Continuous Improvement (CI) and its application to Australian Viticulture

The study of CI management philosophies and their value in Australian viticulture.

A report for

By Stuart Sharman

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Executive Summary

Australian viticulture faces the challenge of building on its strong global market position, by over delivering quality grapes at world competitive prices. To achieve this objective Australian viticulture should consider adopting Continuous Improvement (CI) management philosophies, used widely and successfully, across the globe in many other sectors of the economy. If the Australian viticultural sector does not embrace change and challenge the norm, the survival of the sector will be challenging.

The continuous improvement observations by the author, during the course of 2012 and 2013, highlight the following;

- Continuous Improvement management philosophies are very common in manufacturing, finance and value adding sectors of the economy.
- Extended business relationships and employee retention are paramount to business success.
- Multiple small continuous improvement activities, undertaken by all members of a business, are a more achievable objective than singular large actions.
- Continuous improvement must involve all members of the business unit and will require an investment in time and patience.
- Continuous improvement activities are not expensive, stressful on participants or a "new fad".
- Continuous improvement philosophies should not be used to reduce labour requirements.

The activity of deliberate business improvement must ensure a Planned activity, that can be Done by all members of the business, Checked against predetermined measures and Acted upon based on considered deliberation (PDCA). To achieve these activities, the author recommends the following CI tools;

- Australian viticulture needs to adopt standard Visual Management techniques.
- Australian viticulture needs to use a 5 S approach within its work place.
- Australian viticulture needs to use Waste Identification approaches, across the sector.
- Australian viticulture needs to apply structured Problem Resolution Templates across the sector.

The successful adoption of these tools will deliver results that will translate into handsome financial returns.

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Foreword

As a vineyard manager for Wynns Coonawarra Estate (a business unit of Treasury Wine Estates: TWE), my involvement with Continuous Improvement (CI) management, commenced in 2010, with an introduction to CI and acceptance of 'pilot site' status, to roll out CI within the grape supply department of TWE.

Since 2010, participation in CI within TWE's Coonawarra's vineyard has involved the capacity and knowledge building of 60 permanent staff, understanding value across the value chain for fruit grown, waste reviews within vineyard operations, and extensive problem analysis/resolution. These activities have not been limited to fruit growing operations, but have also incorporated field machinery maintenance teams, administration support and our technical monitoring programs.

Cross-fertilisation of knowledge between agricultural sectors and other sectors of the economy is vital to maintaining competitive advantage. CI is one management technique widely used in manufacturing, service industries, finance, health, and the processing sectors, but not widely used before the 'farm gate' in viticulture or agriculture.

To explore this observation my research was conducted within the domestic market and internationally, to understand where CI has been used, and with what success and what lessons are able to be shared with other viticulturist and primary producers. Many of the businesses visited were proud and knowledgeable regarding the improvements made to their operation, but few were achieving the results of more mature CI businesses, like Toyota or Fonterra are achieving.

While viticulture is consistently dealing with completely uncontrollable business and climatic conditions, many strategies observed during the Contemporary Scholars Conference, Global Focus Tour, private field visits, fellow scholar conservations and business case reviews,

highlighted that some CI practices are occurring “in the vineyard or paddock” but without any of the rigour or structure typical of mature CI businesses.

The lack of ‘vineyard/farm gate‘ activity proved frustrating in identifying suitable operations to visit and discuss their learning’s, however the challenge was subsequently identified to observe early adopters within others sectors of the economy, and observe these management techniques and question what practices could be applied to the vineyard/farm gate level. These observations occurred through visits to manufacturing, value adding, service providers and processing operations in the United Kingdom, France, Germany, The Netherlands and New Zealand.

This report details four recommended CI tools and a pathway to consider for the successful introduction of CI in Australian viticulture.

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Abbreviations

CI:	Continuous Improvement
EL:	Eichhorn –Lorenz, description of vine growth stage nomenclature
GLO:	Grower Liaison Officer
Hoshin:	Japanese translation for compass, document to give business direction or objective
Kaizen:	A continuous improvement activity
Muda:	Japanese translation for waste, anything in a business that does not add value to the customer
PDCA:	Acronym Plan/Do/Check/Act
5S:	Tool to assist in visualising an organised work station
SW:	Standard Work documents outlining the necessary steps required to complete a task
Ridomil®:	Agri-chemical to control downy mildew
Switch®:	Agri-chemical used to control botrytis in grapevines
TPS:	Toyota Production System
Value:	An experience provided to the customer, for an appropriate price, at the right time
VM:	Visual Management, tools used to communicate hoshin & performance to the business
VSM:	Value Stream Map(ing), exercise to determine the process of creating the experience the customer values

Objectives

The objective of this report is to explore the use of CI management philosophies, within the global viticultural and agricultural scene and to determine the effectiveness of these approaches and its suitability to Australian viticultural management.

This objective will be achieved by observing primary producers actively using CI management techniques and by observing other sectors of the economy using CI. Other sectors of the economy will be observed to understand successful adoption strategies that are applicable to Australian viticulture.

Recordings of the observations will be reviewed with reference to Australian viticultural practices and practical recommendations will be conveyed to the reader with examples and recommendations suitable to Australian viticulture.

Chapter 1- Why should Australian Viticulture use Continuous Improvement Management Principles?

The Australian viticulture sector is similar to any other sector of the economy; individuals participate in using resources to create a product that a consumer regards as adding value to their life.

How does this statement translate into the typical vineyard activity?

The grape grower traditionally has land, vines, posts and water (resources) available to grow fruit. They select suitable varieties that the winery (customer) requires and will annually use labour, fuel, chemicals & contractors (resources) to supply the desired quality and quantity of grapes. This is a typical viticultural business activity, so how can (CI) help Australian farmers?

CI assists businesses in the following ways;

- improves the ability & reliability to maximise the value of your product to the customer.
- improves the consistency of your businesses performance in delivering what the customer wants.
- improves the knowledge & the value of contribution of any person or persons who participate in the creation of the value for your product to the customer.
- providing a direction for your business "roadmap/compass" that is transparent to all members of your business.

- in developing a culture in the workplace that relies on empowering employees to take ownership of their work through leadership, standard processes and procedures and respect for peoples capabilities.

The CI philosophies described above originate from the Toyota Production Systems (TPS), originally introduced to Toyota Motor Group in the early 1950's by plant manager Ashii Ohno. By infusing the teachings of W. Edwards Demming, an American statistician and business consultant, Ohno was able to grow the TPS philosophies and embed these in Toyota plants worldwide. Liker, J (2004).

Ashii Ohno studied many of the United States (US) car manufacturing plants and quickly realised very few employees were able to rectify production defects, felt motivated to improve the process, removed waste from the process line, or understood where the US car business was heading. This was the catalyst for the TPS evolution.

The principles of TPS are:

- management decisions are based on a long term philosophy, even at the expense of short term gain.
- continuous improvement flow to bring problems to the surface.
- the "pull" system to avoid overproduction (waste).
- levelling of the workload (standard work).
- the use of visual controls so no problems are hidden (visual management).
- to build a culture of stopping to fix problems to get quality right the first time.
- to standardised tasks are the foundation of CI and employee empowerment.
- to use only reliable tested technology that serves your people and processes.
- to grow leaders who thoroughly understand the work, live the philosophy and teach it to others.
- to develop exceptional people and teams who follow their company's ideals.
- to go and see for yourself to thoroughly understand the situation (go-see-ask-respect).
- to make a decision slowly and by consensus, thoroughly considering all options and implement decisions rapidly.

- to become a learning business through relentless reflection and CI.

Hauss, J. (2009).

By building the capacity of the Toyota employees to identify waste, realise problems, and seek solutions, Ashii Ohno has created a culture where all problems are easily seen and employees feel empowered to solve them and get on with making cars. This cultural foundation is the most powerful aspect of a mature CI business.

If, as a business manager, you answer yes to any of the following questions, then you should consider using CI to help you and your business to improve.

- Do you wish to retain staff you have trained and consider valuable to your business?
- Do you wish to improve the rewards you receive for the effort contributed to the business?
- Do you wish to understand where the problems are occurring in your business?
- Do you want all of your jobs completed on time and right the first time?

Chapter 2 - What Continuous Improvement Tools should be used?

