liked least	Feedback	4	2	4	*NA*	10
Liked Most	Feedback	1	*NA*	4	1	6
Liked least	Idea Scope	6	2	5	5	18
Liked Most	Idea Scope	3	*NA*	*NA*	1	4
Liked least	Implementation	2	1	3	2	8
Liked Most	Implementation	8	1	2	2	13
Liked least	Leader Support	2	1	*NA*	*NA*	3
Liked Most	Leader Support	4	1	*NA*	2	7
Liked least	General	5	*NA*	1	*NA*	6
Liked Most	General	2	*NA*	1	*NA*	3

Liked least	Reward	7	2	1	*NA*	10
Liked Most	Reward	11	1	5	2	19
	Total	67	15	35	28	145

Table 14: Number of Comments by Participants' Groups Providing the "Most" and the "Least" Liked for Each Category

This set of data was analyzed three different ways:

1. **Categories with no response:**

Classification	Category	Participants' Groups				
		EM	**LH**	**MM**	**SLT**	**Total**
Liked least	Feedback Liked least				NA	1
Liked Most	Feedback Liked Most		NA			1
Liked Most	Idea Scope Liked Most		NA	NA		2
Liked least	Leader Support Liked Least			NA	NA	2
Liked Most	Leader Support Liked Most			NA		1
Liked least	General Liked Least		NA		NA	2
Liked Most	General Liked Most		NA		NA	2
Liked least	Reward Liked Least				NA	1
	Number	0	4	3	5	

Table 15: Liked "Most" and "Least": Categories With No Response by Participants' Groups

Table 15 shows that office and production employees commented on all areas, indicating that every category was at least mentioned once within "the most" liked or "the least" liked responses received from some participant of this group.

None of the lead hands participating in the study included "Feedback" and "Idea Scope" in their "the most" liked answers.

None of the middle managers who participated in the study included "Leader Support" in their responses at all, and none of them mentioned "Idea Scope" in their responses for things they liked "the most" in the current CI program.

None of the senior leaders mentioned "Feedback", "Leader Support" and "Reward" in their responses for things they liked "the least" in the current CI program.

2. **Group consensus:**

To measure the consensus within the same group and to be able to compare responses among groups, consensus ratios, which are equal to the total number of comments about things liked "the most", compared to the total number of comments about things liked "the least", were calculated for every participants' group and for every CI program category. When comments were missing in either the numerator or denominator of the ratio, the number 1 was used to avoid mathematical error. These adjusted ratios are highlighted with an "A" next to their value. Also, categories not mentioned at all were highlighted as not applicable "NA". Table 16 (below) summarizes the consensus ratios for all participants' groups:

	EM	**LH**	**MM**	**SLT**
Engagement	11.00	1.00	2.00	1.60
Feedback	0.25	0.50 A	1.00	1.00 A
Idea Scope	0.50	0.50 A	0.20	0.20
Implementation	4.00	1.00	0.67	1.00
Leader Support	2.00	1.00	NA	2.00 A
General	0.40	NA	1.00	NA
Reward	1.57	0.50	5.00	2.00 A

Table 16: Participants Groups' Consensus Ratios by CI categories

Ratio interpretation:

A computed value of around 1 for a certain CI category indicates that the group members were divided in terms of how they perceived that category. In another words, in that participants' group, the number of responses considering this category as liked "the most" was equal to the number of responses considering this category as being liked "the least". The higher or smaller the value, the bigger the consensus magnitude of liking something "the most" or "the least" respectively. Based on the table above, participant groups reported the following consensus measures:

Office and production employees liked the "Engagement" effect of the program the most. The engagement consensus ratio was very high, indicating that most of the

participants liked the engagement impact of the program "the most" compared to any other CI category. There was also another strong consensus within this participant group over "Implementation", "Leader Support" and "Reward System" being those most liked, but at different strength levels.

Lead hands: participants in this group collectively liked "Idea Scope", "Feedback" and "Reward" categories "the least". They were divided on the rest of the categories.

Middle managers: participants in this group collectively liked the "Engagement" impact and "Reward" aspects of the program the most. On the other hand, "Idea Scope" and "Implementation" were liked "the least" by most of the middle managers.

For senior leaders, participants in this group collectively liked "Idea Scope" "the least". For the rest of the categories, senior leaders showed minor consensus tendencies on liking "Engagement", "Leader Support" and "Reward" "the most".

Based on the table above, CI program categories consensus ratios were interpreted as follows:

1. "Engagement" was liked "the most" by all participants' groups. The strongest consensus was among office and production employees, with similar thinking within participants' groups tapering off at higher levels in the organization.
2. "Feedback" was liked "the least" among most office and production employees, lead hands, and middle managers. However, senior leaders were divided on this category.
3. "Idea Scope" was liked "the least" across all participants' groups. The strongest consensus was within the middle managers' and senior leaders' groups.

4. "Implementation" was liked "the most" by a majority of office and production employees' groups, and the least by the majority of the middle managers' group. Both the lead hands' and senior leaders' groups were divided on this category.
5. "Leader Support" was liked "the most" more than "the least" by office and production employees and senior leaders. Lead hands were divided on this one. Middle managers did not include "Leader Support" in their answers at all.
6. Most of the general comments received from office and production employees were considered in "the least" liked section, which explains the low ratio. Middle managers provided equal numbers of general comments in "the most" and "the least" liked sections of the questions.
7. Finally, for the "Reward" category, there was a consensus, although at different levels, among office and production employees, middle managers, and senior leaders as to liking the reward system "the most". To the contrary, lead hands agreed on liking the reward system "the least".

3. <u>Companywide perception:</u>

To evaluate the general perception on what was liked "the most" or "the least" from all groups, the percentages of normalized numbers of comments, to the total number of comments by CI category, is presented as percentages in Table 17 and visually in Figure 14 below:

Category	Liked "the most"	Liked "the least"	Δ
Leader Support	5%	2%	7%
Feedback	5%	3%	8%
None	1%	7%	8%
Implementation	8%	7%	15%
Idea Scope	2%	14%	16%
Reward	11%	6%	17%
Engagement	19%	10%	29%

	51%	49%	100%

Table 17: The Percentages of Normalized Numbers of Comments to Total Numbers of Comments for Questions 3 and 4

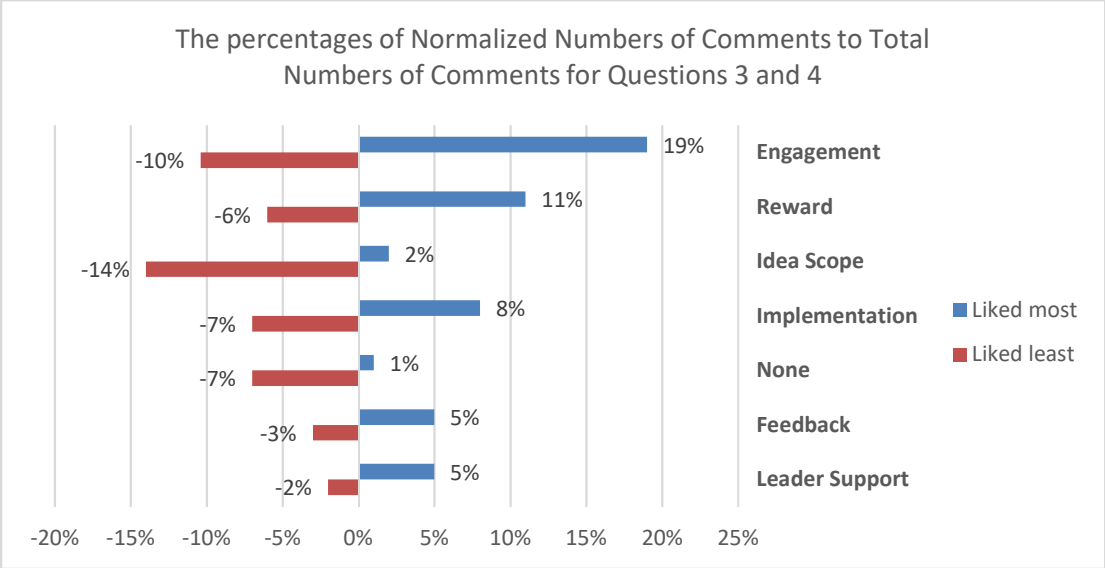


Figure 14: The Percentages of Normalized Numbers of Comments to Total Numbers of Comments for Questions 3 and 4

It was found that the three most discussed categories were "Engagement", "Reward", and "Idea Scope". 62% of all comments covered one of these three categories. More participants liked "Engagement" and "Reward" "the most" than "the least", and more participants liked the "Idea Scope" "the least" than "the most". Noticeably, the difference between the percentages of liked "the most" and liked "the least" for "Idea Scope" was the largest among all other categories.

3.3.2.5 Question 5: "Has your team included an annual performance objective related to the Continuous Improvement Program in 2019? And why?"

Question 5 was addressed only for senior leaders and middle managers. Senior leaders supervise middle managers; middle managers oversee lead hands and other office employees. As per company policy, all senior leaders and middle managers were required to discuss and agree on annual objectives and goals with their subordinates. This survey was conducted a month after the deadline to submit annual goals and objectives. The intention of this question was to measure

leaders' and managers' commitment to influence their teams' involvement and engagement in the CI program. Table 18 shows responses by participants' groups:

CI Included in Annual Performance Objectives	MM	SLT	Total
No	5	4	9
Yes		2	2
Not sure	2		2
Total	7	6	13
Total participants	7	7	14

Table 18: Question 5 Responses by Participants' Groups

1. Only 2 out of 13 responses were registered, which was only 15% of the senior leaders/middle managers who influenced their team to include "supporting the CI program" in their subordinates' annual objectives. All the "Yes" answers were given by senior leaders.
2. All individuals working for middle managers were not asked to include the goal of "supporting the CI program" into their annual objectives.

Table 19 (below) shows comments provided by the senior leadership team and middle managers, explaining their answers when they selected "No" as a response for question 5:

Why supporting "the CI program" was not included in the performance objective for the year
SLT
• Already too many competing priorities for annual team goals. • My team have a goal that involves improving a practice or initiative in their department. • We are actively adding improvements to our own systems as such those ideas don't need to go into the CI boards. • We make improvements every day, but we do not put them on the board.
MM
• Haven't really considered it until now. • I wasn't aware I should or could. • There has been no cascade of company metric with logic • We have objectives related to making improvements within the business, but no link back to the program.

Table 19: Participants' Comment When They Answered "No" for Question 5

From the comments above, it was found that:

1. From among the 4 comments provided by the senior leadership team, it was explained that their team (middle managers) were implementing improvement continuously as part of their job, and that there was no need to include these improvements in the annual performance objectives.
2. On the other hand, 3 out of the 4 comments provided by middle managers highlighted that the group lacked awareness of the program, understanding of its goals, and how it fit within the organization's overall strategy.

3.3.2.6 Question 6: "Continuous Improvement is one of the factors to evaluate during employees' annual reviews; how do you define/measure your team's CI expectation and performance (What is exceeding? What is meeting? And what is not meeting expectations?) – Lead hand (supervisor)"

Question 6 was addressed only for lead hands, who oversee production employees on the shop floor.

Three out of four lead hands answered this question, clearly stating that there was no formal way to evaluate employees' participation and performance in the Continuous Improvement initiatives.

It is important to note that this continuous improvement evaluation point for production employees has been part of the annual evaluation process since even before the CI program was rolled out. Table 20 (below) shows comments provided by lead hands on how they evaluated their production team on continuous improvement initiatives.

LH
• **No formal** way to evaluate. I a use number of ideas - one idea = meeting expectations, more ideas = exceeding expectation • **No formal** way to evaluate.

- **No formal** way to evaluate; working more hours to cover lost time; represents my team's CI contribution. Employees should bring suggestions, as they are the best to improve their work environment.

Table 20: Lead Hands' Comments for Question 6

It was highlighted by the lead hands that, although there was no formal way to measure the participation of production by employees in CI activities, the quantity of ideas submitted (regardless of the ideas' scope and impact) and working overtime were used in appraising CI involvement.

3.3.2.7 Question 7: "How many informal improvements is your department making that are not captured in the CI Program board? Give us an estimate (# idea per week); why are these ideas not captured?"

Question 7 was addressed to middle managers, lead hands, and office and production employees. Participants' estimates varied from no ideas to 10 idea per week, some participants chose not to answer this question. Table 21 (below) shows estimated numbers of CI ideas implemented informally every week, and the associated numbers of participants making those estimates from every group.

