Creative Innovative Company Program Report 4 23 August 2005

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1. Introduction

This is the fourth and final report on the Creative Innovative Company Program (CICP) which has now been implemented in 7 companies in Tasmania using the innovative methodology developed and successfully implemented in a $300 million per year turnover company, under SIP. As a result of the success and profit generated in that program, the company floated on the New Zealand stock exchange under the newspaper banner "Ex Junk to Join NZX 30". (1). The IP for these developments are copyright Blakemore Consulting, but a modified program has been prepared for the SME's in Tasmania and the results of their implementation is reported here.

All major materials for this program have been prepared and described in the three previous reports on this program (2,3,4).

2. The CICP Plan

The three major causes of business failure are under-capitalization, poor operational effectiveness, and poor business planning. Business planning in the context of this program consists of strategic planning and operational planning and formulating a guide for the use of creative innovative flow techniques in improving the profitability of the company. **It is about opportunities and competitive positioning and operational effectiveness and improving the business using:**

- **a pro-forma strategic plan guide**
- **25 creative flow rules**
- **a 7 step process solution technique.**

Strategic planning (5,6), is basically visionary, can be intuitive and is a very innovative assessment of opportunities for development and growth and transferring these to action plans consistent with where the company wants to go. **The objective of this program is to illustrate the advantages of a development of the Toyota production system when it is applied to small business.**

Small to medium sized businesses are not used to thinking strategically about their business. Such thinking is not simply "**rearranging the deck chairs on the Titanic"**, it is intuitive and visionary and requires a leap into the unknown. It therefore requires leadership, creativity, a strong focus, a positive approach, process and particular knowledge of the market, competitor and processes. Using the 25 creative flow rules involves strategic thinking and therefore involves thinking "**outside the square**" and employing all the creative tools that are available.

The strength of the plan is only as good as the information on which it is based. Hence an intuitive leap can be grossly in error if the premise on which it is based is wrong or the information is in error. Measurements must therefore be accurate and timely, reliable, representative and relevant. To understand the strategic positioning of a business it is necessary to understand the competitive position of the business in the market and get a true idea of how efficient it is. The strategic plan should overlay all operational plans and align them with what we define as a **strategic advantage for winning**. In addition it is unlikely that the competitive position will remain in place for very long as the competition in the global economy moves very fast.

Strategic planning must consider all external and internal factors influencing the business. A major determinant of new strategy will be the customer's perception of perceived needs**. This is a moving target!**

To determine the strategy for a company we need to examine both external and internal factors. Some of the key **external** influences influencing the strategic plan will be:

- Market share and growth
- National goals and values
- History and culture
- Government policy
- Public service
- Unions
- Geographical isolation
- Nearness to Asia
- The tyranny of distance
- Dependence on trading with overseas countries

But the key influence is the competition.

The strategic planning process will be unsuccessful if the processes to support the strategy are not in place. In addition processes must be able to generate creativity and management systems must have control aimed at prevention. Successful strategic plans must have the ability to increase value to customers and an overriding objective of improving the competitive position of the company. This means that successful companies must continuously monitor customers and the market, and be able to change direction quickly.

Some of the most significant product innovations were made in the face of marketing advice and the voice of the customer (VOC), that indicated that these products or services would fail, for example the Sony Walkman.

Hence the voice of the customer may be useless if the customer does not understand the features or qualities being surveyed. There are two major attributes that will help us prioritize critical success factors for strategic planning and they are:

- The ability to differentiate our company from the competition
- The ability to create value as perceived by customers.

A competitive advantage is not sustainable for long periods of time and competitive advantages may be defined differently for different products, services and market segments.