2.1 Knowledge Sharing

The core of any viticultural business is the people within that business and the fruit or wine it produces; without cohesion between these two aspects failure is imminent. The power of sharing the business direction, beliefs, problems, opportunities and weaknesses will allow many problems to be solved and opportunities grasped. The saying 'two heads are better than one' when problem solving or exploring opportunities, illustrates the value in sharing knowledge and encourages all members of the business to consider these issues as their responsibility. This openness will create an enlightened work team who understand their purpose and where they can add value to the fruit or wine. The foundation of a business culture that embraces these ideals will be a business prepared to share its problems and ask for help in solving these concerns.

To understand what information should be shared many businesses will undertake a Value Stream Map (VSM) of their product. This exercise involves the gathering of representatives from all aspects of making wine, visualising the entire method of growing fruit, making wine, bottling and selling and then discussing and sharing each of the opportunities and problems that may be evident in the value map. Once the VSM is complete many of the key business objectives will become evident, which will lead to Visual Management (VM) charters and the development of tools to help everyone understand where the "compass" is pointed.

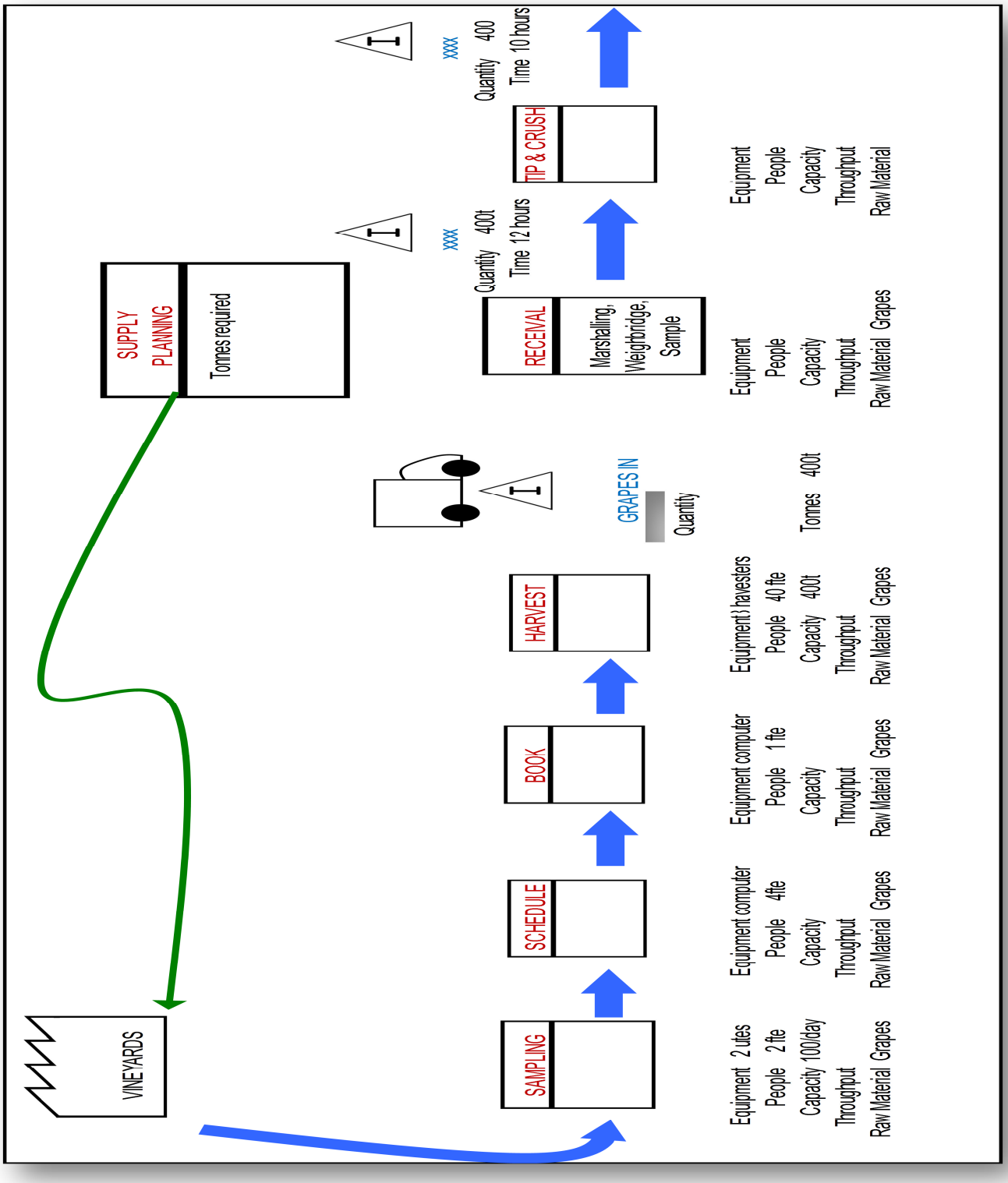

Table 1: Example of vineyard VSM *(Source: Wynns Coonawarra Estate, 2011)*

Understanding what the customer wants is crucial to any business success, but understanding who the customer is, is a necessity prior to answering what they want. As a grape grower you must decide who is your customer; the grower liaison officer (GLO), the winemaker, the brand manager, or the end consumer of the wine?

Winemakers must also decide whether their customer is the cellar door customer, the wine reviewer, the fine wine retailer, the liquor outlets, or the online purchaser.

All these customers have different expectations and requirements, so it is important to understand what they really value. A VSM is the most effective way to fully appreciate where the problems and opportunities lie within the process and to enable everyone to contribute to improving the value the customer receives from the wine.

By using tools, such as value stream mapping, the ability to capture and succinctly present everyone's considerations is invaluable in creating the "compass" and enabling everyone involved to understand where the "compass" is pointed and how the businesses is going to get there.

2.1.1 Visual Management

Some of the tools used in a mature CI business to share and communicate their opportunities, threats, problems etc., are known as Visual Management (VM). Many of these VM tools are posted around work places and/or offices. They can be electronic or paper based and will share necessary information the business believes is crucial to meeting its objectives (the compass).

2.1.2 The Compass (Hoshin)

The compass of the business is the direction which the business wishes to go and the Hoshin will form part of the communication tool to guide the business down this road. Critical to achieving a successful journey down the path, is ensuring everyone in the business is

responsible for their individual actions and feels ownership of the problems identified and resolved.

The Hoshin will form the foundation of goal-setting, identification of business measures, and the allocation of responsibility, timelines and the centre point for regular conversation regarding the CI journey. Many businesses generate business plans detailing history, such as past performance and future business objectives. Unfortunately, these are seldom reviewed or discussed with every team member. The Hoshin captures the essence of the business plan, but presents it in a format which is easily recognisable, and is transferable between years and departments and so provides clarity of the purpose.

The success of achieving objectives identified in the Hoshin can be measured and visualised, as presented below from Double H Nurseries in the UK. Double H Nurseries have identified their strategies and a course to achieve these and have visualised their long term pathway forward.

