CONTINUOUS IMPROVEMENT IMPLEMENTATION AT HIGHLAND VALLEY COPPER

by

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PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF BUSINESS ADMINISTRATION

In the Management of Technology Program
of the
Faculty
of
Business Administration

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SIMON FRASER UNIVERSITY

Summer 2014

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Abstract

Continuous Improvement (CI) is a strong philosophical approach to business operational management. It has roots with the automotive manufacturer Toyota and statistician W. Edwards Deming. Adoption of CI principles into business has documented performance improvement achievements greater than 10% with no capital investment. Operating mining companies share many of the same business conditions that Toyota did during the development of CI.

Under Canada's largest diversified resource company, Teck resources Ltd. (Teck), Highland Valley Copper (HVC) has begun the CI implementation. The status of the implementation is strong but still requires significant efforts over the next five years to solidify it as a culture at HVC. The paper suggests that the next steps for CI at HVC involve developing a communications protocol, resetting the formal aspects of CI practices and defining the progression requirements for potential CI workers as they pertain the participation in CI. These recommendations in concert with continued strong executive sponsorship will progress HVC's CI culture efforts closer to the missions statement set by the Teck corporate operational excellence group at the beginning of the CI implementation effort:

> *Our vision is to embed an improvement culture within our organization that can continually recognize, analyze, prioritize and act on opportunities to improve our results and all other values central to our business.*

Executive Summary

Continuous Improvement is a management philosophy that emerged from a relentless pursuit of principle-based business. Many other industries have adopted Continuous Improvement including mineral extraction. Specifically, the focus of the paper is the implementation of Continuous Improvement at Highland Valley Copper (HVC). Teck Resources Ltd. operates HVC. Mining shares many operational attributes with auto manufacturing, where Continuous Improvement originated. A survey of the staff at Highland Valley Copper revealed three areas for improvement toward successful implementation of Continuous Improvement:

- The value of formal practices.

- Effective communication protocols.

- Development and progression expectations.

The recommendations that follow these areas for improvement are listed in Table 4 and Table 5 as follows:

- Involve Superintendents in a bi-weekly idea audits with their idea owners to promote accountability.

- Set targets for quality improvements in departmental alignment meetings.

- Re-establish competency matrix usage for development of Continuous Improvement personnel.

- Involve junior staff in high level targeting and variance.

- Timely communications of a consistent quality and source

- HVC seconds staff from their operational roles to Continuous Improvement for development. Therefore, they should demonstrate their development.

Dedication

Thank you to Stephanie for supporting me throughout. Your recognition of my workload was wonderfully supportive. I love you dearly.

Thanks to Dad for gently guiding my writing. Short, impactful writing truly is more effective.

Thanks to Rod for never failing to guide my logic and challenge my thinking. Rod was always quick to respond to my questions, even on Sundays.

Thanks to Cynthia and Jason. My home away from home. I am not sure I would have completed without your support.

Acknowledgements

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Glossary

Change Management   The process, tools and techniques to manage the people-side of change to achieve a required business outcome (Definition of Change Management, 2014)

Continuous Improvement (CI)   A culture or collection of efforts toward continually improving products, services, processes or anything.

Ideas Pipeline   A project management approach to implementing ideas into a business.

Inter Alia   Among other things

"The Line"   The term used for the collection of workers that directly add value to the raw materials. The core functioning groups of the process: Operations, Maintenance, Engineering and Technical groups.

Molybdenite   The name for the mineral form of molybdenum concentrate metal.

Results – Action – Review Process (RAR)   A weekly process between an employee and their supervisor designed to bring alignment, prioritization, and coaching to work.

Resource   A mineral deposit that is potentially valuable, that may eventually be economically extracted.

Reserve   A mineral deposit that is legal, valuable, technically feasible, and economical to extract.

Value Driver Tree (VDT)   An illustration of the aspects of the operation that add value to the raw materials as they are transformed to a the saleable product. Mathematical in nature, the VDT is a tool used for prioritization and conceptualization.

Wiring   Alignment within a department. Analogous to the linkages made within electrical circuits. All components of the electrical circuit are wired together to provide predictable results.

1: Introduction: Continuous Improvement, Highland Valley Copper and What Next?

The definition of Continuous Improvement (CI) is a culture or collection of efforts toward continually improving products, services, processes or anything (Dassbach, 1991). Application of the CI culture was successful in the manufacturing industry as exemplified by Toyota motors (Toyota). Implementation of this management philosophy has also been successful in a number of other industries. The reason for this is simple: it is a philosophy, and not simply a passing fad or program of the month. It allows companies to be dynamic. It provides tools to companies so that they may continually adapt and transcend uncertainty. These companies enjoy sustainable results.

Teck Resources Ltd. (Teck) is Canada's largest diversified resource company. The major business units focus on copper, steelmaking coal, zinc, and energy ("News", 2014). The 17 operations that Teck manages are all complex and enormous in scale. With over 11,000 employees across the company, many operations have over 1000 employees. Managing and coordinating activities to optimize value is challenging. For this reason, Teck has set out to implement a continuous improvement culture throughout its operations. There are supplementary benefits from such a program. We will explore the process of implementing a CI culture in a business. This task is enormous. HVC must give adequate time and commitment for it to become a reality. Culture is an integrated system of learned behaviours or habits (Kotter, 1998). Although habits can take years to change, diligence toward an effective future is tremendously valuable.

The focus of the paper is at the site level at Highland Valley Copper (HVC). The goal of the paper is to make recommendations to HVC based on an analysis of CI at HVC. We will draw recommendations from analyses of the history of CI and the implementation of CI at HVC. We

will use Toyota's application of CI as a benchmark in deriving the recommendations. Finally, the concluding section will provide the recommendations for the next steps for CI at HVC.

1.1 Overview of the Canadian Diversified Resource Company, Teck Resources Ltd.

Teck has a rich history within the mining and mineral development fields. Their history has seen the exploration, development, operations and remediation of over forty sites. They have also engaged in the development of new hydrometallurgical processes and a vast host of technological research projects through their facilities in Richmond and Trail, BC. In their own words Teck,

> *… is Canada's largest diversified resource company, committed to responsible mining and mineral development. We produce materials essential to the quality of life of people around the world - copper, steelmaking coal, zinc and energy. ("News", 2014)*

Specifically, the CI implementation at the HVC site is the focus of this paper. HVC operates in the interior of BC, approximately 65 km north of Merritt, or 350 kilometres northeast of Vancouver. Rope shovels and haul trucks extract ore from three main open pits. The ore body primarily contains copper. The most predominant mineral forms of copper at HVC are chalcopyrite and bornite. There are also small amounts of molybdenite and trace amounts of gold, silver and arsenic. There are only two concentrate products from HVC. They are copper and molybdenum. Figure 1 shows the main value added activities.
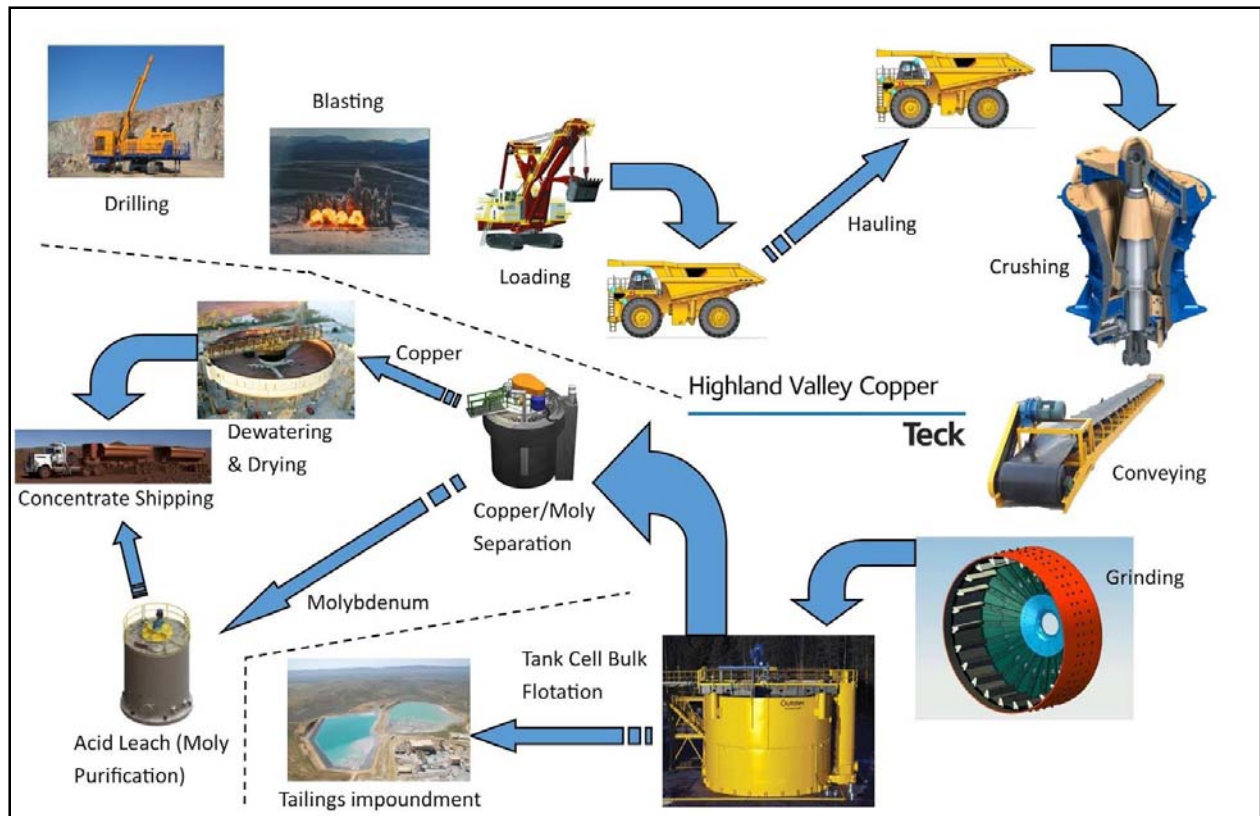
Figure 1 - Overall flow sheet of major activities at Highland Valley Copper (HVC).

Source: Adapted from HVC Flowsheet with clipart (2014)

HVC produces approximately 240 million payable pounds of copper per year and approximately 10 million payable pounds of molybdenum. The mill processes approximately 140,000 dry metric tonnes of ore, daily. The steps from grinding to concentrate shipping represent the activities of the mill. The mine operations crews move approximately 200,000 tonnes of waste each day. HVC does this to maintain access to future ore reserves. Small improvements have a massive impact in terms of financial value due to the scale of operations. Figure 2 shows the organizational chart.
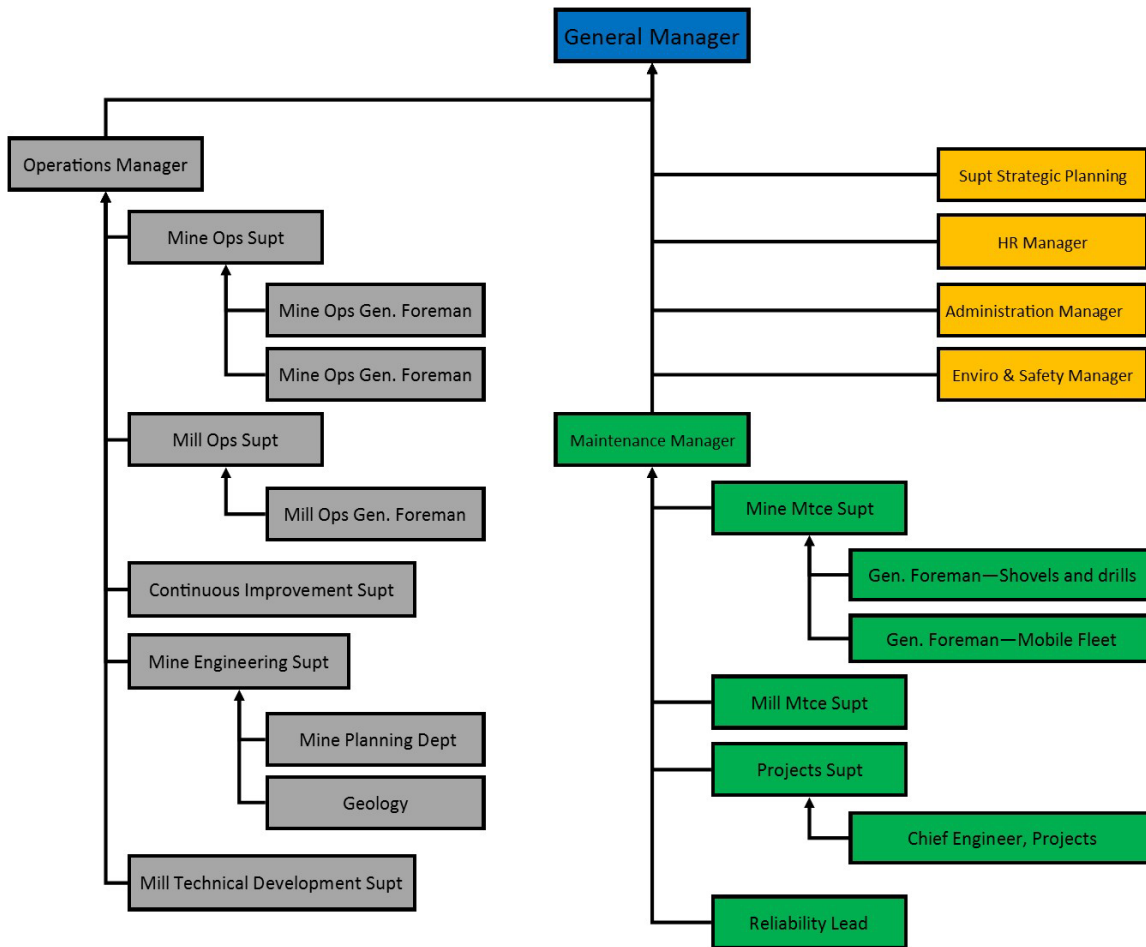
Figure 2 - Organizational Chart for HVC (High level)

Source: Adapted from HVC Org chart (2014)

The organizational chart in Figure 2 shows the support, maintenance and operations departments. The staff members in these management roles set the tone of daily operations. They are responsible and influential with respect to internal improvement. However, a successful implementation of a continuous improvement culture should involve each person from the dozer operator to the General Manager.

There are many activities, shown in Figure 1, that add value to HVC's raw materials. Many activities do not add value. The scale of operations is enormous with complex interdependencies. Because of these operational attributes, the potential gain by implementing an

internal improvement culture is enormous. With respect to implementation, the next section will discuss HVC's readiness in that regard.

1.2 Assessment of the Business Management Culture at HVC

At a corporate level, Teck is concerned primarily with the viability of the portfolio within the current and future market conditions. This is because commodity producers are economic price takers. Teck is an economic price taker. This means that predicting what commodities are going to be provide the highest margins is important.

At HVC, continuous improvement is important with the management team on site. We will examination this claim throughout the paper. The goal of this paper is to understand the status of the development of CI on site at HVC and submit recommendations for the future of the CI culture.

To understand how CI attempts to address prioritization of improvement efforts and reinforce value as a core tenet of management activities we produce a process map also known as a value driver tree (VDT). Close examination of the process and population of the value driver tree with operations data allows managers to make prioritized decisions. Figure 3 below is one such VDT without the data.
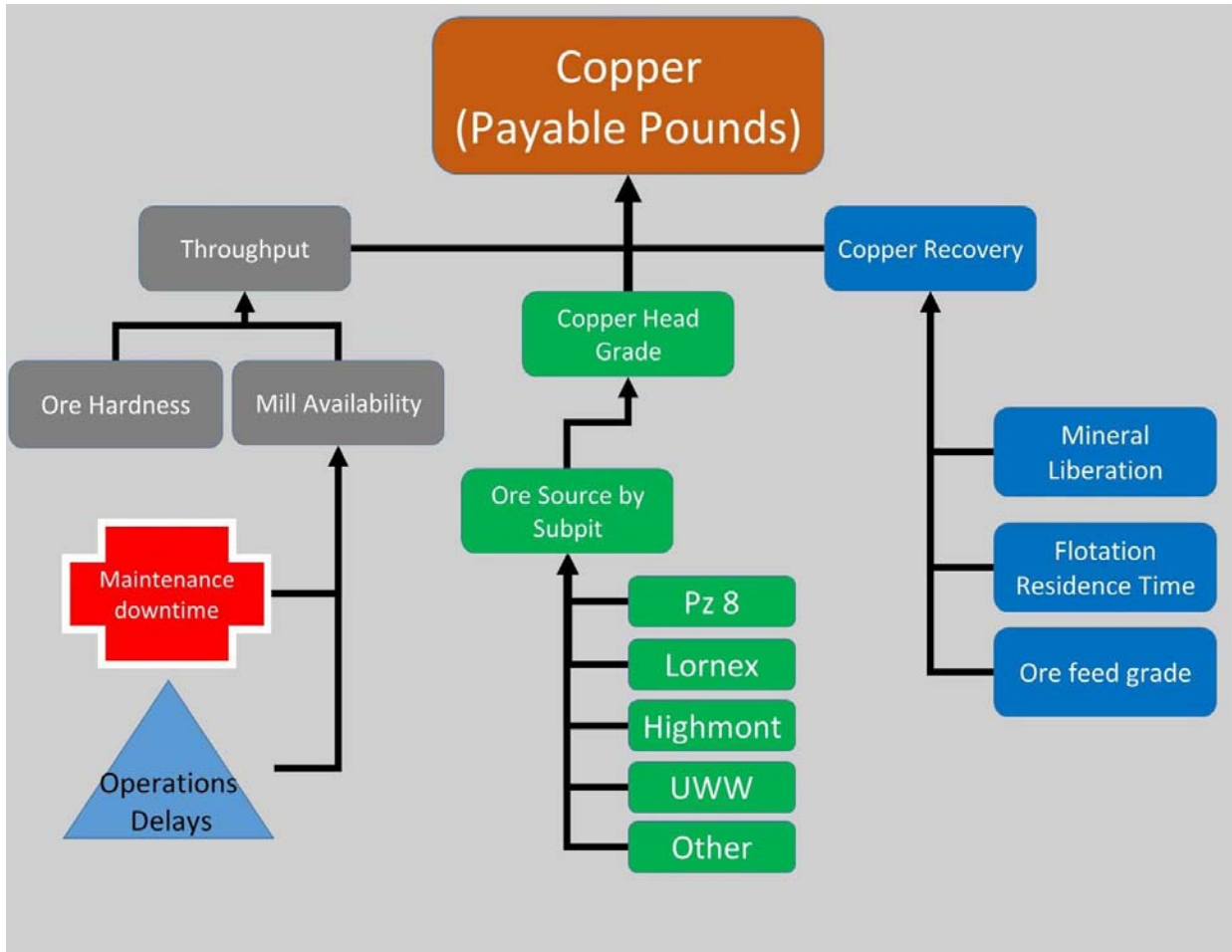
Figure 3 - High level Value Driver Tree for HVC copper production

Source: Adapted from HVC Value Driver Tree (2014)

Figure 3 describes the VDT breakdown for the primary product that HVC produces, copper concentrate. Shown here are the highest-level inputs to value for HVC, which are the focus of the continuous improvement practices. With reference to the site overview in Figure 1, the term throughput relates to the total number of tonnes that the whole system can process. Currently, the ore-processing bottleneck is at the grinding stage. For every percentage point of improvement at the bottleneck, there is a direct impact on HVC's total copper production. For example, one percent improvement in Mill availability will have a cascading percentage of improvement at the throughput level. Hence, HVC produces more payable pounds of copper per unit time. In practice, CI personnel populate the VDT data. A VDT with data provides a sense of

the impact each unit of improvement effort will deliver. This enables prioritization. Prioritization allows HVC to focus on the most valuable work first and generate more profits for Teck. We will reintroduce and expand on this in section 4.

The next section is an assessment of the viability of CI in a mineral extraction company. A comparison of the automotive manufacturing industry with the mining industry will follow. The two industries share many operational attributes.

1.3 Discussion of the Potential for a Manufacturing Management Approach to Mining

Toyota developed the CI culture to maximize its ability to deliver value to customers. Their market changes almost daily and has incredible complexity. Toyota uses effective management practices to mitigate the effects of this variability. The mix of complexity and volatility in the market is at the core of the need for CI. While the markets that resource-mining companies supply are not as volatile, there is certainly a strong case for the complexity of operations. For this reason, HVC adopted CI and made great efforts to promote an operational high standard.

Furthermore, many aspects of CI are fundamental to good business practice in general. The question then becomes, which of the Toyota CI principles should HVC foster more intensely? The two industries share many operational attributes. Therefore, application of similar management methods is possible. The polar diagram in Figure 4 illustrates the overlap between the two industries. The polar diagram shows eight operational attributes and plots the relative score on each axis for each industry. For example, the "Quality requirements" attribute is an important dimension of final product quality. Meaning, a high score indicates that the consumers in that industry demand high quality. HVC scores quite low compared with Toyota. This is

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because copper concentrate only needs to meet three or four quality criterion. However, Toyota vehicles must meet or exceed thousands of quality standards. Toyota developed principles to address these requirements of their business. By the same logic, HVC must develop a similar set of principles to match its operational requirements. Starting from Toyota as a benchmark, HVC can adopt all Toyota CI principles except those that exist to influence exclusively HVC's quality or diverse consumer base. Therefore, HVC should pursue CI practices that enable all principles that address the remaining attributes in Figure 4.
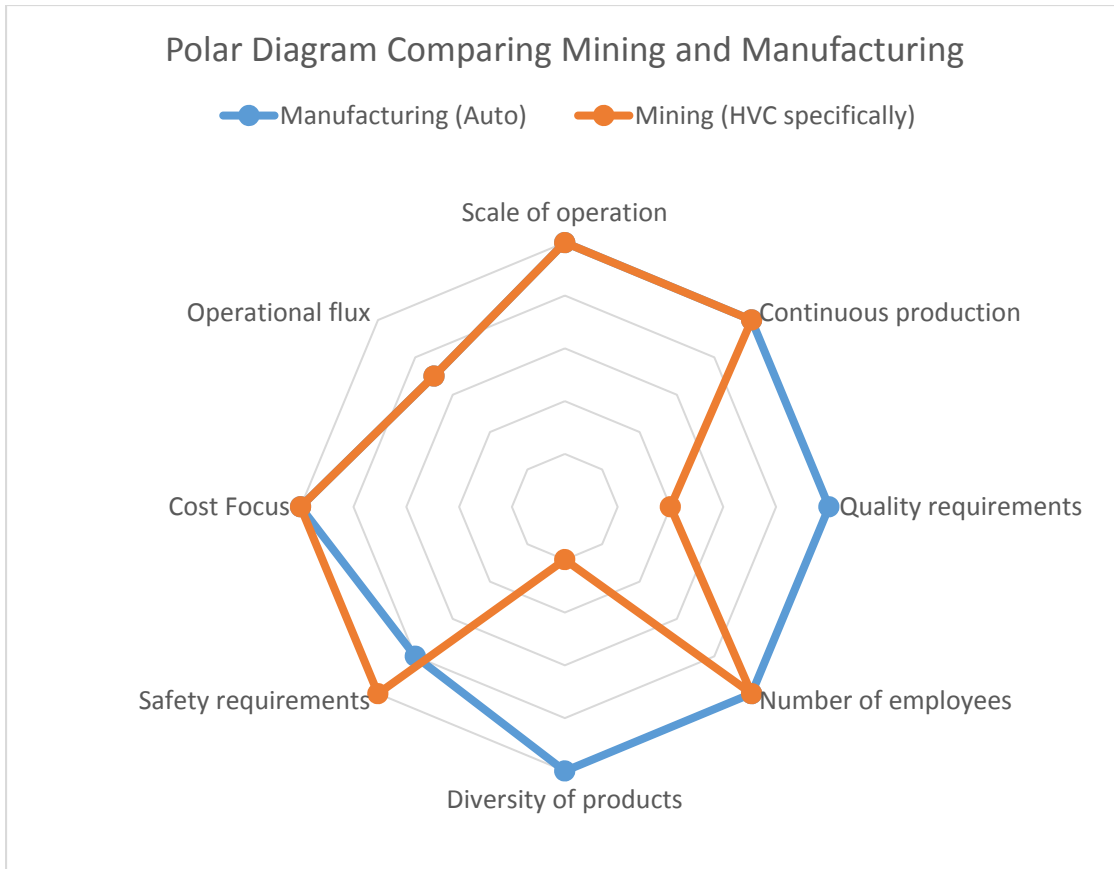
Figure 4 - Polar diagram comparing the auto manufacturing and mining industries, scale from 1 to 10

Source: Charted from comparitive analysis (2014)

1.4 Goals and Means of Analysis

The goal of this study is twofold: 1) to assess the status of CI implementation in HVC, and 2) to advise HVC management the next steps of implementing a desirable CI culture at HVC. The following sections present an overview of the approaches taken to accomplish the study. We will review the original CI principles from Toyota in context with their application in the mining industry. We will then benchmark the results of CI implementations in some other industries. Finally, we will consider HVC staff survey results as an assessment of CI implementation in HVC.

1.4.1   A Case Example of a Successful CI Implementation in the Mining Industry

The development of the proposed method of continuous improvement has its roots in Japan. We will discuss CI's roots at length in chapter 2. To gain a baseline understanding of what the impacts of CI efforts could look like at HVC, consider the following summary of a CI implementation at an iron ore mine in Australia (Liker, 2011):

Two CI business masters, Liker and Kostas, were hired to implement continuous improvement at a pilot mine site. The site hauls iron ore from open pits according to a strict schedule. Compliance with the schedule is important to maintain proper blend of iron ore grade. The mine ships the proper blend via rail car to port. The highlights from the implementation were as follows:

1. The CI consultants engaged in *Genchi Genbutsu*, which means, "go see for yourself". They observed the entire site. They value mapped the process.