Quality was a decided competitive advantage in Japanese motor vehicles from approximately 1985 to 1996. Many European manufacturers have now caught up. The new competitive advantage will be flexibility, engineering, innovation and build-to-order, for example:

- Motorcycles built to order (BTO)
- Computers built to order (BTO)

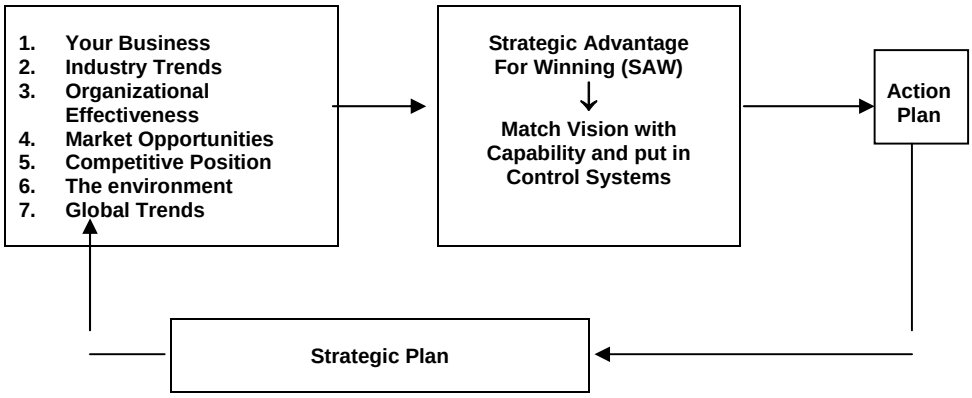
In the future we will need a strategic advantage that includes our competitive advantage because business will be focused on:

- Knowledge
- Human skills
- Logistics capabilities
- Creative value added flow...Speed
- Clever data interpretation.

This means that the supply chain will be more closely orientated with service flexibility and design as products all become high quality.

WHAT WE NEED TO KNOW - To formulate a strategic plan (Figure 1).

Figure 1



General

The initial approved CICP plan was to introduce the concepts into 4 companies. This was extended to 7 companies after the grant monies had been approved, to satisfy the wishes of all concerned. In addition, the initial plan was to run 10 workshops. This was exceeded since the participants needed more training than originally planned.

Methodology

The overall planned methodology for the program has been followed. This was to carry out a series of workshops in Hobart and Launceston with up to 3 participants from each company and to apply the principles learned back at the plant via practical programs all aligned with the strategic business plan which was written via a pro-forma and was to be rewritten at the end of the program. During the learning phase of the program, a minimum of two projects were to be undertaken to illustrate the concepts and principles and benefits of creative flow, and then the Strategic Plan was to be rewritten with new goals set based on the knowledge gained and the achievements of the projects.

All of these goals were met by all of the participating companies.

Strategy

The overall strategy was to implement a continuous flow system into product, process and service and cash retrieval in the company from supply to delivery by utilizing 25 creative flow principles based on innovative developments of the Toyota production System (sometimes called the Lean Manufacturing System). Projects (at least two per company) were to be selected and the results used to demonstrate the benefits from these innovations.

Key measurements from process flow and the profit and loss account and the balance sheet were to be used to show that the value added percentage of the company could be continually improved. All these measurements were discussed and results given in an earlier report (2). All participants have prepared a hard copy of their starting strategic plan, the workshops and a plan for the future. Secretiveness by participants regarding financial data hindered progress.

Workshops

Workshop No	Date
1	May 2004
2	June 2004
3	July 2004
4/5	August 2004
6/7	Aug/Sept 2004
8/9	September 2004
10	November 2004
11/12	February 2005
13/14	April 2005
15	June 2005
16	August 2005

3. Materials Prepared.

CICP Materials

The materials prepared are all developments of the innovations implemented in larger companies than the SME's participating here. (Feltex, Pirelli, Precision Valve,)

Where possible, the materials have been produced in a pro-forma to accelerate the learning process. Details are given below. All booklets were bound separately but fit into a plastic pocket in a briefcase style folder that has been supplied.

Two delegates plus two observers are allowed from each company, plus representatives of The Department of Economic Development and ManSA and TAFE.

The number of people participating back at the company varied depending on the company size.

A list of the materials prepared is given in the table below.