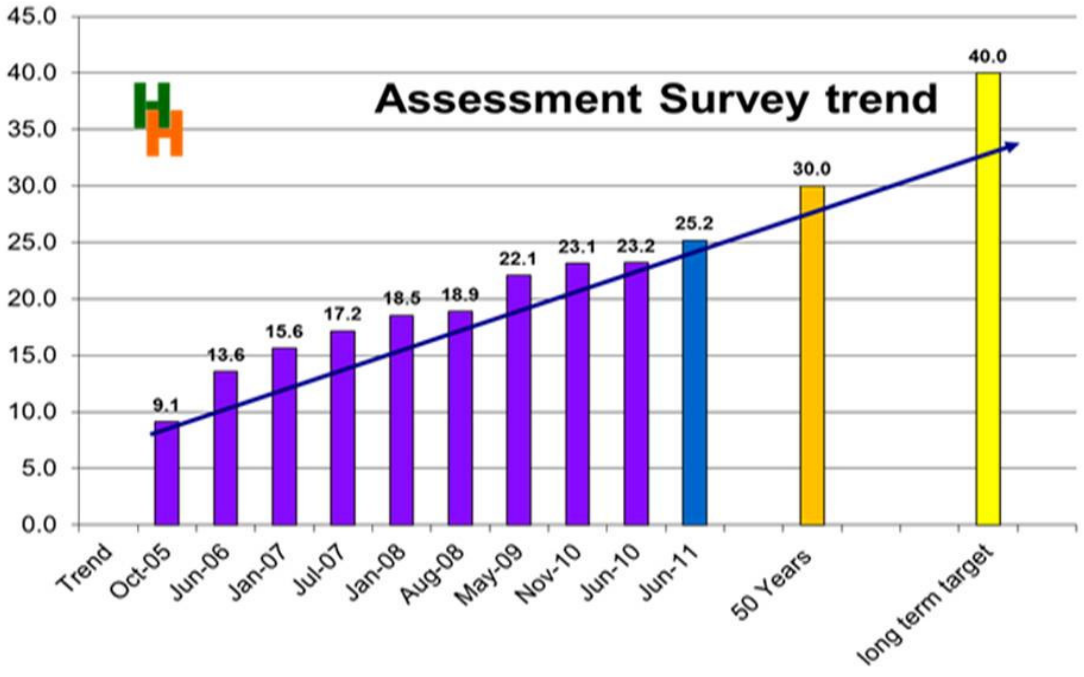

Table 2: Double H Nurseries, UK, 2012

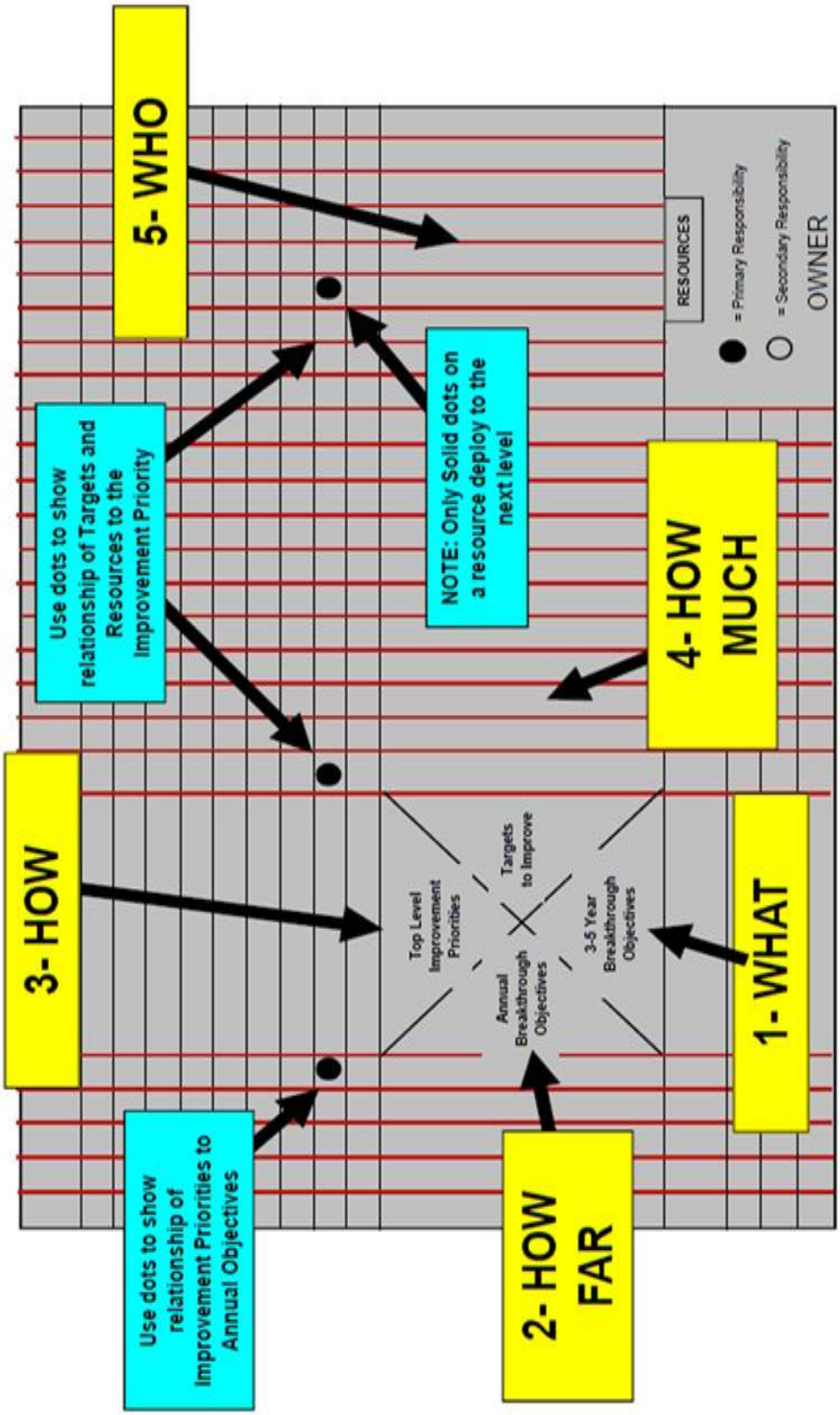

Table 3: Template for Hoshin *(Source: Google Images 2013)*

For a family-owned vineyard with no staff, focusing on fruit production, the details that would occur in the five areas (mentioned in image 3 above) could be;

1. WHAT (3-5 year objective)
    a. Improve irrigation effectiveness.
    b. Increased the knowledge of variable costs & improve profits.
    c. Increased production of B+ graded fruit.
2. HOW FAR (Seasonal Focus)
    a. Improve the understanding of soil moisture levels.
    b. Improve the knowledge of irrigation application uniformity.
    c. Improve water use measuring.
    d. Understand direct costs of vineyard inputs.
    e. Understand what factors contribute to B+ fruit at harvest.
3. HOW (actions)
    a. Install two soil moisture probes.
    b. Complete training on how to read moisture levels & their impact on vine growth.
    c. Trial and measure variable irrigation applications.
    d. Explore timecards for operations.
    e. Complete a labour hour budget for the vineyard.
    f. Compare budget and actual labour costs.
    g. Discuss with the GLO strategies for B+ graded fruit production.
    h. Visit other growers growing B+ fruit.
4. HOW MUCH ($)
    a. Two probes x $3,000 each.
    b. Attend technical training course $500.
    c. Sub-main water meter $1000.
    d. Grower visits $500.
5. WHO
    a. Vineyard owner (VO).
    b. VO and/or partner.

This template clearly demonstrates how the objectives will be met, who is responsible for achieving them and how much capital should be allocated for these improvements. Ideally the development of the Hoshin should occur away from the vineyard, be driven by the priorities of the business owners, displayed in a noticeable area of the business and reviewed monthly.

2.1.3 Visual (Business) Indicators

Visual indicators are used extensively in society and guide us through the maze of our normal everyday lives. Often visual management (VM) is used to indicate traffic directions, hazards on the road, ideal operating machine conditions or personal danger. These VM aids are designed to be clear, attention grabbing and simple.

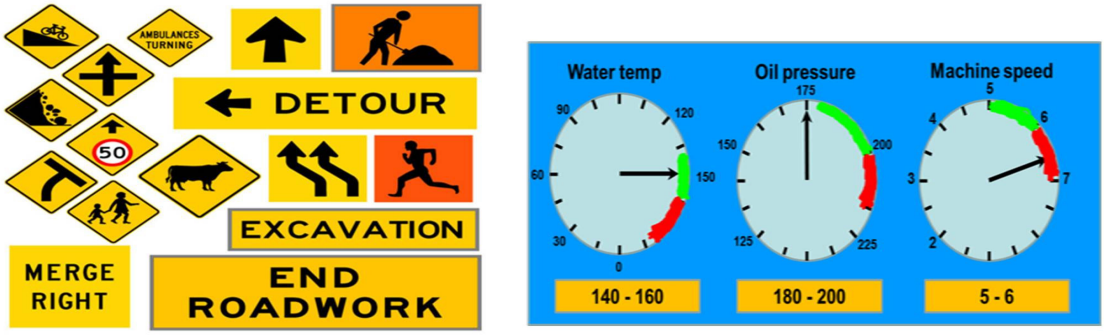

Table 4: Public VM aids *(Source: Google Image, 2013)*

These visual aids help us to complete the task, ensure the safest path is chosen and give us direction for the journey we are making. The business journey is no different; it needs guidance around the hazards, routes for the most effective path forward and monitoring how the journey is going. The premise of any successful VM aid is measured by the message delivered and the speed at which it can occur.

Presented below are some visual management examples that can assist in understanding the business hazards or the progress of activities critical to success.