2. Once they understood the state of the operation, a baseline was set. They compared all subsequent improvement efforts against that baseline.

3. Staff at the iron ore mine were resistant to new performance metrics brought by the consultants. The consultants noticed that tracking a slightly different metric to one of their previous metrics would change behaviour. They started tracking "*accessible* blasted ore", instead of just "blasted ore". Meaning management would pay more attention to the ramp and road crew. Identification of that slight difference was from a *Genchi Genbutsu* campaign.

4. The first daily meeting with new metrics took twice the scheduled time. The staff had to adjust to the new format and meaning of the new performance metrics. Additional discussion and troubleshooting was necessary to create an action plan.

5. Prior to the consultants' arrival, management told dispatchers and haulage truck operators to deliver the scheduled *amount* of tonnes no matter what. This forced them to make decisions that deviated from the *planned* tonnes. This is because the ore source flexibility was low.

Rather than spending the time on their shift to work on opening up access to new ore sources at a sacrifice to delivered tonnes, they would cut corners to make sure to deliver the ore on their shift. Their supervisors passively accepted this practice and so the behaviour continued. The new metric of "*accessible* ore tonnes" revealed the root cause and allowed them to address it directly.

6. The consultants made a CI abilities matrix for the senior management team. This was to ensure the sustainability of CI on site. The consultants then trained the management team through the matrix. They tracked how the managers progressed to the final skill of facilitating a communications session effectively. The skills associated with PDCA (Plan-Do-Check-Act) were of particular importance with this progression.

7. The site management team and consultants delivered similar wins for another 9 months. They used new metrics to bring a sense of urgency for change.

8. During the following two years of operation, the site enjoyed two record setting years for production. Beyond the subtle differences in the operation at the iron ore mine, the principles of CI remain valid in most of mining operations. The section below presents the principles of CI that Toyota adopted.

1.4.2   An Overview of Toyota's Principles of Continuous Improvement

The Toyota way is a philosophy and a set of guiding principles. Every employee at Toyota embodies these principles. At least that is Toyota's goal. Over a forty-year period, Toyota managers derived fourteen main CI principles to guide their automotive manufacturing operations. We classify the fourteen principles into four categories:

1. A long-term philosophy

2. The right process will produce the right results

3. Add value to your organization by developing your people.

4. Continuously solving root problems drives organizational learning.

Observations, reflection, and action by many people helped to shape these principles over time (Liker, 2004). Below are the management principles that guide Toyota forward on a daily basis. Each principle represents an extension of the four categories above. We will elaborate on each of these in chapter two.

The Toyota Way and their 14 management principles (Liker, 2004)

1. Base your management decisions on a long-term philosophy, even at the expense of short-term results.

   "Be the tortoise, not the hare."

2. Create continuous process flow to bring problems to the surface.

   "Have the courage to address your problems, not bury them."

3. Use pull system to avoid overproduction.

   "Downstream circuits are customers."

4. Level out the workload.

   "Minimize surging to optimize flow and quality."

5. Build a culture of stopping to fix problems, to get quality right the first time.

   "Take enough time the first time, or you'll have to take twice as much later to fix."

6. Standardized tasks are the foundation for continuous improvement and employee empowerment.

   "Only once you reach a relatively steady state can you expend effort to improve."

7. Use visual control so problems are not hidden.

   "Short interval controls help identify problems."

8. Use only reliable, thoroughly tested technology that serves your people AND your process.

9. Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others.

   "Zealotry, harnessed."

10. Develop exceptional people and teams who follow your company's philosophy.

    "Promoting culture is better than promoting theory."

11. Respect your extended network of partners and suppliers by challenging them and helping them to improve.

12. Go and see for yourself to thoroughly understand the situation.

13. Make decisions slowly by consensus, thoroughly considering all options; implementing decisions rapidly.

14. Become a learning organization through relentless reflection (*Hansei*), and continuous improvement (*Kaizen*).

Toyota uses the principles to great effectiveness. One such example of the effectiveness these principles have brought Toyota is their quality reputation. Toyota/Lexus produced fifteen of the thirty-eight vehicles on the 2003 consumer report study on the most reliable cars. No other manufacturer comes close. Furthermore, not a single Toyota model is on the "vehicles to avoid" list. (Liker, 2004). Financially speaking, these guiding principles have elevated Toyota's profitability. Toyota generated $8.13 billion in profit for the fiscal year 2003. Those profits were higher than the combined profits of Ford, GM and Chrysler. Toyota's return on assets is 8 times the industry average. Its net profit margin was 8.3 times the industry average. These statistics are outputs of a steady, unwavering input of CI effort.

1.4.3 Benchmarking to Other Industries

The manufacturing industry is the primary industry to apply CI. This is because CI began in manufacturing. Therefore, can easily envision application of the practices and principles of CI.

As CI gained popularity with western companies, they rebranded it "Lean". The Lean Enterprise Research Centre (LERC) is an enterprise within the Cardiff business school. They have done a great deal of consulting and research in the field of Lean and CI. LERC suggests that most production operations have the following breakdown of tasks with respect to value (Melton, 2005):

- 5% add value

- 35% are necessary supporting tasks but don't directly add value

- 60% add no value

Reducing the percentage of tasks that do not add value is an attractive endeavour. Effort spent adding no value to raw materials is waste and is an obvious focus for CI transformation. For purposes of comparison to another industry, many healthcare establishments have implemented Lean operations thinking and tools to great effect. One such case was that of the Flinders Medical Centre (Burgess, 2013). After two and a half years of CI implementation efforts the centre was processing 15-20% more work. They achieved these results with fewer safety incidents, on the same budget, and with the same people and technology. They also enjoyed approximately 90% reduction in turnaround time for pathology results. This result is an obvious example of worthwhile efforts toward elimination of waste.

Numerous manufacturing operations that have implemented CI baseline their improvement in the 10% increased productivity range. One manufacturer in particular has listed the improvement in its output at the 11.95% mark (Hemenand, 2012). Manufacturing firms increase their productivity by 10% through cycle time reduction. Others improve the bottom line by spending less on financing for work in progress and inventory. For example, one chemical engineering production facility remarked individual areas of improvement as follows (Melton, 2005):

- ~50% reduction in overall supply chain cycle time

- ~25% increase in customer order accuracy

- ~30% reduction in inventory

Depending on the operation, there are many ways to derive value from improvements. This exercise in identifying benchmarks in industries that have already implemented the CI management culture is not only to illustrate what potential exists. This is also to demonstrate planning as a central theme of CI. It is important to plan based on value, which aspects of the operation to improve first. This exercise of prioritization is fundamental to CI. The VDT makes this clear for HVC in Figure 3. The VDT prioritization exercise with the chemical company from above would reveal that customer order accuracy contributes significantly to profit.

1.4.4   Progress of Implementation of CI at HVC

The continuous improvement implementation began in Q4 of 2011 at HVC. Implementation required an internal team of eight professionals. HVC considered these professionals outstanding in their "line" (operational departments) functions. In addition to the internal staff, HVC hired a team of consultants for a 9-month implementation contract. The consultants specialized in continuous improvement implementation. The consultants set out to teach the internal professionals through theoretical training and application of the practices. The consultants departed after 11 months, once the internal professionals and consultants were satisfied that HVC would sustain CI implementation progress.

I conducted a survey of the staff at in June 2014. The results serve as a proxy indication of the CI implementation status at HVC (for the survey and responses see Appendices A and B respectively). Respondents submitted polarizing responses in some cases. One positive observation is that the respondents mostly indicated understanding of the practices that foster the

CI principles. Specifically, they understand the implementation of a departmental alignment tool known as the results-action-review (RAR). RAR meetings emphasize that members of a management team align their goals and activities. Figure 5 shows the survey results are positive with respect to the adoption of the practice.
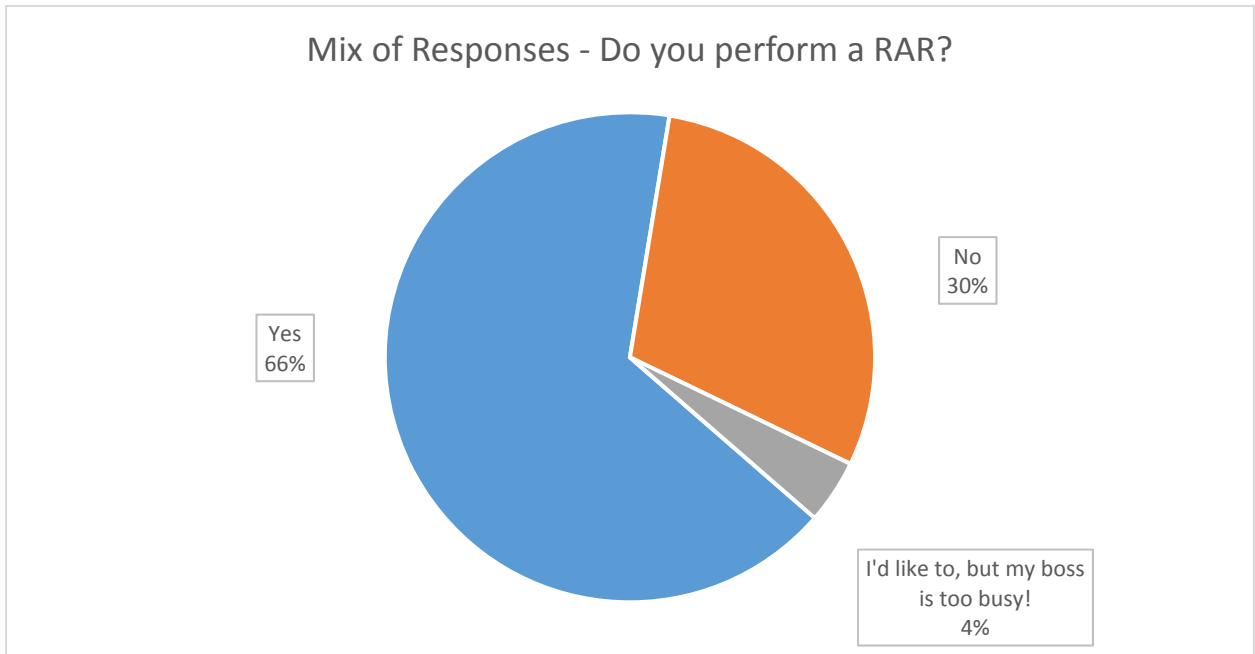
Figure 5 - The percentage of respondents that currently complete a RAR

Source: Charted from survey resutls (2014)

HVC's goal for RAR adoption is to have sufficient people engaged in the RAR process on a weekly basis to ensure alignment. To achieve this everyone down to the senior foreman level had to completing a RAR. Referring to Figure 2, all managers, superintendents, general foremen and senior foremen must participate in a RAR with their superiors. Meaning the goal is achieved if fifty-one percent of respondents indicating they participate in the RAR process. The survey results indicate a 66% adoption rate.

The last question in the survey asked respondents to indicate how long before their department would not have any trace of CI practices. The average result is subjective, but is a result that clearly indicates further CI implementation efforts are required. Seventy-five percent

of respondents indicated that CI practices would disappear in less than 6 months. Further explanation of the survey results, and the CI practices and principles will follow in chapter 3. Chapter 4 covers the specific recommendations for these efforts and suggest ways to ratify them.

1.4.4.1   How Well has the Continuous Improvement Culture been Adopted?

The next steps of CI implementation require establishment of HVC's current position. Generally, the survey response rate of the staff at HVC was better than anticipated. With recognition of the implications of collecting the data the survey was probing for, the superintendent of CI made the initial request to the staff. The CI superintendent made it clear that responses were supporting the researcher in pursuit of information. The survey only required seven to ten minutes to complete. The survey was mostly multiple choice questions or ratings from one to ten. In total, seventy-three (21%) HVC staff responded. Appendix A and B show the survey and the results.

In addition, two interesting categories of responses came in person. One potential respondent asked directly if the survey was indeed for research purposes. This particular respondent went on to describe how he would not spend the time to fill out the survey had it been for HVC use only. This was an interesting response as it shows his view of CI. Speculation can be inaccurate, but it was clear from conversation that this individual did not see any value in the CI culture in his area. The second response category was from a larger proportion of people who did not believe they were meaningfully involved in CI and therefore should not fill out the survey. This idea is philosophically against the CI culture model. Meaning, CI should be a philosophy exercised in the actions and behaviours of the majority of the company, not just a chosen few. I asked those respondents to continue with the survey despite their bias and to answer as best as they could. The observation that many potential respondents felt they would not provide a meaningful submission, likely indicates that the majority of the remaining seventy-nine percent of

potential respondents feel the same. Overall, the response is mixed. Chapter 3 discusses the results of the survey further. Finally, chapter 4 uses the observations derived from the survey results for recommendations.

1.4.4.2   Financial Results of CI at HVC to Date

The hard financial metrics of CI implementation performance fall into two categories: cost and revenue. Managers set the expectation with superintendents to direct their workforce toward reducing the unit cost of production. The implemented 2013 ideas that came from that imperative have resulted in an annual savings of over 5%. On the other hand, there have been numerous behaviour related ideas that have allowed HVC to bring copper forward in the life of mine plan for increased revenue this year. The proxy valuation based on the time value of money for these ideas is over 1.4%.

Furthermore, HVC in 2012 was on track to underachieve to budget production by 10%. The implementation of the targeting and variance practices throughout 2012 by the CI group significantly influenced the production departments. HVC overcame the production deficit in the last six months of 2012 through application of application of improvement methodology and accountability. HVC also achieved an additional 12.5% production against budget.

2: Continuous Improvement Works: The Evidence

The history of the management practice of continuous improvement has its beginnings with the Japanese automaker, Toyota (Liker, 2004). Toyota developed the practices associated with continuous improvement over a long time. Rather than focusing on practices alone, continuous improvement endeavours to provide guiding principles to allow individuals to make sound decisions. Briefly, one such example of improved decisions and overall turnaround is with CI implementation at Nissan. Nissan experienced a decrease in design turnaround time from 20 months to 10.5 months (Continuous Improvement, 2013).

It is important to note that just like the process of implementing continuous improvement; the development of the management culture of continuous improvement is a process. Throughout the process of honing the practices that capture value for business, one aspect remains. That aspect is that it is critical to allow time to reflect and learn from actions taken and mistakes made to improve future iterations. There were many contributors to the current CI literature. Two of those contributors are Fredrick Taylor with his emphasis on the scientific method of management (Taylor, 1967) and Henry Ford with his use of mass production and low customer choice to drive up production (Dassbach, 1991). Additionally, W. Edwards Demings influenced CI management culture. His contributions came after the Second World War. The Japanese were in dire need of assistance to get their economy back on its feet after the destruction of vast amounts of infrastructure during WWII. The Toyota production system (TPS) was the next step in the evolution documented by an industrial engineer named Shigeo Shingo (Liker, 2004). He produced a handbook of the principles and practices of TPS for use by anyone at Toyota from the design engineer to the mechanic on the shop floor. A flurry of iterations to TPS followed. The

two most well known of those iterations are Lean and Six Sigma (Continuous Improvement Through Six Sigma, 2014). They are primarily concerned with reduction of waste and providing premier quality respectively.

2.1   Historical Contributors to Present Day CI

2.1.1   Scientific Management and Taylor

The first embodiment of a formal focus on internal improvement was with Frederick Taylor and Scientific Management (also known as Taylorism). Taylor decided that a closer look at efficiency and incentive could unlock the potential of average workers. He achieved impressive productivity improvements through observation, planning, analysis of best practices and enforcement of workflows.

Taylor developed Scientific Management (SM) in the late nineteenth and early twentieth centuries. SM had hit full stride by 1910. Manufacturing and simple labour firms adopted it readily. SM's methods involved disproportionately low compensation for the increase in productivity. This made the incentives difficult to justify. One instance where compensation and productivity were not aligned occurred at the Watertown Arsenal. The application of SM at Watertown Arsenal led to an investigation by the U.S. House of Representatives Committee (Bluedorn, 1986). The committee concluded that SM had placed too much power in management's hands. The committee banned the use of SM at Watertown Arsenal. The obvious need oversight of SM methodologies was clear. SM provoked the ire of employees. Employees were united which transferred political strength to labour unions.

Many aspects of SM remain useful. However, many practices are not sustainable. Fair and equitable work for unskilled labour turned out to be much more important than Taylor had imagined. As a result, Taylorism in its pure form from the early 1900's does not exist in the

modern world. However, elements of Scientific Management remain, and have helped guide the development of CI over the years. Specifically, Taylor initiated a number of management ideas. One idea that remains loosely in CI is analysis and implementation of process improvement suggestions from the front line worker. Time studies are another idea. Companies only apply time studies for CI under specific circumstances. Taylor would reduce a task to thoughtless repetitive motions. A supervisor would follow a worker around throughout the shift with a clipboard and stopwatch. The supervisor would order every action, including rest. It is important to standardize work tasks to provide a baseline for improvement. However, present day CI does not employ these practices to this extent.

2.1.2 Fordism and the Moving Assembly Line

Another great management thinker of Taylor's time was Henry Ford. While there are many similarities between the two systems, Ford maintained that he developed his production systems independently of Taylorism. Ford reduced almost every task within the manufacturing cycle to a very small number of movements requiring little thought. The idea was to employ many people to perform extremely short interval repeated tasks. The result being a process as close to continuous flow as possible. The moving assembly line was another innovation of Fordism. Side assembly groups facilitated the moving assembly line (Dassbach, 1991).

In addition to mind numbing repetition in the workflows of Fordist manufacturing, the products also lacked variety (A Brief History, 2014). For example, consumers wanted choice of colour for their model T automobile. However, black was the only colour that Ford produced. Standardization and throughput came at the expense of creativity for workers. Many consumers who could afford a vehicle also desired stylistic refinement. Fordism alone could not provide both style and low cost. Taylorism and Fordism where management philosophies that enabled change in the workplace and the greater economic landscape. Neither Fordism nor Taylorism was

independently sustainable. There was not an adequate assessment of the boundaries of any firm's most fundamental resource, that is, people.

2.1.3   W. Edwards Deming's Contributions to CI Culture

W. Edwards Deming was first involved in the 1951 census for post WWII Japan (Saunders, 1994). As is described in the change management theories of Kotter, Japan had the perfect conditions for rapid change. They had a real sense of urgency to rebuild, which is step 1 in Kotter's change model (Kotter, 2009). The Japanese were so impressed with Deming's ideas concerning quality that the Japanese Union of Scientists and Engineers (JUSE) invited him to teach. He taught several hundred engineers, managers and scientists about the virtues of quality to overcome common business problems such as market share, operating expenses, and productivity. Specifically, he believed there are 14 management principles to that all work together to provide continuous improvement (Saunders, 1994):

1. Create a constancy of purpose toward improvement of products and service, with the aim to become competitive and to stay in business, and to provide jobs.

2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.

3. Cease dependence on inspection to achieve quality. Eliminate the need for massive inspection by building quality into the product in the first place.

4. End the practice of awarding business on the basis of a price tag. Instead, minimize total cost. Move towards a single supplier for any one item, on a long-term relationship of loyalty and trust.

5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.

6. Institute training on the job.

7. Institute leadership (see Point 12). The aim of supervision should be to help people and machines and gadgets do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.

8. Drive out fear, so that everyone may work effectively for the company.

9. Break down barriers between departments. People in research, design, sales, and production must work as a team, in order to foresee problems of production and usage that may be encountered with the product or service.

10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.

11.
   a. Eliminate work standards (quotas) on the factory floor. Substitute with leadership.
   b. Eliminate management by objective. Eliminate management by numbers and numerical goals. Instead substitute with leadership.

12.
   a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.
   b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, *inter alia*, abolishment of the annual or merit rating and of management by objectives.

13. Institute a vigorous program of education and encourage self-improvement.

14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.

Over the years, many people have praised Deming's work in the engineering of management. In contrast with the fourteen Toyota Production System principles of management, only nine of Deming's principles have direct overlap. The only major discrepancy between the two philosophies is the idea of targets and objectives. The business community at large contests the idea that neither management nor workers should be working toward production goals. As for the application of CI at HVC, targets for management metrics is a core principle that inspires a great deal of intrinsic motivation.

2.2   The Toyota Way and TPS

Many others came after Taylor and Ford attempting to perfect business management methods to gain maximum value from a process. Most notably was Toyota with their continuous improvement approach, also known as *Kaizen* (Liker, 2004). For clarity, CI and the term 'Lean' are interchangeable. This paper will use the term CI. The culture that Toyota developed and fostered was deliberate and took many years. The business world did not take notice until the 1980's when Toyota excelled at producing cars that effectively competed with General Motors and Ford. As mentioned previously, their automobile reliability record was world class. Fifteen of thirty-eight Toyota's automobile models were on the consumer reports most reliable vehicles. Not one of Toyota's models were on the 'avoid' list. These results captured the attention of the business world. A few key areas where Toyota stood out are the following:

1. Long-term philosophy.

2. Understanding that the correct process will produce the correct results.

3. Adding value to the organization by developing your people and partners.

4. Continuously solving root problems drives organizational learning.

Successful application of practices that propagate these aspects is pivotal. Toyota has done so. This section discusses the practices Toyota implemented. The descriptions are to illustrate how CI practices align with CI principles and the nature of the business. These links will provide a basis for the same comparison with HVC and its CI practices and principles.

There is a strong correlation between a company's ability to learn and their preparedness for a rapidly changing competitive environment. Too often in western culture, there is a tendency to assign blame when issues arise or when people make poor decisions. This leads to behaviours that stunt learning and promote hiding issues. Learning organizations meet challenges and overcome them. They do this by accepting inevitable mistakes and focusing on learning from them. The learning makes those mistakes evitable. Learning organizations realize the futility of the blame game. The equivalent practice for Toyota is *Hansei*: the practice of reflection. The Japanese culture celebrates the habit of reflection and by extension, the learning organization.

There are many theories of how Western culture came to align with a blame culture. Stephen Covey submits that at the root of this culture is a maturity spectrum (Covey, 1997). Dependence is the culture of 'you'. Meaning people easily absolve themselves of responsibility by assigning blame to 'you' (someone other than themselves). This is an easy conclusion for when problems arise. Further along the spectrum is the culture of independence or the culture of 'I'. While independence accepts responsibility, it still lacks the ability to synergize or cooperate with others to produce higher results than can be sustained alone. The highest level of maturity on the spectrum is the culture of interdependence, or the culture of 'we'. People in a culture of interdependence accept responsibility and accept that alone they do not always possess the abilities to perform optimally. This level of maturity takes discipline. Observations of blame in Western culture indicates a lack of maturity in this model. Hence, implementation of CI and a

interdependence level of maturity for accountability and improvement progress will take time and diligence.

The Japanese teach reflection at a very young age. When a child has done something wrong, the parents will simply ask the child to "Do the *Hansei*". Once the child understands the meaning of the word, he knows exactly what is needed. A deep sadness for the error or mistake, and a powerful urgency to work toward a future where that mistake will not occur. The *Hansei* cycle is not complete until the child has communicated a plan to avoid the problem in the future. Hence, the cycle of future challenges and future reflections brings about the habit of *Kaizen*. *Hansei* and *Kaizen* go hand in hand.

CI aligns well culturally with the Japanese (Liker, 2004). CI comes naturally to Toyota employees because the Japanese focus on guiding principles such as reflection, which promotes learning. Specifically, however, it is important to have the workforce work to the same guiding principles in a consistent way. Therefore, careful design of management tools and processes that promote alignment with the guiding principles is necessary. A brief overview of those processes and tools for comparison with those used at HVC is as follows: (Lean Systems Program, 2014)

1. *Andon*

   A visual control that illustrates, on a very short time horizon, the state of the work being performed in that area. *Andon* works to progress *Jidoka* (just in time or one piece flow) by identifying challenges in production so that they can be addressed. They help to bring awareness to overproduction, underproduction and generally where the process needs attention in a simple Red (needs immediate attention), Yellow (problems surfacing), and Green (good range) indicator. The tendency is to start with a simple flag to prove the concept in an area. Permanent

light fixtures that alert workers to a potential issue are adopted later in the

development of a 'pull' system of production.