Number informal CI not captured / week	EM	LH	MM	Total
0	2	1	1	4
1	5		1	6
2	4		1	5
3	1		1	2
4		1		1
5	1		1	2
10	1			1
No Answer	3		1	4
Total	17	2	6	25

Table 21: Estimated Number of CI Ideas Implemented Informally Every Week Associated With Numbers of Estimators From Every Participants' Group.

Furthermore, the expected annual number of CI ideas that were implemented informally, without being channelled through the CI Program[1], was 96. The figure of 96 ideas was equal to 32% of the total number of ideas submitted during the first year, as presented in study 1. Remarkably, 96 informal ideas being implemented was equal to 97% of the total ideas implemented during the first year of the CI program (refer to table 4 in study one).

Participants were asked to comment on why these ideas were not captured through the CI program. Participants' answers were grouped according to the following reason codes. For clarification, every code was associated with a sample of participants' comments.

Table 22 (below) shows a summary of participants' feedback sorted by how many times each reason was mentioned:

Why Ideas are not Captured in the CI Program	**Frequency**
Added bureaucracy: "The ideas need to be put in place quickly, rather than waiting for a meeting and then for the task to be assigned".	7
Idea scope: "They are departmental changes to improve our processes."	4
Part of my job: "I assume it's a normal part of the job."	3
Busy with other priorities "Lack of Time/Effort"	3
Implementation is very slow: "I put in 6 suggestions, and it was never implemented or fixed."	3
Lack of reward "Why go through the process if there are no real rewards?"	1
Total Answered	**21**
No answer: "The comment box was left blank."	4

Table 22: Summary of Participants' Feedback on Why Ideas Were not Captured in the CI Program

The top three reason codes illustrate 67% of the reasons as to why ideas were not being channelled through the CI program. "Added bureaucracy" was the most frequent reason code. 33% of all respondents' feedback considered the CI program to be an added complexity, and involved bureaucracy to implement improvement. "Idea scope" and "part of my job" were the

[1] The estimated quantity of ideas implemented annually outside of the CI program was calculated by summing the annual projected number for every participants' estimate based on its frequency weights.

second and third most frequent reason codes, through which employees felt that these informal ideas were within their department control, and naturally expected from them.

3.3.2.8 Question 8: "Describe your contribution to the program? (submitting, reviewing, implementing ideas, providing feedback)?"

Question 8 was addressed to all participants' groups. Participants had the option to list all activities to which they contributed. 38 out of 40 participants who completed the survey answered this question. If the activity was not listed, it was classified as "No", and if the activity was listed it was classified as "Yes" as shown in Table 23, which shows participants' groups' contribution in the CI program by CI activities:

	EM		LH		MM		SLT		Total	
Feedback provided →	21		4		7		6		38	
Contribution ↓	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Submitting	18	3	2	2	1	6	2	4	23	15
Reviewing	2	19	1	3	2	5	5	1	10	28
Providing feedback	1	20	2	2	1	6	3	3	7	31
Implementing	3	18	3	1	3	4	4	2	13	25
Grand Totals	24	60	8	8	7	21	14	10	53	99

Table 23: Participants' Groups' Contributions in the CI Program by CI Activities

To be able to compare contributions across groups and activities, contribution ratios were calculated by dividing the total numbers of "contributing" answers (Yes) by the total numbers of "non-contributing" answers (No) within every participants' group, and for every activity.

A ratio value of one (1) indicated that 50% of that group contributed to a certain activity; for the purpose of this study, this threshold was designated as a moderate contribution. Numbers higher or lower than one (1) represented increased or decreased contribution among that group's participants.

Contribution ↓	EM	LH	MM	SLT
Submitting	6.0	1.0	0.2	0.5
Reviewing	0.1	0.3	0.4	5.0
Providing feedback	0.1	1.0	0.2	1.0

Implementing	0.2	3.0	0.8	2.0

Table 24: Contribution Ratios by Activities for all Participants' Groups

From Table 24, presented above, it was found that participants' groups had contributed as follows:

- Office and production employees had contributed mainly as submitters of ideas, very low contributions in other activities.
- The heaviest contribution for lead hands was in implementing ideas. By contrast, lead hands had a very low contribution ratio in reviewing ideas.
- Many of the middle managers showed low contribution records in all activities.
- Finally, the senior leadership team had moderate to high contribution ratios in all activities except for submitting ideas. Their highest contribution ratio was in reviewing ideas.

In summary, office and production employees were the heaviest submitters; senior leaders were the main reviewers; and lead hands and senior leaders made the highest contributions in providing feedback; while finally lead hands were the highest implementers. Table 25 shows CI activities, including the highest contribution ratios, indicating relevant participant groups.

Contribution ↓	Highest contribution ratio	Group(s)
Submitting	6.0	EM
Reviewing	5.0	SLT
Providing feedback	1.0	LH and SLT
Implementing	3.0	LH

Table 25: CI Activities' Highest Contribution Ratios Indicating Participants' Group.

From the data presented above:

- It was found that the highest contribution ratio for "Providing feedback" was equal to 1. This was considered a moderate contribution, which indicated a performance issue in this activity.
- The middle managers' group were not a heavy contributor for any activity.

3.2.3.9 Question 9: "Have you received Continuous Improvement training?"

This question was addressed to all participants, and they were given the chance to select one of the following four answers. Table 26 (below) shows the answers for this question by participants' groups:

Have you received Continuous Improvement training?	EM	LH	MM	SLT	Total
• Yes, while working for this organization	4	1	1	1	7
• Yes, before joining this organization	5	2	1	5	13
• Never	6	1	4	1	12
• Not sure	7	0	1	0	8
Total	22	4	7	7	40

Table 26: Participants' Groups' Answers for Question 9

It was found that only seven employees from the entire pool of participants' groups answered the question with "Yes – I received the training while working in this organization". Because the program was new to the organization, these responses were challenged by referring to the human resources training records. It was found that the company has only provided CI training to one lead hand, one manager and one senior leader. Office and production employees were never trained on Continuous Improvement topics. Upon inquiry, and according to human resources, participants from the office and production employees' groups may have been mistakenly mixing up CI training with other occupational health and safety mandatory training. Based on this feedback, the results were adjusted to reflect these responses in the "not sure" category. Table 27 shows the adjusted data results for this question:

Have you received Continuous Improvement training? ***(Adjusted)***	EM	LH	MM	SLT	Totals
• Yes, while working for this company	0	1	1	1	3
• Yes, before joining this company	5	2	1	5	13
• Never	6	1	4	1	12
• Not sure	11	0	1	0	12
Totals	22	4	7	7	40

Table 27: Adjusted Answers by Participants' Groups for Question 9 After Consultation with Human Resources

The adjusted results show that:

- 24 out of 40 (which is 60%) of the total participants selected "never trained on CI" or "not sure about CI training".
- 13 out 40 (which is 33%) of the total participants had received training before joining this organization, which means that they may have been exposed to different interpretations and expectation of CI concepts in the past.
- 5 out 7 (which is 71%) of the middle managers who participated had "Never" been trained or were "not sure" about the CI program.

3.2.3.10 Question 10: "Rate the following aspects of the program (7 being Very good and 1 being Not very good)"

This question was addressed to all participants' groups. The responses were analyzed from three different perspectives:

1) **Passive answers** were analyzed to understand and evaluate employees' familiarity and understanding of every aspect of the CI program. The question gave the participant the option to select answers on a scale from 1 to 7, to skip the rating, or to choose "not sure". The numbers of participants who provided passive answers (i.e. chose to skip, or to answer "not sure") from each participants' group for every aspect on the CI program are presented below. Since the survey was confidential, it was reasonable to assume that passive

answers were due to participants' lack of knowledge, and no other reason. Table 28 (below) shows the number of participants from each group who chose not to rate CI aspects:

Number of Passive Answers by Participants' Groups and CI Aspects						
CI Program Aspect	EM	LH	MM	SLT	Total	% of total participants
1. Clarity of ownership to move ideas forward	7	0	2	0	9	23%
2. Employee appetite to participate	4	0	1	0	5	13%
3. Feedback process	7	0	2	2	11	28%
4. Idea's impact	6	0	2	0	8	20%
5. Idea's quality	6	0	2	0	8	20%
6. Implementation speed	8	0	1	0	9	23%
7. Middle management commitment	5	1	2	0	8	20%
8. Overall CI culture at the site	5	0	1	0	6	15%
9. Reviewing speed	5	0	1	0	6	15%
10. Reward program	4	1	2	1	8	20%
11. Senior leadership commitment	4	1	2	0	7	18%
12. Team's CI skills	7	1	3	0	11	28%
Average number of passive answers for every group	5.7	0.3	1.8	0.3	8.0	
Total group's participants	22	4	7	7	40	
Percentage of passive answers for each group, out of the total number of participants	26%	8%	25%	4%	20%	

Table 28: Number of Passive Answers by Participants' Groups and CI Aspects

The following results were derived from the above table.

Percentage of passive answers by CI aspects:

- 28% of all participants in this study were not able to rate "the feedback process" and their "team's CI skills".
- 23% of all participants were not able to rate "clarity of ownership to move ideas forward" and "implementation speed".
- 20% of the total pool were not able to rate four other aspects.

Percentage of passive answers by participants groups:

- On average, more than 25% of office and production employees and middle managers were not able to rate an aspect of the CI program.
- On the other hand, only 8% and 4% of lead hands and senior leaders, respectively, provided passive answers. It was found that these groups were more able and willing to rate CI program aspects.

2) **Participant Group statistics:** For every CI aspect/participant's group, the average rating score (Avg) and standard deviation (STDV) were calculated, in order to be able to understand the overall rating within that group. This statistical approach helped in understanding how the group's answers for all CI aspects were distributed.

Answers within every group were colour coded independently to reflect the scores. Green shows the most favourable outcome (higher average score and lower standard deviation); red shows most unfavourable outcome (lower average score and higher standard deviation); and the spectrum between these 2 colours (orange, yellow, and light green) have been used to represent range outcomes in between favourable and unfavourable values. Table 29 shows these details:

Avg and STDV by Group for Each CI Aspect		EM		LH		MM		SLT	
		Avg	STDV	Avg	STDV	Avg	STDV	Avg	STDV
1	Clarity of ownership to move ideas forward[2]	4.1	1.5	3.3	1.3	4.4	1.5	5.5	1.6
2	Employee appetite to participate	4.1	1.5	3.8	0.5	3.8	2.0	4.5	0.5
3	Feedback process	4.4	1.5	3.8	1.3	4.6	1.3	5.5	0.6
4	Idea's impact	4.4	1.7	5.0	1.4	4.4	0.9	5.0	1.7
5	Idea's quality	4.5	1.5	4.5	1.3	4.4	0.9	4.2	0.8
6	Implementation speed	3.8	1.5	4.0	1.4	3.5	1.4	3.3	1.0
7	Middle management commitment	4.3	1.2	4.7	0.6	4.0	1.2	4.2	1.0
8	Overall CI culture at the site	4.6	1.4	4.3	1.5	4.3	1.2	4.7	0.8
9	Reviewing speed	4.2	1.7	5.3	1.0	4.3	1.6	5.2	1.0
10	Reward program	5.0	1.9	4.7	1.2	5.6	2.1	6.0	1.0
11	Senior leadership commitment	5.2	1.4	4.0	1.7	5.6	1.7	6.0	0.6
12	Team's CI skills	4.4	1.5	4.0	1.0	4.3	1.3	4.5	1.0

Table 29: Avg and STDV by Group for Each CI Aspect

The summary of findings from the above table for participants' group is as follows:

- **Office and production employees:** this group's lowest average scores were for "Implementation speed" and "Review speed", followed by "Clarity of ownership to move the ideas forward" and "Employee appetite to participate". Standard deviations for these four aspects were on the moderate side, indicating a reasonable spread among answers. On the other hand, the highest average scores were for "Senior leadership commitment" and the "Reward program". It is worth mentioning that the "Reward program" had the highest standard deviation, indicating a wide spread of responses for this aspect within this group.
- **Lead hands**: this group's results showed an interesting and different dynamic. Their lowest average score was for "Clarity of ownership to move the ideas forward", followed by "Employees appetite to participate" and "Feedback process". Standard deviations for these three aspects were on the low to moderate side, indicating a limited spread among

[2] In the context of this study, this aspect refers to the participant's clarity on who is reviewing and implementing his idea once approved.

answers. On the other hand, the highest two average scores were for “review speed” and “idea impact”. It is worth mentioning that the “review speed” had a moderate to small standard deviation indicating a limited spread of responses for this aspect within this group.