No	***Booklet Title***	***Pages***
1	Strategic Plan	19
2	Concepts	13
3	Definitions	17
4	Kit	41
5	Charts	13
6	7 Steps	8
7	Velocity	31
8	Successful Cultural Change	11

4. The Creative Innovative Company Agenda for the First Workshop (An Example of all the workshop Agendas)

No	Topic	Details
1	Introduction	How the program will work. What you can achieve What you are required to do Publications
2	Records	In Kind Support (Records for Schedule 3) Time, People, Travel, Overheads Achievements The future after the 10 workshops
3	Time Between Workshops	On site Consulting…JB & TAFE On site projects
4	Workshops 2 to 9	Review of data collected Outline of next phase Recording and analysis
5	Review of Materials	1. Strategic Plan (19 pages outline to be filled in) 2. Concepts (PPT 13 pages 74 slides) 3. Definitions (17 pages) 4. Kit (41 pages) 5. Charts (13 pages) 6. 7 Steps example (8 pages) 7. Velocity (31 pages)
6	AusIndustry Expectations	1.Understanding Lean, Innovation and Creativity 2. Reduce Working Capital 3. Increase Inventory Turns 4. Improve on time deliveries 5. Reduce Time to produce financial information 6. Improve CA/CL 7. Improve ROI 8. Reduce cost of quality 9 Reduce Lead Time
7	Initial Learning	1. Strategic Plan (Book 1) 2. Concepts (Book 2) Slides 1 to 15 only 3. 7 Steps Example
8	Workshop 1	1. Fill in page 5, 6, 7 Strategic Plan…Products processes 2. Plot an sku versus $ graph and compare with GM 3. Fill in pages 25,26,27,(Kit) 11,12,13 (Chart) 4. Fill in Opportunity Evaluation page 11 Strategic Plan 5. Fill in page 12 Strategic Plan 6. Select projects 7. Fill in Project Description and Gantt Milestones.
9.	Outline Strategy	1. Work on site 2. Work for next Workshop1
10	Feedback & Conclusions	

As was anticipated, the measuring systems in small companies needed to be extensively modified and improved if the full benefits of the program were to realized. What wasn't anticipated was the significant need for process innovation in all the participating companies. This led to the preparation and publication of two papers on this issue. These have now been published in the "New Engineer". (8,9).

4. Participating Companies.

Creative Innovative Company Program (CICP) Participants

No	Company	Participants	Education	Position
1	Novaris Pty Ltd	Diane Tompson	B Ed	GM
	72 Browns Road	PJ Bester	Cert 4 Bus	Ops Mngr
	Kingston 7050	+ 2 staff		Mkt Mngr
	03 6229 7300			
2	Uniform City	Charles Cook	B Bus	MD
	174 Bathurst St	Diane Cook	Dip Radiog	Prod Mngr
	Hobart			
	03 6234 9244			
3	Tasmanian Timber Eng	Chris Ward	Des Eng	MD
	1063 Cambridge Rd	Phillip Riley	Yr 12	Prod Mngr
	Cambridge 7170	+ 2 staff		
	03 6248 5433			
4	SERS	Diane Edgerton	Gen	MD
	47 Strachan St	James Emmerton	Trade	Workshop F
	Sth Burnie 7320	+ 2 staff		
	03 6431 9991			
5	AMAX Eng P/L	Robert Mantach	MBA	MD
	69 Lilydale Rd	+ 2 staff		
	Rocherlea 7248			
	03 6326 9682			
6	Hazard Systems P/L	Brenton Heath	B Eng (Elect)	MD
	25 York St	+ 3 staff	B Eng (Mech)	Eng Mngr
	Launceston 7250			
	03 6332 4000			
7	Muir Engineering	Paul Hollingsworth	BE, M Tech	GM
	100 Browns Road,	Brent Hardy	Certificate IV	
	Kingston 7050	Ian Stocks	Trade Cert	
	03 62118811			
8	TAFE	Ian James	B Eng (Mech)	State Mngr
	Clarence Campus	Andrew Richardson	B E	Teacher
	03 6233 7219	Michael Mohr	B Ed	Teacher
		Len Bambridge	Dip Teach	Teacher
9	Skilled Engineering	Andrew Benson	Grad Dip Arch	Dev Manager
	ManSA	Bill Ferme	MBA	Nat Pres
	Dept Econ Development	Sushila Desai	CPA	Proj Mngr
	Dept Econ Development	John Keller	B Bus	Proj Mngr
	Dept Econ Development	Debra Hill	BA	Ass GM
	Dept Econ Development	David Anderson	PhD	Proj Mngr