2. The five "Whys"

The practice of attempting to address the root cause of an issue by asking the

question "Why?" five times. This practice is part of the problem solving process

that is ingrained in the Toyota culture as follows:
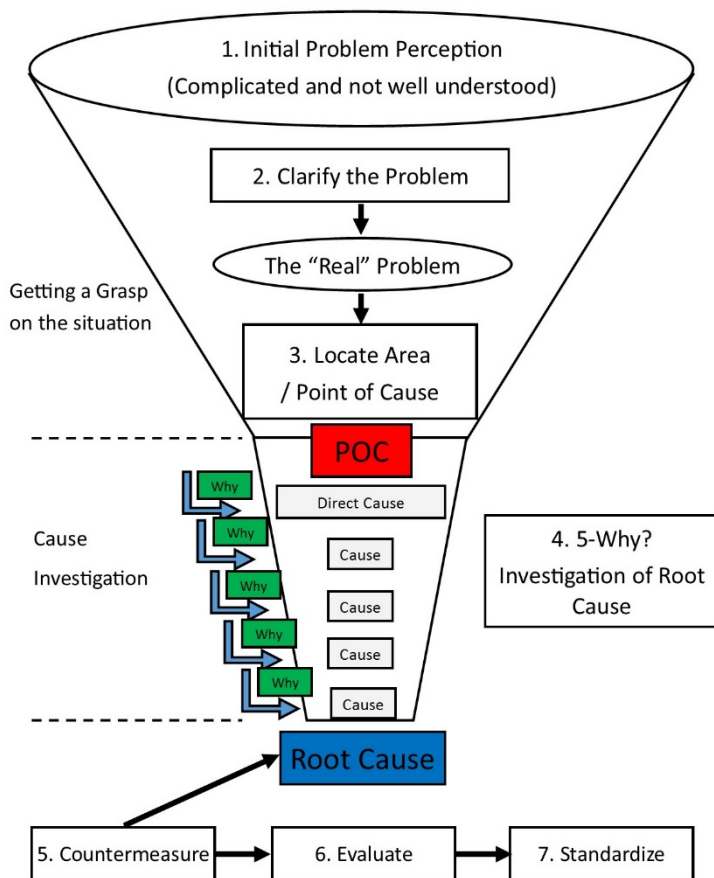
Figure 6 - The Toyota problem solving process

Source: Adapted from The Toyota Way (Liker, 2004)

3. The Five "S" System

The five "S" idea describes a practice of maintaining one's work area. The

guiding principle behind this practice is one of a belief that a high degree of

discipline and standardization is the basis for improvement. Until there is a solid

foundation from which to work, there is no possibility of improvement or

measurement of improvement. Each worker at Toyota is in alignment with the

practice of 5 "S" according the following diagram:
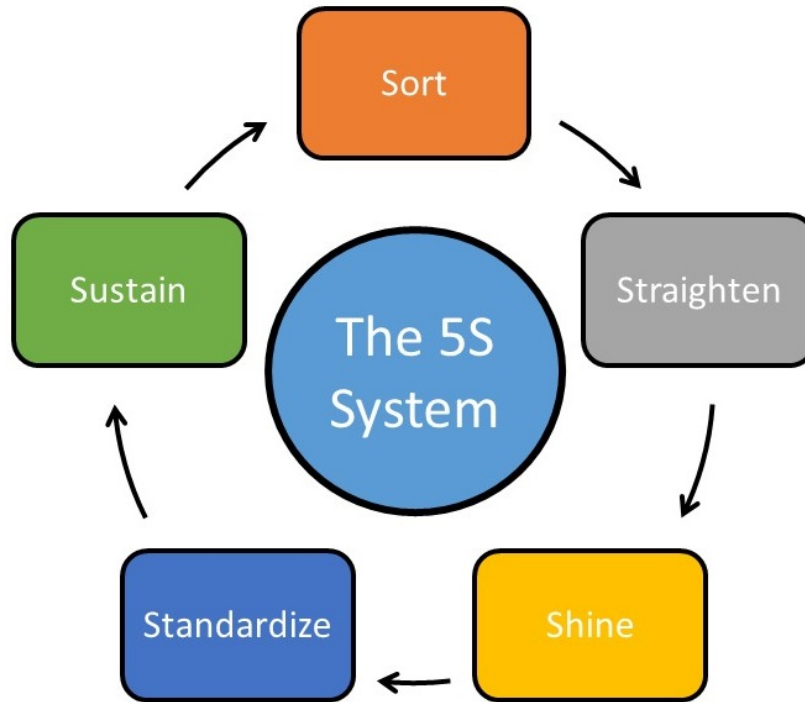
Figure 7 - The process of five "S" for maintenance of a tidy work area
Source: Adapted from The Toyota Way (Liker, 2004)

4. *Genchi Genbutsu*

    This is a practice of going to see for yourself. It is in alignment with the notion

    that facing challenges and gaining practical knowledge is more valuable than

    theoretical knowledge. *Genchi Genbutsu* puts the worker face to face with the

    problem.

5. *Heijunka*

This is the practice of levelling out the workflow. In order to apply a "pull" system (much like a grocery store only restocks shelves to match the customer demand) to your production line, there cannot be wild swings in customer demand from day to day. Much like the five "S" practice, promotion of standardized work is essential for continuous improvement to begin. Another key aspect of *Heijunka* is it enables another guiding principle embodied in the "just-in-time" pillar, which is elimination of waste. A level workflow can predictably produce parts to support production without overproduction or wait time for parts because of underproduction. Narrowing the gap between actual customer demand and actual production is at the core of *Heijunka*.

Elimination of the three M's is the means to achieve *Heijunka*:

     i.   *Muda* is non value-added activities or inventory. Anything wasteful that causes lengthened lead-time for parts, or extra movement to produce parts.

    ii.   *Muri* is overburdening of people or machines. *Muri* describes the need to avoid pushing any machine or person beyond their natural limits. Doing so increases the likelihood of safety and quality problems, which must be avoided in alignment with Kaizen and improvement goals.

    iii.   *Mura* is the overarching resolution of *Muda* and *Muri*. Directly translates to unevenness.

6. *Hoshi Kanri*

This is the practice of setting objectives. In alignment with the notion that the first step toward any change effort is a sense of urgency (Kotter, 2009), setting targets and having healthy discussion with a supervisor about those targets is a great way to promote progress toward achieving them.

7. *Jidoka*

This is a process where the goal is zero defects. It does not exist as a tool however, but as a principle. *Jidoka* is a pillar of the whole system. *Andon* brings issues to the surface and corrects them before they are irreversible. The most important aspect of this principle must be the empowerment of the people through a pride in the overall product quality. Production line stoppages can easily result in reprimand in some firms. Where *Jidoka* is being adopted, line stoppages for quality improvement intervention are met with praise.

8. Just-In-Time

Besides *Jidoka*, this is another pillar, which stands for a manufacturing process that is supplied exactly what is needed, when it is needed and in exactly the right amount. This practice is a theoretical goal to drive action to minimize waste in the manufacturing process. Contained within the just-in-time idea is the operating principles of a pull system, continuous flow processing, and management of *Takt Time*.

9. *Kaizen*

Kaizen presupposes the grasp of almost all other principles listed here. It is a cultural realization of the processes of reflection, built in quality, going to see for yourself, targeting and variance action, eliminating waste from the production line through collaborative efforts, and all the other principles that encompass the CI philosophy.

10. *Kanban*

Kanban is a scheduling system for parts and inventory in the manufacturing operation. *Kanban* cards exist to signal the need for more parts at a specific workstation. The premise behind the *Kanban* system is in alignment with a Just-In-Time production system where parts are 'pulled' by downstream processes. It

provides the opportunity for managers to understand where process issues reside. Reducing the amount of inventory across all production areas will highlight problem areas for improvement.

11. *Nemawashi*

    This is the practice of bringing many insights together into a proposed change. Recognizing the probability that changes in one area can have consequences up and down stream, *Nemawashi* reminds the operators to involve many disciplines in the decision making process. Seeking input from many will reduce the fallout of making changes and disrupting the entire production line.

12. Pull System

    A pull system, in theory, means that the consumer dictates the flow of the production line. While this can be difficult to attain, the notion can be expanded to sub-categories of the production line to consider. For example, the grinding mills at HVC are the consumer of the stockpiles. They "pull" ore, which is work in process or inventory, from the stockpiles and add value to it by liberating the copper within the host rock. As the upstream processes align with the grinding mills, the mine operations department replaces immediately each tonne processed by the grinding mills. This is a fundamental aspect of the Just-In-Time principle.

13. Standardized Work (Tasks)

    The recognition that efforts to improve any process must start with a standardization of the work tasks within. Standardized Work comprises codified *Takt Time*, working sequence, and stock (materials used). Once standardized work is established, management can attempt process improvements and track the change predictably.

14. *Takt Time*

The amount of time it should take to produce one unit from a process under normal circumstances. We define *Takt Time* with the understanding that the machines and people in the process are working with 100% efficiency (Not 110%, and not 90% - i.e. not being overworked or underworked).

A key distinguishing aspect of the Toyota way is its respect for people (Lean Blog, 2014). The Toyota Way is an implicit principle guiding every decision. It is a personal commitment to principled presentation in each moment. It is an insatiable urge to learn, and use knowledge. It suggests teaching and helping people to learn. It proposes a continued development of continuous improvement culture, while holding people constructively accountable to results and improvement upon the status quo. It is the security that the belief in the system, and active participation in the principles, will hold one above any negative peer judgements. The results that flow from respect are self-evident and this virtuous cycle can continue to manifest in people's ability to think and act. Respect for people is core to a CI culture. Without a healthy relationship with others in the effort to improve, failure in a changing business landscape seems probable.

2.3   Application of CI in Mining

With reference to the practices employed at Toyota to promote the guiding principles of CI and the application of CI with the Iron Ore case study, the following section will outline the practices that employed at HVC. As a point of comparison, the following table shows the fourteen guiding principles as described by Toyota, and the practices that satisfy the principle for Toyota and HVC.

Table 1 - Comparison of the practices employed at Toyota and HVC to satisfy CI guiding principles

	Principle	Toyota	HVC
1	Long term philosophy	*Hoshi Kanri* - setting objectives	5 Year planning exercise
2	Aim for one piece flow to surface problems	Just in Time, *Kanban*	Daily, weekly, and monthly variance and targeting
3	Pull system to avoid overproduction	Just in Time	Daily, weekly, and monthly variance and targeting
4	Low variability in workload	*Heijunka* - level workload (eliminating waste: *Muda*, *Muri*, *Mura*)	Daily blending discussion at Integrated Targeting meeting
5	Build in Quality	*Jidoka* = zero defects	No CI practice
6	Standardize tasks	The five "s" system, 5 whys,	Standard operating procedures
7	Visual Controls so problems aren't hidden	*Andon* (Green, Yellow, Red flags)	Human machine interface alarms, KPI Charts
8	Technology that serves process and people	As principle states	Idea pipeline process, Idea generating sessions
9	Promote leaders who live philosophy	As principle states	CI team as a learning tool and promotion prerequisite
10	Develop teams who live philosophy	As principle states	RAR accountability and development. Targeting Variance.
11	Challenge partners to improve and support them	As principle states, using all principles to support (teach them *Kaizen*)	No CI practice
12	Go see for yourself to understand	*Genchi Genbutsu*	Visible Felt Leadership
13	Make decisions slowly, implement rapidly.	*Nemawashi* - insights on changes or designs from all over the company	Idea pipeline process, Idea generating sessions, value driver tree exercise
14	Employ reflection to become a learning organization.	*Hansei* - reflection.	Post shutdown meetings, variance and targeting sessions

3: Implementation of CI at HVC

Continuous improvement implementation began at HVC concurrently with all other Teck operations. The goal of this exercise was in alignment with a recognition that CI principles have brought tremendous value to other similar organizations. The mission statement at the beginning of the implementation was simply to incorporate continuous improvement under the guidance of a consultant, tracking the benefits and implementation along the way.

3.1   Administrative Aspects of the Implementation to Date

Continuous improvement at HVC started in 2011 with the appointment of a manager on site as the leader. From that point, a consulting firm to assist in the training and initial implementation of the practices of CI was selected. Concurrently, six individuals from other departments within HVC and one previously continuous improvement worker from another site were brought together to form the initial CI team. Altogether, between the consultants and HVC staff, there were 16 people working full time on the initial rollout of CI at HVC. The consultants were hired for a 9 month implementation period, which meant that time was scarce. They organized themselves for maximum effectiveness according to the following matrix:
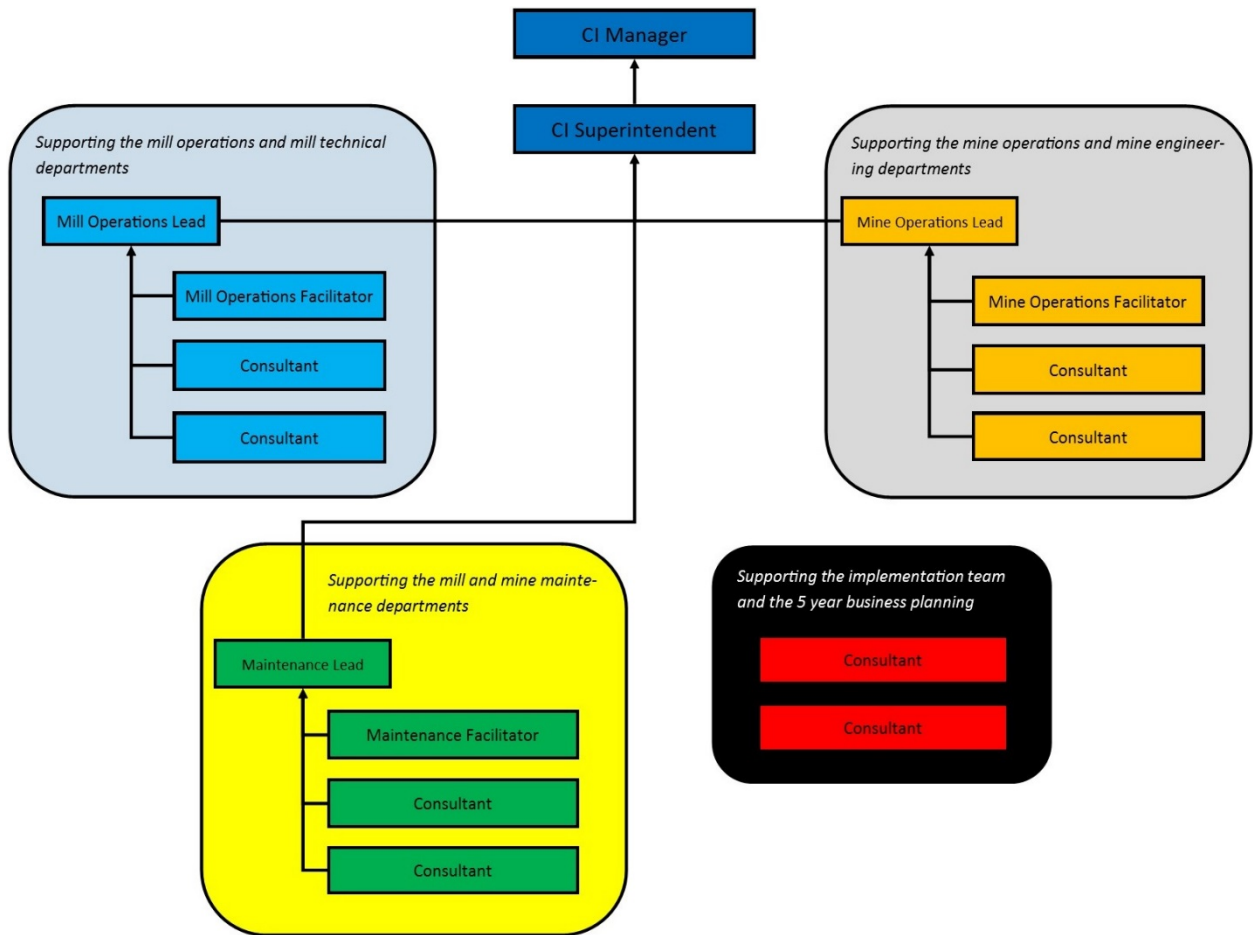
Figure 8 - Initial organization of the CI department

Source: Illustration from CI Org chart (2014)

The six departments listed above in Figure 8 were the initial focus. They have the most influence over copper production. The bulk of the activities that began implementation started near the end of 2011. The official implementation started in January 2012.

3.2 Initial Activities of the CI Team

HVC assembled the team and the initial work began:

- Value driver tree mapping

- Coaching of "line" managers on principles of continuous improvement

- Adoption of a Targeting and Variance culture (monthly, weekly, then much later daily)

- Adoption of an ideas pipeline in each department

- Implementation of Results-Action-Review (RAR) meetings (weekly between managers and their subordinates)

- Management of improvement activities with strict focus on value and prioritization

- 5-year planning exercise

Internal training within the CI group supported the adoption of the above tools, exercises and habits. There were not any guiding principles brought by the consultants for the initial implementation, but rather five elements of an atmosphere that can engage in CI. This is an important point when attempting to consider what the next steps for CI at HVC should be. The CI department took action throughout the first two years of implementation at HVC in order to establish the five elements:

1. Departmental alignment (wiring)

2. Support for staff (coaching)

3. Value driven efforts (ideas)

4. Targeting and variance processes to drive accountability

5. Change management theory to guide successful and sustainable results

Table 1 illustrates the prescribed activities to fulfil the development of the five elements at HVC.

Table 2 - Initial CI and business elements with specific practices

Element	Practice or promoter
Wiring	Tracking Input and Output KPIs
	Action Plans
	Checklists
	Operator guides
	Role Clarity guides
	Scorecards
	Variance reporting
	Results - Action - Review meetings
	Monthly stretch targeting
	Ideas pipeline reviews
	Prioritisation
Coaching	Accountability
	Results - Action - Review meetings
	Good meeting management
	Showing staff what good looks like
	Effective use of verbs for accountability
	Fact based discussions
	Ensuring enough analysis to make a decision
	Recognition when accountable staff complete what they said they would
	Removing barriers to achieving targets
	Empowerment - guidance not micromanagement
Ideas	Prioritisation
	Value Driver trees
	Results - Action - Review meetings
	Value : Ease matrix
	Idea Generating Session
	Idea Owner Review meetings
	Implementation idea pipeline
	Continuous process, not one off projects
	Specificity - Value, Risks, Resources, Analysis, Action Plan, Ownership
Change Management	Multi-disciplinary steering committees
	Idea forms
	Project tracking
	Slow consultation through stakeholder involvement
	Support for improvement idea owners
	Data validation and valuation through Finance for credibility

	Senior Management sponsorship
	Results - Action - Review meetings
	Idea Owner Review meetings
	"SPIN" cycles
Targeting and Variance	Stretch targeting
	The 4 questions toward value: What? Why? What learned? Prevention Plan?
	Results - Action - Review meetings
	Accountability is taken, not assigned
	Value Driver trees
	Interlocked targets so efforts aren't wasted
	KPIs, charts, data, fact based discussions
	Monthly, weekly, and daily stretch targeting and variance meetings

The consultants presented the above elements and supporting practices. The CI team and consultants agreed to implement the practices. Consequently, the elements would then be present at HVC. These elements enable each other and none stands alone.

Good wiring that promotes business improvement requires alignment of priorities at all levels of the hierarchy. Wiring is the systems, processes, habits, norms, skills and personalities that exist within a business. These attributes are indicators of the future of the business. The wiring of a department predicts the results the department achieves. Meaning, if everyone understands departmental priorities, people can accomplish tasks effectively. If priorities are not well understood, disparate activities and duplication is the result.

Coaching is any opportunity to aid managers or staff improve their business for themselves. Coaching is not enabling behaviour or avoiding holding people to their responsibilities. Coaching involves pushing staff to set targets for themselves. Then supporting them to achieve those targets. Also helping staff to reject the status quo. CI personnel help address challenges by facilitating potentially uncomfortable meetings. These types of meetings are only productive when people foster a culture of learning and growth.

The ideas element is a benefactor of the previous two elements. It also provides meaning to coaching and wiring. In other words, ideas are the subject matter that coaching and wiring act upon. Ideas, as an element, utilizes project management and change management theory to provide guidance for the improvement implementation process. CI team members coach staff the skills required to implement ideas. Those ideas become a reality through defined practices such as idea owner reviews. The ideas element emphasizes ownership within the department where improvements are applied. Idea implementation is most probable when staff from the line take ownership of the process. Furthermore, prioritization through a proxy valuation of the potential ideas is a pillar of the ideas element.

The targeting and variance element provides direction toward a future state. Targets are set toward improving performance in the most valuable areas of the operation. A discussion of the variance to target promotes learning and performance correction. Ideas serve to help the operation close the gap between baseline performance and a target. Achievement of a target triggers re-establishing the base line and setting a new target. The staff must then adopt and implement more improvement ideas to achieve the new target. The final element, change management, drives the cycle.

The change management element promotes all other elements. Change management is the theory behind formal communications, engagement of stakeholders, and other aspects of the CI process. Change management explains the importance of idea ownership within the line. Meaning, change management acknowledges stakeholder buy-in. Idea implementation is a change and ownership is buy-in. CI considers change management theory because CI requires sustainable change to capture value.

As mentioned previously, a survey inquired about the main CI practices. It received seventy-three responses. Appendix A shows the survey questions. Appendix B shows the results

of the survey. Section 3.3 discusses the results of the survey with intent to bring clarity to the recommendations in the final section of the paper.

3.3   The CI Practices at HVC

Table 2 outlines the CI practices employed at HVC. The following section will examine all the CI practices under each element header. We will consider each element's practices in four ways:

1. A detailed description of the practice in its ideal state

2. The ways the practices incorporate guiding principles of CI

3. An analysis of the survey results

4. A brief narrative of what potential for improvement exists for each element.

The survey results represent the status of implementation of CI at HVC. The description is to provide meaning to the conclusions drawn. Finally, the discussion of the extent to which the practices foster CI principles is to provide insight toward a successful implementation such as the culture at Toyota.

3.3.1   The Results-Action-Review (RAR) process

3.3.1.1   RAR description

The RAR process puts a supervisor and their direct reports in alignment each week. Alignment provides meaningful direction and clear expectations of performance. The process starts with a staff member booking a meeting time each week with her supervisor. For consistency, this meeting time is preferably the same time slot each week. The staff member then updates her RAR package for the current week. Twenty-four hours before the RAR meeting, the

staff member must send the RAR package to her supervisor. The supervisor then reviews the document. The supervisor makes notations throughout the RAR package wherever alignment is not present. Then the supervisor and employee discuss variances to previously established goals, actions and targets in the RAR. The supervisor considers items in the RAR package by exception. This means that the supervisor and employee should only discuss items where they are not in alignment. Consideration by exception promotes meeting effectiveness. As long as the supervisor reviews the package ahead of time, the meeting itself takes as little as 10 minutes. Finally, the meeting should start and end on time to promote effective communication.

The RAR document itself has several important elements:

1. Results
   a. Did we get the results we thought we would? (KPIs)
   b. What targets should we attempt next week?
2. Actions
   a. Did we do what we said we would? (Action log has Done / Not Done status updates).
   b. Create a plan for the actions we want to complete next week. (Keeping "not done" actions from last week with revised action verbs to ensure actions are completed).
3. Prioritization
   a. Throughout the document, the supervisor and subordinate should agree on priorities for the week.
   b. The supervisor and subordinate should also agree on actions and resource allocation.
4. Resources
   a. Who is available the coming week?

b. What critical equipment is available?

c. How well did we use our resources last week?

5. Communication and Praise

a. Are there others who need consultation about a decision from the meeting?

b. Are there people outside the meeting who need feedback, both good and bad, about their performance?

c. Any opportunity for personal coaching is important during the RAR meeting.

6. Recording

a. Both individuals should record all actions that arise from the meeting.

b. RAR participants should use strong active verbs to write clear actions. This leaves no room for interpretation.

c. The supervisor and employee must also agree on deadlines for actions.

d. Finally, the supervisor must allocate resources to the employee to complete the actions. These factors combined increase the probability of a positive outcome.

More specifically, the RAR package has five sections as follows:

1. Highlights and Lowlights Page

This page contains information about what went well and what went poorly. Topics for discussion and emerging issues (specifically related to priority deliverables). The priority deliverables appear here for the staff member over the coming 8 weeks.

Overview			
Highlights	**Emerging Issues**		
- Greg and Chris very pleased with the Daily HIT - 5 Year business planning off to a good start - Communication/Collaboration progress	- Vacation for key people related to 5 year planning exercise completion		
Lowlights	**Priority Deliverables (8 Weeks)**	**Date**	**Status**
- Lack of ownership for pneumapress development within the line	1 Develop and implement Daily VAT meeting (facilitate development)	15-Jun	☺
- Unplanned work in Mill Mtce preventing staff from RARing	2 Implement Maintenance pipeline ideas related to throughput and wear rate	13-Jun	☺
- Reluctance to engage in formal CI idea process in Mine Mtce	3 Deliver plan for communication/collaboration - integrated operations project	30-Jun	☺
	4 Facilitate the development of a dewatering plan - pneumapress capacity and future concentrate dewatering needs	15-Jun	☹
	5 Support the delivery of a 5 year plan for the mill and mine maintenance, and tailings & Water management departments	30-Jun	☺
Topics for Discussion (need help, by whom, by when); decisions to be made; other topics			
- Cost reduction tracker support for maintenance departments			

Figure 9 - The highlights and lowlights page of a RAR

Source: Adapted from HVC CI RAR (2014)

The first page of the document provides the overview of the previous week. RAR participants consider risks and opportunities for the near future on the front page. Throughout the discussion, both the supervisor and employee record actions. Actions remedy situations that threaten completion of deliverables.

2. The Resources Page

This page is a record of the resources available for completion of short-term actions. It can include people, equipment, or other resources.

Resource Scorecard									For W/E 2014-6-16		
Role	Status (Week Ending, -2 / +3 weeks)								Mitigating actions to counter low availability	Who?	When?
	26-May	2-Jun	9-Jun	16-Jun	23-Jun	30-Jun	7-Jul	14-Jul			
Supt. Mine Maint.	☺	☺	☺	☺	☺	☹	☹	☹	GF mobile fleet to cover GM review	Wade	July 10th
Maint. Manager	☺	☺	☹	☹	☺	☺	☺	☺			
Supt. Mill Maint.	☹	☺	☺	☺	☺	☺	☺	☺			
Maint. CI Lead	☺	☺	☺	☹	☺	☺	☹	☺			
Maint. CI Facilitator	☺	☺	☺	☺	☺	☺	☺	☺	Cover GM review slide creation while Lead away	Mark	July 10th

Figure 10 - Resource page for CI maintenance team

Source: Adapted from HVC CI RAR (2014)

3. The Work Plan

The work plan is where the subordinate records the specific actions from the previous week and for the upcoming week. It should address all work in pursuit of the priority deliverables for the subordinate. Based on the priority deliverables for the department, the supervisor should provide guidance on prioritization of the work plan. Figure 10 shows assignment of each action to one individual. That individual accepts the responsibility for completion of the action.