Simple/clear measure of vine growth stage, influences chemical selection, using the traffic light system

Wynns, Coonawarrra Estate, AUS

Comprehensive business wide VM board, Braud New Holland, Coex France

Russian Visual Management board detailing CI activities and achievements, Chumuk, Kakhovka, Ukraine

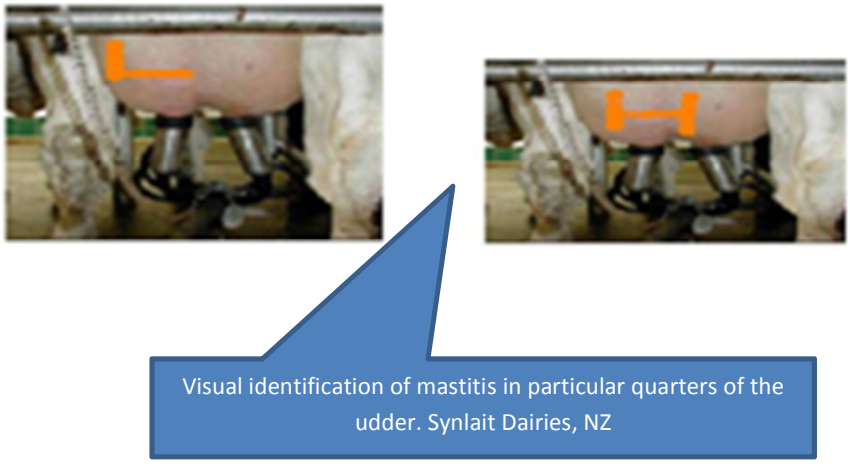

Figure 1: Collection of VM tools *(Source: Author,2013)*

All of these simple VM aids have been identified as business critical in the CI process for these businesses, so it is important to ensure these are shared amongst the operators, as they are the primary influencers of the success in achieving the plan.

Colin Watts, 6 Sigma lead at Aimia-Foods UK, commented "without transparency of the business problem, solutions will remain hidden." (June 2013,.Pers. Comm.).

If achievement of the plan or corrections of the trend lines do not occur, this would indicate that current practices need reviewing and the problem solving process needs to commence.

2.2 5 S

5S is one of the pillars of TPS and a fundamental aspect of CI. It assists in delivering a visual workplace that is organised and standardised, thereby creating an environment where problem detection is quick (such as finding lost tools) and routine maintenance reduces wasted time.

This CI tool is one of the most easy and powerful concepts to educate and visualise improvement. By simply asking 'what frustrates you about the task being performed' many

answers will involve *"I cannot find this or that, or it is dirty and I cannot see why it is not working".* If these are answers you, as the reader, have heard then 5 S will assist in bringing the problems to the surface.

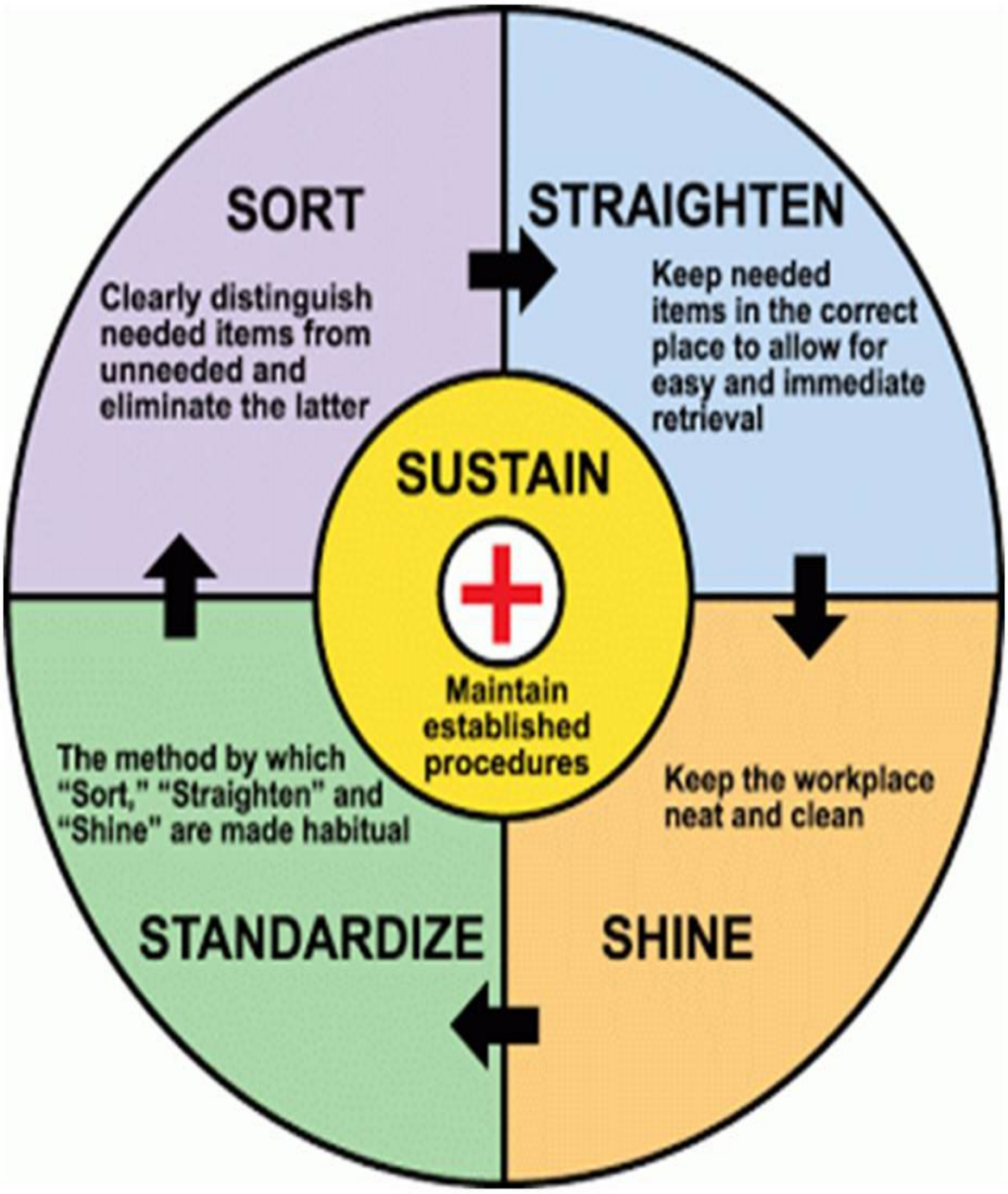

Table 5: 5S circle *(Source: Google Image, 2013)*

The five aspects are:

Sort – Organise

Straighten – Tidy

Shine - Purity

Standardise - Cleanliness

Sustain - Discipline

Sort

This is the action of identifying necessary materials (tools, raw items) both in requirement and quantity and eliminating anything that is not required in the performance of the work. To achieve this goal it is recommended all materials are removed from the place of work and only returned to be used and sorted during the activity. Any surplus materials should be stored in a "red tag" area which will allow the operator to return and collect the necessary material only when required.

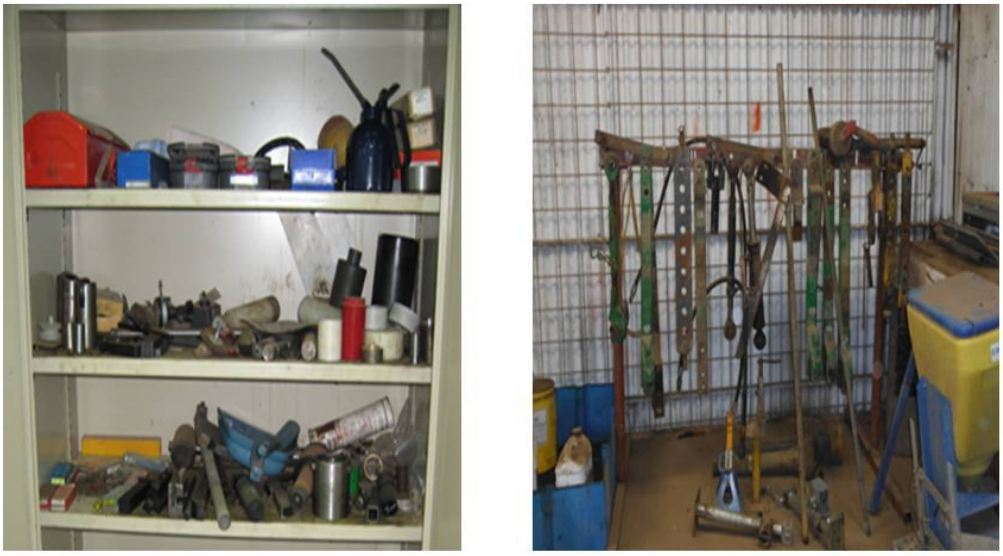

Figure 2: Disorganised storage *(Source: Author 2010)*

Straighten

This is the process of setting all the necessary materials required to carry out the task, in the best location to minimise waste of motion and transportation. Typically the result of this activity will be the creation of a "shadow board" for tooling and organised storage of necessary raw materials to complete the task.