- **Middle managers**: this group’s lowest average score was for “Implementation speed” followed by “Employee appetite to participate”. Standard deviations for these two aspects were moderate to high, indicating a wide spread among answers, especially for “Employee appetite to participate”. On the other hand, their highest average scores were for “Senior leadership commitment” and “Reward program”. It is worth mentioning that both these aspects had comparatively high standard deviations, indicating a wide spread of responses for these two aspects within this group.
- **Senior leadership team**: this group results showed an interesting dynamic as well. Their lowest score was for “Implementation speed” followed by “Middle management commitment”. Standard deviations for these two aspects were on the moderate side, indicating a reasonable spread among answers. On the other hand, their highest score was for “Senior leadership commitment” and “Reward program”. It is worth mentioning that the latter two aspects had the lowest standard deviation, indicating consistency in responses for these aspects within this group. Notably, in this group, there were six aspects scoring more than 5, which is a high average score, with a low standard deviation. The two aspects where the average score was high, but associated with high standard deviations, were “Clarity of ownership to move the ideas forward” and “Ideas impact”. The last finding highlights a wide divergence between the respondents’ answers for ideas’ ownership and impact.

3) **Entire pool of participants' statistics:** The average rating scores, standard deviations, and coefficients of variation (CV) for the entire pool of participants were calculated based on their normalized frequencies (Table 30, below). Higher CV values indicated greater levels of dispersion around the average.

CI aspects		Normalized frequencies		
		Avg	STDV	CV
1	Clarity of ownership to move ideas forward	4.3	1.6	0.37
2	Employee appetite to participate	4.0	1.3	0.31
3	Feedback process	4.4	1.3	0.29
4	Idea's impact	4.7	1.4	0.29
5	Idea's quality	4.4	1.1	0.24
6	Implementation speed	3.7	1.3	0.34
7	Middle management commitment	4.3	1.0	0.23
8	Overall CI culture at the site	4.4	1.2	0.27
9	Reviewing speed	4.7	1.4	0.29
10	Reward program	5.3	1.6	0.30
11	Senior leadership commitment	5.2	1.5	0.28
12	Team's CI skills	4.3	1.1	0.26

Table 30: Avg, STDV and CV for the Entire Pool of Participants (Normalized to Groups' Sample Size)

The data as presented above show that participants had dispersed opinions when it came to "Clarity of ownership to move ideas forward", "Implementation speed", and "Employee appetite to participate". These three aspects scored the highest CV values and the lowest overall averages. Although "Idea's quality" and "Middle management commitment" had the highest CV scores, their average scores were in the medium range as compared to other aspects. Despite their very high STVD, "Reward program" and "Senior leadership commitment" had moderate CV values, indicating moderate consensus among participants, who rated these two aspects with the highest average scores, of greater than 5.2.

3.3.3 Discussion for Study 2

The purpose of Study 2 was to understand the employees' experience of the CI program during its first year of implementation. In this discussion, light is shed on the procedural and structural aspect of the program, based on the study's findings.

Being part of this organization, employees at all levels had to deal with the CI program, or at least be somehow exposed to it. Using Ashby's Law of Requisite Variety presented in the literature review above, it was observed that the program may have generated variety in the organization as a dynamic system. This new reality, brought by the CI program, demanded that the company become more flexible and better equipped to handle and absorb those variety, or possibly to respond in such a way that would reduce the variety generation pace, by clearly defining the CI ideas scope through training and coaching, so that employees, at all levels, could handle these changes according to their ability or willingness.

By evaluating the responses received from participants on the CI program's structure and design, how management handled and/or regulated the variety, introduced by the Continuous Improvement program to achieve its goal of enhancing engagement, was examined.

On a higher level, evidence was found in the data from Study 2 suggesting that management was struggling with the program. Figure 13 indicates that all leaders of the organization demonstrated a high pessimistic index when it came to the performance of the current CI program, with senior leaders scoring 5.5 (the highest value of pessimism index among all participants' groups).

Office and production employees, on the other hand, had a mildly optimistic view for the program during its first year (their pessimistic index value was just less than 1). The gap in

perception was mainly due to the different way employees and management evaluated the program. Management was looking at the entire program as one unit, measuring its success by the number of ideas generated (which was going down as presented in Figure 5) , whereas office and production employees were looking at the program only through their individual submitted ideas, and whether these ideas were being implemented or not.

The CI program was created to enhance engagement by facilitating a good flow of ideas (information) starting from idea submission, idea review, idea feedback, idea implementation (if approved), and finally an employee's recognition and ultimate reward.

These processes are examined individually, and discussed according to their impacts on variety introduction, and handling and/or regulation in this organization. Each of these processes impact one or more of the CI program aspects reviewed in Study 2. Table 31 shows CI processes and their associated CI aspects:

CI Process Steps	CI Program Aspects
• Idea submission	• Engagement • Idea scope
• Idea review	• Review quality and speed • Leaders' support • Feedback
• Idea implementation	• Implementation speed • Engagement
• Idea reward	• Reward • Engagement • Leader support

Table 31: CI Processes and Their Associated CI Aspects

First, a given idea's submission was mainly linked to two major aspects of the CI program; the first aspect was employees' "engagement" levels, and the second was "idea scope". As mentioned in the company background outline, the CI program was created to give employees the opportunity to have their voices heard and their contributions valued. As also

discussed in the company background and its CI program journey, the senior leadership team supported the creation of the CI program as a countermeasure to improve engagement in the organization. The program intention was to encourage employees not only to participate and submit ideas to improve their workplace and have an impact on how decisions were made, but also to reward them for implemented ideas. On the other hand, employees looked at this program as being the new platform not only to submit ideas, but more importantly to have them implemented, and to see the impact of the proposed changes.

This outcome has created a significant gap in expectations between senior leaders, who expect employees to bring in many ideas to reflect improvement in engagement, and employees, who expect the organization to implement all their ideas and as quickly as possible. Table 11 (see first question results) shows that 62% of the participants, who defined a good CI program as one that generates many ideas, were senior leaders, and 60% of the participants who defined a good CI program as the one that has robust and fast implementation performance were office and production employees. The more ideas senior leaders expect employees to generate, the more ideas the employees expect management to implement; these expectations have created a new variety in the organization with no additional resources to handle these changes, or a reduction mechanism in place to level the load in this flux of ideas.

Table 19 (Question 5) highlighted that senior leaders and middle managers stated that they already had competing priorities for their departments, and that "supporting the CI program" was perceived as an additional workload, given the same existing resources. Data from this study suggested that having more ideas to implement, with the same resources, meant slower or no implementation. As a result, employees were disappointed. Therefore, they would participate less in the future, putting the goal of the program at risk. This outcome also explains

the pessimistic overall view on the engagement aspect of the current program from all levels. Table 13 (Question 2) showed that the pessimistic view on engagement was more prevalent than its corresponding optimistic view for all participants, and at the organizational level. 22% of the total comments received by all participant had a pessimistic view on the engagement aspect of the program, compared to only 7% of the comments having an optimistic view on the same aspect.

Another important observation in the idea submission process was that idea scope was poorly defined. Although the CI program allowed the submitter to define the idea's type on the ideas tag, these categories were very general and subjective; as a result, it was found that management had its own way of classifying ideas upon reviewing. We also found, as shown in Table 17 (in the results for Questions 3 & 4), that idea scope had not only the highest percentage of liked "the least" commentary among all participants, at 14%, but also that there was a significant consensus on this view within all participants' groups, as all groups' consensus ratios were below 1. This conclusion was redrawn later, from Table 16, for the same questions.

It was also noticed that, although senior leaders and middle manager groups had the highest consensus, they liked "idea scope" the least, management had not defined nor made any effort to help employees define the boundaries of a good idea's scope. This observation is supported by the following points:

Firstly, senior leaders and managers are not seriously committed to support and invest in the CI program amongst themselves or within their teams; therefore, they may not be able to reinforce expectations to the rest of organization. Table 18 (Question 5 findings) shows that only 15% of the surveyed senior leaders and middle managers have promoted "supporting CI

program" within their teams and encouraged them to include this in their annual performance objectives. Senior leaders and middle managers reported that they could not support the CI program because they had many other competing priorities; or they informally improved their workplace, but did not see the value of channelling these improvement ideas through the CI program; and finally, they are not aware that they could or should be engaging their teams in the program. This attitude introduced significant challenges in variety handling (in term of responding to submitter's ideas and allocating resources to implement them or provide feedback otherwise), since the top levels of the organization were not ready to define directions and provide coaching and support regarding the scope.

Secondly, variety could have been dealt with another way through training of employees on CI content and problem solving; in that way, employees would be better able to define the scope of a meaningful improvement in alignment with company's focus and objectives. However, Table 27 (Question 9) highlighted that only two out of seven middle managers (29%) had been exposed to CI training in the course of their entire careers. The same table revealed that, on the organizational level, only 40% of employees had been trained on CI programs (7% while working in this company, and 33% before joining). Although this "lack of training and commitment" would impact many areas in the program, it is believed that the worst impact was on "idea scope", as this was what defined and aligned expectations between all employees' levels as to what would be considered a good CI idea, and where the organizational focus should be. When the organization fails to define and align teams on "idea scope", employees are left free to submit any ideas in any areas they wish; then if a CI committee rejects ideas as they deemed their scope to be irrelevant, employees become disappointed and lose their interest in further participation in the program.

Thirdly, another reason why "idea scope" ambiguity impacted the participation rate in the program was the fact that 33% of employees who were actively engaged in implementing informal improvement (per Table 22 regarding Question 7) thought that ideas within the same department did not qualify as part of the CI program. This perception among many employees made them lose rewards for their efforts, and left their implemented ideas unrecorded in the CI program, thereby reducing the program's impact on enhancing engagement.

After ideas were submitted, they were reviewed by the CI committee in a stand-up meeting, and the decision was made at that point as to whether the idea would be rejected, approved, or marked for further review. Regardless of the result, the CI committee's job was assumed to be over, the idea was moved to the lead hands (or to a subject matter expert in the organization) to explain to the employees why their idea was rejected, or when it would be implemented, or when the review process would be expected to finish. Table 25 (for Question 8) shows that lead hands were among the heaviest providers for feedback. At this point, the idea status was logged in an Excel spreadsheet, and no longer visible to production employees, who did not have access to this log.

This review process has highlighted issues with the competency of reviewer and leader support, and also with issues of the feedback process. In many cases, the committee members did not have adequate understanding of how ideas might lead to "rejection" or being marked for "further review" by subject matter experts in the company, in the best scenario. Although they could participate, it was noted that middle managers and lead hands were not part of this review and decision-making process, and instead found themselves in a position to react to the committee's decisions. Table 25 (Question 8) results showed that senior leaders had the highest

contribution rate in the reviewing process (5.0), compared to 0.3 and 0.4 for lead hands and middle managers respectively.

The review process *per se* was a huge variety introduction that the organization had not adapted to deal with. Many ideas could be about issues with which the lead hands did not agree or consider high priority. If these disputed ideas were approved by senior leaders, that outcome would lead to significant delay in implementation, or to conflict while providing feedback, which in turn might further delay feedback and/or implementation. This potential conflict resulted in diverged perceptions of "leaders' support" as reflected clearly in Table 30, Question 10, where "senior leaders commitment" had a comparatively high standard deviation (at 1.5, the second highest). It was noted that lead hands felt unsupported in how senior leaders were making decisions and passing these decisions on to them (Table 24, Question 8 shows that senior leader were reviewing ideas and making decision and he lead hands were mainly involved in implementation). However, employees felt that senior leaders were very supportive when they approved their ideas. Also, as noted in Table 11, Question 1, 61% of the participants who considered that having leader support was a key factor for the success of the CI program were lead hands and middle managers (25% and 36% respectively), which further highlights this pain point for these two groups contributing to their pessimistic view of the program as presented in Figure 13, Question 2.

Regardless of the CI review committee's decisions, it was very clear that any idea was considered a burden for lead hands and middle managers, with no reward for the reviewer or the implementer. This gap in perception between participants' groups regarding "idea reviewing" and "feedback process" was also reflected in the comparatively high coefficient of variation ratios of (0.29) for both aspects, as presented in Table 30, Question 10.

It was found that these delays may have acted as new ideas' regulators and reducers. When delays occur, because of review and feedback processes, employees are less motivated to bring in more ideas, which ultimately will reduce the variety introduction pace (new CI ideas), not by enhancing the quality and relevancy of the ideas, but at the expense of the employees' engagement, which is the main purpose of the program. In other words, this poor and complicated review and feedback mechanism is acting as an unintended variety reducer, discouraging employees to participate. Table 16 (questions 3 & 4) shows that the majority of office and production employees who participated liked the "feedback" aspect of the program "the least", obtaining a ratio of 0.25; the ratio moved up gradually to 0.5 and 1 for lead hands and middle managers respectively. Senior leaders did not provide any commentary expressing that the "feedback process" was liked "the least" as they were never in conflict with their own decisions as a CI committee, or burdened with the impact of these decision on their day to day activities. The findings also showed that bureaucracy in the review and approval process was the most significant reason why employees were motivated to implement ideas more informally; Table 22 (question 7) shows that 33% of employees who were actively engaged in implementing informal improvement were discouraged to participate in the CI program due to its cumbersome bureaucracy.