Last Week's Work Plan					NOTE: # TOP 3
Priority	**Action**	**By Whom**	**By When**	**Top 3?**	**Status**
Cost Reduction tracker up to date - Finalize FY14 tracker with corporate (Sword)	Update the tracker by June 10th - M2M cost savings	Mark	10-Jun		**Done**
Develop and implement Daily SIC meeting (facilitate development)	Finish the format of the sheet - Flow	Mark	05-Jun		**Done**
Develop and implement Daily SIC meeting (facilitate development)	**Add the weekly tonnes to get back on target, and the crusher wait times**	**Mark**	**05-Jun**	**3**	**Done**
Develop and implement Daily VAT meeting (facilitate development)	**Establish a method for senior foreman to insert Daily Met Report numbers in to the HIT meeting sheet (So that WTD numbers are more reliable)**	**Frank**	**26-Jun**	**1**	**Not Done**
Develop and implement Daily VAT meeting (facilitate development)	Finish the conditional formating for the HIT sheet.	Mark	19-Jun		**Not Done**
Develop and implement Daily VAT meeting (facilitate development)	Walk M2M group through the HIT process as part of the M2M conference (onsite Wednesday)	Rod	18-Jun		**Done**
Develop and implement Daily VAT meeting (facilitate development)	Create an email list to send HIT	Mark	19-Jun		**Done**
Implement Maintenance pipeline ideas related to throughput and wear rate	Prepare slides for liner steering committee meeting next week	Mark	24-Jun		
Implement Maintenance pipeline ideas related to throughput and wear rate	Prewire the liner steering committee meeting with stakeholders	Mark	25-Jun		
Implement Maintenance pipeline ideas related to throughput and wear rate	Faciliate the liner steering meeting and send out meeting minutes and actions.	Tom	26-Jun		
Implement Maintenance pipeline ideas related to throughput and wear rate	Gain signatures from stakeholders for implementing status - Liner Inspection	Rick	12-Jun		**Not Done**
Support the delivery of a 5 year plan for the mill and mine maintenance, and tailings & Water management departments	Establish a list of actions for (with Clint and Mill maintenance) Clint and mill maintenance in the development of their 5 year strategic plan	Mark	19-Jun		**Done**
Deliver plan for communication/collaboration - integrated operations project	Follow up with my actions from last weeks meeting - # of screens for flotation control and grinding control	Mark	19-Jun		**Done**
other	**Discuss and then take action on conveyor chute liners - design is appropriate for operations or maintenance? TABLE THIS AT THE LINER STEERING**	**Mark**	**26-Jun**	**2**	**Done**
other	Discuss and then take action on conveyor chute liners - design is appropriate for operations or maintenance? TABLE THIS AT THE LINER STEERING	Mark	15-Jun		**Not Done**

Figure 11 - Example of last week's work plan for a CI lead

Source: Adapted from HVC CI RAR (2014)

When the staff member updates the work plan from last week, each action must have a "not done" or "done" status. The subordinate should address any incomplete actions in the current week's work plan. This presents the opportunity for a discussion to see if additional resources are required.

This Week's Work Plan				NOTE: # TOP 3
Priority	**Action**	**By Whom**	**By When**	**Top 3?**
Develop and implement Daily VAT meeting (facilitate development)	Establish a method for senior foreman to insert Daily Met Report numbers in to the HIT meeting sheet (So that WTD numbers are more reliable)	Frank	26-Jun	
Develop and implement Daily VAT meeting (facilitate development)	Finish the conditional formating for the HIT sheet.	Mark	19-Jun	
Develop and implement Daily VAT meeting (facilitate development)	Walk M2M group through the HIT process as part of the M2M conference (onsite Wednesday)	Rod	18-Jun	
Develop and implement Daily VAT meeting (facilitate development)	Create an email list to send HIT	Mark	19-Jun	
Implement Maintenance pipeline ideas related to throughput and wear rate	**Prepare slides for liner steering committee meeting next week**	**Mark**	**24-Jun**	**2**
Implement Maintenance pipeline ideas related to throughput and wear rate	Prewire the liner steering committee meeting with stakeholders	Mark	25-Jun	
Implement Maintenance pipeline ideas related to throughput and wear rate	Faciliate the liner steering meeting and send out meeting minutes and actions.	Tom	26-Jun	
Implement Maintenance pipeline ideas related to throughput and wear rate	Gain signatures from stakeholders for implementing status - Liner Inspection	Rick	12-Jun	
Support the delivery of a 5 year plan for the mill and mine maintenance, and tailings & Water management departments	**Establish a list of actions for (with Clint and Mill maintenance) Clint and mill maintenance in the development of their 5 year strategic plan**	**Mark**	**19-Jun**	**1**
Deliver plan for communication/collaboration - integrated operations project	**Follow up with my actions from last weeks meeting - # of screens for flotation control and grinding control**	**Mark**	**19-Jun**	**3**
other	Discuss and then take action on conveyor chute liners - design is appropriate for operations or maintenance? TABLE THIS AT THE LINER STEERING	Mark	26-Jun	

Figure 12 - Example of this week's work plan for a CI lead

Source: Adapted from HVC CI RAR (2014)

4. Idea Pipeline Progress Chart

Each department has an idea pipeline, which contains information about the implementation of ideas. This section of the RAR drives ownership and implementation of improvement ideas. The value based discussion between supervisor and subordinate creates the need for implementation of improvement ideas. Meaning, when a gap exists between actual performance and target performance, discussion of improvement idea implementation is important. The value comes from those ideas affecting the department's key performance indicators (KPIs).

Idea Pipeline - Maintenance													
Idea Name	Output KPI	Status	Current Idea Status	Evaluating Date	Implemented Date	Cash Flowing Date	Locked-In Date	Value ($,000)	Idea Owner	Next Steps	By Whom	By When	Priority
Permanent Inch Drive for each Mill	Mill Availability	🙂	On Hold	31-May-13	6-Jan-14			$1,397	Clint	Deferred to a future date			
Liner inspection process	Found work downtime hours	😣	Evaluating	25-Nov-13	13-May-14			$1,196	Clint Ellison	No update this week. Next week review liner inspection profiles at post shutdown.	Clint	29-May	
Compressed Air consistency and torque tool selection	Mill Availability	🙂	Locked In	25-Mar-13	16-May-13	28-Jan-14	29-May-14	$462	Mick	Next Week, Todd to have planners write E-Rad specifics into the auto mill relining procedure.	Todd	19-Jun	
Increase reliability of Pneuma Presses to reduce dryer usage by 30%	Pneumapress Availability	😃	Cash Flowing	28-May-13	26-Jun-13	21-Nov-13		$270	Remo	Next week, Remo to reach out to reliability to see about an update to the RCM	Remo	19-Jun	
Rework reduction/elimination	# of Rework Man-hours	😣	Implementing	25-Nov-13	20-Feb-14			Enabling	Clint Ellison	Continue tracking and relaying information back to frontline	Todd	26-Jun	
Mill Mtce Housekeeping Scheduled Walk Through	Audit Compliance Score	😃	Implementing	29-Jan-14	13-Mar-14			Enabling	Clint Ellison	Audits moved to responsibility of GFs - Email from Clint to GFs and SFs	Clint	19-Jun	1
Pick Lists for Found Work (HD Shop)	Pick Lists printed weekly (by crew)	😃	Cash Flowing	18-Apr-13	1-Nov-13	1-May-14		Enabling	Steele	Audit results , Lock in at the End of May providing data supports so	Tom	11-Jun	
PM Repair Management	Total PM duration	😐	Implementing	19-Dec-13	20-Feb-14			$550	Tyler F/Glen G/Mike C	Capture wenco data to reflect total time truck is out of production in order to evaluate true progress	Tom	11-Jun	3
Wash Bay Protocol	Total PM duration	😐	Implementing	19-Dec-13	20-Feb-14			$825	Steele	Decide on whether or not to put a camera in the wash bay	Steele	11-Jun	
PM Bay Optimization	Total PM duration	😐	Implementing	19-Dec-13	20-Feb-14			Enabling	Mike F	Remove mechanic toolboxes and install vidmars	Mike F	10-Jun	
SIC Meeting Development	Daily Targets Met	😃	Cash Flowing	28-Apr-14	5-May-14	5-Jun-14		Enabling	Tom/Mark	Vette KPIs with Stakeholders, prepare tools and room for trial meeting run, prep for 7 day a week continuity	Mark	15-Jun	
Hotspots Board Development	TBD	😐	Implementing	29-Apr-14	10-Jun-14			Enabling	Tom	Determine SSRS vs. Wenco Dashboard direction with go-live schedule for mid June	Tom	11-Jun	

Figure 13 - Overview of the maintenance idea pipeline

Source: Adapted from HVC CI RAR (2014)

5. Key Performance Indicators - Data, Charts and Targets

The KPI section of the RAR is by far the most variable. Each department has different drivers of value and performance. This section illustrates those drivers for a constructive conversation. Regular review of the pipeline stimulates efforts in the improvement idea pipeline. All KPIs should have targets in order to promote accountability and battle the status quo.
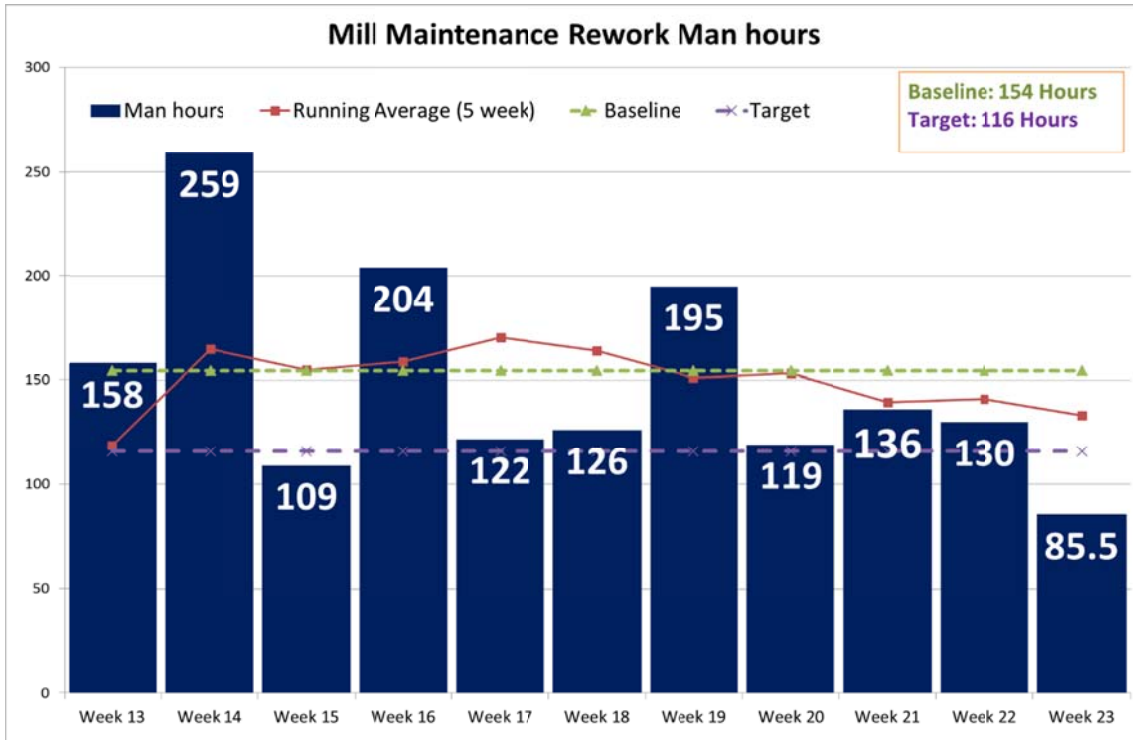
Figure 14 - KPI chart with target and baseline values for mill maintenance rework man hour

Source: Adapted from HVC CI RAR (2014)

The rework KPI chart above shows a clear trend (red trend line) for the weekly man hours used for rework. Rework is whenever the maintenance crew has to return to a job because the initial attempt was inadequate. Rework hours directly affect the reliability of critical equipment. In the VDT, this means that equipment availability is lower and hence copper production is lower. For reference, the graph shows the baseline and the target. The trend line shows the staff member and supervisor in maintenance their progress toward the target. The discussion surrounding this chart in the RAR is where alignment of actions and priorities takes place. The supervisor can also provide praise for the positive results toward a reduction of wasted person-hours. Both the supervisor and the employee record the reasons for this positive trend here in the RAR for future reference.

Scheduled Shutdown KPI Tracker

	Responsible	3-Oct	15-Oct	30-Oct	5-Nov	19-Nov	3-Dec	6-Dec	11-Dec	17-Dec	14-Jan	21-Jan	28-Jan	4-Feb	11-Feb	25-Feb	4-Mar	6-Mar	8-Apr	15-Apr	23-Apr	30-Apr	1-May
Checklist completed and OPS contacted	Todd V																						
OPS contacted	Bill K																						
Electrical / Instrumentation Log Used	Larry B																						
Overtime Staffed	Clint E																						
Coverage During Breaks	Clint E																						
Two Cranes Used	Remo T																						
Post-Shutdown Meeting Held	Rick S																						
Grinding Line		D	A	B	C	E	B	A	C	D	A	B	C	D	E	A	B	C	A	B	C	D	E

Grinding Line Shutdown Times as a % of Target (Target = 100%)

Shutdown Time (% of Target): 134%, 82%, 86%, 106%, 200%, 82%, 99%, 91%, 93%, 97%, 107%, 129%, 87%, 96%, 82%, 87%, 81%, 102%, 121%, 104%, 98%, 136%

Legend: Shutdown Time (% of Target) — Target — 4 per. Mov. Avg. (Shutdown Time (% of Target))

Figure 15 - KPI chart showing input KPIs (ideas green or red) and output KPIs (shutdown time to target)

Source: Adapted from HVC CI RAR (2014)

Figure 15 shows a comparison of the ideas used for each individual shutdown and the results achieved for the shutdown. Compliance with improvement ideas are the input KPI. They are a predictor of the output KPI. The output KPI is the shutdown performance in percent of the target. This direct comparison clearly shows that when the crews focused on implementing their own improvement ideas, they outperformed their shutdown targets. The RAR provides the opportunity for the supervisor to question the crew's compliance with improvement ideas based on real results.

3.3.1.2   CI Principles Reinforced by the RAR

There are a few important aspects of the conduct associated with the RAR. It should be treated as an opportunity for alignment, prioritization, enabling excellence, managing by exception, and respect for all involved. The RAR should never be onerous, redundant or an opportunity to assign blame. For these reasons, the RAR process promotes many of the guiding principles of CI. Specifically, the RAR uses departmental alignment to drive a long-term strategy. Furthermore, the RAR acts as the conduit for developing people and teams within the CI

philosophy. It also promotes all the principles relating to the operation. Principles such as levelling the workload for optimization and using visual controls to identify problems. The visual controls in this case are the KPI charts and variance reports within the RAR document. At HVC the RAR has influence with all five elements; Ideas, coaching, variance and targeting, wiring, and change management.

3.3.1.3   Survey Results for RARs

The survey results offered many observations regarding the adoption and value of the RAR process at HVC. The first observation is positive and shows a promising adoption rate illustrated in Figure 16.

Do you perform a weekly or bi-weekly Results-Action-Review (RAR) meeting?

Yes	48	66%
No	22	30%
I'd like to, but my boss is too busy!	3	4%
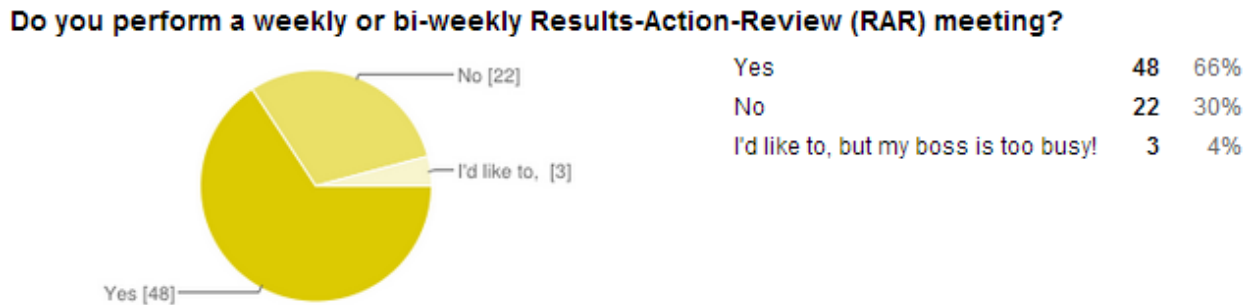
Figure 16 - Number of RARs survey results

Source: Survey Form Results (2014)

The second observation is that more respondents than actually participate in a RAR believe there is value in having a RAR. Figure 17 shows that only five respondents believed that the RAR meeting is not valuable. This is even more impressive considering the mix of respondents. All levels of the hierarchy believe there is value in a RAR meeting.

Do you believe there is value in having a RAR meeting?

Yes	52	71%
No	5	7%
Maybe, if only...	16	22%
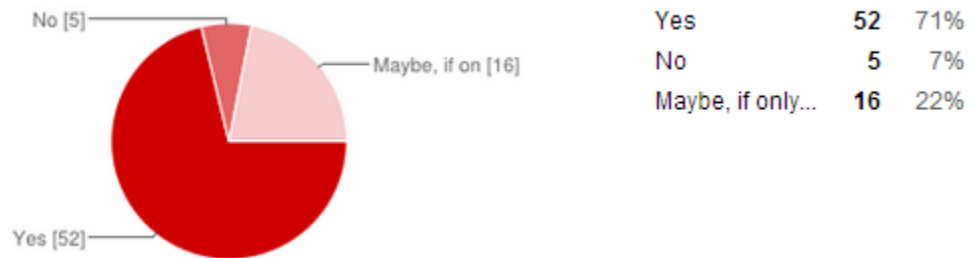
Figure 17 - RAR value survey result

Source: Survey Form Results (2014)

Next, there were some insightful comments made by those who responded "maybe" when probed regarding the value of the RAR process:

1. Many respondents have no idea what a RAR is!

2. Some respondents indicated that discussions with their supervisor regarding KPIs never ends up in action. More often simply a change in the targets and rationalization of the variances.

3. Many respondents indicated that they believed HVC should implement the RAR process in all departments and to lower levels of the hierarchy.

4. Finally, there were respondents who believed the RAR process was redundant with other conversation and meetings that occur throughout the week.

Figure 18 shows that those who answered yes further indicated that they felt more in control of their work because of the RAR. In addition, Figure 19 shows the majority of people indicated that they preferred to resume the RAR process if given the option to cease. These results are positive and reveal opportunity. The nineteen people who indicated that they do not feel more in control of their work is an opportunity to educate for the managers associated with those individuals.

Do you feel like you are more in control of your work using the RAR process?

Yes	33	63%
No	19	37%
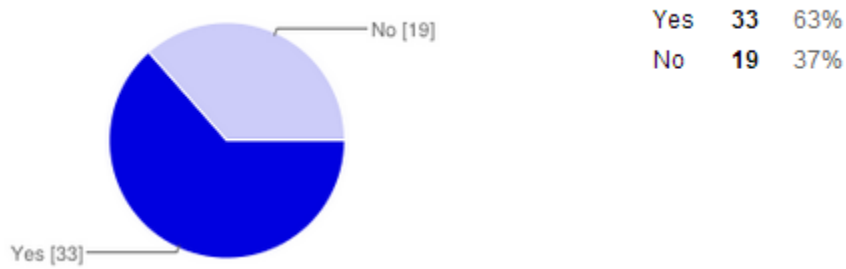
Figure 18 - RAR work control survey result

Source: Survey Form Results (2014)

If given the option, would you like to cease producing and engaging in the RAR process?

Yes	3	6%
No	44	85%
Not a chance, I can't live without it now!	5	10%
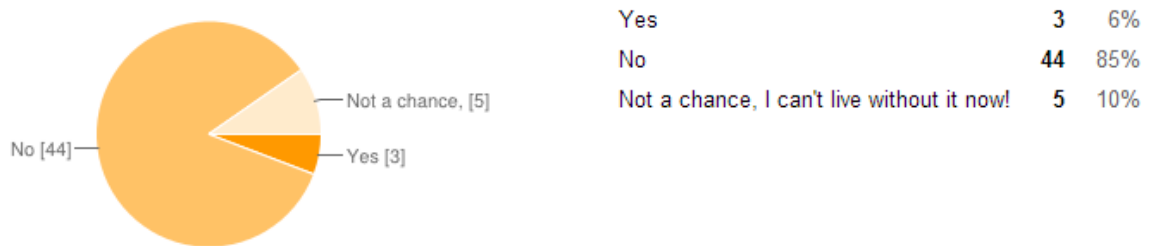
Figure 19 - RAR cessation survey results

Source: Survey Form Results (2014)

3.3.1.4   Potential Next Steps for RARs

The people involved are a fundamental aspect of CI. Hence, the RAR focuses on the human aspect of improvement and facilitates it well. The RAR provides a constructive setting focused on development supported by data and value. The CI department audits RARs for quality of process and content monthly. The CI department uses RAR quality in each department as an indicator of the CI adoption. The RAR process represents an influential opportunity to foster a culture of CI at HVC. The CI department should support RAR development going forward.

3.3.2   Targeting and Variance Processes

3.3.2.1   Description of the Targeting and Variance Processes

At the core of improvement at HVC is the targeting and variance processes. The reason for this is that targets provide direction. Specifically at HVC, targets have many time horizons. The most important targets horizons are Life of Mine (LOM), five year, annual, monthly, weekly, and daily planning. The senior management at HVC reviews the LOM, five-year and annual targets annually. The superintendents review the monthly targets with the General Manager at HVC. The general foreman and senior foreman review the weekly and daily targets. The review session align all active operational departments. The reviews also promote improvement. The targets incentivize action toward an improved operation.

The organization agrees on high-level goals based on value. Individuals with their supervisor develop personal goals that align with those organizational goals. The VDT demonstrates the value for HVC. A properly constructed VDT illustrates the areas with the most to gain from change efforts. The VDT reveals bottlenecked areas. Bottlenecked areas then become the focus of improvement targets. Prioritization in this regard translates directly to higher copper production and hence financial value. This is because HVCs consumers will take as much copper for smelting as HVC can supply. The targets are the catalyst for improvement effort. The following section outlines how targets are set at HVC.

The process of establishing a target for any given metric or area is simple. First, a performance baseline founded upon historical data is articulated. Then, a target is set with understanding of the system. Staff should always attempt to set stretch targets. A stretch target is an amount above baseline performance that is possible, but not probable. Significant effort is required to achieve a stretch target. Figure 20 shows the spectrum of certainty that describes target setting.

The Spectrum of Certainty			
Certain	Probable	Possible	Fantasy
The probability of this targeted outcome is 1. No difference from baseline and requires no special efforts.	Reasonably likely to occur and only requires minimal effort.	Within the realm of possibility means that significant efforts will result in achieving this target.	Nobody who understands the system believes this target is even possible.

Figure 20 - The spectrum of certainty for target setting

Source: Adapted from HVC CI training materials (2014)

A target in the "possible" range of certainty, by nature invokes motivation to achieve. If the target is too easy to achieve, accountability and potential are lost. In that case, the status quo has remained the dominant paradigm. If the targets are in the fantasy zone of the spectrum, people can become disenchanted with the process and absolve themselves of the responsibility for meeting the target. This leads to the final aspect of the targeting process: individual must take accountability for targets, not have accountability assigned. An individual who takes the responsibility for a performance target is much more likely to accomplish that target than otherwise. That individual will also exert more effort than someone who is assigned a performance target. Ownership assumes accountability and thrives on it. An individual that is passionate about achieving a target but is never held accountable by her superiors will become disconnected from the process. The individual who has not taken ownership of a target will perceive accountability as blame. Careful management of both outcomes is important. Targets only drive value when effective review of them is completed. Management derives value from the targeting and variance process by closing the loop with the following four-step process:

1. Articulate what happened.

2. Articulate why the result happened.

3. Investigate and analyze the situation to add to the body of knowledge about that system (i.e. articulate the key learnings from the situation).

4. Articulate and effectively present an action plan to mitigate the situation from reoccurring, or promote it depending on whether the consequences of the situation were positive or negative.

At HVC, many practices incorporate the targeting and variance process. In addition to the operational target and variance discussions, targets are set for implementation time for improvement ideas. Each functional department head is accountable for idea implementation targets. There are also targets set for individual equipment maintenance shutdowns to drive improvement. The variance discussions can be in a RAR or their own meeting with designates from many departments. Below are a few examples of the KPIs reviewed, which warrant their own meetings. Figure 21 shows the KPIs for the Daily Highland Valley Copper Integrated Targeting (HIT) Meeting.