6. Measurements (The Core Objectives and Principles Applied)
6.1 Muir Engineering

Muir Engineering CICP Objective Measurements

No	Unit
1	Sales
2	Working Capital (Dr-Cr+Inv)
3	Inventory (RM+WIP+FG)
4	Finished Goods
5	Debtors
6	Inventory Turnover (COS/(RM+WIP+FG)
7	Return on Investment
8	Current Assets/Current Liabilities
9	Cost of Quality (QA,+Scrap+Rework+Returns)
10	R&D as % Sales
11	On Time Deliveries (to cust req date)
12	Time to Produce New products

25 Creative Flow Rules

1	Demand = Production = Supply	A B C 20% sales as Pleasure Craft Winches
2	Continuous Flow	PCW
3	The Magic of Pull	PCW
4	Maximise Value Added	Planned for CNC
5	Demand to Pacesetter	Takt system for PCW
6	Prevention not Rework	ISO 9001, costs just implemented
7	Use Statistical Process Control (SPC)	Not used yet
8	Use Single Minute Exchange of Dies (SMED)	Jigs and Tools being implemented
9	Minimise Variation (Demand Amplification)	This will occur as the system
10	First in First Out (FIFO)	Will become a principle
11	Minimise Inventory Hold Points	Planned
12	Link and Match Processes	Will result from PCW
13	Use 5S methodology	In progress
14	Load Levelling	Will occur
15	Even Mix to Pacesetter	Will Occur
16	Equal Batches Every Time (EBET),at EPR	Not yet calculated
17	Shorten the Financial Reporting Cycle	Not yet contemplated
18	Team Up	Occurring
19	Minimise Waste	In progress
20	Apply to the Whole of the Supply Chain	Applying some principles
21	Remove need to sequence Products	Not in focus yet
22	Optimise Supply (RM)	Being considered
23	Optimise Customer Response	OTD still low
24	Measure at the Source	Some measurement
25	Innovate Continuously	6% of sales on R&D

6.2 AMAX

Co Amax CICP Objective Measurements

No Unit

1 Sales
2 Working Capital (Dr-Cr+Inventory)
3 Inventory (RM+WIP+FG)
4 Finished Goods
5 Debtors
6 Inventory Turnover (COS/(RM+WIP+FG)
7 Return on Investment
8 Current Assets/Current Liabilities
9 Cost of Quality (QA,+Scrap+Rework+Returns)
10 R&D as % Sales
11 On Time Deliveries (to customer requested date)
12 Time to Produce New products

25. Creative Flow Rules

1	Demand = Production = Supply	Implemented for Comalco “T” bars
2	Continuous Flow (CONWIP)	Implemented in principle for “T”bars
3	The Magic of Pull	Yes for “T” bars
4	Maximize Value Added	Improved
5	Demand to Pacesetter	N/A Processes synchronized almost
6	Prevention not Rework	Needs Improvement
7	Use Statistical Process Control (SPC)	Not Used
8	Use Single Minute Exchange of Dies (SMED)	Not Used
9	Minimise Variation (Demand Amplification)	Not Used
10	First in First Out (FIFO)	Yes
11	Minimise Inventory Hold Points	Yes
12	Link and Match Processes	Almost
13	Use 5S methodology	Being trialled. Some improvement.
14	Load Levelling	Improved for Comalco
15	Even Mix to Pacesetter	N/A
16	Equal Batches Every Time (EBET), at EPR	Improved. Comalco not on side.
17	Shorten the Financial Reporting Cycle	Positive Progress being made.
18	Team Up	Improving
19	Minimise Waste	Improving
20	Apply to the Whole of the Supply Chain	Not ready yet.
21	Remove need to sequence Products	N/A
22	Optimise Supply (RM)	Understood. To be studied.
23	Optimise Customer Response	Discussed with Comalco.
24	Measure at the Source	Understood. More work needed.
25	Innovate Continuously	Understood. More work needed.