At a certain time, someone has to move an idea forward if it is approved for implementation. Although study 1 discussed which ideas have the highest chances of being implemented, Study 2 provided a different perspective on this topic. Through the formal CI program, 48% of ideas implemented during the first year were related to facility maintenance. Although maintenance-related ideas are not considered a major variety to the organization, as they can be done quickly by hiring a contractor (as explained previously in study 1), this has not

led to improve how low employees rated “implementation speed”. Implementation speed has the lowest average score, of 3.7, among all other CI aspects (refer to Table 30, Question 10). It may be reasonable to conclude that the underlying reason behind this low score was due to the high number of ideas implemented informally outside the CI program, which set the expectations very high for the implementation speed of ideas channelled through the CI program. Calculations based on Table 21 (question 7) show that employees estimated that they had implemented 96 ideas in their own department, without submitting a CI program tag, which is equal to 97% of total ideas implemented throughout the time period of the formal CI program. Ideas implemented informally tend to be accomplished at a faster speed, with more buy-in from colleagues, and with less administrative work. When the implementation speed for these 96 informally implemented same-department work-related ideas were compared to the implementation speed of the ten formally implemented same-department work-related improvement ideas (refer to Table 4 in Study 1), one was able to understand why employees gave “implementation speed” the lowest rate, despite the fast implementation of so many ideas.

Another factor contributing to this low score for “implementation speed” related to who “owned” an idea’s implementation. In the informal system, employees implement their own ideas, with little or no support from their leaders, whereas in the formal CI program, ideas lack clarity on who is moving the ideas forward. As seen earlier, senior leaders push the idea to an assignee to review, provide feedback, or implement, assuming ownership is defined. According to the comments provided by lead hands, the assignee may struggle in finding resources to support moving ideas forward, implementing, or even finding time to give proper feedback, all of which explains the highest coefficient of variation for this “ownership” aspect of the program.

Table 30 (question 10) showed that the "clarity of ownership to move ideas forward" had the highest coefficient of variation, at 0.37.

It was also observed that most lead hands and senior leaders have participated in implementing ideas. However, the contribution rate for implementation was very low for employees and middle managers, showing a complete disconnection between generating ideas on the one hand, and being part of implementing them "for employees" or supporting them "from middle managers" on the other hand. Table 24 (question 8) indicates implementation contribution ratios of 3.0 and 2.0 for lead hands and senior leaders, and 0.2 and 0.8 for office and production employees and middle managers respectively.

Finally, the following section will evaluate the findings related to the design of the "reward system" and its impact on the CI program goals and accomplishments within this company. The system has been designed to reward employees whose submitted ideas have been implemented. This reward system is aimed to motivate employees to submit ideas in general, and to bring in ideas that are more implementable and supposedly more beneficial.

The reward, as mentioned earlier, is a silver coin with the company logo on it for every idea implemented. These coins can be redeemed for company gear, such as T-shirts, coffee mugs, water bottles, and other merchandised items. Employees can also keep these coins as a recognition for their participation. Study 2's findings suggested that employees in general did not factor the reward aspect of the current CI program into their evaluations; Table 13 (question 2) showed that only 1% of the total comments evaluating the current CI program talked about rewards, and that that came from office and production employees. However, when they were asked to list things that they liked "the most" and "the least" in the program, Table 16, Questions

3 & 4, indicate that the majority of participants across all groups, except lead hands, liked the reward system "the most"; the lead hands' ratio for liking the reward system was 0.50 (which meant that more lead hands liked the reward system "the least" than "the most").

Similarly, Table 11 (question 1) showed that 84% of the comments considering a fair "reward" system to be an essential part of a good CI program came from lead hands and middle managers, perhaps simply because lead hands and middle managers felt that the current system not only demanded additional work from them, and bypassed their authority to approve and disapprove ideas in their departments (Table 24, Question 8), but also did not recognize the effort they put into implementing ideas. Table 30 (question 10) confirmed this notion by virtue of the fact that, although the "reward" aspect of the program had the highest average score from all employees (5.3), it also had the highest standard deviation among all 12 aspects (1.6), indicating a noticeable difference in how every group evaluated and benefitted from these rewards.

Furthermore, the findings in Study 2 revealed still more interesting observations about how the reward system impacted program participation. Evidence suggested that the current reward mechanism may have worked as an unintended variety reducer of the variety of ideas generated and submitted in more than one way. For example, Table 22 (question 7) showed that 33% of employees perceived the program to be "added bureaucracy", and that they weighed the reward of submitting ideas (and therefore going through the time-consuming process of idea review, approving, and implementing) versus bypassing the formal CI program and just informally implementing the same ideas. This factor led to lower participation in the program.

It was also noted that the organization was not successful in making a clear link between the CI program's success, and employees' performances at all levels. First, lead hands and

middle managers were neither rewarded nor effectively motivated to support the program. Because "supporting the success of the CI program" was rarely a part of their annual objective, middle managers, lead hands, and office employees could not earn a better appraisal by being advocates for the program. Table 18 (question 5) shows that only 15% of senior leaders and middle managers made a clear connection between "supporting the CI program" and the annual performance of their teams. Again, Table 11 (question 1) showed that 84% of the nominations to consider "reward structure" as being critical to a successful CI program came from the lead hands and middle managers, supporting the statement that the system has just added varieties to the middle manager and lead hand groups, with no motivation or support to make it all work.

Secondly, production employees were always measured against their CI initiatives – even before the start of the CI program. However, Table 20 (question 6) showed that 75% of the lead hands, who evaluated production employees, did not have a formal way to connect production and employees' performance with the CI program. The remaining 25% had considered bringing in ideas to improve workplace, from employees, as part of the job with no extra reward expected. This motivated employees to implement ideas informally and to avoid using the CI program. The above impact of the reward system would explain why "employee appetite to participate" was rated at 4.0, being the second lowest average score, as shown in Table 13 (question 10).

In summary, although the reward aspect of the program had a satisfactory overall rating of 5.3, the results show that it was not effective in motivating employees to generate more ideas, or in motivating lead hands and middle managers to implement and move ideas forward.

Chapter Four: Final discussion and implications

This thesis is a case study conducted on a Canadian manufacturer that had started a Continuous Improvement program as a tool to enhance employees' engagement. The overall case study consisted of two related studies. One study was conducted using the company's own data, in the form of the CI program log, and the other study was based on a survey that collected employees' feedback and assessments of the CI program. The author's position within the company helped in gaining insightful understanding of the organization's dynamics, while maintaining an unbiased fact-based approach for analyzing and interpreting data and results. In this final discussion section, the academic contributions and findings of this paper will be summarized, highlighting practical implications both to the company under study, and for other organizations who have implemented and are willing to improve, or who are planning to implement, a CI program in their workforce. Finally, some of the limitations observed during these studies will be shared.

4.1 Academic Contribution

This paper uniquely contributes to the Continuous Improvement literature in three different ways:

1. It was found that Continuous Improvement literature currently lacks detailed case studies conducted on the content and structure of the CI program within any single company. Most of the cases studies found in the literature focus only on the impact of Continuous Improvement on the organization, as opposed to the process of implementing such programs.
2. The nature of the company under study has contributed to our knowledge about CI program implementation. It is a builder of customized machines, with a job shop

environment. The company is growing at a high pace organically, and through acquisition.

3. The use of Ashby's Law of Requisite Variety as a conceptual framework to analyze findings of these two interrelated studies has provided a new perspective on evaluating CI program implementation. This law has not only provided a diagnostic tool, but also highlighted potential solutions and strategies to bridge gaps and overcome obstacles, as presented in the implications section below.

What did we learn from this study?

There have been many valuable findings to enrich current understanding of Continuous Improvement areas:

- Senior leadership commitment to the CI program is only effective if middle managers and lead hands are committed and aligned toward the same goals.
- Gaps between employees' and management's interpretation of the purpose of CI ideas will not only lead to slow implementation, but also to negative impact on employees' engagement.
- Management-observed decisions and behaviours relating to CI programs act as a regulator to varieties introduced through the CI program. This means management's ideas approval and rejection decisions impact future participation and engagement in the CI program. It was also found that lack of resources to support inter-functional ideas implementation does not justify rejecting these ideas, or having them sit still for a prolonged period under review. This nature of handling mechanism had a further negative impact on engagement.

- Employees' training and understanding of CI scope plays a significant role in reducing variety, by enhancing the quality and relevancy of ideas suggested, and therefore their chance of being implemented.
- Ideas implemented informally by employees form a significant undocumented part of the improvement activities, in this job shop manufacturing facility, where standardization is low and product mix is high.
- It was also found that, when left unmotivated and without reward, middle managers and lead hands struggled in supporting the CI program and using its avenues, as points to engage employees and coach them. The creation of the CI program is aimed mainly at rewarding the senior leadership team, by achieving higher engagement scores and empowering office and production employees through giving them a platform to express their ideas.
- Upon reviewing how this organization managed CI changes, it was found that the program was implemented cosmetically by installing a CI board, printing CI tags, and asking people to participate. Management had not prepared the organization to understand and accept this change, to deal with it, and to define successful outcomes. When reflecting on Lewin's proposed model of change management (Lewin, 1951) and on how this change was managed, it was noticed that management has only to unfreeze and refreeze the organization to introduce the CI program. In other words, senior leaders would see the need to engage employees, decide on how, launch the program, and finally expect everyone to support it and to be engaged. Lewin's change model highlights a process in between the unfreezing and refreezing stages, which is called the "movement". In the movement stage, middle managers' and lead hands' buy-in should be sought,

employees' involvement and reward clarified, and at all levels knowledge building and training plan laid out. All these preparation activities should be done before the organization moves to a post-launch stage, expecting employees to participate and middle managers and lead hands to support (refreeze mode).

4.2 Practical implications

This study was conducted in a company where the author has worked, in the Operational Excellence department. This circumstance has helped in gaining an insightful understanding as to how the results of this study have influenced management perception on CI program improvement. In the section below, a list of proposed changes is presented that the company under study has undertaken or is in the process of evaluating. The purpose of this section is to share lessons learned with other companies, at similar stages of their Continuous Improvement journey, to increase their chances of enhancing employees' engagement through the CI program.

It has been communicated that the CI committee is considering the following changes, based on the findings, implications and discussion of these two studies:

- Formally to define and communicate Continuous Improvement scope, to include achievement of at least one of the following three objectives:
    - The idea of clearly eliminating any non-value-adding activity (from the customer's perspective);
    - The idea of clearly eliminating one or more of the seven wastes identified in the Lean literature covered earlier;
    - The idea of enhancing the customer's experience in dealing with the company.

- To provide simple training to middle managers and lead hands on the above three dimensions of CI scope.
- To set an annual target for every middle manager and lead hand to work with their team (office and production employees) on generating and implementing one idea in their department for every team member.
- Middle managers and lead hands will share their stories of successfully implemented ideas during the site daily management meeting in the morning.
- Middle managers' and lead hands' discussions about ideas, brought by their team members, that do not meet the scope definition are to be used as coaching opportunities for those team members.
- Ideas requiring cross-functional collaboration will be addressed to the CI committee for evaluation and support by middle managers or lead hands.
- Office and production employees will still be able to submit their ideas directly to the CI committee by using the CI board in the lunchroom, if they wish to.
- Middle managers and lead hands will be able to reward their team directly upon implementing ideas.
- Departments achieving their targets of implemented ideas will receive company sponsored parties or other recognition.
- Ideas that have a significant impact could be promoted by the middle managers or lead hands to be rewarded with more than one coin.
- Coins can be redeemed by paid days off.

The above proposed actions by management will enhance alignment in the scope of CI by having middle managers and lead hands more involved, which will support varieties handling as

suggested by the study's findings. Middle managers' and lead hands' involvement will facilitate faster review, transparent feedback, clearer implementation planning, and immediate reward.

It is worth pointing out that, despite the expected benefit of these practical improvements in the CI program, it was observed that management has not considered focusing on or taken a different action to implementing work-related ideas on a cross-functional level. In addition, office and production employees are expected to be trained by their managers and leaders, which may expose them to different interpretations of the scope of CI. Finally, although office and production employees are more empowered to work with their managers, they are still not part of the significant decision-making changes, when it comes to varieties introduced onto them by other functions.