	Last Night			Today			WTD			Required/Shift to make week target	Tonight	Tomorrow
	Target	Actual	Variance	Target	Actual	Variance	Target	Actual	Variance		Target	Target
Lbs Copper	544,608	299,221	-245,387	544,608	760,360	215,752	3,684,230	4,067,743	383,513	620,423	684,342	684,342
Mill Tonnes	70,000	48,537	-21,463	70,000	65,000	-5,000	595,000	526,602	-68,398		65,000	60,000
Mine Tonnes	72,000	49,248	-22,752	72,000	40,259	-31,741	583,216	501,271	-81,945		71,307	71,307
Cu Grade	0.391	0.441	0.050	0.391	0.547	0.156	0.357	0.463	0.106		0.364	0.364
Recovery	93.0%	91.0%	-2.0%	93.0%	93.0%	0.0%	89.4%	91.0%	1.6%		89.6%	89.6%
Hardness	1,141	1,074	-67	1,124	1,106	-18	1,190	1,138	-51		1,156	1,156
#1 Pile				90%	90%	0%					85%	85%
#2 Pile				90%	80%	-10%					85%	85%
#3 Pile				90%	80%	-10%					85%	85%
1 Cr. Wait Time	2.0	0.1	-1.9	2.0			2.0	1.1	-0.9		2.0	2.0
4 Cr. Wait Time	2.0	2.6	0.6	2.0	1.0	-1.0	2.0	2.6	0.6		2.0	2.0
5 Cr. Wait Time	2.0	2.0	0.0	2.0	0.5	-1.5	2.0	1.3	-0.7		2.0	2.0

Mill — Cu in Tails 0.038

June 22, 2014

This weeks Cu Lbs Target: 6,447,402

Mill Availability: 100.0%

Weekly Ore Tonnes Target: 933,756

Theoretical Pounds Cu based on targets below: 467,028 | 431,102

Maintenance Notables | Ore Quality Notables (Wet, Clays, Hardness) | Operations Notables

Any safety meetings, crew dinners or other operations meetings that should be discussed for coordination purposes?

Figure 21 - The one page KPI sheet for targeting and variance setting on a daily basis

Source: Adapted from HVC Daily Targeting Meeting (2014)

Figure 21 illustrates the daily high-level performance indicators at HVC. These targets help the operation to achieve its weekly and monthly targets. The mix of targets above are both input and output KPIs. Input KPIs are metrics that individuals have direct influence over. Output KPIs are the consequences of input KPIs. An input KPI for example, is mine tonnes. The mine operations foreman is in control of the mine tonnes KPI. It is a function of the number of trucks allocated to ore hauling versus waste hauling. Copper recovery is an example of an output KPI. Recovery is a function of the liberation of the copper mineral, among other things. Liberation depends on the geology of the ore and the throughput. There are many opportunities for variance to target. Figure 21 shows that the HVC produced over one million pounds of copper despite the missing the mine tonnes target. This observation is the genesis of a fruitful variance discussion between mine operations and mill operations. They must reconcile this variance. HVC produces copper best at stable rates. HVC must reduce the variance in the stability to achieve optimized production.

Figure 22 shows one slide from the Weekly Variance and Targeting Meeting that is held every Thursday afternoon.

The weekly targeting and variance meeting gives each department an opportunity to present their contribution to that week's production. Designates from each department present fifty-five to seventy slides. Each slide addresses operational aspects of HVC. These slides include planned maintenance for key pieces of equipment, ore characteristics, mining fleet performance, grinding performance, flotation performance and action items from previous weeks.
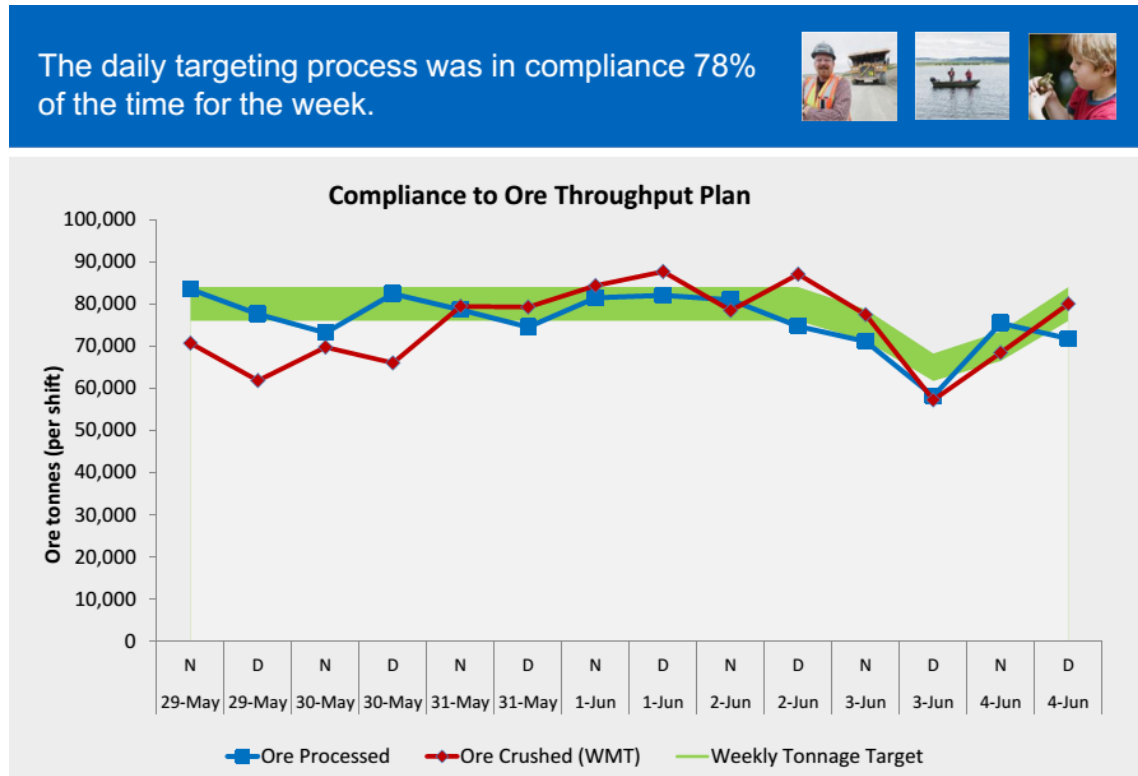
Figure 22 - Example KPI chart illustrating compliance to plan

Source: Adapted from HVC Weekly Targeting Meeting (2014)

Figure 22 shows how well HVC adhered to the production plan for one week. This specific chart drives an optimal throughput level throughout the week based on the ore delivered and the planned maintenance. When the mine and mill management teams align their efforts toward the plan, optimization of production is the result. The weekly variance and targeting sessions position management to succeed in delivering on their commitments at the monthly review.

The senior management review the KPIs for the Monthly General Manager Variance and Targeting Review on the first Thursday of every month. The monthly variance and targeting session is similar to the weekly. The CI department compiles the highest level KPIs for HVC into one slide deck for review. Designates from each functional area present their KPIs, data and progress on action items. An additional section in the monthly review has the superintendents of each department identify risks and opportunities for the coming month. Additionally, the superintendents articulate risk mitigation tactics and actions to capture opportunities.

Finally, management iterate throughout the year to establish the Five-Year Planning Cycle targets. The Five-Year targeting and variance review is at the annual time horizon and embodies the entire site vision. Each year the Five-Year plan is re-baselined and new targets set. If a target is changed, there must be a reason discussed and communicated. It grants each group on site the ability and opportunity to articulate how it will deliver value. They must also set aggressive targets for performance. HVC sets Five-Year targets iteratively throughout the year. This is because each department's performance depends on all the others. The results of the 5-year planning process is a single page document outlining the highest-level drivers of value along with their targets. Having the Five-Year plan on a single page helps HVC communicate its operational intentions to corporate management teams for forecasting purposes.

3.3.2.2 CI Principles Reinforced by Targeting and Variance Processes

The targeting and variance processes foster a culture of CI by providing incentive to improve. Target and variance processes act as a catalyst. Articulating the baseline performance is the first step in the process. This baseline provides a starting point for employees to improve from, much like the standardized tasks in the Toyota culture. An accurate articulation of the current state provides enormous potential for identifying existing possibilities for improvement. Additionally, targeting and variance promotes the ideas element. The ideas are the discrete

actions between baseline performance and a target. Without a firm understanding of the current state, improvement becomes frivolous and unmeasurable. Targeting and variance discussions further foster CI by providing opportunities for coaching, but only if handled properly. This means target and variance discussions must have initially agreed upon consequences in order to be effective in this regard. Proper coaching also develops people in a targeting and variance sub culture in two ways. Supervisors challenge those who require strict accountability. In contrast, supervisors can encourage those who require encouragement to achieve a target.

In alignment with the Toyota principle of *Hansei*, or reflection, the variance discussion supports the development of a learning organization. Instilling the habit of reflecting on actions people agreed to and reviewing the results that accompany those actions is central to a learning organization. This process is analogous to the scientific method in this regard. Keeping as many variables as constant as possible, management can change one facet of the operation and observe the results. A prediction or forecast of the results of that action act as a hypothesis from which to learn. The cycle starts over again with different operational areas.

3.3.2.3   Survey Results and Potential Next Steps for Targeting and Variance

The survey asked respondents to indicate their feelings about targeting and variance at HVC. When asked about the extent to which they believed HVC is a learning organization, the results were neutral with a relatively even distribution about the mean. A 10-point scale was used, where 1 indicated a poor result or no value, and 10 indicated the respondent agreed strongly with the question. For reference, the entire survey is in appendix A and the results in appendix B.

To what extent do you think CI has made HVC a learning organization?

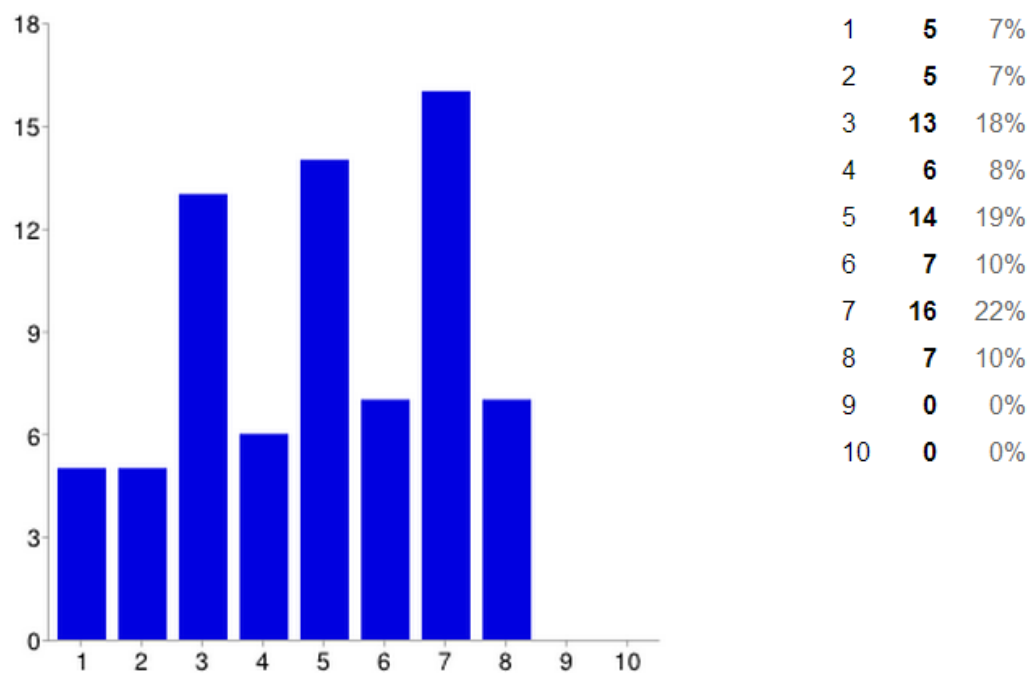|		
1	5	7%
2	5	7%
3	13	18%
4	6	8%
5	14	19%
6	7	10%
7	16	22%
8	7	10%
9	0	0%
10	0	0%

Figure 23 - HVC a learning organization survey results

Source: Survey Form Results (2014)

The mean result in Figure 23 regarding HVC being a learning organization was 4.9. The respondents skewed the results slightly to the right. No respondents answered the question with a nine or ten. Meaning, respondents believe there is room for improvement in this regard. Anecdotally, one respondent indicated that his opinion regarding the targeting and variance process was that it was purely a "blame game." This helps stress the point that people must seek accountability. Sought after accountability drives responsibility and motivation. Conversely, assigned accountability promotes resistance to achieving the target. If the purpose for the targeting and variance process is not well articulated, people who resent a challenge could react poorly without coaching.

The survey asked respondents to assign a value from one to ten indicating their personal views on the value of the daily, weekly and monthly targeting and variance meetings. The results

are polarizing with nearly equal groups of respondents who are seemingly unaware of the sessions and those that have varying feelings about the value.

What value do you see in the DAILY variance and targeting session?

1	27	38%
2	3	4%
3	5	7%
4	0	0%
5	4	6%
6	5	7%
7	14	20%
8	5	7%
9	4	6%
10	4	6%

Figure 24 - Value in Daily Variance and targeting session survey results

Source: Survey Form Results (2014)

What value do you see in the WEEKLY variance and targeting session?

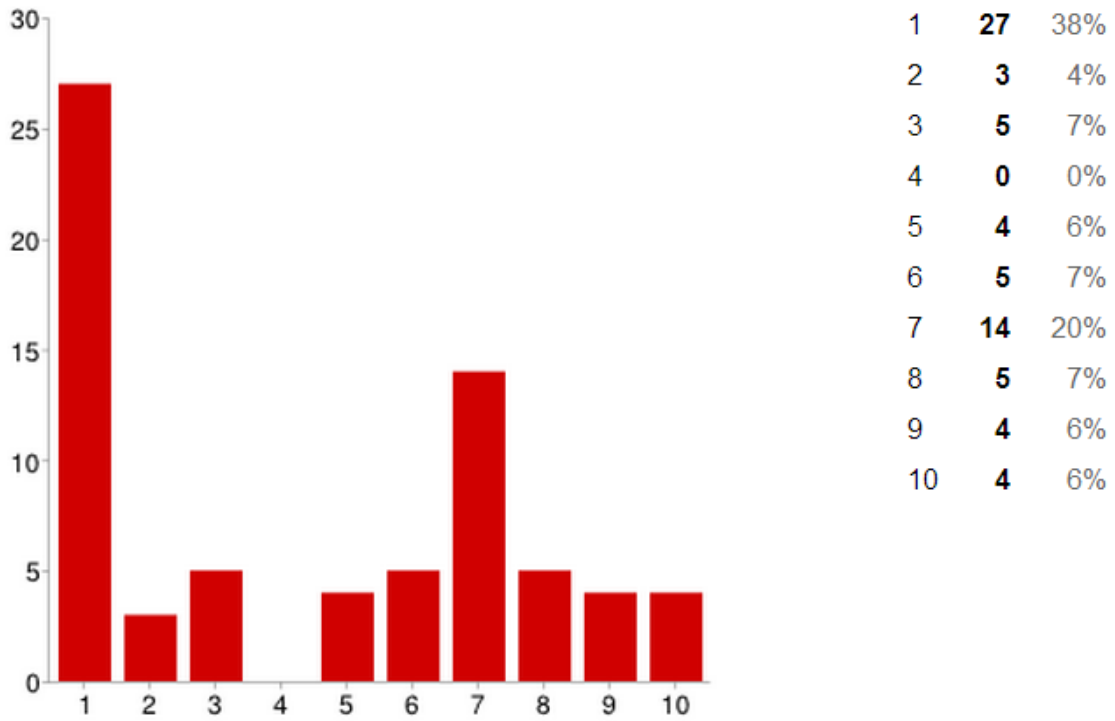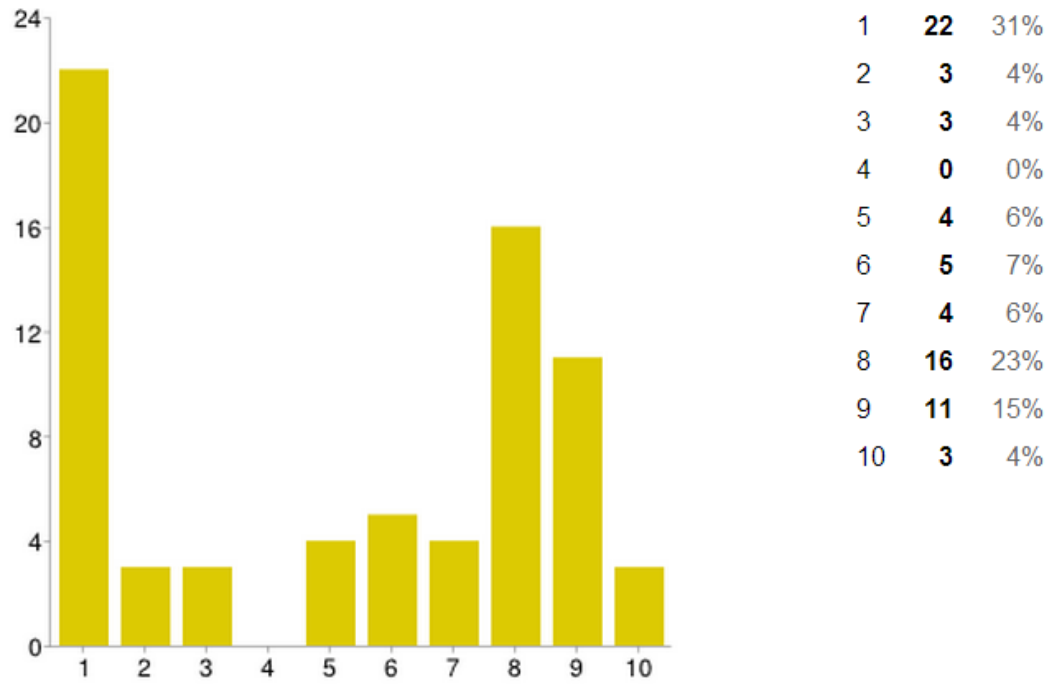|		
1	**22**	31%
2	**3**	4%
3	**3**	4%
4	**0**	0%
5	**4**	6%
6	**5**	7%
7	**4**	6%
8	**16**	23%
9	**11**	15%
10	**3**	4%

Figure 25 - Value in Weekly variance and targeting session survey results

Source: Survey Form Results (2014)

What value do you see in the MONTHLY variance and targeting session?

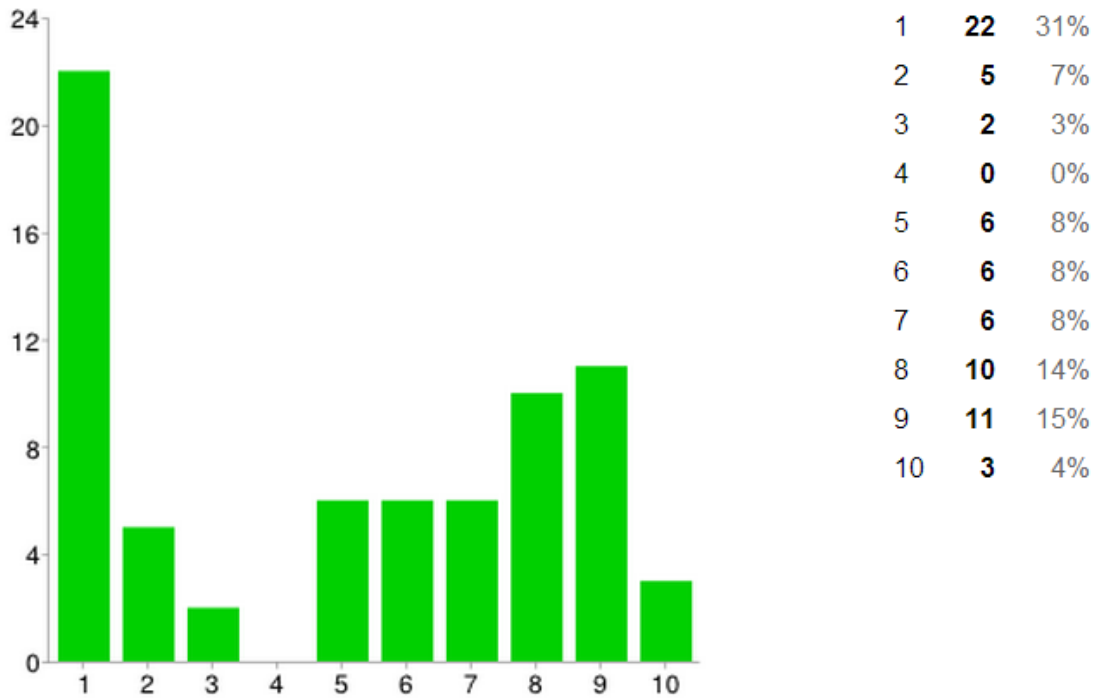|		
1	**22**	31%
2	**5**	7%
3	**2**	3%
4	**0**	0%
5	**6**	8%
6	**6**	8%
7	**6**	8%
8	**10**	14%
9	**11**	15%
10	**3**	4%

Figure 26 - Value in Monthly variance and targeting session survey results

Source: Survey Form Results (2014)

These results reveal an opportunity for the CI department to pursue further promotion of the targeting and variance process. Analysis of the respondents that indicated no value (scored the variance and targeting sessions a 1 out of 10) shows that the majority of those individuals are in lower hierarchical positions. This result is obvious because only senior staff attend the weekly and monthly targeting and variance meetings. This observation represents an opportunity to create CI promoters of those front line staff members. All that is required is to expose them to the process. Front line staff reviewing high-level KPIs provides them a sense of responsibility to the whole operation. Their gain is also in understanding their influence over other departments.
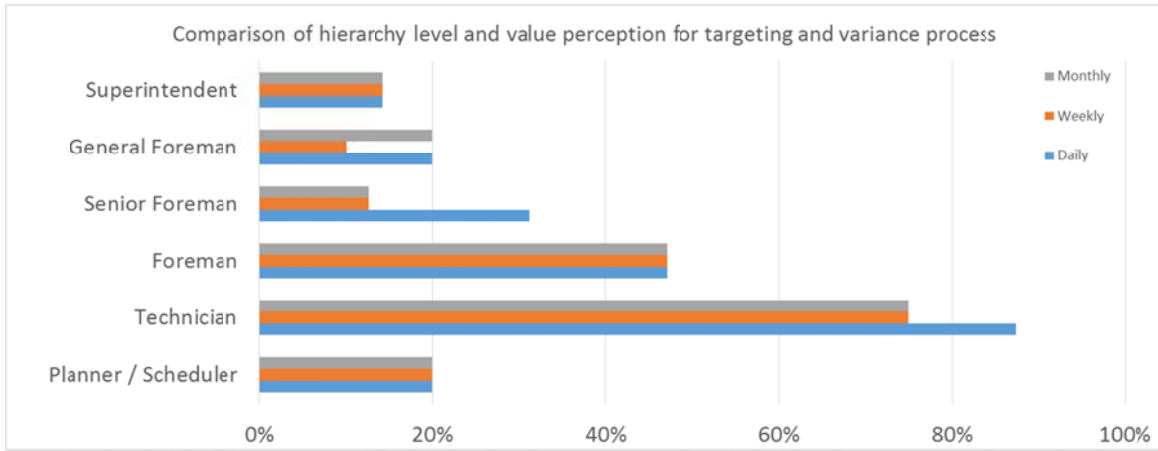
Figure 27 - Comparison of hierarchy and value perception of targeting and variance process

Source: Charted from survey results (2014)

The comparison or response to the targeting and variance processes' value and hierarchical position was revealing. The numerical response '1' indicates that the respondent believes the practice has no value. Figure 27 shows the percentage of '1' responses from each position below manager. Foremen and technicians responded '1' the most. This makes sense considering neither group actively participates in the targeting and variance meetings.