6.3 Hazard

Hazard No	CICP Objective Measurements Unit
1	Sales
2	Working Capital (Dr-Cr+Inventory)
3	Inventory (RM+WIP+FG)
4	Finished Goods
5	Debtors
6	Inventory Turnover (COS/(RM+WIP+FG)
7	Return on Investment
8	Current Assets/Current Liabilities
9	Cost of Quality (QA,+Scrap+Rework+Returns)
10	R&D as % Sales
11	On Time Deliveries (to customer requested date)
12	Time to Produce New products

25. Creative Flow Rules

1	Demand = Production = Supply	Understood. RM classified.
2	Continuous Flow (CONWIP)	Being practiced in parts.
3	The Magic of Pull	Main Contractor system in place.
4	Maximize Value Added	More improvement needed.
5	Demand to Pacesetter	Not Yet Practiced.
6	Prevention not Rework	To be improved.
7	Use Statistical Process Control (SPC)	Not Used. Planned.
8	Use Single Minute Exchange of Dies (SMED)	Not Used Planned.
9	Minimise Variation (Demand Amplification)	Understood. Improvement needed.
10	First in First Out (FIFO)	Some evidence.
11	Minimise Inventory Hold Points	Understood.
12	Link and Match Processes	To be improved.
13	Use 5S methodology	Not used but is appliacable.
14	Load Levelling	To be studied.
15	Even Mix to Pacesetter	To be studied
16	Equal Batches Every Time (EBET),at EPR	Need established.
17	Shorten the Financial Reporting Cycle	Understood. Use US based systems and periods.
18	Team Up	Improved.
19	Minimise Waste	Needs more improvement.
20	Apply to the Whole of the Supply Chain	Not Ready Yet.
21	Remove need to sequence Products	Not greatly applicable.
22	Optimise Supply (RM)	Being implemented
23	Optimise Customer Response	Improving dramatically.
24	Measure at the Source	Needs improvement.
25	Innovate Continuously	Understood.

6.4 Novaris

Novaris CICP Objective Measurements

No	Unit
1	Sales
2	Working Capital (Dr-Cr+Inventory)
3	Inventory (RM+WIP+FG)
4	Finished Goods
5	Debtors
6	Inventory Turnover (COS/(RM+WIP+FG)...Ass GM = O.4
7	Return on Investment
8	Current Assets/Current Liabilities
9	Cost of Quality (QA,+Scrap+Rework+Returns + Inspection)
10	R&D as % Sales
11	On Time Deliveries (to cust req date)
12	Time to Produce New products

25. Creative Flow Rules

1	Demand = Production = Supply	Was 100% MTO, A's to invent and pull from there.
2	Continuous Flow (CONWIP)	Accepted as a principle. Except Al extrusion fr Supplier
3	The Magic of Pull	Accept and practice with limitation that MLT>CRLT
4	Maximize Value Added	Accept
5	Demand to Pacesetter	At extrusion and powder coating. Control by Lge Batches Now changed supplier.
6	Prevention not Rework	Rework 2%, at WIP, Prevention by in process inspection
7	Use Statistical Process Control (SPC)	Not used yet but will be using at FG
8	Single Minute Exchange of Dies (SMED)	Jigs to be designed
9	Minimize Variation Demand Amp)	Will improve as a result of new methods
10	First in First Out (FIFO)	Serial no system assists the application of this rule
11	Minimise Inventory Hold Points	Studying Kanban supply to workstations
12	Link and Match Processes	N/A
13	Use 5S methodology	Started using
14	Load Levelling	Determined by skill level of the person at the workstation
15	Even Mix to Pacesetter	N/A
16	Equal Batches Every Time (EBET), at EPR	Setups are negligible, therefore the EBET and EPR are set by the size of the rack
17	Shorten the Financial Reporting Cycle	Agreed in principle
18	Team Up	Agree
19	Minimize Waste	N/A
20	Apply to the Whole of the Supply Chain	Accept as a principle
21	Remove need to sequence Products	N/A
22	Optimize Supply (RM)	Working on optimizing supply size L cash flow improved
23	Optimize Customer Response	Recognized as a principle.
24	Measure at the Source	Not practiced.. but have standard times
25	Innovate Continuously	Yes 7.5% R&D as % sales

6.5 Timber Engineering

Timber Engineering CICP Objective Measurements

No	Unit
1	Sales
2	Working Capital (Dr-Cr+Inventory)
3	Inventory (RM+WIP+FG)
4	Finished Goods
5	Debtors
6	Inventory Turnover (COS/(RM+WIP+FG)
7	Return on Investment
8	Current Assets/Current Liabilities
9	Cost of Quality (QA,+Scrap+Rework+Returns)
10	R&D as % Sales
11	On Time Deliveries (to customer requested date)
12	Time to Produce New products