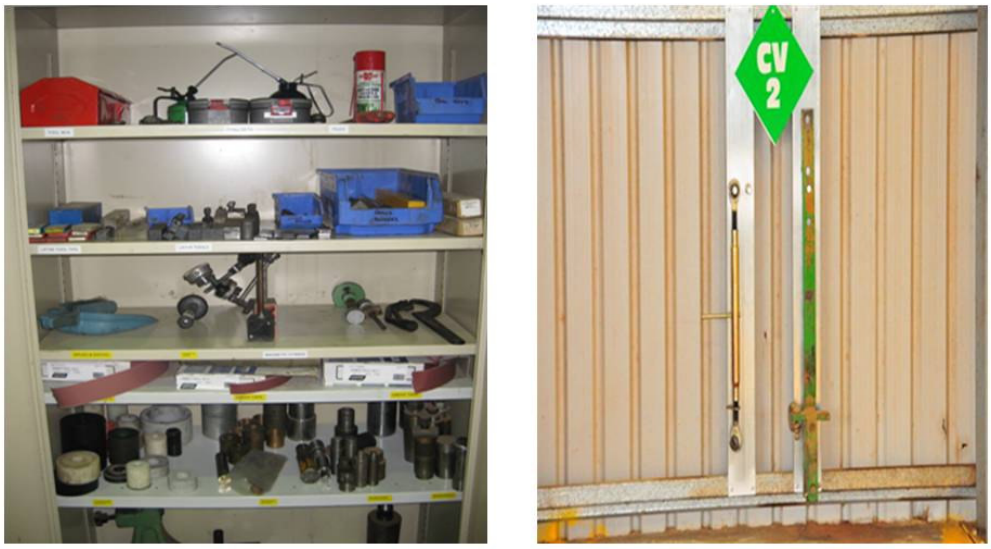

Figure 3: Straightened storage *(Source: Author, 2010)*

Shine

This is the action of cleaning the workplace of any rubbish, surplus materials and dirt, which may contribute to the root cause of equipment wear, breakdowns, wasted time, lost equipment and defects in the process. This activity will require a lot of discipline and time to embed in the business and will be the hardest ‘S’ to sustain.

Figure 4: Shined work place (*Source: Author, 2011)*

Standardise

This is the action of ensuring the above three S's have been completed by compiling written procedures/instructions or simple visual aids such as photographs of before 5S activity and after 5S activity. By setting clear standards it becomes second nature to observe variation from the standard, for example, an oil spill will be very noticeable around this tractor.

Figure 5: Clear standard workplace *(Source: Author, 2012)*

Sustain

This is the activity of developing and enforcing the previous 4 S's and using other problem solving tools to improve the workplace, to remove waste and ensure value is being added at all times. This activity can be audited with a 5S tool or regular walks throughout the business comparing work stations before and now photo's and then having conversations with operators discussing your observations.

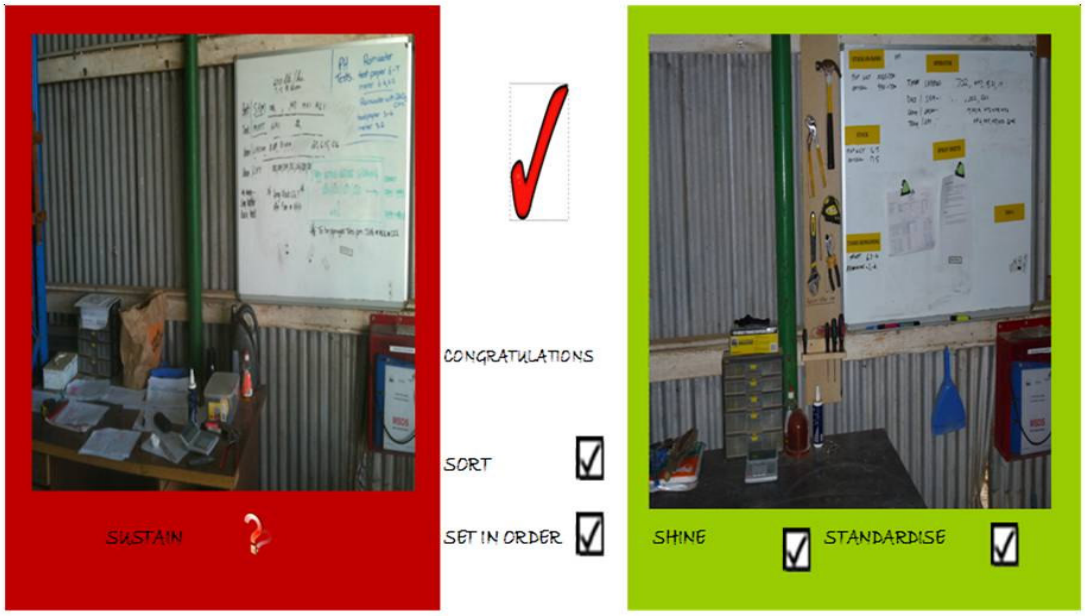

Figure 6: Celebration Template (*Source: Author 2012)*

2.3 Waste Identification

The identification of waste within the business is paramount to business survival and prosperity. No business is without waste, be it Toyota or the grape grower in Coonawarra. The challenge is to identify this waste and being prepared to tackle the problem of removing it. Shook, J (2011).

Waste will be present in all businesses within the following categories;

- Waiting
- Correction (rework)
- Processing (more work than required)
- Overproduction
- Movement (in/out storage, double handling)
- Resources
- Motion
- Lost intellect.

The challenge for management is to deal with these waste classes individually and systematically reduce their impact on the business success.

Waiting: this form of waste deals with resources remaining idle while they wait for other activities to be completed. A common example of this form of waste would be the necessity of a harvesting team to remain stationary whilst they wait for grape bins or transport to arrive. The implication of poor logistical planning and inadequate resource allocation can add significant costs to the business during harvest and ultimately to the value of the final wine produced. Equally challenging in this situation is the over allocation of grape bins, contributing to over resourcing, poor asset allocation or opportunity loss for deliveries from other growers.

Correction: this waste has a cumulative effect on the fruit, as any correction or re-working of the process of adding value, not only costs money but also time. The activity of re-spraying a vineyard because of incorrect sprayer calibration, costs money in additional product, lost time and an opportunity cost in machinery and people. The activity of poor filtration of finished wines will produce a wine of substandard clarity, requiring re-filtering that may damage the wine but will also require additional labour and logistics to complete, again adding to the built-in cost of the wine.

Processing: the activity of using excessive process time in achieving the desired outcome the customer wants. The activity of recreational mid row management (slashing or cultivation) is a historical example of over processing. A base level of mid-row management is required to ensure correct soil moisture management occurs, however, excessive activities can

constitute over-processing and cost the business resources and time, with no added value to the end wine.

Overproduction: the action of producing more fruit than required by the customer. This action can have a double edged financial effect as additional costs have been used to maintain the increased fruit level and the fruit quality may have also been affected due to vine stress. This will result in a decrease in the value the customer's place on the fruit and an increase in the cost of production for that quantity of fruit produced.

Movement: the increased activity of double handling inventory because of overproduction or poor planning. The delivery of pine posts for vineyard developments ideally will occur just prior to requirement and to the designated site of installation. Due to supply demand imbalances, posts invariably arrive out of season and will require storing on a second site, leading to "double handling" of the posts and additional resources to relocate to the required site.

Resources: this is generally the most significant, noticeable and financially impactful form of waste which will manifest itself as wasted stock, wasted machinery or wasted land assets. When looking at the resources used in the production of grapes, if this view has underutilised resources such as stationary machinery, surplus chemicals or posts and vacant land, business growth is being dampened. The challenge is to determine which of these resources are required to ensure continuation of the business and which can be removed, without affecting the daily operations.