Figures 25, 26 and 27 all show a dichotomy divided at the middle response, five. The respondents in the 5+ category have a mean response values of 7.33, 7.80, and 7.55 for daily, weekly and monthly respectively. This indicates that the majority of the people that engage in the targeting and variance processes at HVC believe that they are deriving value from their efforts. This is important to the next steps for HVC because the result indicates that generally, the staff are translating theory to value.
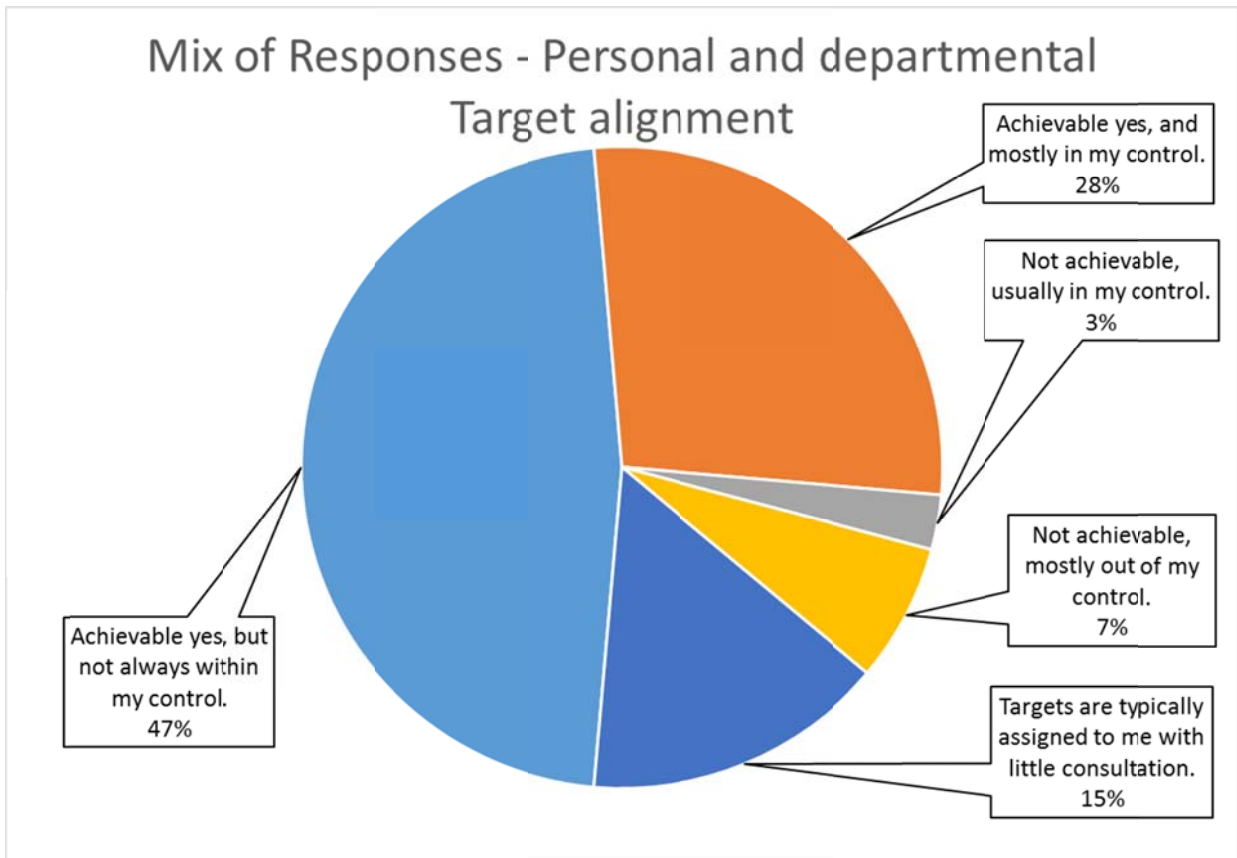
64

Figure 28 - Survey results from the question regarding alignment of personal targets with departmental targets

Source: Charted from survey results (2014)

The results of the survey question "Do you feel the targets for your area are achievable and within your control?" indicate two things. First, approximately 75% of respondents said that they believed their targets were achievable, which is positive. Additionally, only 15% of respondents indicated that their supervisor assign targets to them without consultation. This indicates an opportunity to improve the way HVC manages targets. Second, the largest group of respondents believes that while the targets are achievable, they are not within their control. Improving the quality of the RAR process is the remedy. Supervisors need to coach staff on ways to achieve targets through channels they control. The RAR provides an opportunity for this coaching. Equal proportions of people from all levels of the organization believe their targets are achievable but not in their control. The distribution is nearly equal throughout:

1. Technician   (50%)

2. Planner / Scheduler   (40%)

3. Foreman   (53%)

4. Senior Foreman   (56%)

5. General Foreman   (40%)

6. Superintendent   (29%)

7. Manager   (50%)

This analysis bolsters a case for reintroducing the theory of target setting with the whole organization.

3.3.3   Idea Element and Associated Practices

3.3.3.1   Description of the Ideas Element and Associated Practices

Several practices under the heading of ideas facilitate improvement. The target setting and variance discussions create the need for improvement, and the ideas are the means. Every department possesses ideas for improvement. Therefore identifying ideas is not difficult. The key is finding the right ideas, aimed at a specific opportunity based on facts and possessing value. Furthermore, idea ownership within the "line" reduces the resistance to implementation. The rest of the ideas section describes how to setup ideas so that HVC can successfully implemented them into the "way we do business".

The beginning of the ideas cycle rests in the value driver tree (VDT) for the operation. The VDT, with current data, provides a snapshot of where the most value per unit of effort resides. The VDT articulates this value in dollars or tonnes depending where in the VDT it exists. Value analysis prioritizes the specific area of improvement. Further data identifies the focal point of an idea generating session (IGS). This also requires going to see the area of the operation itself.

Planning the IGS also requires speaking with workers that interact with the situation. Issues are listed in a Pareto chart to identify the most frequent or most impactful. The Pareto prioritization exercise involves listing all the different occurrences of a disruption or issue and then tabulating the frequency that those issues occur over a given time period. The result is typically four or five Pareto items causing eighty percent of the total disturbance or issue. Pareto's principle is that eighty percent of a system's issues arise from twenty percent of its causes. The CI personnel work with "line" managers to complete all of these tasks. The remaining detail is to set up the IGS with a presentation and a carefully selected group of individuals who interact with the issue from all functional perspectives (engineering, operational, maintenance). The extent to which the three elements (people, Pareto, preparation) are completed is revealed in the value of the outcome.

The CI lead facilitates the IGS. The CI lead establishes the ground rules at the beginning of the session. The rules state that everyone is in the room for a common purpose and hierarchy carries no weight when attempting to solve the problem. They go on to state that there are no bad ideas, and that valuation of the ideas will be a post-meeting exercise. Finally, the ground rules indicate that the session is not a venue for war stories or actually solving the problem. Generating ideas according to the data and VDT is the object of the session. Solving the problem is a result of implementing ideas. Once the CI lead describes the situation and VDT, the CI facilitator or scribe for the session tabulates ideas from the participants. The CI lead will go through each cause on the Pareto list until the participants have no more ideas. The CI personnel then prioritize the ideas with the participants. The whole group ranks the ideas based on value and ease of implementation. Figure 29 shows an example value ease matrix. Nine ideas have been identified in the example IGS, and the participants have indicated that ideas one, two and three carry the highest value with the highest ease of implementation.
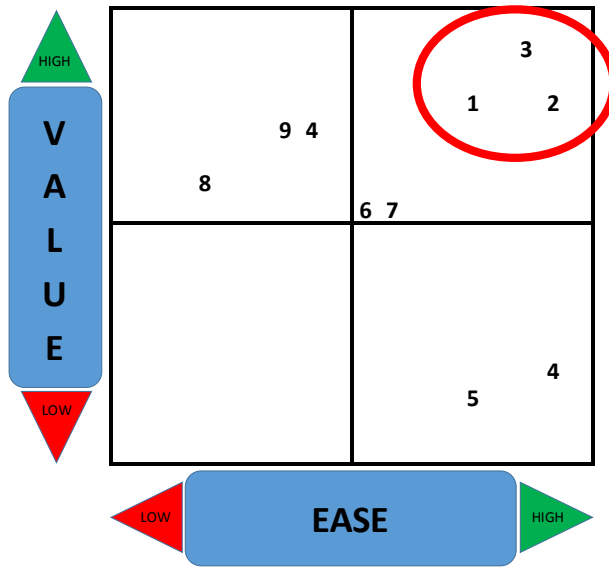
Figure 29 - Example value ease matrix with nine ideas ranked

Source: Adapted from HVC CI training materials (2014)

The final component of the session is communicating the next steps with all involved. In the example from Figure 29, CI personnel should communicate the next steps for ideas 1, 2, and 3 immediately during the session. One aspect of this communication is idea ownership. Typically, one individual from the session that feels passionate about the idea will take ownership. CI personnel together with the idea owners will complete financial valuations of the three ideas. To keep momentum beyond the IGS, the CI lead will send out all materials presented and ideas generated to the entire group.

The next step of the idea process is CI personnel develop the idea forms for the prioritized ideas. This step also involves nomination of an idea owner from the line if nobody took ownership during the session. CI personnel complete a checklist with the idea owner to clarify the responsibilities of ownership. This allows the idea owner the opportunity to internalize the responsibilities. It also sets the expectations for implementation. Strong ownership within the line is the strongest indicator of successful improvement idea implementation. Typically, strong ownership comes from an individual present at the IGS who suggested an idea and is currently

passionate about solving the problem. Next, CI personnel together with the idea owner write the idea form. The idea form is a document formalizing the action plan for implementation. It also describes the performance merits of the idea ($ value per day, and annual savings/revenue) and which KPIs to track to show improvement. Finally, the idea form describes the performance stage gates needed to consider the idea "locked in".

Once the CI personnel and idea owner finish writing the idea form, they schedule idea owner review meetings. Agreed upon by the idea owner and the CI lead, idea owner reviews give incentive to the idea owner to stick to the implementation plan. The idea owner review is simple but critical for keeping improvement ideas important and urgent. CI personnel book the idea owner reviews as a reoccurring outlook meeting. The idea owner review focuses on data and implementation progress. The CI personnel and idea owner track a number of idea aspects at owner reviews:

1. The baseline performance.

2. The monthly actual results with direct comparison to the target for that month.

3. The percent improvement achieved compared to target (from implementation plan).

4. The financial results.

    a. Annualized target.

    b. Annualized actual benefits achieved.

    c. Cumulative savings or revenue increase achieved to date.

### 3.3.3.2 CI Principles Fostered by the Ideas Practices

The individual practices associated with the idea process foster many of the principles endorsed by Toyota and the CI consultants hired at HVC. The VDT shows bottlenecks in the operation thereby exposing opportunity for improvement. Similar to the Toyota practice of *Andon*, with its red, yellow and green flags for exposing problems in the operation. The VDT

development and use for prioritization further endorses the wiring element of CI by clearly articulating the goals of improvement to align departments toward common targets. The IGS fosters the principle of making decisions slowly by consensus as approved by Toyota. Bringing cross-functional members that interact with the same issue allows for proper evaluation of the situation. The IGS also helps promote the principle that improvement is everyone's responsibility. Assisting passionate people to implement their ideas develops them. A positive experience with CI will also reinforce the CI philosophy for the individual. If a sceptical individual's ideas are heard and he or she is supported in implementing their idea, they will more likely to endorse the improvement idea paradigm and teach it to others. The idea form represents the principle of visual controls and the proper setup for *Hansei*, or reflection. Finally, the idea owner review practice fosters the elements of a learning organization: reflection and CI. It presents the owner of an idea the opportunity to justify resources toward an improvement based on reflection of progress and data.

3.3.3.3   Survey Results and Potential Next Steps for the Ideas Element

The first question regarding the ideas pipeline asked respondents what they thought its purpose was. The largest group of respondents indicated that they did not know what an idea pipeline was.

The ideas pipeline. What does it mean to you?
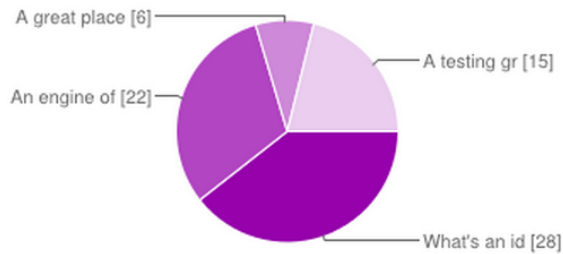
What's an ideas pipeline?	28	39%
An engine of prioritization and project management whose ownership resides in the the department	22	31%
A great place to have my ideas be heard and implemented by CI	6	8%
A testing ground for process improvements	15	21%

Figure 30 - Meaning of the ideas pipeline survey results

Source: Survey Form Results (2014)

This result reveals another opportunity for the CI department and HVC in general. The next largest group of respondents indicated that they believed in the change management supported form of the idea pipeline. Meaning, that the idea ownership is best within the department. The results of the question regarding implementation progress are the same as the results of the previous question. Figure 31 shows that the majority of respondents indicated poor implementation of the idea pipeline process in their department.

How would you rate the implementation of the ideas pipeline into your department?

1	28	38%
2	5	7%
3	7	10%
4	8	11%
5	6	8%
6	7	10%
7	7	10%
8	3	4%
9	2	3%
10	0	0%
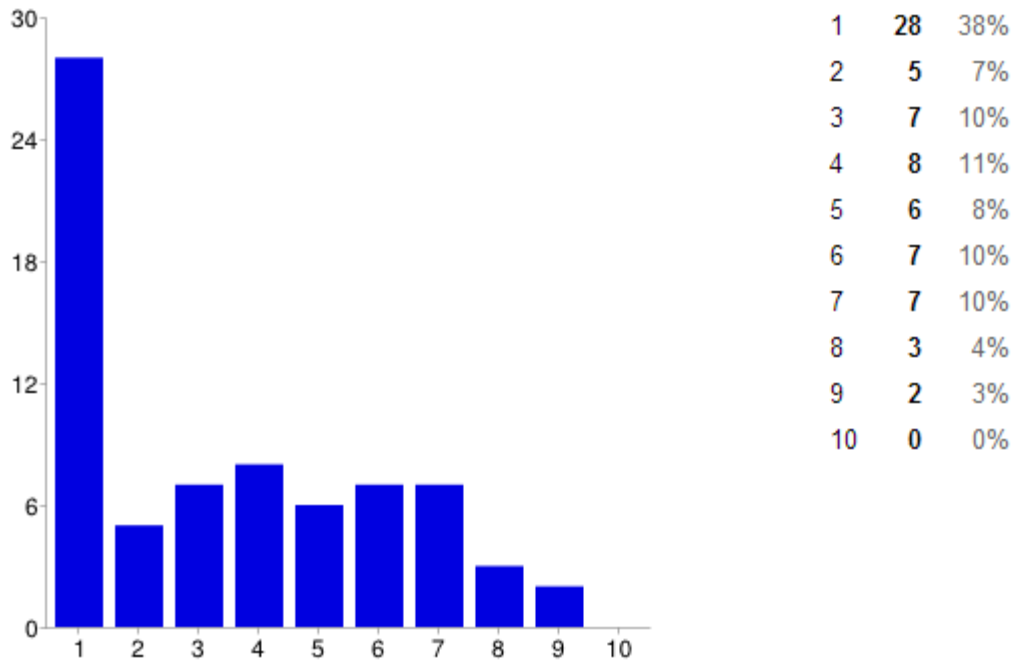
Figure 31 - Implementation of ideas pipeline survey results

Source: Survey Form Results (2014)

This result also incorporates responses from auxiliary or support departments who have literally not attempted to implement the idea pipeline. If we exclude the 1's from Figure 31, the mean implementation score is five. This score indicates an opportunity for the next steps toward adoption of CI culture within the line. CI and HVC have room to improve the implementation of the idea pipeline.

How valuable do you feel it is to have a pipeline to help you implement your departments ideas?

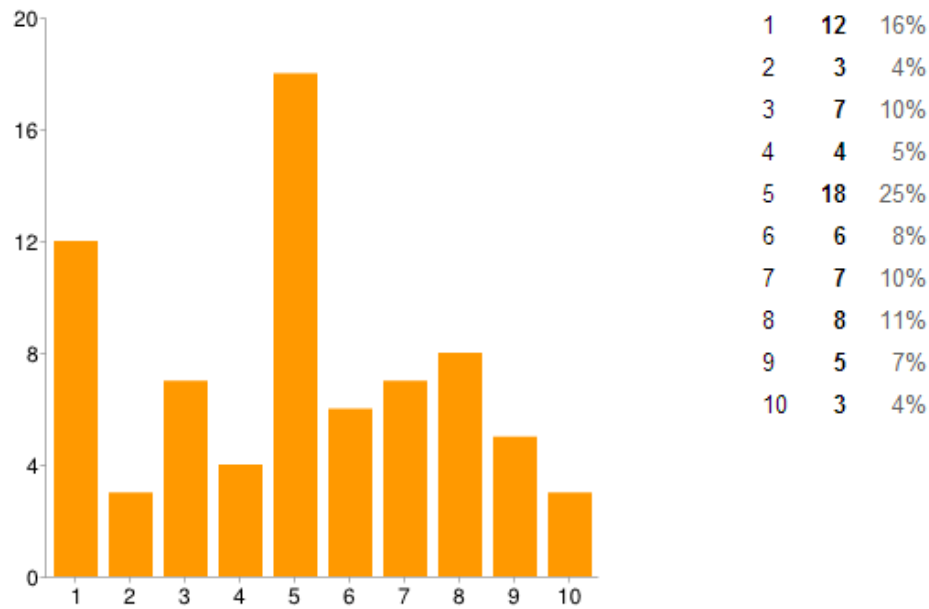|		
1	12	16%
2	3	4%
3	7	10%
4	4	5%
5	18	25%
6	6	8%
7	7	10%
8	8	11%
9	5	7%
10	3	4%

Figure 32 - Value of the ideas pipeline survey results

Source: Survey Form Results (2014)

The respondents indicated that despite the lack of implementation, the value of the idea pipeline is recognized. This is a positive outcome and definitely represents an opportunity for further reinforcement of the ideas pipeline to the "line". Excluding the respondents who had never heard of the idea pipeline, the average score was 5.9.

The next question asked whether improvement ideas are ever a topic for discussion in RARs. A high degree of acceptance of the idea progress discussion within the RAR would indicate that CI culture is strong. Unfortunately, only twenty-one percent of respondents indicated that they had discussed their improvement ideas in their RAR.

During your RAR, assuming you complete one, do pipeline ideas get discussed or decision made surrounding their progress?
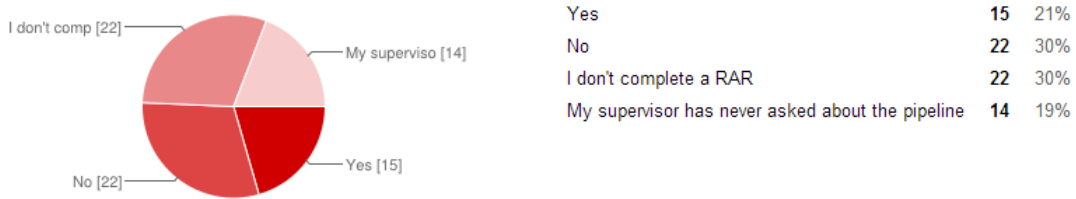

Yes	15	21%
No	22	30%
I don't complete a RAR	22	30%
My supervisor has never asked about the pipeline	14	19%

Figure 33 - Ideas pipeline discussion in RARs survey results

Source: Survey Form Results (2014)

This result indicates an enormous opportunity to promote the CI culture with the 36 respondents that do not discuss improvement ideas with their supervisor in their RARs. Because the RAR offers a one on one opportunity for coaching, improvement idea discussion is perfectly suited for the RAR.

Do you feel the pipeline should reside in CI or with the department where the ideas come from?

CI	18	25%
Department where ideas reside	35	48%
Other	20	27%

Figure 34 - Ownership of ideas pipeline survey results

Source: Survey Form Results (2014)

The next question asked respondents to comment on where ownership of the ideas pipeline should reside. Based on continuous improvement principles surrounding idea ownership, and change management theory, the most effective implementation of improvement ideas occurs when ownership is within the department where the issue resides. The majority of respondents understand this principle of departmental idea ownership. Only twenty-five percent of respondents indicated that they believed the ideas pipeline ownership be with CI, which is positive. The respondents who indicated "other" to this question had mostly progressive comments. Of the twenty respondents in the "other" category, nine indicated that the two groups

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should be working together (CI and department where the issue resides). Another seven had never heard of the idea pipeline and four indicated they believe there is no need for an idea pipeline.

Unfortunately, of the respondents who answered "CI" to the ownership of the idea pipeline question, there was not a significant correlation between hierarchical position and response. All hierarchical levels had between 10% and 30% of their cohort respond that the ideas pipeline should reside solely within the CI department. While concerning, further education in this case of effective means of improvement idea implementation and change management will be productive. I observed a very interesting result when comparing hierarchy and the number of respondents who indicated that the pipeline should reside in the department where the ideas are from. Only twenty percent of each of the groups "General Foreman" and "Planner / Scheduler" indicated that the pipeline should have ownership within the department. The other hierarchical cohorts all had significantly higher response rates to this question. This observation indicates an enormous opportunity for improvement in the adoption of CI principles within the "line". The majority of the improvement opportunities in many areas of the operation rely heavily on those two groups for support.

The survey's final question regarding the idea pipeline asked respondents to indicate their sense of support from the CI department. The most notable result observed with this question is the percentage of foremen who indicated they have not gotten enough support for their ideas. Of the seventeen foremen who responded to the survey, nine felt they had not received the proper support from the CI department. Yet another opportunity for improvement in the ideas element.

Do you feel as though you get adequate support from CI to properly advance your ideas?
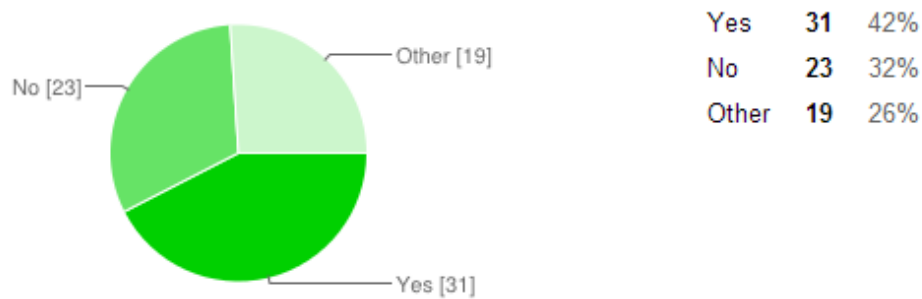
Yes	31	42%
No	23	32%
Other	19	26%

Figure 35 - Support from CI for ideas survey result

Source: Survey Form Results (2014)

The idea process is quite prescriptive. This has led to less than adequate adherence to the principles guiding the CI department with respect to the idea-associated practices. For instance, CI theory indicates that formal tracking of idea progress with schedule idea owner reviews and KPI tracking will garner momentum and positive progress toward locked in results. This is not however, a single point of concern as continuous improvement requires work on all elements and principles simultaneously for the culture to change. Following up on ideas with idea owners in the line who have not accepted or taken true accountability of the ideas will result in frustration and resentment for all parties involved. Therefore, efforts toward improvement in the idea pipeline implementation will have to be in concert with efforts to reinforce the CI culture from all other elements.

3.3.4   Business Coaching Practices

3.3.4.1   Description of the Coaching Practices

Every department at HVC has people with improvement ideas. That part of continuous improvement does not require coaching. Development of continuous improvement culture and the practices that foster continuous improvement culture do require coaching. The reason for this is simple and Stephen Covey explains it well with a framework described in his book, The 7 Habits

of Highly Effective People (Covey, 1997). Figure 36 shows the framework. It is a two by two matrix with importance and urgency axes.
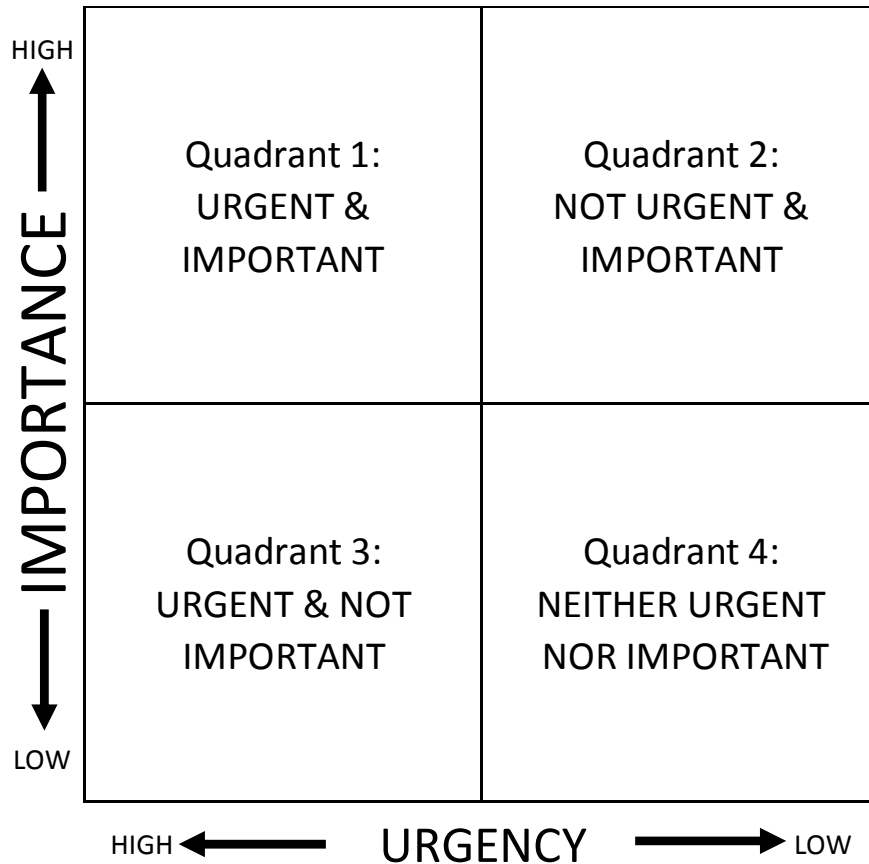

Figure 36 - Time management matrix

Source: Adapted from The 7 Habits of Highly Effective People (Covey, 1997)

The framework classifies activities based on two aspects, importance and urgency. Urgency is a function of time, and importance a function of relevancy or value. Activities that are urgent and important will dominate. These are crises, and working exclusively in quadrant 1 is firefighting or crisis management. A doctor treating a patient in the emergency room for a heart attack is both urgent and important. This example is urgent because there is a short time frame that the individual can be saved and important because a human life is at stake. The opposite is true in quadrant 4, where the activities are neither urgent nor important. A perfect example of a quadrant 4 activity is watching a TV show. Quadrant 3 activities are purely distractions because

engaging in them brings zero value, and yet they are difficult to refrain from doing. An example of a quadrant 3 activity is the phone ringing. Mistaking the urgency of a phone ringing for importance is a common misjudgement. The final quadrant possess a true test of will. Continuous improvement activities are in the illusive quadrant 2 of this matrix. Activities that everyone understands are important for excellence, and yet they possess negligible amounts of urgency. These activities require unwavering discipline to sustain. The previous example of the heart attack could have been a condition prevented altogether by a vigorous quadrant 2 exercise and diet plan. The idea is not to focus all energy on activities in any one quadrant, but rather find an optimal balance. Ideally, the activities in the bottom two quadrants that have little value or importance can be minimized, but the quadrant 1 activities should not be completely avoided in favour of quadrant 2 activities. It takes coaching to put these concepts into action at the practical level.