4.3 Research Limitations

Similarly to any case study, the following limitations were noted:

- With a one-company detailed case study, although findings can be very useful in terms of understanding the dynamics and behaviours demonstrated by the organization studied, these findings cannot be completely generalized to other companies. Other organizations' industries, sectors, products, processes, and history could all be significant variables toward scaling conclusions from this case study.
- Additionally, CI idea classification, by employees and CI committees, and the CI program aspects reviewed, were very specific to this company's experience, and other companies may have chosen different classifications or aspects to review and study.

- It was also noted that the present study did not differentiate between office and production employees, while analyzing employees' feedback, or through studying ideas' types, impact, and progress.
- The statistical analysis conducted, to understand the relationships between idea types and impact on the one hand, and ideas' progress status on the other hand, used snapshot data of the CI log at the first anniversary of the CI program. It could be argued that more data time points could better help to understand these relationships, and enhance the findings' accuracy.
- Finally, although having the author working in this organization helped better access to collect data and observe behaviours, it could be claimed that playing a double role could have presented a challenge to remaining unbiased throughout the study.

4.4 Future research

Based on the review of the literature, it was found that there was a lack of detailed case studies focusing on CI program implementation within any single company. Most of the studies conducted have focused on the impact of CI programs on one company or multiple companies.

With respect to this specific case study, it will be worthwhile to conduct a study on the impact of the changes to the current program proposed by the CI committee based on the thesis results.

References

Ashby, W. R. (1958). *An Introduction to Cybernetics.* London: Chapman and Hall.

Berger, A. (1997). Continuous improvement and kaizen: standardization and organizational designs. *Integrated Manufacturing Systems*, 110-117.

Bessant, J., Caffyn, S., & Gallagher, M. (2001). An evolutionary model of continuous improvement behaviour. *Technovation*, 67-77.

Bhuiyan, N., & Baghel, A. (2005). An overview of continuous Improvement: from the past to present. *Management Decision*, 761-771.

Garcia-Sabater, J. J., Marin-Garcia, J. A., & Perello-Marin, M. R. (2012). Is Implementation of Continuous Improvement Possible? An Evolutionary Model of Enablers and Inhibitors. *Human Factors and Ergonomics in Manufacturing & Service Industries*, 99-112.

Haddas, M. A., Asiri, M. H., Reham, M. F., Salha, A. S., Shatha, A.-Q. A., & Syed, H. H. (2014). Continuous Improvement – Development with Time. *International Journal of Computer Applications*, 35-39.

Hirzel, A.-K., Leyer, M., & Moormann, J. (2017). The role of employee empowerment in the implementation of continuous improvement. *International Journal of Operations & Production Management*, 1563-1579.

Jurburg, D., Viles, E., Tanco, M., & Mateo, R. (2017). What motivates employees to participate in continuous improvement activities? *Total Quality Management*, 1469-1488.

Jurburg, D., Viles, E., Tanco, M., & Mateo, R. (2018). Continuous improvement leaders, followers and laggards: understanding system sustainability. *Total Quality Management*, 817-833.

Kerrin, M., & Oliver, N. (2002). Collective and individual improvement activities: the role of reward systems. *Personnel Review* , 320-337.

Kornfeld, B. J., & Kara, S. (2011). Project portfolio selection in continuous improvement. *International Journal of Operations & Production Management*, 1071-1088.

Lam, M., O'Donnell, M., & Robertson, D. (2015). Achieving employee commitment for continuous improvement initiatives. *International Journal of Operations & Production Management*, 201-215.

Lewin, K. (1951). *Field theory in social science.* New York: Harper.

Lleo, A., Viles, E., Jurburg, D., & Lomas, L. (2017). Strengthening employee participation and commitment to continuous improvement through middle manager trustworthy behaviours. *Total Quality Management*, 974-988.

Macpherson, W. G., Lockhart,, J. C., Kavan, H., & Iaquinto, A. (2015). Kaizen: a Japanese philosophy and system for business excellence. *JOURNAL OF BUSINESS STRATEGY*, 3-9.

Marin-Garcia, J. A., Pardo del Val, M., & Martı´n, T. B. (2008). Longitudinal study of the results of continuous improvement in an industrial company. *Team Performance Management*, 56-69.

Robinson, A. G., & Schroeder, D. M. (1993). Training, Continuous Improvement, and Human Relations: The U.S. TWI Programs and the Japanese Management Style. *California Management Review*, 35.

Sánchez-Ruiz, L., Blanco, B., & Raquel, G.-L. (2019). Continuous Improvement Enablers: Defining a New Construct. *Journal of Industrial Engineering and Management*, 51-69.

Singh, J., & Singh, H. (2015). Continuous Improvement philosophy - literature review and directions. *Benchmarking: An International Journal*, 75-119.

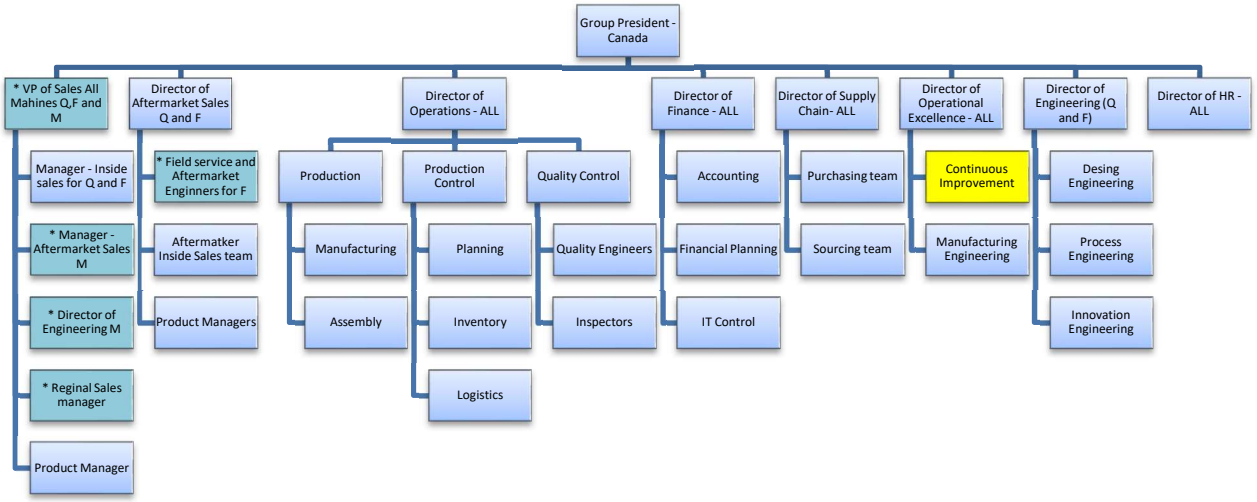
Stadnicka, D., & Sakano, K. (2017). EMPLOYEES MOTIVATION AND OPENNESS FOR CONTINUOUS IMPROVEMENT: COMPARATIVE STUDY IN POLISH AND JAPANESE COMPANIES. *Management and Production Engineering Review*, 70-86.

Stimec, A., & Grima, F. (2019). The impact of implementing continuous improvement upon stress within a Lean production framework. *International Journal of Production Research* , 1590-1605.

Womack, J. P., & Daniel, J. T. (2003). *Lean Thinking: Banish Waste and Create Wealth in Your Corporation.* New York: Free Press.

Appendices

1. Organizational Chart



Most of the operations are in the Canadian Site, with an exception of the positions marked with asterisk *. The later are located in the USA and other parts of the World. The continuous improvement function, that is part of the Operational Excellence, covers all employees who are part of the group.

2. Fields used in the company's continuous improvement log

1. Tag #
2. Idea owner
3. Idea #
4. Department
5. Committee rep
6. Idea Type
7. Date Submitted
8. Idea Details: Problem / Solution
9. CI Committee Idea type
10. Point of impact by the CI committee
11. Status
12. Reviewer
13. Deadline for review
14. Implementor
15. Expected implementation date
16. Comments

17. Code for rejection

3. Chi-square: Idea type versus idea's point of impact

Hypotheses Statement

H0: submitter's classification of idea's type and CI committee interpretation of ideas' impact are independent.

H1: submitter's classification of idea's type and CI committee interpretation of ideas' impact are not independent.

- Observed vs expected data:

Observed data						
	Work related					
Idea type / Idea point of impact	Inter-functional	Same function	Facility maintenance	Treat me better	CI program improvement	Total
Cost	15	3	7	1		26
Delivery	36	7	5	1		49
Other	22	3	23	44	4	96
Quality	22	5	4	2		33
Safety	8	4	72	8		92
Total	103	22	111	56	4	296

Expected data						
	Work related					
Idea type / Idea point of impact	Inter-functional	Same function	Facility maintenance	Treat me better	CI program improvement	Total
Delivery	17	4	18	9	1	49
Other	33	7	36	18	1	96
Quality	11	2	12	6	0	33
Safety	32	7	35	17	1	92
Total	103	22	111	56	4	296

- Calculation of individual expected value

Multiply each row total by each column total and divide by the overall total

- Calculation of degree of freedom

DF = (r - 1) * (c - 1) = (4)x(4) = 16

- Chi-Sq value = 191.61

P-value < 0.0001

The null hypothesis is rejected since p < 0.001.

4. Chi-square: Idea's point of impact versus an idea's progress status

Hypotheses Statements

H0: Idea's impact category and Implementation status are independent.

H1: Idea's impact category and Implementation status are not independent.

- Observed vs expected data:

Observed data						
	Implemented	On hold for another review	Rejected and Communicated	Under Implementation	Under review with assignee	Total
CI program improvement	3	0	1	0	0	4
Facility maintenance	48	4	33	17	9	111
Treat me better	15	2	32	2	5	56
Work related: inter-functional	23	9	28	21	22	103
Work related: Same function	10	0	5	1	6	22
Total	99	15	99	41	42	296
Expected data						
Idea's status / idea's impact	Implemented	On hold for another review	Rejected and Communicated	Under Implementation	Under review with assignee	Total
CI program improvement	1	0	1	1	1	4
Facility maintenance	37	6	37	15	16	111
Treat me better	19	3	19	8	8	56
Work related: inter-functional	34	5	34	14	15	103
Work related: Same function	7	1	7	3	3	22
Total	99	15	99	41	42	296

- Calculation of individual expected value

Multiply each row total by each column total and divide by the overall total

- Calculation of degree of freedom

DF = (r - 1) * (c - 1) = (4)x(4) = 16

- Chi-Sq value = 47.9

P-value < 0.001

The null hypothesis is rejected since p < 0.001.

5. Chi-square: Idea's type versus Idea's progress status

- Hypotheses Statements

H0: Idea's type category and Implementation status are independent.

H1: Idea's type category and Implementation status are not independent.

- Observed vs expected data:

Observed data						
Idea type / Idea status	Safety	Quality	Delivery	Cost	Other	Total
Implemented	41	13	8	7	30	99
On hold for another review	2	1	3	4	5	15
Rejected and Communicated	24	10	15	7	43	99
Under Implementation	17	4	11	3	6	41
Under review with assignee	8	5	12	5	12	42
Total	92	33	49	26	96	296

Observed data						
Idea type / Idea status	Safety	Quality	Delivery	Cost	Other	Total
Implemented	31	11	16	9	32	99
On hold for another review	5	2	2	1	5	15
Rejected and Communicated	31	11	16	9	32	99
Under Implementation	13	5	7	4	13	41

Under review with assignee	13	5	7	4	14	42
Total	92	33	49	26	96	296

- Calculation of individual expected value

Multiply each row total by each column total and divide by the overall total

- Calculation of degree of freedom

DF = (r - 1) * (c - 1) = (4)x(4) = 16

- Chi-Sq value = 36.12

Based on excel formula P-value = 0.00278448

The H1 hypothesis is accepted, and a conclusion is made that the relationships discussed above between ideas' type and their status are due to chance.

6. Request to complete surveys by participants' groups:

6.1 Senior leadership team

To: 8 participants

Subject: CI Program - 1st anniversary feedback

Dear Senior leadership team,

Good morning

By the end of last month, our site celebrated the 1st anniversary of the our CI Program. We have around 300 ideas submitted since the program started, 102 of them got implemented, currently 50 ideas are in the process of being reviewed. On this milestone, I would like to have your feedback on program performance in the last 12 months.

In fact, we have seen a reduction in the participation rate which is an indication that we need to do something different and more effective and your thorough input is going to be helpful for the site to

use the program to its maximum potential. Please use the link below to access the evaluation form the link

---

CI Program Evaluation*

Dear All, By the end of last month, MPT Waterloo site celebrated the 1st anniversary of the our CI Program. We have more than 300 ideas submitted since the program started, 102 of them got implemented, currently 50 ideas are in the process of being reviewed. On this milestone, I would like to have your feedback on program performance in the last 12 month.
In fact, we have seen a reduction in the participation rate which is an indication that we need to do something different and more effective and your thorough input is going to be helpful for the site to use the program to its maximum potential.