To achieve the removal of wasted resources the best approach is to use a 'red tag' area within the workplace. This area should be designed to be very visible to all members of the worksite. It should be created with determinable boundaries, such as red lines, and should be used to place any resource that has not been used in the past month. As the production year continues items are added to the 'red tag' area and removed as required or used. After 12 months all items that are still in the 'red tag' are considered surplus to requirement and disposed of. This method allows considered assessment of resources that are crucial to daily operations.

Resources such as vineyard inputs will be required at varying points across the growing season. The opportunity lies with developing a very close relationship with resellers, to deliver a 'pull' strategy of input delivery. This methodology will require focused planning and possibly the necessity to carry a buffer of inputs required to allow the business to continue when delivery plans are delayed. The development of this relationship can be mutually beneficial to both parties, as the reseller will understand the planned requirements and delivery times which will then assist their business's performance planning.

Motion: this form of waste is most evident when people are involved in repetitive tasks that involve excessive walking or moving to complete the assigned operation. Typically observing the operation and the tracking of the path used, via a spaghetti map, will identify where wasted motion occurs. Once this map is presented to the operator, they can then identify what paths are adding value to the task and which are wasted tasks. With this knowledge the reorganising of work stations, path routes and placement of items can create a simpler task flow path, which ultimately removes wasted motion.

The identification of wasted motion must be handled with respect for the people involved, as a persons life is an accumulation of time, employees provide their time to the business, are we using that time effectively? if not, we are wasting their life and company resources !

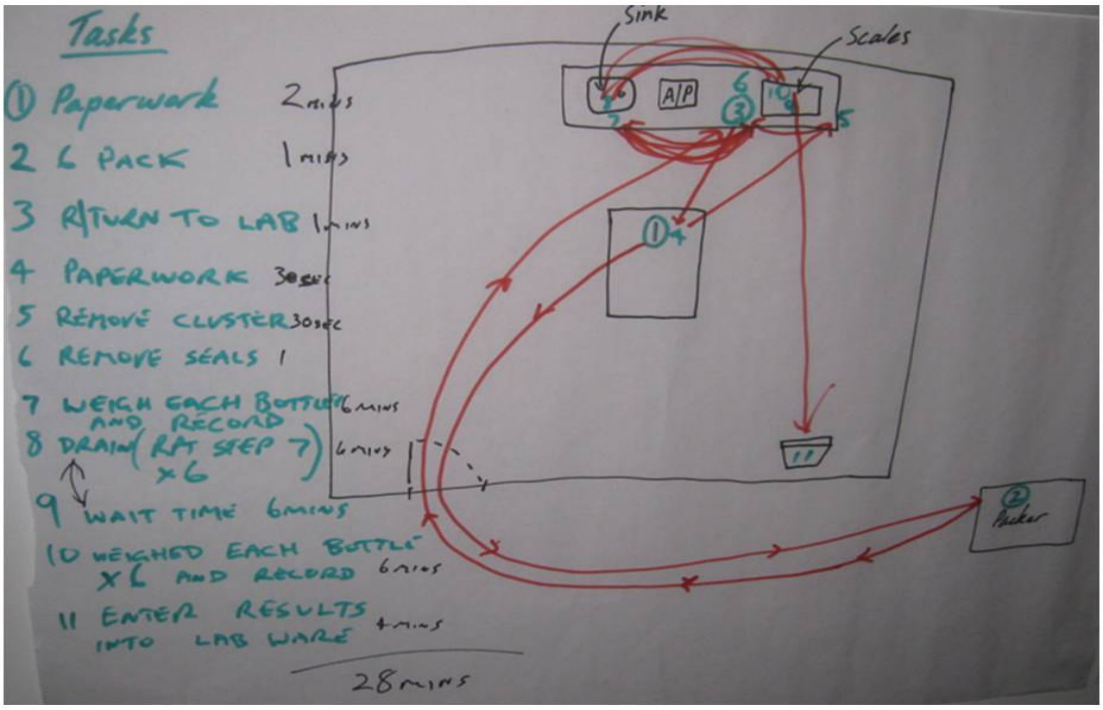

Figure 7 : Spaghetti map of laboratory activity : LabMax, New Zealand *(Source Author 2011)*

Lost Intellect: this form of waste involves the culture of the business preventing employees expressing their ideas for innovation and problem solving. People who work closely with the vines or wines are the real individuals who add value to the wine experience felt by the customer. By dampening their intellectual input with historical cultural norms/replies (eg. 'it is the way we do it here, that is not what they want'), innovation and continuous improvement will be stifled.

Encouraging the development of new ways of tackling problems and "thinking outside the square" is critical to business success.

Waste Audit - Attaching Implements

	Possible Cause	Proposed Action	How will we know if we are Successful
Transportation			
Excess Inventory	Too many 3 point linkage balls	Reduce to required number or place with all implements	Reduced time looking & reduced expense in replacing
Excess Motion 1)	Lack of communication causing lots of running around to find implements	UHF, Mobile phone to locate implements before looking	Gauge how much running around occurs when attaching an implement in the future compared to the past
Excess Motion 2)	Common to look for balls as they go missing if an implement sits for a while.	Identify why balls go missing. (do we have enough?, Does each implement have its own set of balls?). Each supervisor match a set of balls to each implement to determine	Eliminate ball searching
Waiting	Operator waits if others are chasing up implements/balls	Have list of "go to jobs" for the waiting operator while implement is readied	Eliminate operators standing waiting
Over Production			
Over Processing			
Defects			
Under Utilised Talent			

Ideal situation Operators can go to and hook up implements immediately
Current situation Supervisor and/or operators search for implements/balls before attaching implements.

Table 6: Waste Audit template (*Source: Wynns Coonawarra Estate, 2013)*

2.4 Practical Problem Resolution

Taiichi Ohno (TPS founder) famously quoted “No Problem is a Problem"; what does he mean? Womack, J (1990).

A business without transparent problems is a business that is not continually improving. Without continuous improvement business survival and growth will not occur. CI principals encourage and force problems to the surface and provide disciplined tools to solve these problems, "right the first time".

2.4.1 How to visualise problems

Within the CI framework the visualisation of the business objectives will provide a platform for problems to be identified and encourage all participants to understand at a glance their opportunities for improvement (OFI). When "*problems can be discovered immediately and everyone can initiate improvement plans*" (Shorland,G. Feb 2012,pers comm). then, dramatic business wide improvement is possible.

To understand the business objectives, measures must be developed that record the performance of the business If you cannot measure you cannot improve. By developing measures across the business and discussing the actual business performance against plans, problems will become evident, and invariably relate to an inability to achieve the planned objective. The root cause of this problem will be;

(1) over production

(2) under production

each being equally significant in the business of continuous improvement.

Once the cause of deviation from the plan is identified, practical problem resolution can commence, using an array of tools within the CI tool kit.

A3 PR Chart

The A3 PR chart provides a template to record and discuss any problem that has been identified in the natural course of the business function. The activity of solving a problem is referred to as a Kaizen or Continuous Improvement activity.

The A3 template provides a mechanism to capture the current state of the issue, and outline what measures are used to identify this problem, where there are variances from the plan (the initial trigger for the kaizen), what the immediate controls will be, what is the root cause

of the problem (determined by 5 Why's or fishbone analysis), what the long term controls will be, measures to assess the success of the controls and what additional action needs to occur. Many kaizen events follow the simple flow chart of PlanDoCheckAct, or PDCA.

The example below demonstrates the sequence of activities to solve a problem.

Problem identification: empty container of Switch® on the ground at a spraying in January.

Measurement: Unplanned use of Switch®, this can only be used at EL34 (growth stage)

Actual: 10kg less of Switch® at stock take EL45.

Immediate Controls: identify where Switch® may have been applied and quarantine vineyards.

Root Cause: Why are we spraying => (for downy mildew control).

What product are we spraying =>Ridomil®

Why replace Ridomil® with Switch® => mistaken box taken off shelf

Why mistaken product =>box the same size and colour

Why was box taken off shelf=>no Ridomil® left on pallet

Why out of Ridomil® => no check of amount used

Why no check of amount used => no standard work practice to measure amount used.

Controls can then be put in place:

Controls: ensure no downy mildew occurs by better protective sprays early in the season, change chemicals, do not overhead irrigate, improve P&D monitoring.

Controls: store all non EL allowable sprays away from chemical mixing area, flag off product, colour red for danger to EL stage.

Controls: discuss with chemical manufacturer to change box shape or colour.

Controls: provide small buffer of Ridomil® on the pallet to accommodate small mixing variances and spillage.