Coaching manifests itself at HVC in many ways and between many different people. The CI department leads and facilitators work with all levels of their assigned departments. CI personnel coach idea owners to demand performance from their people. They also coach cross-functional teams to overcome the status quo in idea generating sessions. CI workers at HVC also demonstrate the skills of prioritization, accountability, targeting and value based discussions with the managers they assist. This is often because "line" managers are in a quadrant one paradigm. They require assistance visualizing the value of balancing quadrant one and two activities. Coaching also plays a role in RARs and the targeting and variance discussions. Many line managers at HVC have the knowledge and experience to present opportunities for improvement. Managing those interactions is a practice facilitated by the CI department through, among other interactions, meeting management practices, action log follow-ups, and idea owner review meetings.

The most effective application of coaching at HVC for the CI department is the practice of influencing through the line. This method involves accepting that a hierarchy exists and authority can dominate over project value. With acceptance of this phenomenon, an idea owner can seek support from their CI facilitator. The CI facilitator coaches the manager regarding value and releasing resources for idea implementation. If the idea owner's supervisor does not understand the value and hence cannot properly prioritize the work, influencing at the idea owner level will result in disappointment. The idea owner and CI facilitator must keep the managers updated on the progress and value of the improvement ideas within the department. This allows the managers to drive accountability toward implementation. The coaching in this practice is with the manager, revealing the true value of the work their department is doing, or not doing.

3.3.4.2   CI Principles Fostered by Coaching

Coaching alone stands as a pillar or principle of the CI department at HVC, but the effective practice of coaching presents a fulfilment of many continuous improvement principles. According to the Toyota model for continuous improvement, coaching serves to develop your future leaders and help them realize the value of continuous improvement. The interactions that coaching presents undoubtedly foster a culture of reflection and organizational learning. Coaching creates a positive development culture for teams to develop and thrive in as well.

Beyond just fostering the principles, coaching stimulates a great deal of sustainability because it creates converts to the principles of continuous improvement. Coaching seeks to teach not provide. It also promotes all other facets of the continuous improvement method through relentless, unwavering pursuit of value and learning.

3.3.4.3   Survey Results and Potential Next Steps for Coaching at HVC

With regard for the RAR process, the survey asked respondents if they felt they had received adequate coaching from the CI department. The majority indicated they had, however thirty-five percent still indicated that they had not. These respondents were evenly distribution across all positional levels. Unfortunately, very few respondents below General Foreman indicated that they had received adequate coaching from the CI department. While this group of individuals is quite small to begin with, it is still very important to provide coaching. Disenchanting this group is costly. Positive value based discussions in this case can promote CI effectively. Cynicism and resentment can influence CI in the opposite manner. A lack of clarity can deflate progress.

Do you feel you've gotten adequate coaching from the CI department?

Yes	34	65%
No	18	35%
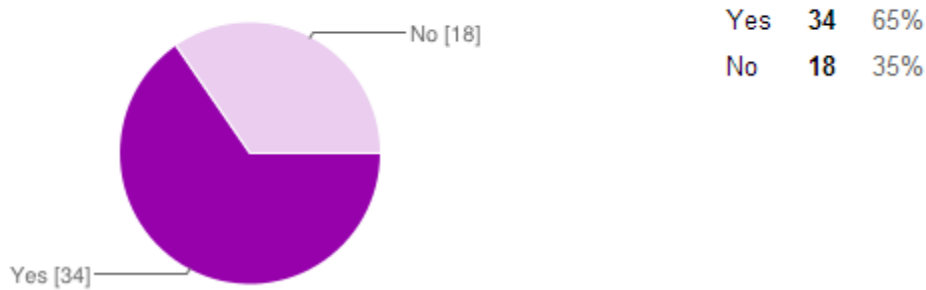
Figure 37 - Coaching from CI survey results

Source: Survey Form Results (2014)

The second coaching question asked the respondents in general if they received coaching from the CI department. The results are deceiving as the "other" category was predominantly respondents who had never worked with the CI department. Further, those respondents were approximately twenty-five percent of each position below General Foreman. These employees ideally receive the majority of their coaching from their supervisor, not CI personnel.

Does your CI representative provide meaningful, insightful coaching from time to time?

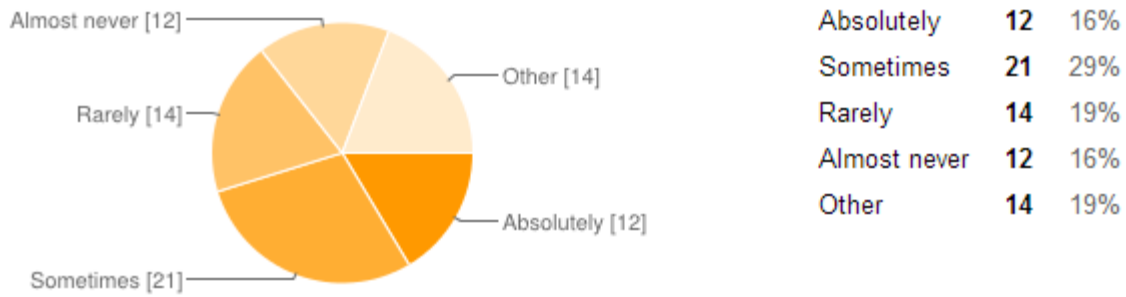|		
Absolutely	12	16%
Sometimes	21	29%
Rarely	14	19%
Almost never	12	16%
Other	14	19%

Figure 38 - Insightful Coaching from CI survey results

Source: Survey Form Results (2014)

Excluding those respondents reveals a positive sentiment toward frequency of relevant coaching. One further observation regarding coaching came when considering the mix of positions that responded "almost never". Fifty percent of the managers who responded indicated they almost never receive coaching from the CI department, which reveals an opportunity for CI leads and facilitators to engage in the practice of influencing through the line.

Coaching represents a core tenet of the continuous improvement method at HVC and manifests itself in many interactions around improvement ideas. Continuing to teach, reflect, coach and develop must be part of the future for CI. Recently however, due to a challenging economic environment, only a superintendent and three CI Leads remain in the streamlined continuous improvement department. This presents a significant challenge to providing the coaching behind a sustainable CI culture.

3.3.5   Change Management Theory in CI Practices

3.3.5.1   Description of Change Management in CI Practices

The change management principle at HVC manifests itself in many practices. The majority are the concepts surrounding documentation and formalization of process. The practices previously described such as idea forms, RARs, targeting and variance meetings all incorporate

change management. Most elements of continuous improvement for Toyota or HVC incorporate change management theory.

Change management at HVC is all the practices that, when adhered to, theoretically, provide a positive and sustainable change outcome. The prevailing theory on change management indicates that there are several steps to promote change. They include creating a climate for change, engaging the entire organization with the change, and sustaining the change until it becomes part of the way the company operates. For simplicity, the Kotter model will be the extent of the change management theory considered. Specifically, Figure 39 describes the steps (Kotter, 1997).
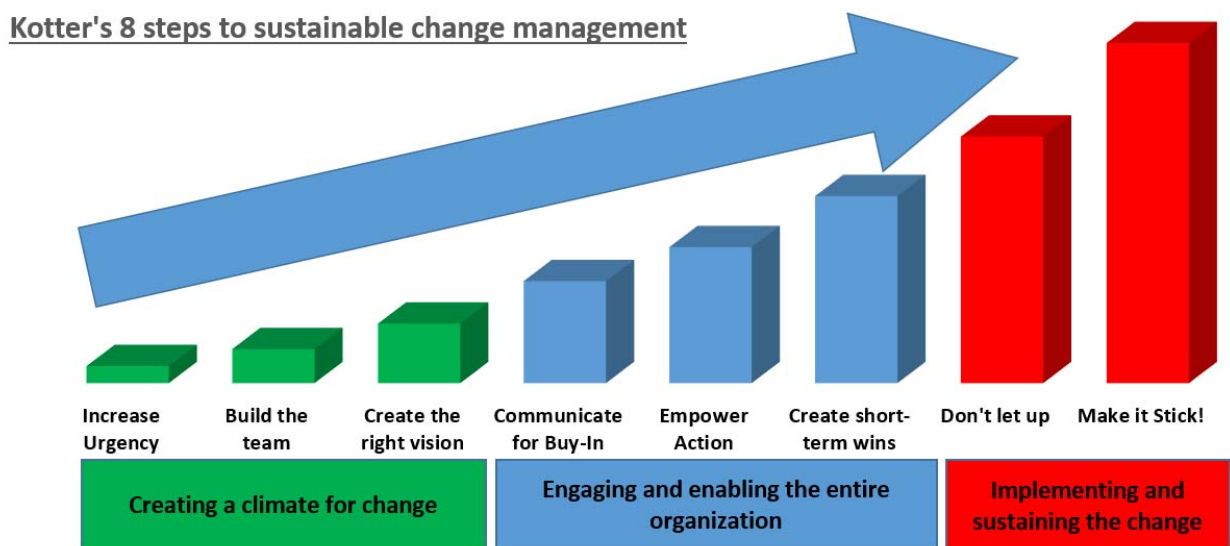

Kotter's 8 steps to sustainable change management

| Increase Urgency | Build the team | Create the right vision | Communicate for Buy-In | Empower Action | Create short-term wins | Don't let up | Make it Stick! |

| Creating a climate for change | Engaging and enabling the entire organization | Implementing and sustaining the change |

Figure 39 - John Kotter's eight steps to change management

Source: Adapted from Kotter's Change Management Model (Kotter, 2009)

The essence of John Kotter's change management theory is that change requires a great deal of time, effort, planning and process to be successful. When companies force change on people through authoritative channels, they do not get the opportunity to be a part of the change. The natural tendency for people in this situation is to resist the change. This is human nature. In a more modern sense, imposed change also carries a connotation that people were not doing a good

job in the first place. This can be damaging to the ego, further reinforcing a defensive and resistant stance to the proposed change. The table below describes specifically the practices that exists at HVC and the steps the change outlined by Kotter in table 3.

Table 3 - Alignment of CI practices with change management theory

Change Management Step - Kotter	CI Practices - HVC
1) Increase the sense of urgency	Targeting and Variance KPI tracking 5 Year Planning
2) Build a guiding team	Cross-functional teams for ideas Idea Owners
3) Create the right vision for the change	Idea Generating Sessions Value Driver Trees Idea Forms RARs - Prioritization
4) Communicate the vision for buy-in	CI idea posters Coaching Idea Owner Reviews
5) Empower action	Targeting and Variance Accountability through Idea Ownership and RARs Idea Owner Reviews Provide value based analysis to line managers
6) Create short-term wins	Idea pipeline progress RARs - praise and accountability
7) Don't let up	Targeting and Variance processes RARs - Priority deliverables Idea Owner Reviews
8) Sustain the change	Locked in idea KPI review - quarterly Monthly cost tracker RARs

CI at HVC incorporates all the process steps outlined by the above change management model. The continuous improvement cycle starts with a target. In perfect alignment with change

management theory, creating a sense of urgency. Accountability to a target provides line managers the reason to try something new or change. The guiding team is typically comprised of the CI department facilitators for the specific department and a cross-functional team of individuals from the department. Once ideas surface from the workers at an idea generating session, idea ownership delivers the change management aspects of team, buy in, and communication of vision. The idea form acts as a record of the vision for the change and promotes a clear understanding of who completes what actions by when. Empowerment the idea owner is primarily discussed in the idea owner's RAR meeting. Further action empowerment toward change comes through the targeting and variance process. Results of the efforts put toward a positive change idea will be evident in the weekly and monthly key performance indicators. The RAR and the targeting and variance processes provide an opportunity for praise and short terms wins. The cycle continues with reinforcement of the improvement idea through idea owner reviews. Additional reinforcement comes from KPI reviews at the weekly and monthly targeting and variance sessions. The stage gate process of the idea pipeline promotes a sustained motivation toward a locked in practice within the department. Once the improvement ideas is implemented, the sustainability of those ideas is addressed through individual RARs, the targeting and variance process, and a quarterly locked-in idea KPI review. Throughout the CI process, idea pipeline reviews further promote the last two elements of the Kotter change management model, "don't let up" and "sustain the change". The Kotter change management process mirrors each step along the implementation path of improvement ideas.

3.3.5.2 CI Principles Fostered by Change Management

Change management theory is embedded within all CI practices. Consequently, the change management element of CI fosters the CI principles by enabling all other elements. Change management does explicitly address many of the principles also. The development of a

sense of urgency communicated using targets as visual controls aligns with the Toyota CI ethic well. Confirming the right vision for change aligns well with the CI principles concerning making decisions slowly and by consensus in order to implement change quickly. Building a guiding team for change translates the CI principle of developing your people and teams to HVC well. Robust communications protocols as described by change management theory aligns with becoming a learning organization through reflection. Overall, change management supports many CI principles directly and indirectly.

3.3.5.3   Survey Results for Change Management

The survey did not include any questions that explicitly requested the respondents indicate the extent to which CI is in alignment with change management theory. However, the extent to which the respondents commented on attributes of the CI practices does allow for an analysis. As illustrated in Table 3, every aspect of change management has associated practices within CI. The first instance of such commentary is with respect to the RARs. The survey asked the respondents to indicate the three best attributes of the RAR for them. The results indicated the most popular attributes were those that align with change management theory.

What is the best parts of the RAR for you?

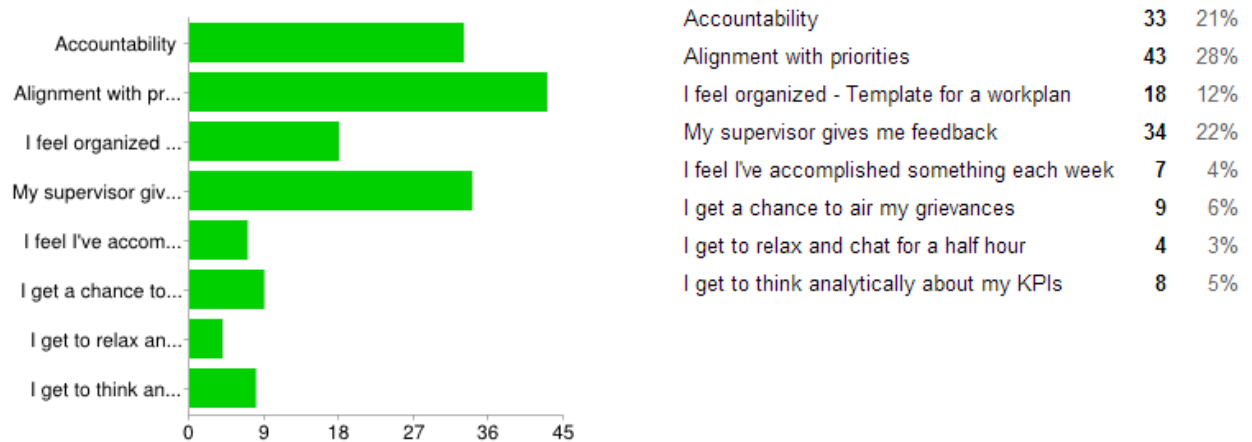|		
Accountability	33	21%
Alignment with priorities	43	28%
I feel organized - Template for a workplan	18	12%
My supervisor gives me feedback	34	22%
I feel I've accomplished something each week	7	4%
I get a chance to air my grievances	9	6%
I get to relax and chat for a half hour	4	3%
I get to think analytically about my KPIs	8	5%

Figure 40 - Best part of a RAR survey results

Source: Survey Form Results (2014)

Accountability creates empowerment within the change effort and is the third most popular attribute as seen by the survey respondents. With respect to communication of any change efforts, the second most popular response was in alignment with feedback from the supervisor. The popularity of this response also indicates that employees value the appraisal from their supervisors, which is important for empowerment, buy in, and short term wins for change efforts. Finally, the most popular response is in direct support of change management theory through a recognition of alignment. Prioritization and alignment support the vision, actions, and sustainability of change. If the RAR supports alignment with priorities for a change effort, there will be sustained momentum toward implementation of the change. It is clear from the responses that those who engage in the RAR process see the value of the exercise specifically related to its strength in change management.

With respect to the sustainability of the CI process and therefore the change management practices fostered by the CI process, survey results were less than ideal. The survey asked respondents to indicate how long the CI practices such as RARs, targeting and variance, and improvement ideas would continue beyond the departure of the CI department. An overwhelming proportion of respondents indicated that these practices would cease within a month.

Last question! If the CI department left your department to manage itself, how long until you couldn't tell CI was ever there?

1 Week	24	34%
1 Month	14	20%
3 Months	10	14%
6 Months	7	10%
1 Year	6	8%
We would never drop the CI processes	10	14%

Figure 41 - Sustainability of CI survey results

Source: Survey Form Results (2014)

Only a small proportion of respondents indicated that they would never drop CI processes from their department. With respect to sustainability, speculation indicates that those respondents followed change management theory during CI implementation in their department. Meaning, they feel empowered by CI because implementation of CI in their department followed change management theory. The remainder of respondents indicated less sustainability of CI practices in their departments. Seventy-five percent of respondents indicated that CI would be gone from their department within 6 months. A lack of diligence with the formal change management practices could be the main influence behind this survey result.

3.3.5.4   Potential Next Steps for Change Management at HVC

While the theory of CI and change management align well, it appears by the results of the survey that the sustainability of CI at HVC is tenuous. The survey result is a function of the respondents understanding of CI practices, and the application of that understanding to the sustainability of CI in their department. That is the essence of the main recommendation of this paper. Bolstering the formal aspects of CI should bring the CI culture at HVC into closer alignment with theoretical change management, consequently increasing the sustainability of CI within all departments of HVC.

3.4   Putting the Pieces of HVC's CI Together

We have reviewed the five elements of HVC's CI implementation. Each element endorses CI just as the Toyota's fourteen principles do in auto manufacturing. The survey results indicated that all five elements still require further efforts to reach a sustainable implementation. The next section discusses the next steps to keep the CI implementation on track.

4: The Next Steps of CI Implementations at HVC

This chapter incorporates the principles learned from Chapter 2 and the analysis from Chapter 3 to provide HVC management with guidance on the next steps of CI implementation at HVC. This chapter recommends three follow-up steps with suggested timelines and prioritized actions for implementing CI fully at HVC. I have consulted HVC management and they are in full support of the proposed steps. HVC management is committed to carrying out the steps. Further to these recommended steps, CI personnel will continue to track implementation of CI culture at HVC. Finally, CI personnel will administer a survey annually to gauge HVC employees' understanding of CI and its goals.

The General Manager should re-establish the original intent of CI implementation at HVC with the entire staff. Meaning, everyone should review at regular intervals the reasons HVC practices CI. This global step aims to improve ownership of improvement efforts within the line departments (operations, maintenance, engineering, and technical). As is consistent with change management theory, clear communication will contribute to improved use of resources toward improvement idea implementation.

4.1 Step #1: Reset the Formalization of CI Practices

With reference to CI practice at HVC aligning with change management theory, HVC should reset the formal aspects of CI. The results of the survey surrounding sustainability were less than ideal. Acknowledgement of this indicates further efforts toward diligence with change management theory will result in increased sustainable adoption rates within the operation departments of HVC. This idea, in combination with the subsequent two recommendations, will

set the implementation of CI at HVC on track to meet the original mission statement as articulated by the Teck corporate operational excellence group:

> *Our vision is to embed an improvement culture within our organization that can continually recognize, analyze, prioritize and act on opportunities to improve our results and all other values central to our business.*

Specifically, Table 4 shows the main CI elements of focus and associated actions that need a reset.

Table 4 - Specific change management reset actions for CI at HVC

Continuous Improvement Element	Current State	Change Management Reset Action	Priority	Target Date
Ideas	Monthly Reviews – no idea owners present.	Involve line Superintendents in bi-weekly idea pipeline reviews with their line idea owners (Outlook calendar event reoccurring every 2 weeks).	1	Immediately
	Ad Hoc accountability.	Idea ownership is held accountable to progress at reoccurring idea owner review meetings with their superintendent.	2	Immediately
RARs	Reviewed Quarterly with no discrete targets for improvement.	Install a RAR audit review monthly meeting with Operations and Maintenance Managers. This review would set the expectation that RARs improve. This recommendation is in defense of RAR complacency.	4	Q3 2014
		Set targets with line superintendents for RAR quality – to be reviewed with managers monthly.	5	Q4 2014
Coaching	Matrix not used.	Re-install the competence matrix for CI facilitators and leads with target dates to achieve skills.	6	Q1 2015
Targeting and Variance	Ad Hoc attendance with no formal effort to disseminate knowledge surrounding CI efforts with targeting and variance processes.	Provide guidance to line managers (Senior foremen, General Foreman, and Superintendents) with respect to involving all individuals in their department with the target and variance processes – to gain buy in for the process with front line supervisors. Specifically, one opportunity would have the superintendent bring each of his or her staff, one at a time, to the monthly variance and targeting session.	3	Q3 2014

4.2   Step #2: Develop a Communications Protocol and Implement

The change management theory is explicitly clear on this aspect of change. Kotter's change management model suggests that throughout any change effort communications in a formal, timely, and effective fashion are mandatory. Specifically, HVC should engage in the development of a standard set of guiding principles for communications during the CI processes. The following table outlines the updates to the communication plan:

Table 5 - Recommended communications protocols related to specific CI processes

Related CI process step	Communications Protocols	Priority	Target Date
Targeting and Variance	Keep KPI charts in public areas of the site up to date monthly.	3	Q3 2014
Idea generating sessions	One page posters of the issue at hand to be posted 2 weeks prior to holding the session with requests for input.	4	Q3 2014
	After the session, a poster revealing the ideas selected for immediate attention posted.	5	Q3 2014
Idea ownership	All public improvement idea communications to come from superintendent or idea owner (with support from CI department)	1	Immediately
	Improvement public notices must have the following: 1. Relevent input and output KPI charts 2. Brief description of issue and idea 3. Description of Benefits (extra tonnes, or $) 4. Status of idea 5. Request for feedback to idea owner 6. Signature of Idea Owner	2	Immediately

In addition to the above prescriptive protocols, HVC should further reinforce the vision and mission statements from the corporate operating excellence group established at the outset of CI implementation. "Line" managers that understand the vision statement of CI have a greater chance of improving their operation as well as the mission statement of CI. Open and transparent communication related to CI practices reinforces the sense that CI is a conversation. If there are aspects of an improvement idea that have not been addressed, revealing the ignorance of the idea publically may be the only way to face those challenges and move forward. Those conversations create a higher likelihood of stakeholder buy in as well and ultimately increased sustainability of CI culture at HVC.

4.3 Step #3: Pertaining to CI, HVC Should Clearly Define the Progression Requirements

In addition to defining a clear path for the future managers of HVC with respect to their participation in CI, HVC should clearly define the requirements for secondment to the CI department. Formal tracking of the development of CI workers toward a specific skillset further incorporates strong change management ethic for sustainable results. Investment in the development of CI workers then becomes a clear decision. The CI department becomes a training ground for managers with a proper definition of the traits that foster a continuous improvement culture. CI personnel then foster CI culture upon reintroduction to the "line" from secondment.

The same process for setting targets should be in place when considering individuals for secondment to the CI group. Establishing expectations for development and empowerment to that development through stewardship are paramount for embedding CI principles in the management of HVC. The leadership of HVC, along with previous CI seconded managers should engage in development of a robust skills development matrix. After those managers approve the matrix, CI leadership must use it when determining whom to second to the CI group for development. Furthermore, seconded individuals should use the matrix to demonstrate their effectiveness as CI managers back in the line. The recommendations above along with strong executive support will position HVC to be in alignment with CI principles and establish CI as the dominant management culture.

5: Conclusion

Understanding the extent to which CI at Toyota has increased their effectiveness in their industry gives rise to application of the principles of CI in other industries. With recognition that automobile manufacturing and resource mining are different operations and industries, the paper considered different CI elements from Toyota's CI principles. While the survey results of the staff at HVC were positive, cultural change still requires more work and time. Analysis of the CI practices at HVC compared with the benchmark of CI principles and practices at Toyota allowed for discussion of the state of implementation at HVC. Because the automotive manufacturing and mining industries are different on product quality and consumer demand diversity, the CI principles established are cosmetically different. However, the foundation of both the Toyota and HVC application of CI are identical. The philosophy is the same. The only attribute missing at HVC is full integration of the practices that wholly enable the principles.

Change management plays a role in every CI practice. The paper recognizes change management as a significant contributor to the recommendations for HVC. Those recommendations will create habits within the management team. Stabilization of the process through constant coaching and guidance from CI personnel will support this slow advancement in culture. Finally, in alignment with the original mission statement of the Teck corporate operational excellence group, HVC will advance the implementation of continuous improvement within the organization through execution of the recommendations.

> *Our vision is to embed an improvement culture within our organization that can continually recognize, analyze, prioritize and act on opportunities to improve our results and all other values central to our business.*

Appendices

Appendix A – Survey Form

Continuous Improvement (CI) Implementation
* Required

1. **What position level do you currently hold?** *
   Mark only one oval.

   ◯ Foreman
   ◯ Planner / Scheduler
   ◯ Technician
   ◯ Senior Foreman
   ◯ General Foreman
   ◯ Superintendent
   ◯ Manager

2. **Are you, or have you ever been, directly involved with any continuous improvement ideas?**
   *
   Are you an idea owner or have you been?
   Mark only one oval.

   ◯ Yes
   ◯ No
   ◯ Yes, idea owner in the past but not currently
   ◯ I've assisted in CI ideas but never an owner

3. **Do you believe there is value in having a RAR meeting?** *
   Mark only one oval.