1. What would you expect from a good Employees Continuous Improvement Program?

2. How would you describe our current Continuous Improvement program?

3. Name 3 things you like the most in the current program?

4. Name 3 things you like the least in the current Program?

5. Has your team included a performance objective related to the Continuous Improvement Program in 2019? Why?

6. Describe your contribution to the program? (submitting, reviewing, implementing ideas, providing feedback)?

7. Have you received Continuous Improvement training?

- ☐ Yes, while working for MPT - Waterloo
- ☐ Yes, before joining MPT
- ☐ Never
- ☐ Not sure

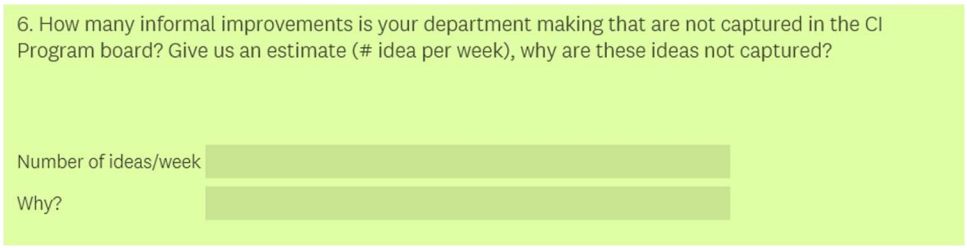
8. Rate the following aspects of the program: (7 being very good and 1 being Not very good)

	1. Not very good	2	3	4	5	6	7. Very good	I am not sure
Senior leadership commitment	○	○	○	○	○	○	○	○
Middle management commitment	○	○	○	○	○	○	○	○
Employee's appetite to participate	○	○	○	○	○	○	○	○
Your team CI skills	○	○	○	○	○	○	○	○
Idea's quality	○	○	○	○	○	○	○	○
Idea's impact	○	○	○	○	○	○	○	○
Reviewing speed	○	○	○	○	○	○	○	○
Feedback process	○	○	○	○	○	○	○	○
Implementation speed	○	○	○	○	○	○	○	○
Reward program	○	○	○	○	○	○	○	○
Clarity of ownership to move ideas forward	○	○	○	○	○	○	○	○
Overall CI culture at MPT Waterloo	○	○	○	○	○	○	○	○

9. Name (Optional)

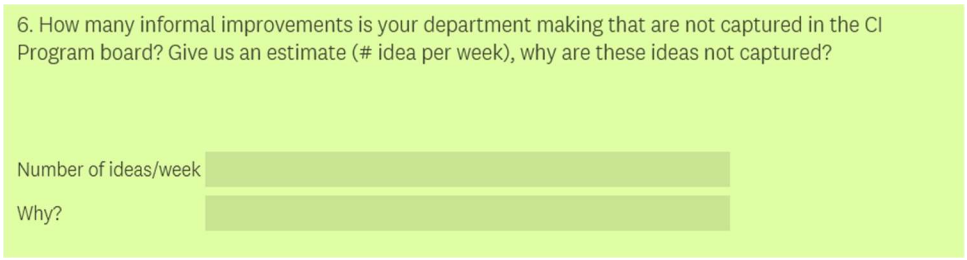
6.2 Middle managers

Same letter was sent to the middle managers. Their questionnaire has the following extra question when compared to the senior leadership team:

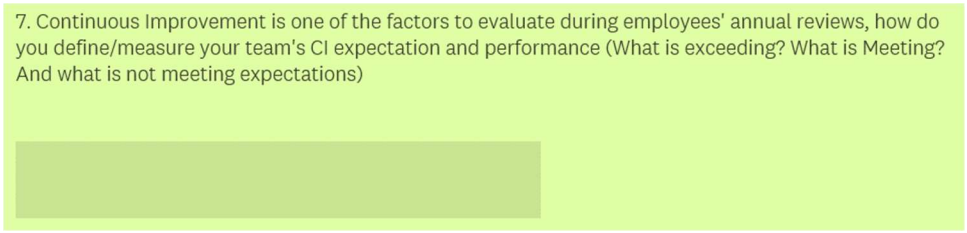


6.3 Lead hands

Same letter was sent to the lead hands. Their questionnaire has the following 2 changes when compared to that of senior leadership team:



And



6.4 Office and production employees

This version of the survey was offered online as well as printed on paper.

"Dear All, By the end of last month, our site celebrated the 1st anniversary of our CI Program. We have more than 300 ideas submitted since the program started, 102 of them got implemented, currently 50 ideas are in the process of being reviewed. On this milestone, I would like to have your feedback on program performance in the last 12 months.

Your thorough input is going to be helpful for the site to use the program to its maximum potential.

1. What would you expect from a good Employees Continuous Improvement Program?
2. How would you describe our current Continuous Improvement program?

3. Name 3 things you like the most in the current program?
4. Name 3 things you like the least in the current Program?
5. How many informal improvements is your department making that are not captured in the CI Program board? Give us an estimate (# idea per week), why are these ideas not captured? Number of ideas/Week and Why?
6. Describe your contribution to the program? (submitting, reviewing, implementing ideas, providing feedback)?
7. Have you received Continuous Improvement training?

    Yes, while working for this organization - Waterloo

    Yes, before joining this organization

    Never

    Not Sure
8. Rate the following aspects of the program: (7 being Very good and 1 being Not very good)
9. Name: (Optional):"

	1. Not very good	2	3	4	5	6	7. Very good	I am not sure
Senior leadership commitment	○	○	○	○	○	○	○	○
Middle management commitment	○	○	○	○	○	○	○	○
Employee appetite to participate	○	○	○	○	○	○	○	○
Your team's CI skills	○	○	○	○	○	○	○	○
Idea's quality	○	○	○	○	○	○	○	○
Idea's impact	○	○	○	○	○	○	○	○
Reviewing speed	○	○	○	○	○	○	○	○
Feedback process	○	○	○	○	○	○	○	○
Implementation speed	○	○	○	○	○	○	○	○
Reward program	○	○	○	○	○	○	○	○
Clarity of ownership to move ideas forward	○	○	○	○	○	○	○	○
Overall CI culture at MPT Waterloo	○	○	○	○	○	○	○	○

7. Study 2: Collected data and categorization

7.1 Question 1

	What would you expect from a good Employees Continuous Improvement Program?
SLT	A program where employees were empowered to spend time working on and implementing their ideas. I would be an approach where an employee pitched an idea and then was enabled to go and give it a try (and provided cross functional support where needed).
SLT	a program that regularly is reengaging the employee population. Employees constantly need reminders why their input is necessary.
SLT	Continual participation and implementation of good ideas that will solve our process / people issues to get barriers out of our employees' way.
SLT	Engagement from the LT and supported by employees, focused on the key business improvement needs & support of team "performance enablement" & engagement. There should be a pull from the business for the resource that forms the team and who govern the program.
SLT	Actionable ideas that improve the safety, quality, culture, customer experience or results of the business
MM	A consistently high level of engagement across the business into the generation and implementation of ideas. Buy-in to champion the ownership of implementation. Top-level management should speak to and drive the importance of this program.
MM	Good follow through on ideas submitted Meaningful recognition for ideas submitted Suggested "ideas to focus on" or "goal of the month" (ie ideas to reduce hand cuts) to encourage people to submit ideas when participation starts to decrease.
MM	Regular updates & ideas implemented
MM	Open to ideas, listen to employees
MM	User Friendly Clear Expectation of the program with targets and ongoing metrics Good reward system to drive engagement
MM	Transparent feedback/responses on all submitted ideas. There has to be some feedback regardless if the idea is accepted or not.
MM	consistency, accountability and measurable improvement
LH	More RIE's and communication regarding them.
LH	A prompter response directly to the person who suggests the idea, followed by a target implementation date, that is then followed up on to guarantee success. Follow that up with a formal announcement, in order to better capture the employee's contributions, since they are part of the annual review.
LH	Timely feedback and support to implement ideas. Acknowledgement.
LH	employees being rewarded fairly
EM	To be able to submit changes from safety issues to process and organizational changes and have them discussed and considered.
EM	To provide constant updates on big projects so that the organization can see tangible improvements in real time.
EM	I'm assuming the question is supposed to read "What would you expect from a good Continuous Improvement Program?" In which case, I would expect employees to receive feedback on all ideas regardless of if the idea was considered for implementation or not. I believe this gives employees more motivation to continue to submit more ideas. I also expect that ideas that have been chosen for implementation would be seen through,

	What would you expect from a good Employees Continuous Improvement Program?
	regardless if the idea submitter has a solution or resources to implement the idea by him/herself or not. This also ties into motivation to continue to submit more ideas.
EM	one that is open minded, willing to accept suggestion that will benefit the company and to see a fast turnaround time.
EM	if it saves money for the company, profit split for the idea is essential
EM	Fair and unbiased analysis (consideration) of an idea. Good Feedback. Virtual Tracker for Ideas. Possibly virtually depict number of ideas submitted by category (safety, operational cost, etc...) through a pie chart or bar graph.
EM	Appreciation of submitted ideas.
EM	Constant flow of ideas, as well as implementation. Continuous goal setting and plans created to reach them. Communication to all employees.
EM	Feedback Quick change turnaround Assistance Accountability for when its happening and if it is happening or not
EM	Good solid positive changes being made that will benefit all of us.
EM	Value added improvements to processes/ tools/ facilities
EM	To expand a fun and friendly culture at the Organization so people would be more involving and supporting the CI Program.
EM	Transparency and upper management buy-in (management taking suggestions seriously and valuing the program)
EM	Proactive ideas that solve problems without pushing the work to another group.
EM	seeing change for the better
EM	GOOD IDEALS BEING IMPLEMENTED
EM	Positive change that make our jobs easier, quicker and leading to efficiency
EM	I think a good program would take all the suggestion given and follow through with whatever might be
EM	Evolution: 1) Improvement, 2) make part flow/delivery better/make processes more efficient and keep employee safe and healthy/ideas and input to be taken seriously
EM	Improve only what is necessary, employees should be expected to improve and maintain own work efficiencies
EM	To smooth out everything, starting from the office down.

Data categorization:

Participant's Group	Statement	Category
SLT	Key business improvement	Idea Scope
SLT	Customer experience	Idea Scope
SLT	CI culture	Implementation
SLT	process improvement	Implementation
SLT	Empower	Engagement
SLT	Try new ideas	Engagement
SLT	Engage	Engagement
SLT	Engagement	Engagement
SLT	performance enablement	Engagement
SLT	input	Engagement

Participant's Group	Statement	Category
SLT	Encourage to submit	Engagement
SLT	Actionable ideas	Engagement
SLT	Safety	Engagement
SLT	Quality	Engagement
SLT	remove barriers	Leader support
SLT	People issue	Leader support
SLT	Cross functionals team	Leader support
MM	focus ideas	Idea Scope
MM	Measurable improvement	Idea Scope
MM	Engagement	Engagement
MM	encourage to submit	Engagement
MM	Friendly to use	Engagement
MM	Follow up	Feedback
MM	Regular update	Feedback
MM	Listen to employees	Feedback
MM	Transparent Feedback	Feedback
MM	Must have feedback	Feedback
MM	meaningful recognition	Reward
MM	Good reward	Reward
MM	Clear expectation	Leader support
MM	Consistency	Leader support
MM	Buy in	Leader support
MM	Accountability	Leader support
MM	Champion ownership to implement	Leader support
LH	RIE	Idea Scope
LH	Annual reviews	Implementation
LH	capture individual contribution	Engagement
LH	Prompt responses	Feedback
LH	Timely feedback	Feedback
LH	Communication	Feedback
LH	Formal announcement	Feedback
LH	acknowledgement	Feedback
LH	Fair reword	Reward
LH	target implementation date	Leader support
LH	support to implement ideas	Leader support
EM	Update on big project	Idea Scope
EM	linked to goal / plan	Idea Scope
EM	Positive change	Idea Scope
EM	Value added improvement	Idea Scope
EM	necessary improvement	Idea Scope
EM	smooth processes	Idea Scope
EM	tangible improvement	Idea Scope
EM	benefit company	Idea Scope
EM	Fast turn around	Idea Scope
EM	Improve process	Idea Scope
EM	safety issue	Implementation
EM	Save money	Implementation