Controls: develop recording method to measure product used in each mix and provide reducing balance of area left to spray and product left on pallet.

Control: write standard work practice with allowable variances of products across the

spraying activity.

Check: develop visual management actions that can provide the operators a clear picture of amount of product planned to be used and what has actually been used.

The investigation above has identified a number of areas within the process where checks and measures would contribute to ensuring this error does not occur again, whilst making the operation of mixing and recording simpler.

These observations and messages can be presented in a ‘quick kaizen’ table (below).

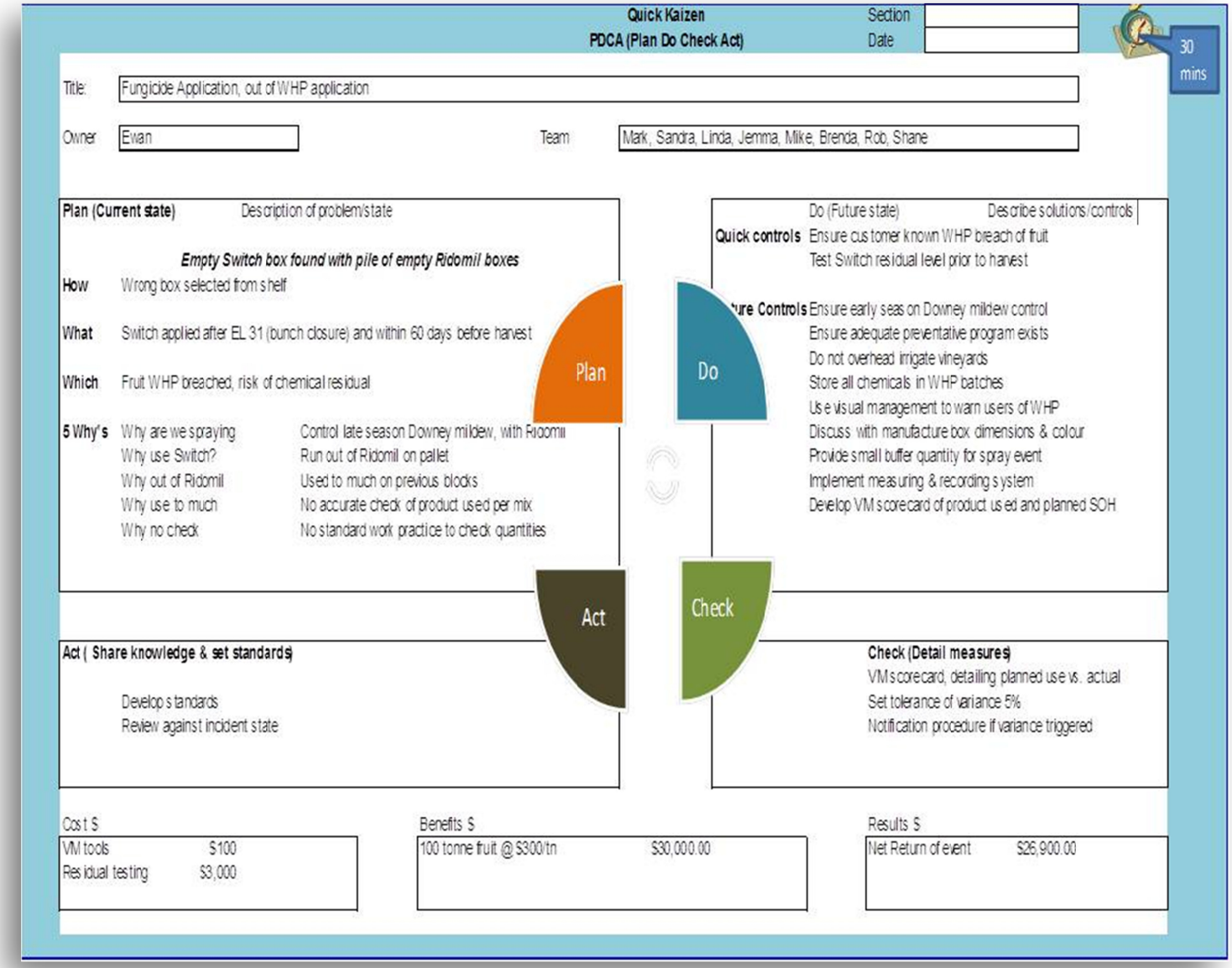

Table 7: Modified Quick Kaizen (*Source: CNH Coex, France)*

By considering the root cause of this problem, it is obvious that many contributing factors have created the issue. However, by drilling deeper into the issue the solutions identified will provide sustainable controls that will ensure this problem is not repeated in the future. Crucial to the success of these solutions/countermeasures are the involvement of everyone who participates in the activity of controlling the downy mildew, be they spray operators, disease monitors, chemical resellers and vineyard managers. Without everyone's input, a long term sustainable solution will not prevail.

Chapter 3 - How To Use Continuous Improvement Tools.

Fundamental to the success of any change in the business operation is sharing the vision of the change and engaging all involved in the business. CI presents this ethos in the CI House, below.

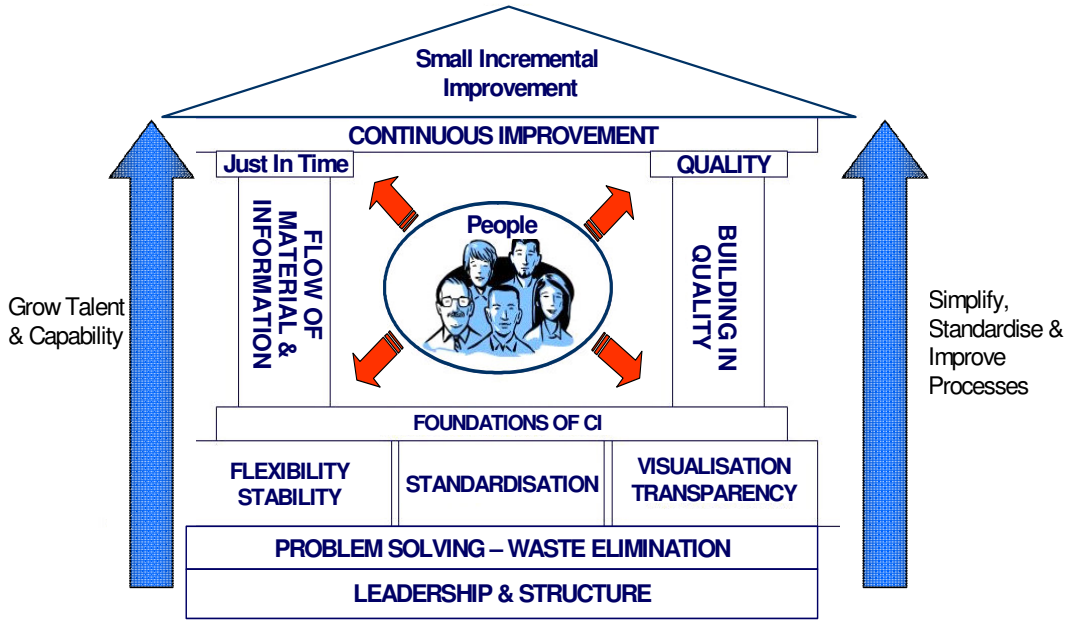

Table 8 : CI House, (Source : Google Images 2013)

Centre of attention are the people involved in the business. By ensuring the change planned is transparent, respectful, has direction and is correctly resourced, the ability to achieve these objectives will be assured.

Building the capability of the people within the business should be the starting point of any CI adoption. This capacity-building should occur with focused training on the selected tools chosen to adopt CI management.

"*Practicing what is preached*" is a common cry heard globally from employees and managers. Imperative to success of any business change is ensuring strong consistent leadership which is transparent and respectful. These qualities are very difficult to teach and are inherently associated with the personality of individuals; however if the business standards are rigorous and transparent, the personalities of the individuals will change to conform to the standard workplace practices, creating respect and consistency.

Standardisation could be considered rigorous, inflexible, rigid and not forgiving, however in the CI house it contributes to clarity and efficiency. Standardised work provides clear sequences and expectations of work being performed, thereby fulfilling the objective of improving the effectiveness of employee's time and improved reliability, and achieving value for the customer.

Visual transparency of the business direction and reasoning behind decisions sits within the foundation of CI adoption. Capturing these objectives and measuring the success, or otherwise of the journey, will ensure positive engagement in the business change. Visual management tools must be simple, capable of conveying a message in 15 seconds, easy to update and demonstrate the measures the business has chosen as being crucial to success.