   ◯ Yes   *After the last question in this section, skip to question 5.*
   ◯ No   *After the last question in this section, skip to question 9.*
   ◯ Maybe, if only...   *After the last question in this section, skip to question 12.*

4. **Do you perform a weekly or bi-weekly Results-Action-Review (RAR) meeting?** *
   Mark only one oval.

   ◯ Yes
   ◯ No
   ◯ I'd like to, but my boss is too busy!

2
You answered yes!

5. **What is the best parts of the RAR for you?** *

Select your top three.

Check all that apply.

- ☐ Accountability
- ☐ Alignment with priorities
- ☐ I feel organized - Template for a workplan
- ☐ My supervisor gives me feedback
- ☐ I feel I've accomplished something each week
- ☐ I get a chance to air my grievances
- ☐ I get to relax and chat for a half hour
- ☐ I get to think analytically about my KPIs

6. **Do you feel you've gotten adequate coaching from the CI department?** *

Mark only one oval.

- ◯ Yes
- ◯ No

7. **Do you feel like you are more in control of your work using the RAR process?** *

Mark only one oval.

- ◯ Yes
- ◯ No

8. **If given the option, would you like to cease producing and engaging in the RAR process?** *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Not a chance, I can't live without it now!

Skip to question 13.

3

You answered no... interesting...

9. **Please select the number one reason you feel the RAR process doesn't provide any value:** *

Mark only one oval.

- ◯ Waste of time
- ◯ Nothing ever changes based on the RAR
- ◯ We already talk about everything - RAR is redundant.
- ◯ I'm always beaten up in the meeting.

10. **If the RAR was easier, would you say it would be more valuable? ***

Mark only one oval.

◯ Yes

◯ No

11. **What is the hardest part of the RAR process for you? ***

Mark only one oval.

◯ Excel

◯ Time - Too busy

◯ Fetching the data for my RAR

◯ Prioritization

Skip to question 13.

4

Maybe you say? Tell us more...

12. **What would you change, and why? ***

Just one quick short answer would be great.

....

....

....

....

....

Skip to question 13.

5

The ideas pipeline.

13. **The ideas pipeline. What does it mean to you? ***

Mark only one oval.

◯ What's an ideas pipeline?

◯ An engine of prioritization and project management whose ownership resides in the the department

◯ A great place to have my ideas be heard and implemented by CI

◯ A testing ground for process improvements

14. **How would you rate the implementation of the ideas pipeline into your department?** *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
What's an idea pipeline?	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	This department works on the idea pipeline everyday!

15. **How valuable do you feel it is to have a pipeline to help you implement your departments ideas?** *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
We can implement ideas on our own.	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	It's the only way to truly change any process.

16. **During your RAR, assuming you complete one, do pipeline ideas get discussed or decision made surrounding their progress?** *

Mark only one oval.

◯ Yes

◯ No

◯ I don't complete a RAR

◯ My supervisor has never asked about the pipeline

17. **Do you feel the pipeline should reside in CI or with the department where the ideas come from?** *

Mark only one oval.

◯ CI

◯ Department where ideas reside

◯ Other: ....

99

18. **Do you feel as though you get adequate support from CI to properly advance your ideas?** *
   Mark only one oval.

   ◯ Yes

   ◯ No

   ◯ Other: ....

6
Coaching and improvement.

19. **Be honest... Do you prefer your job with CI presence or without?** *
   Mark only one oval.

   ◯ With CI

   ◯ Without CI

   ◯ Other: ....

20. **To what extent do you think CI has made HVC a learning organization?** *
   A learning organization is defined as one that continuously transforms itself and seeks knowledge.
   Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
ZERO impact on learning	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	I learn something every day because of CI

21. **Does your CI representative provide meaningful, insightful coaching from time to time?** *
   Perhaps some advice on how to prioritize, or manage to KPIs, or assist you in overcoming the uncertainty in a decision?
   Mark only one oval.

   ◯ Absolutely

   ◯ Sometimes

   ◯ Rarely

   ◯ Almost never

   ◯ Other: ....

7
Variance and Targeting

22. **What value do you see in the DAILY variance and targeting session?** *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
We have daily variance and targeting?	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	Great place to communicate, couldn't live without it.

23. **What value do you see in the WEEKLY variance and targeting session?** *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
We have Weekly Variance and Targeting?	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	Couldn't operate the site without it.

24. **What value do you see in the MONTHLY variance and targeting session?** *

Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
We have monthly Variance and Targeting?	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	⬭	Couldn't operate the site without it.

25. **Do you feel the targets for your area are achievable and within your control?** *

Mark only one oval.

- ⬭ Achievable yes, but not always within my control.
- ⬭ Achievable yes, and mostly in my control.
- ⬭ Not achievable, usually in my control.
- ⬭ Not achievable, mostly out of my control.
- ⬭ Targets are typically assigned to me with little consultation.

26. **Do you feel your departmental targets align well with your BSWP incentives? ***

    Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
No alignment	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	All BSWP incentives cascade up to departmental targets.

8

General thoughts about continuous improvement

27. **Do you feel as though CI has promoted a progressive culture of accountability? ***

    An accountability culture of learning as opposed to one of judgement.

    Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
Total culture of judgement	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	Total learning environment

28. **What percentage of the time, would you say, do you have the data to prioritize your own work? ***

    Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
Never (0% of the time)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	Always (100% of the time)

29. **What percentage of the time, would you say, do you have the data to prioritize your subordinates work? ***

    Mark only one oval.

	1	2	3	4	5	6	7	8	9	10	
Never (0% of the time)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	Always (100% of the time)

30. **With a CI presence, do you feel more or less in control of your work and the management of HVC?** *

Mark only one oval.

- ( ) More
- ( ) Less
- ( ) Same
- ( ) Other: _____

31. **Last question! If the CI department left your department to manage itself, how long until you couldn't tell CI was ever there?** *

Mark only one oval.

- ( ) 1 Week
- ( ) 1 Month
- ( ) 3 Months
- ( ) 6 Months
- ( ) 1 Year
- ( ) We would never drop the CI processes

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Appendix B – Survey Form Results

73 responses

View all responses   Publish analytics

Summary

What position level do you currently hold?
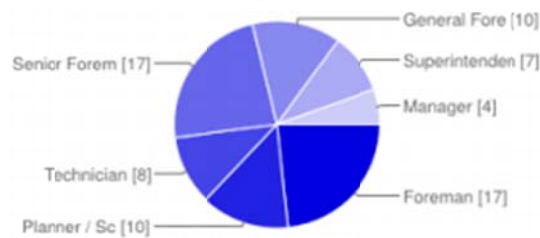
Foreman	17	23%
Planner / Scheduler	10	14%
Technician	8	11%
Senior Foreman	17	23%
General Foreman	10	14%
Superintendent	7	10%
Manager	4	5%

Are you, or have you ever been, directly involved with any continuous improvement ideas?
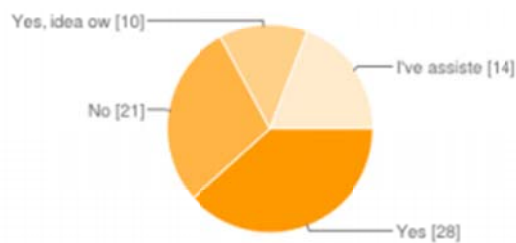
Yes	28	38%
No	21	29%
Yes, idea owner in the past but not currently	10	14%

105

I've assisted in CI ideas but never an owner   **14**   19%

Do you believe there is value in having a RAR meeting?
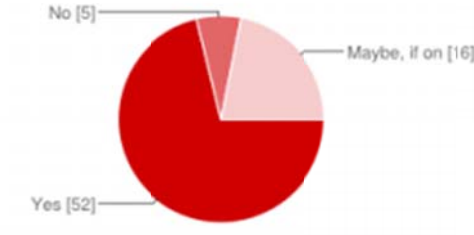
Yes	52	71%
No	5	7%
Maybe, if only...	16	22%

Do you perform a weekly or bi-weekly Results-Action-Review (RAR) meeting?
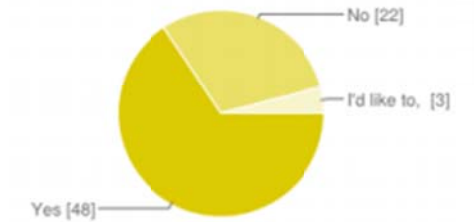
Yes	48	66%
No	22	30%
I'd like to, but my boss is too busy!	3	4%

2

What is the best parts of the RAR for you?
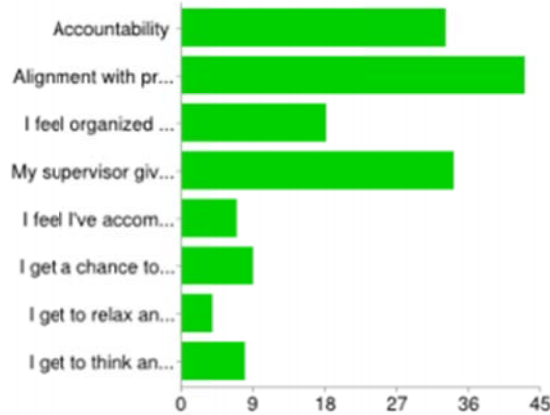
Accountability	33	21%
Alignment with priorities	43	28%
I feel organized - Template for a workplan	18	12%
My supervisor gives me feedback	34	22%
I feel I've accomplished something each week	7	4%
I get a chance to air my grievances	9	6%
I get to relax and chat for a half hour	4	3%
I get to think analytically about my KPIs	8	5%

Do you feel you've gotten adequate coaching from the CI department?
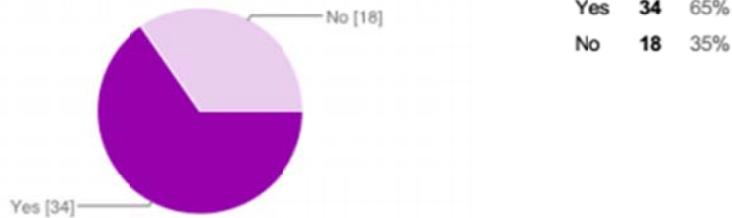
Yes	34	65%
No	18	35%

Do you feel like you are more in control of your work using the RAR process?

Yes	33	63%
No	19	37%
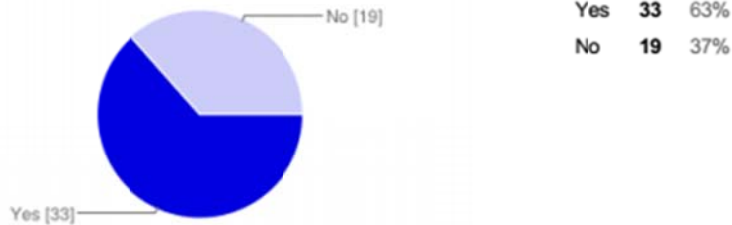
If given the option, would you like to cease producing and engaging in the RAR process?
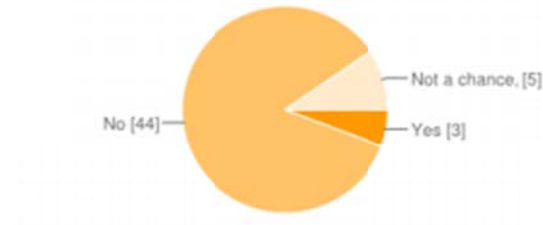
Yes	**3**	6%
No	**44**	85%
Not a chance, I can't live without it now!	**5**	10%

3

Please select the number one reason you feel the RAR process doesn't provide any value:
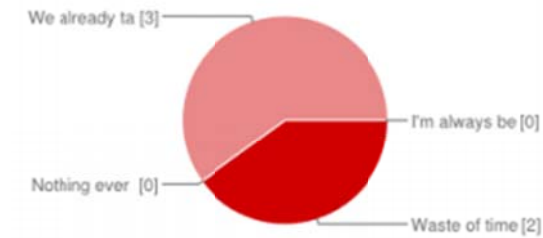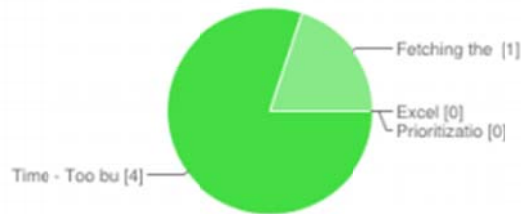

Waste of time	**2**	40%
Nothing ever changes based on the RAR	**0**	0%
We already talk about everything - RAR is redundant.	**3**	60%
I'm always beaten up in the meeting.	**0**	0%

If the RAR was easier, would you say it would be more valuable?

108

Yes	2	40%
No	3	60%

No [3]

Yes [2]

What is the hardest part of the RAR process for you?
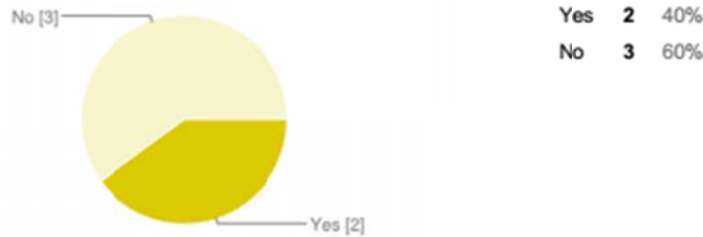
Fetching the [1]

Excel [0]
Prioritizatio [0]

Time - Too bu [4]

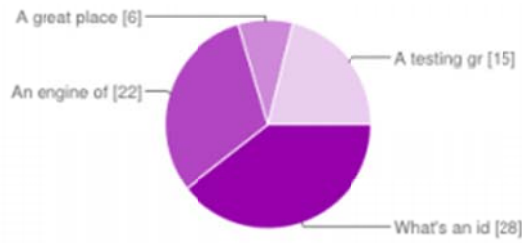|		
Excel	0	0%
Time - Too busy	4	80%
Fetching the data for my RAR	1	20%
Prioritization	0	0%

4

What would you change, and why?

ok   I have never been involved with a RAR.   We have never acted on our KPI's other than changing the goal posts.   RAR process is only just beginning. I have no basis on which to judge its effectiveness, yet.   Not familiar with the process so don't know.   The RAR process is not currently utilized, in its entirety, within the Human Resources area   more continuity, as in all levels to participate   Go to a simple discussion of the week past and current to see if objectives are achievable and what has been met or missed and why.   Don't have RAR and I am not sure what it entails.   I am not overly familiar with the process, so I cannot comment on it's value.   Real World Assesments of savings would have value & increase participation.   Never done one so not sure   Involvement in all areas - to date seems limited focus   RAR's are only wothwhile if you do not have direct contact with your supervisor. If you are in the position of working and interacting with your supervisor each day you are going thru the process on a daily basis. Doing the RAR is a sumerization of those points.   unstructured - detail priorities and issues, some designation of deadlines and timelines, but without the obstruction of formality and templates   If I knew what it

109

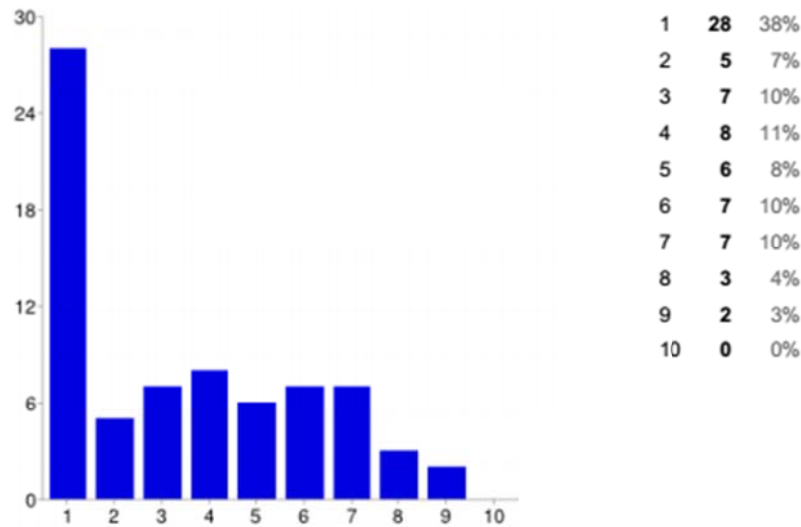was on site. Only have a vague idea of what the CI department even does.

5

The ideas pipeline. What does it mean to you?

|		
What's an ideas pipeline?	28	39%
An engine of prioritization and project management whose ownership resides in the the department	22	31%
A great place to have my ideas be heard and implemented by CI	6	8%
A testing ground for process improvements	15	21%

How would you rate the implementation of the ideas pipeline into your department?

1	28	38%
2	5	7%
3	7	10%
4	8	11%
5	6	8%
6	7	10%
7	7	10%
8	3	4%
9	2	3%
10	0	0%

How valuable do you feel it is to have a pipeline to help you implement your departments ideas?

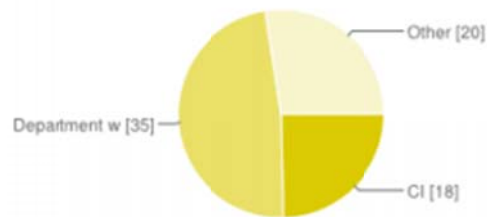| 1	12	16%
2	3	4%
3	7	10%
4	4	5%
5	18	25%
6	6	8%
7	7	10%
8	8	11%
9	5	7%
10	3	4%
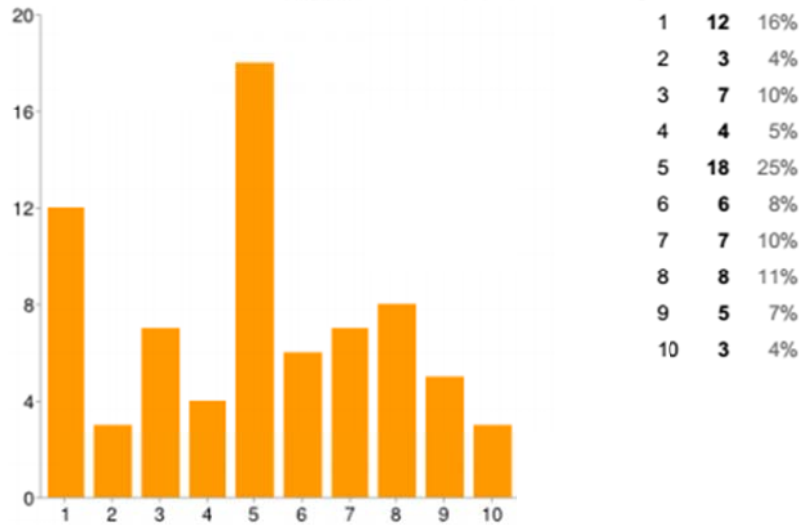
During your RAR, assuming you complete one, do pipeline ideas get discussed or decision made surrounding their progress?
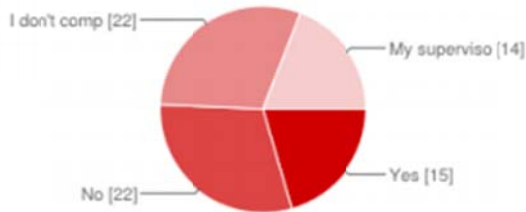
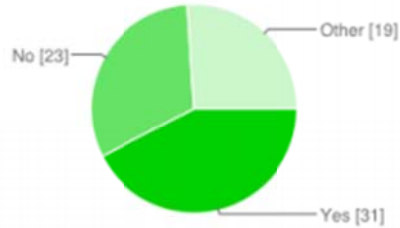| Yes	15	21%
No	22	30%
I don't complete a RAR	22	30%
My supervisor has never asked about the pipeline	14	19%

Do you feel the pipeline should reside in CI or with the department where the ideas come from?

CI	**18**	25%
Department where ideas reside	**35**	48%
Other	**20**	27%

Do you feel as though you get adequate support from CI to properly advance your ideas?

Yes	**31**	42%
No	**23**	32%
Other	**19**	26%

6

Be honest... Do you prefer your job with CI presence or without?
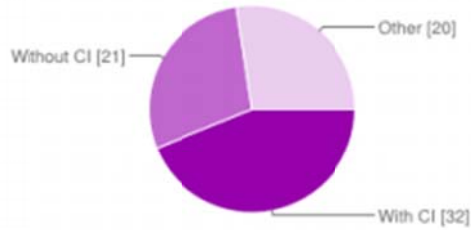
With CI	**32**	44%
Without CI	**21**	29%
Other	**20**	27%

To what extent do you think CI has made HVC a learning organization?
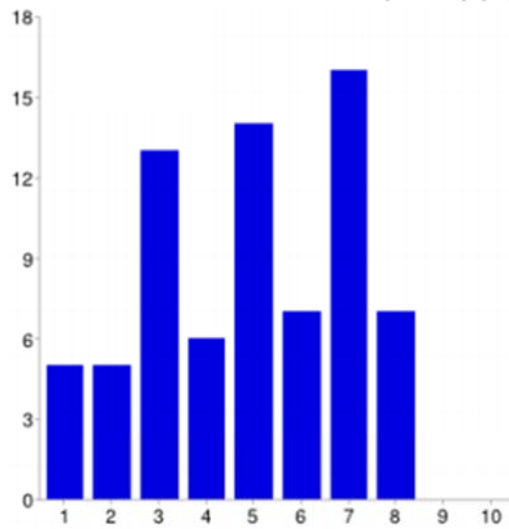
1	5	7%
2	5	7%
3	13	18%
4	6	8%
5	14	19%
6	7	10%
7	16	22%
8	7	10%
9	0	0%
10	0	0%

Does your CI representative provide meaningful, insightful coaching from time to time?
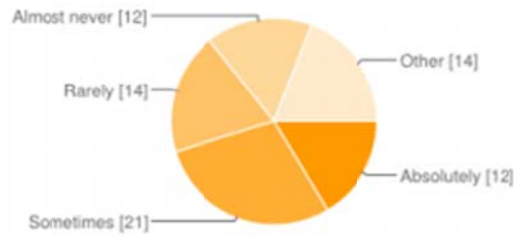
Absolutely	12	16%
Sometimes	21	29%
Rarely	14	19%
Almost never	12	16%
Other	14	19%

7

What value do you see in the DAILY variance and targeting session?

113
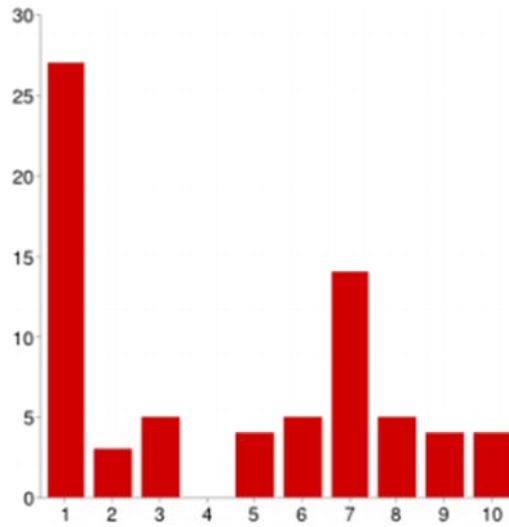
1	27	38%
2	3	4%
3	5	7%
4	0	0%
5	4	6%
6	5	7%
7	14	20%
8	5	7%
9	4	6%
10	4	6%

What value do you see in the WEEKLY variance and targeting session?
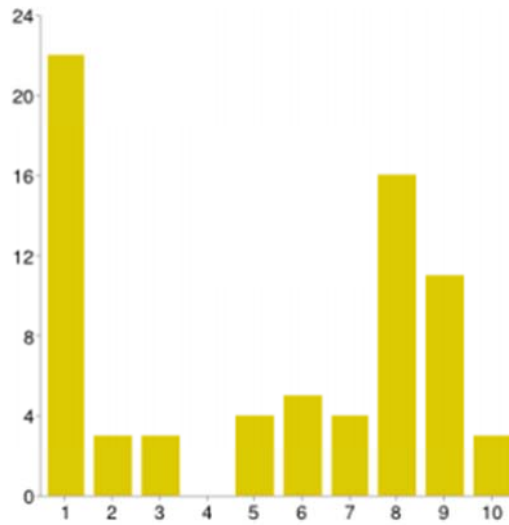
1	22	31%
2	3	4%
3	3	4%
4	0	0%
5	4	6%
6	5	7%
7	4	6%
8	16	23%
9	11	15%
10	3	4%

What value do you see in the MONTHLY variance and targeting session?

114
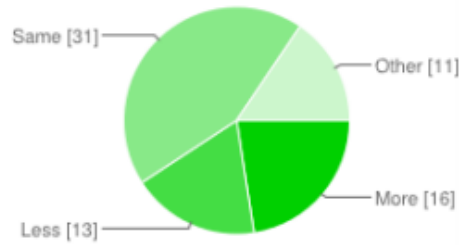
More	**16**	23%
Less	**13**	18%
Same	**31**	44%
Other	**11**	15%

Last question! If the CI department left your department to manage itself, how long until you couldn't tell CI was ever there?

1 Week	**24**	34%
1 Month	**14**	20%
3 Months	**10**	14%
6 Months	**7**	10%
1 Year	**6**	8%
We would never drop the CI processes	**10**	14%

115
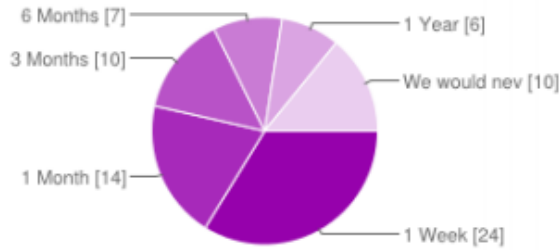
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