Participant's Group	Statement	Category
EM	Fun/friendly culture	Implementation
EM	change	Implementation
EM	Positive change	Implementation
EM	Improve delivery	Implementation
EM	organizational changes	Implementation
EM	efficient process	Implementation
EM	Improve tools	Implementation
EM	Improve facility	Implementation
EM	safety	Implementation
EM	solve problem	Implementation
EM	Make parts flow	Implementation
EM	Open minded	Engagement
EM	Fair & unbiased analysis	Engagement
EM	All suggestion	Engagement
EM	motivate to submit ideas	Engagement
EM	receive feedback for all ideas regardless	Feedback
EM	Feedback	Feedback
EM	Transparency	Feedback
EM	Good feedback	Feedback
EM	Communication	Feedback
EM	no push of work to another group	Implementation
EM	immediate implementation	Implementation
EM	fast turn around	Implementation
EM	resources/solution neutral	Implementation
EM	Implementation	Implementation
EM	Appreciation	Reward
EM	profit split	Reward
EM	Visual count of relevancy	Leader support
EM	self-improve	Leader support
EM	accountability	Leader support
EM	Leaders buy in	Leader support
EM	assistance / support	Leader support
EM	taking suggestion seriously	Leader support
EM	value the program	Leader support
EM	seriously buy in	Leader support

7.2 Question 2

	How would you describe our current Continuous Improvement program?
SLT	There is a high proportion of ideas that are more complaint related than business improvement related, which creates noise distracting the team from implementing impactful CI improvements.
SLT	Ideas are hard to implement as they are often not simple and require cross functional buy in. I think this results in many not moving through the process. I believe we should reject far more ideas. Unless we can execute them in a reasonable amount of time I think it makes sense to not continue to accept and then let them sit. I believe it makes more sense

	How would you describe our current Continuous Improvement program?
	to only accept the best of the best of the ideas and any idea where the idea giver needs our support rather than for us to drive a solution.
SLT	it does feel stale.
SLT	Very positive initiative in our organization since its implementation but now stale since it has been in place for over a year.
SLT	Evolving to focus more on clear business needs as opposed to discrete projects.
SLT	Good but has lost traction recently
MM	Started strong, but interest/engagement petered off about half-way through the year.
MM	- Started very strong, but people are now struggling to come up with good ideas. People seemed genuinely interested at first, but most suggestions were mostly from manufacturing floor vs office staff.
MM	Very well organized and well used in it's first year.
MM	better than most
MM	Pretty Good for first year! We need to after the first year tighten up more on items that should be parts of regular GDP and known issues.
MM	inconsistent. I have heard from multiple employees that they submit ideas but never receive any feedback. Now they are no longer interested in submitting ideas.
MM	I am not too familiar with it as I am in 617 so I don't really know too much about it. Based on OTD and quality issues I personally believe we have much work to do.
LH	It seems to revolve around safety and Screen Mfg. department. These are very important, but a little more diversity would be a good thing.
LH	The program is fairly well received; however, idea implementation has been slow. It is also all but impossible to know who has submitted an idea, or who has had one implemented.
LH	Okay. Kind of a "second thought". Only when things are not busy and only updates at townhalls
LH	below average
EM	Good but would like to be able to submit process and organizational change ideas.
EM	Limited to superficial and cosmetic facility improvements.
EM	Great concept seems to be working very well. Needs a few improvements.
EM	It had a great start. The rewards program is working. need more engagement, especially with older employees...
EM	It is a good start
EM	The program is off to a good progressive start. It is receiving traction (ideas) from different departments.
EM	It could be reminded often to participate...no idea too small.
EM	I am not aware of the current program. Increased communication to employees would be appreciated by all.
EM	Okay
EM	very good
EM	Medium effectiveness
EM	- Thumbs up this great Idea! Changes can be noticed all around at the MPT site on improvements achieved.
EM	Over all performing well; suggestions are valued but maybe not always prioritized for implementation if they are not "easy" fixes

	How would you describe our current Continuous Improvement program?
EM	It works, but I believe that a lot of the ideas could be routed through regular channels such as speaking to their supervisor/manager or entering a Zendesk ticket.
EM	good
EM	JUST OK
EM	Very good
EM	Ok but needs some improvement
EM	I am not sure really if It has affected me
EM	It is not bad, but needs to be more focused on making changes to be more efficient and accurate
EM	Not sure, we are spending money for the wrong reasons
EM	Not sure

Data Categorization

Participants' Group	Statement	CI Category	+	-
SLT	There is a high proportion of ideas that are more complaint related than business improvement related,	Idea Scope		1
SLT	Creates noise distracting the team from implementing impactful CI improvements.	Implementation		1
SLT	Ideas are hard to implement as they are often not simple and require cross functional buy in.	Idea Scope		1
SLT	I think this results in many not moving through the process.	Implementation		1
SLT	I believe we should reject far more ideas. Unless we can execute them in a reasonable amount of time I think it makes sense to not continue to accept and then let them sit.	Engagement		1
SLT	I believe it makes more sense to only accept the best of the best of the ideas	Idea Scope		1
SLT	Only accept idea where the idea giver needs our support rather than for us to drive a solution.	Engagement		1
SLT	it does feel stale.	General		1
SLT	Very positive initiative in our organization since its implementation	Engagement	1	
SLT	but now stale since it has been in place for over a year.	Engagement		1
SLT	Evolving to focus more on clear business needs as opposed to discrete projects.	Idea Scope		1
SLT	Good	General	1	
SLT	has lost traction recently	Engagement		1
MM	Started strong,	General	1	
MM	but interest/engagement petered off about half-way through the year.	Engagement		1
MM	Started very strong	General	1	

Participants' Group	Statement	CI Category	+	-
MM	but people are now struggling to come up with good ideas.	Idea Scope		1
MM	People seemed genuinely interested at first	Engagement	1	
MM	but most suggestions were mostly from manufacturing floor vs office staff.	Engagement		1
MM	Very well organized and well used in it's first year.	General	1	
MM	better than most	General	1	
MM	Pretty Good for first year!	General	1	
MM	We need to after the first year tighten up more on items that should be parts of regular GDP and known issues.	Idea Scope		1
MM	Inconsistent.	Engagement		1
MM	I have heard from multiple employees that they submit ideas but never receive any feedback.	Feedback		1
MM	Now they are no longer interested in submitting ideas.	Engagement		1
MM	I am not too familiar with it as I am in 617 so I don't really know too much about it.	Engagement		1
MM	Based on OTD and quality issues I personally believe we have much work to do.	Idea Scope		1
LH	below average	General		1
LH	It seems to revolve around safety and Screen Mfg. department.	Idea Scope		1
LH	a little more diversity would be a good thing.	Engagement		1
LH	These are very important but	General	1	
LH	The program is fairly well received;	Engagement	1	
LH	however, idea implementation has been slow.	Implementation		1
LH	It is also all but impossible to know who has submitted an idea,	Feedback		1
LH	or who has had one implemented.	Feedback		1
LH	Kind of a "second thought". Only when things are not busy and only updates at townhalls	General		1
LH	Okay.	General	1	
EM	Good	General	1	
EM	but would like to be able to submit process and organizational change ideas.	Idea Scope		1
EM	Limited to superficial and cosmetic facility improvements.	Idea Scope		1
EM	seems to be working very well	General	1	
EM	Needs a few improvements.	General		1
EM	Great concept,.	General	1	
EM	It had a great start.	General	1	
EM	The rewards program is working.	Reward	1	

Participants' Group	Statement	CI Category	+	-
EM	It is a good start	General	1	
EM	need more engagement, especially with older employees...	Engagement		1
EM	It is receiving traction (ideas) from different departments.	Engagement	1	
EM	The program is off to a good progressive start.	General	1	
EM	It could be reminded often to participate...no idea too small.	Engagement		1
EM	I am not aware of the current program.	Engagement		1
EM	Increased communication to employees would be appreciated by all.	Feedback		1
EM	Okay	General	1	
EM	very good	General	1	
EM	Medium effectiveness	General	1	
EM	Thumbs up this great Idea!	General	1	
EM	Changes can be noticed all around at the MPT site on improvements achieved.	Implementation	1	
EM	Over all performing well;	General	1	
EM	suggestions are valued but maybe not always prioritized for implementation if they are not "easy" fixes	Idea Scope		1
EM	It works	General	1	
EM	but I believe that a lot of the ideas could be routed through regular channels such as speaking to their supervisor/manager or entering a Zendesk ticket.	Idea Scope		1
EM	good	General	1	
EM	JUST OK	General	1	
EM	Very good	General	1	
EM	Ok	General	1	
EM	but needs some improvement	General		1
EM	I am not sure really if It has affected me	General		1
EM	It is not bad	General	1	
EM	but needs to be more focused on making changes to be more efficient and accurate	Idea Scope		1
EM	Not sure,	Engagement		1
EM	we are spending money for the wrong reasons	Idea Scope		1
EM	Not sure	Engagement		1

7.3 Questions 3 and 4

Participants' Group	Question 3: Name 3 things you like the most in the current program?
SLT	Ideas are presented on a daily basis, implementation is decided upon quickly, and it involves a cross functional team.
SLT	Hearing from the idea owner about their implemented ideas when they are presented with their coin.
SLT	visual, spotlights the employee and their idea, the business sees its benefit
SLT	simplicity of use ease of access visibility
SLT	1. Dedicated leader supported by cross functional groups. 2. Projects are varied and are starting to focus on the most urgent activities. 3. It can be innovative, and it is generating new thinking.
SLT	Availability to all employees, accountability for actionable ideas, that it rewards the employee
MM	1. Reward system - though at this time it doesn't seem to be able to drive continuous participation, having A reward system is important. Is there a rotation of the prizes you can win? People are motivated by different things, so there should at least be a rotation. Could there be a financial incentive? Gift cards? Pool up your Quadro Dollars to earn an extra vacation day? People could also be more motivated if there were a more-public recognition program for participation. 2.The CI Board - great visual tool to show the progress through the different stages of idea-vetting and implementation. 3. Idea-submitters are encouraged to participate in implementation.
MM	very timely review of ideas (daily if applicable) -good reward system -good publicity of ideas implemented
MM	. Gives employees a chance to voice their opinions. 2. Gives employees a chance to be a part of change.
MM	1. frequent employee involvement 2. regular follow-up 3. rewards
MM	Quadro Dollar & Good Prizes Easy card to fill out We talk about it often
MM	idea board is displayed publicly we get periodic e-mails on how many ideas are submitted and implemented. when an idea is implemented the company explains the benefits of the idea.
MM	As mentioned previously I am not familiar with many details of the program.
LH	Progress board is in a public and busy place (Lunch room 613). -Generally, items move a reasonable progression through the process. -Prices are appropriate

Participants' Group	Question 3: Name 3 things you like the most in the current program?
LH	Allows employee input Has management backing IDK
EM	The reward, being heard and having your ideas considered.
EM	The staff running it and the ability to submit ideas.
EM	Everyone has a chance to submit their ideas. People are recognized for ideas implemented. People are rewarded for their contribution.
EM	implementation time. rewards
EM	easy to suggest an improvement
EM	ease of submission-card system Quadro Dollar offerings a positive feeling when an idea (not just mine) is submitted and implemented
EM	N/A
EM	Making the company improve in all ways Motivating employees Prizes
EM	rewards, changes that are made and the benefits from them.
EM	Driving incremental improvement Everyone can contribute ideas Person with idea is included in implementing
EM	Open Idea Sharing & Implementation process visuals Employee Engagement in CI Program "Quadro Dollar" Of Course
EM	Timeliness of review (daily after DM), management buy-in, employees rewarded
EM	Ideas are vetted by leadership. Rewards. Simple method of recording ideas.
EM	Nour the terrific ideas seeing the change
EM	COINS REWARDS IMPROVING THINGS THRU IDEALS
EM	Team of people looking at the issues and contributing
EM	Opportunities to make things better
EM	No sure
EM	Improve areas which would benefit the company the most. (make money) - stop spending money like running water