Flexibility & stability are a necessity for any foundation of a "house", the CI house is no different. The TPS approach encourages decision making to occur in the following manner:

'*take a long time to make a decision, but execute that decision with haste'*.

This phrase reinforces the premise that TPS is not a rigid, military style management approach, but a very considered and fluid style that has the capacity to take advantage of market opportunities when they arise.

Like scaffolding on a building, once the foundation has been laid, support must occur as the house grows in strength. By growing employee capacity and ensuring effort is targeted to

simplifying, standardising and improving the processes of adding value to the product, then business improvement and growth will follow.

Chapter 4 – How to adopt CI *(a pathway to success)*

The introduction of any new technology, system, or belief will take time, but success can be improved by ensuring the pathway is mapped, the obstacles considered and the method of solving problems is documented. Tabled below is this authors' 'map' for the adoption of CI philosophies in Australian viticulture.

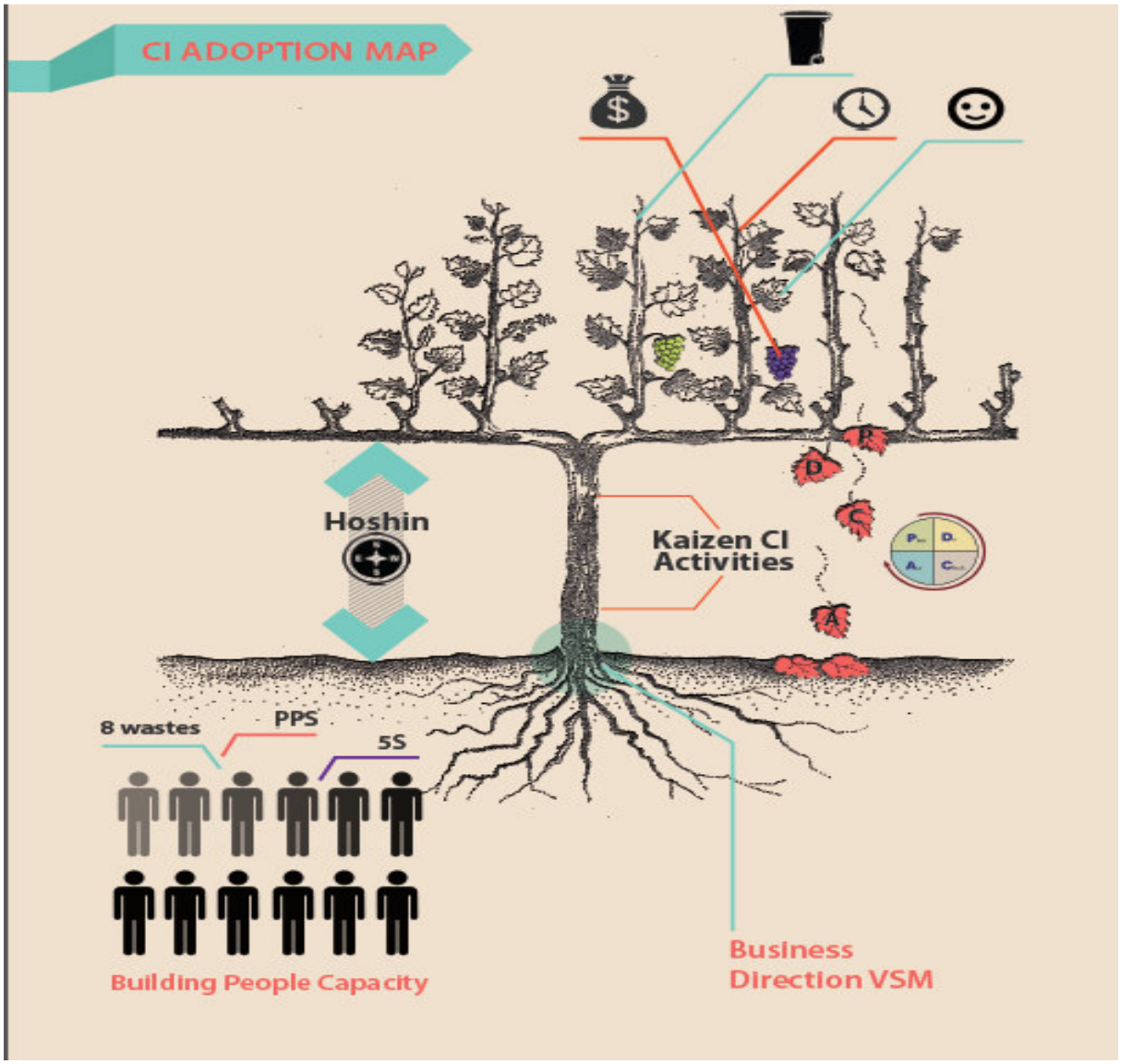

Table 9: CI Adoption *(Source: Author 2013)*

Day 1 of CI adoption should involve employee training and knowledge building, focusing on 3 CI tools, namely Practical Problem Resolution, Waste knowledge and 5S disciplines.

Day 2 should be spent understanding the Value Stream map and the generation of the business direction or 'compass'.

Day 3 should concentrate in setting realistic business goals, formulating how these will be measured and developing simple effective Visual Management boards to communicate the journey.

Day 4+ will involve actively completing a range of Kaizen activities that will feedback to all members of the business and drive the PDCA cycle for holistic business improvement.

The systematic adoption of these tools and the pathway outlined will ensure repetitive business improvement that will contribute to answering the four primary questions posed at the beginning of this report.

1. Do you wish to retain staff you have trained and consider valuable to your business?
2. Do you wish to improve the rewards you receive for the effort contributed to the business?
3. Do you wish to understand where the problems are occurring in your business?
4. Do you want all of your jobs completed on time and right the first time?

Chapter 5 – Recommendations

The key observations from this study and the recommendations for the Australian viticultural sector are presented based on varying business sizes and complexities;

Small Medium Enterprises (SME's) and Corporate Enterprises

1. The building of knowledge, across the entire process of fruit growing, is crucial for sustainable growth of the Australian viticultural sector.
2. Teaching employees to understand where the waste exists in the fruit growing process, as their input will be paramount to the future economic success of the sector and will contribute to improved value for the end consumer of Australian wines.
3. Extended business relationships, between growers, input suppliers, intermediate customers and resellers, must be explored to enable all members of the value stream to survive and succeed. Unsustainable profits/margins in one segment of the VSM is not a sustainable, long-term pathway for collective success of the Australian Wine sector.
4. The CI tools identified have proven successful in other sectors of the economy; there is no reason why their success cannot be transferred to the Australian viticultural sector.
5. Small, repeatable, continuous improvement events (kaizen) will contribute to long term sustainable improvements in the business and are more achievable at a vineyard level.

Owner Operator Businesses

1. Concerted effort is required to understand where business waste is occurring and a strategy of reducing its impact adopted.
2. Organise the immediate workplace to remove errors, save time and identify problems quickly.

3. Tackle problems collectively, understand what the real cause was and ensure solutions are repeatable, visual and agreed upon.
4. Start improving the business with simple waste removal practices and focus on repeating the success regularly.

It is critical for Australian viticulture to embrace systems and thinking from other sectors of the economy and to apply the knowledge that these sectors have implemented successfully. This approach will not only drive continuous improvement in the individuals business but across the sector as a whole.

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Plain English Compendium Summary

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Objectives	To observe the use of CI management in the viticultural and non-primary production sectors of the economy across the globe and report on the successful use and adoption of these practices and their application to Australian viticulture.
Background	CI is a business management philosophy entrenched in manufacturing, health and the service sectors of the global economy. Australian viticulture can learn from these sectors and consider adopting some of the tools, within the CI teachings, to assist in improving the sustainability of the sector.
Research	Investigations conducted during the past 18 months have highlighted three business fundamentals that should be considered; • Businesses without a planned direction (compass) are like a rudderless ship: lost. • If you cannot measure the problem, you cannot solve the problem. Pers Observation: *French viticulture has been using agronomic measurements for centuries.* • Wasted opportunities and resources are costing Australian viticulture a significant amount of money.
Outcomes	GWRDC should consider rapid knowledge sharing which identifies where waste exists in the value stream of fruit production. GWRDC should upskill sector educators on the importance of business direction and problem solving. GWRDC should lead CI adoption and celebrate success, within its R&D programs
Implications	
Publications	