Participants' Group	Question 4: Name 3 things you like the least in the current Program?
SLT	Focus and prioritization is lacking, implementation drags out, and many ideas are not related to business improvement.
SLT	Seems we have fewer ideas being implemented. Seems we have few ideas where they are 'go do's'
SLT	better definition of categories and new categories need more engagement from across the organization focus on process improvements
SLT	1. Sustainability after handover. 2. Level of engagement from the wider team. 3. Constant push Vs a pull.
SLT	Need to get a wider range of employees participating
MM	1. Limited - if any - accountability to complete actions that would lead to idea implementation. 2. Task of implementation is assigned to parties without that party being involved in discussion. 3. See Recognition/Incentive program comments above.
MM	-It seems people are still resisting implementing their own ideas, rather someone else help implement.
MM	I don't recall learning that much about the program when I first started. I think it would be good to have regular reminders on how to submit ideas, and the process for review and implementation of ideas.
MM	I don't find any fault with the program
MM	Many items are already in the works and should not be included (we need to make this clear through the program roll out) No KPI that we discuss as a management team Need to push more to have associate implementation for quick wins
MM	- not all ideas submitted receive feedback. Original idea submitter does not always hear back from the group. - i don't know all the members on the team reviewing these ideas. - reminders to submit feedback are infrequent
MM	I don't think it's effective so far.
LH	-Not enough diversity throughout the shop departments. -No metrics to measure improvements on each suggestion
LH	Only gets looked at when not busy (understandable) Not much support to get actual idea implemented Rewards are not so great.
LH	Not all the right people get rewarded
EM	- submit organizational changes - be able to support and add to your colleagues' ideas - monthly report posted on board and via email discussing recent changes that have been implemented and how it helped the company (time savings, cost savings, etc.)
EM	The scope is limited to superficial or cosmetic challenges for most employees, discussion is limited on submitted ideas and individuals who submit do not have an obligation or opportunity to present their idea in its proper context.
EM	Unable to show support of other people's ideas. Rewards are still very much the same and not that appealing. (Add the Blue CI Shirts) Not able to submit ideas electronically.
EM	rewards are geared more to men..
EM	-no real payback for an idea that saves company money
EM	see above
EM	N/A

Participants' Group	Question 4: Name 3 things you like the least in the current Program?
EM	Turnaround time Accountability, never know when its implemented or not
EM	none to mention
EM	Some use it frivolously **Suggestion**- increase "reward" based on value of CI improvement. ie improvement saves $10k/yr - extra coins or larger reward?
EM	N/A
EM	I think that maybe middle management commitment could be a bit stronger, and maybe participation in the review meetings could be a bit more structured (all management levels from all departments participating; right now some management members do not attend the meetings).
EM	The current program rewards behavior that adds bureaucracy and wastes time. An example is submitting an idea to request a change to a report that should just be routed through a IT ticket. All ideas are rewarded equally despite some ideas having a larger benefit to the organization. Ideas are submitted just to get a Quadro dollar for processes that they know how to do or just need training on.
EM	cant think of anything
EM	NO FOLLOW UP ON SOME IDEALS. IDEALS BEING IGNORED FOR SAFETY DECISION ON ALL IDEALS
EM	Rewards, not hearing about the outcome of some of the idea, not seeing the idea come to life
EM	MSDS sheets, information on rental return unit and refurb components. Implement issue on making process better/more efficient
EM	Spending money for non-essential project, CI $ does not work

Data categorization:

Participants' Group	Question 3 - Statement	Most Liked Category
SLT	Ideas are presented on a daily basis	Engagement
SLT	it involves a cross functional team	Engagement
SLT	spotlights the employee and their idea	Engagement
SLT	simplicity of use	Engagement
SLT	ease of access	Engagement
SLT	visibility	Engagement
SLT	It can be innovative, and it is generating new thinking.	Engagement
SLT	Availability to all employees	Engagement
MM	Idea-submitters are encouraged to participate in implementation.	Engagement
MM	Gives employees a chance to voice their opinions.	Engagement
MM	frequent employee involvement	Engagement

Participants' Group	Question 3 - Statement	Most Liked Category
MM	Easy card to fill out	Engagement
MM	We talk about it often	Engagement
MM	idea board is displayed publicly	Engagement
LH	Progress board is in a public and busy place (Lunch room 613).	Engagement
LH	Allows employee input	Engagement
EM	being heard and having your ideas considered.	Engagement
EM	the ability to submit ideas.	Engagement
EM	Everyone has a chance to submit their ideas.	Engagement
EM	easy to suggest an improvement	Engagement
EM	ease of submission-card system	Engagement
EM	Motivating employees	Engagement
EM	Everyone can contribute ideas	Engagement
EM	Open Idea Sharing	Engagement
EM	Employee Engagement in CI Program	Engagement
EM	Simple method of recording ideas.	Engagement
EM	Team of people looking at the issues and contributing	Engagement
SLT	Visual	Feedback
MM	The CI Board - great visual tool	Feedback
MM	regular follow-up	Feedback
MM	we get periodic e-mails on how many ideas are submitted and implemented.	Feedback
MM	when an idea is implemented the company explains the benefits of the idea.	Feedback
EM	visuals	Feedback
SLT	Projects are varied and are starting to focus on the most urgent activities.	Idea Scope
EM	the terrific ideas	Idea Scope
EM	seeing the change	Idea Scope
EM	IMPROVING THINGS THRU IDEALS	Idea Scope
SLT	implementation is decided upon quickly,	Implementation
SLT	the business sees its benefit	Implementation
MM	timely review of ideas (daily if applicable)	Implementation
MM	Gives employees a chance to be a part of change.	Implementation
LH	Generally, items move a reasonable progression through the process.	Implementation
EM	implementation time.	Implementation
EM	Making the company improve in all ways	Implementation
EM	changes that are made and the benefits from them.	Implementation
EM	Driving incremental improvement	Implementation
EM	Person with idea is included in implementing	Implementation
EM	Implementation process	Implementation
EM	Timeliness of review (daily after DM)	Implementation
EM	Opportunities to make things better	Implementation
SLT	Dedicated leader supported by cross functional groups.	Leader Support

Participants' Group	Question 3 - Statement	Most Liked Category
SLT	accountability for actionable ideas	Leader Support
LH	Has management backing	Leader Support
EM	The staff running it and	Leader Support
EM	Management buy-in	Leader Support
EM	Ideas are vetted by leadership.	Leader Support
EM	Nour	Leader Support
MM	As mentioned previously I am not familiar with many details of the program.	None
EM	N/A	None
EM	No sure	None
SLT	Hearing from the idea owner about their implemented ideas when they are presented with their coin.	Reward
SLT	that it rewards the employee	Reward
MM	Reward system -	Reward
MM	good reward system	Reward
MM	good publicity of ideas implemented	Reward
MM	rewards	Reward
MM	Quadro Dollar & Good Prizes	Reward
LH	Prices are appropriate	Reward
EM	The reward,	Reward
EM	People are recognized for ideas implemented.	Reward
EM	People are rewarded for their contribution.	Reward
EM	The reward,	Reward
EM	Quadro Dollar offerings	Reward
EM	A positive feeling when an idea (not just mine) is submitted and implemented.	Reward
EM	Prizes	Reward
EM	rewards,	Reward
EM	Quadro Dollar Of Course	Reward
EM	Rewards.	Reward
EM	COINS REWARDS	Reward

Participants' Group	Question 4 - Statement	Least Liked Category
SLT	Focus and prioritization is lacking	Idea Scope
SLT	implementation drags out	Implementation
SLT	many ideas are not related to business improvement.	Idea Scope
SLT	Seems we have fewer ideas being implemented	Implementation
SLT	Seems we have few ideas where they are 'go do's'	Idea Scope
SLT	better definition of categories and new categories	Idea Scope
SLT	need more engagement from across the organization	Engagement
SLT	focus on process improvements	Idea Scope
SLT	Sustainability after handover	Engagement
SLT	Level of engagement from the wider team	Engagement
SLT	Constant push Vs a pull.	Engagement

Participants' Group	Question 4 - Statement	Least Liked Category
SLT	Need to get a wider range of employees participating	Engagement
MM	Limited - if any - accountability to complete actions that would lead to idea implementation	Implementation
MM	Task of implementation is assigned to parties without that party being involved in discussion	Implementation
MM	See Recognition/Incentive program comments above.	Reward
MM	It seems people are still resisting implementing their own ideas,	Idea Scope
MM	rather someone else help implement.	Idea Scope
MM	I don't recall learning that much about the program when I first started	Engagement
MM	I think it would be good to have regular reminders on how to submit ideas	Engagement
MM	reminder on the process for review and implementation of ideas.	Implementation
MM	I don't find any fault with the program	None
MM	Need to push more to have associate implementation for quick wins	Idea Scope
MM	Many items are already in the works and should not be included (we need to make this clear through the program roll out)	Idea Scope
MM	No KPI that we discuss as a management team	Idea Scope
MM	not all ideas submitted receive feedback.	Feedback
MM	Original idea submitter does not always hear back from the group	Feedback
MM	i don't know all the members on the team reviewing these ideas	Feedback
MM	reminders to submit feedback are infrequent	Feedback
MM	I don't think it's effective so far.	Engagement
LH	Not enough diversity throughout the shop departments.	Engagement
LH	No metrics to measure improvements on each suggestion	Idea Scope
LH	Only gets looked at when not busy (understandable)	Implementation
LH	Rewards are not so great.	Reward
LH	Not much support to get actual idea implemented	Leader Support
LH	Not all the right people get rewarded	Reward
LH	submit organizational changes	Idea Scope
LH	be able to support and add to your colleagues' ideas	Engagement
LH	not having a monthly report posted on board and via email discussing recent changes that have been implemented and how it helped the company (time savings, cost savings, etc.)	Feedback
LH	Unable to show support of other people's ideas.	Feedback
EM	Rewards are still very much the same and not that appealing. (Add the Blue CI Shirts)	Reward
EM	Not able to submit ideas electronically.	Engagement

Participants' Group	Question 4 - Statement	Least Liked Category
EM	rewards are geared more to men.	Reward
EM	-no real payback for an idea that saves company money	Reward
EM	see above	None
EM	N/A	None
EM	not hearing about the outcome of some of the idea,	Feedback
EM	not seeing the idea come to life	Feedback
EM	IDEALS BEING IGNORED FOR SAFETY	Idea Scope
EM	DECISION ON ALL IDEALS	Feedback
EM	All ideas are rewarded equally despite some ideas having a larger benefit to the organization.	Reward
EM	Ideas are submitted just to get a Quadro dollar for processes that they know how to do or just need training on.	Idea Scope
EM	Some use it frivolously	Reward
EM	Turnaround time	Implementation
EM	Accountability never know when its implemented or not	Implementation
EM	none to mention	None
EM	N/A	None
EM	I think that maybe middle management commitment could be a bit stronger	Leader Support
EM	maybe participation in the review meetings could be a bit more structured	Leader Support
EM	The current program rewards behavior that adds bureaucracy and wastes time. An example is submitting an idea to request a change to a report that should just be routed through a IT ticket.	Idea Scope
EM	Can't think of anything	None
EM	NO FOLLOW UP ON SOME IDEALS.	Feedback
EM	Rewards,	Reward
EM	MSDS sheets, information on rental return unit and refurb components.	Idea Scope
EM	Spending money for non-essential project,	Idea Scope
EM	Implement issue on making process better/more efficient	Idea Scope
EM	CI $ does not work	Reward

7.4 Question 7

Participant's Group	Statement: Why are these ideas not captured in CI program?	why?
EM	change is hard to come by	Added bureaucracy
EM	not enough time to suggest them and not sure how to resolve them	Added bureaucracy
EM	Implemented directly	Added bureaucracy

Participant's Group	Statement: Why are these ideas not captured in CI program?	why?
EM	our department does not need to use the program to make changes	Added bureaucracy
EM	Need to be put in place quickly, rather than waiting for a meeting and then for the task to be assigned.	Added bureaucracy
EM	We implement them ourselves. On the go. Quicker. (mostly because it is not operational/shop floor related.	Added bureaucracy
EM	Too expensive to implement, too hard to implement, not worth the time to implement or already submitted by others	Added bureaucracy
MM	Busy, some other priority or distraction comes up	Busy with other priority
LH	Just things we have wanted to do for a long time but have not had the time until recently	Busy with other priority
EM	Lack of Time/Efforts	Busy with other priority
MM	We typically just make small process changes as needed.	Idea scope
MM	Not top of mind. Think that improvements are too narrowly-focused to warrant submitting as formal idea.	Idea scope
EM	The ideas are quality of life improvements specifically for individuals or fall outside of the scope of the CI team.	Idea scope
EM	they are departmental changes to improve our processes, output to the customer and efficiencies.	Idea scope
LH	select ones at the initial stage didn't progress because they were not formally submitted	Implementation is very slow
EM	I put in 6 suggestions and it was never implemented or fixed. Not sure why isn't / wasn't implemented.	Implementation is very slow
EM	NO FOLLOW UP	Implementation is very slow
EM	why go through the process if there are no real rewards	Lack of reward
MM	I do not track ideas submitted by my team	N/A
EM	Not sure, lots in the beginning of the program	N/A
EM	None	N/A
EM	N/A	N/A
MM	They are part of regular business improvement and need to be separate	Part of my job
MM	I assume it's a normal part of the job	Part of my job
EM	Typically, are small ideas that either are part of our jobs, or small changes to make jobs easier. Not sure that these small job-related ideas should be "rewarded" OR are so small that it seems insignificant.	Part of my job