25. Creative Flow Rules

1	Demand = Production = Supply	Almost MTO, close to Lean
2	Continuous Flow (CONWIP)	New Model planned not yet implemented 1 cell
3	The Magic of Pull	Understood
4	Maximize Value Added	Applying the principle to Glulam Cell
5	Demand to Pacesetter	Pacesetter identified as big press (press to be lengthened)
6	Prevention not Rework	ISO 9001, Rework low
7	Use Statistical Process Control (SPC)	Finger Joints, Testing, Monash produces results.
8	Use Single Minute Exchange of Dies (SMED)	1. Small Electrode in Hi Freq Finger Joint. 2. Auto sensor with feedback on the beam planer 3. Big Press Quick change plattens
9	Minimize Variation (Demand Amplification)	1. 35% T/O one customer, order wed ship Monday mostly 100% OTD (most cust 7 weeks in advance, but details not complete
10	First in First Out (FIFO)	Practice where possible.
11	Minimize Inventory Hold Points	Where possible
12	Link and Match Processes	This is the planned principle of the Glulam cell
13	Use 5S methodology	Cells to be 5S. staff to go to Topline Furniture to observe 5S
14	Load Levelling	Must look at orders over a longer period
15	Even Mix to Pacesetter	Program on the bottleneck
16	Equal Batches Every Time (EBET), at EPR	Batch size = order size, width is standardized
17	Shorten the Financial Reporting Cycle	Rosemary reports 7 days, ext accountant
18	Team Up	Team Culture well entrenched
19	Minimize Waste	Not measured... timber yield (expect 30% wastage in RM)
20	Apply to the Whole of the Supply Chain	Already focusing on the whole of the supply chain
21	Remove need to sequence Products	Not a big issue
22	Optimize Supply (RM)	Buying in large batches on spec. overbuying,
23	Optimize Customer Response	On time deliveries at 60% to 90%.
24	Measure at the Source	Tried but not totally successful
25	Innovate Continuously	Attempting

6.6 Uniform City

Uniform City CICP Objective Measurements

No	Unit
1	Sales
2	Working Capital (Dr-Cr+Inventory)
3	Inventory (RM+WIP+FG)
4	Finished Goods
5	Debtors
6	Inventory Turnover (COS/(RM+WIP+FG)
7	Return on Investment
8	Current Assets/Current Liabilities
9	Cost of Quality (QA,+Scrap+Rework+Returns)
10	R&D as % Sales
11	On Time Deliveries (to customer requested date)
12	Time to Produce New products

25. Creative Flow Rules

1	Demand = Production = Supply	Pull from RM stock MTO, RM forecast
2	Continuous Flow (CONWIP)	Yes
3	The Magic of Pull	Yes
4	Maximize Value Added	Yes
5	Demand to Pacesetter	Sewing, batch sizes small
6	Prevention not Rework	No Prevention but Rework
7	Use Statistical Process Control (SPC)	Not practiced
8	Use Single Minute Exchange of Dies (SMED)	Not Used
9	Minimise Variation (Demand Amplification)	Aware but not controlled
10	First in First Out (FIFO)	Generally OK 90%
11	Minimise Inventory Hold Points	RM and FG only
12	Link and Match Processes	N/A
13	Use 5S methodology	Not used but planned
14	Load Levelling	N/A
15	Even Mix to Pacesetter	N/A
16	Equal Batches Every Time (EBET),at EPR	N/A
17	Shorten the Financial Reporting Cycle	Yes
18	Team Up	Yes
19	Minimise Waste	Waste is excessive
20	Apply to the Whole of the Supply Chain	Yes
21	Remove need to sequence Products	N/A
22	Optimise Supply (RM)	25 suppliers at least
23	Optimise Customer Response	Try
24	Measure at the Source	No
25	Innovate Continuously	Yes

6.7 SERS

SERS CICP Objective Measurements

No	Unit
1	Sales
2	Working Capital (Dr-Cr+Inventory)
3	Inventory (RM+WIP+FG)
4	Finished Goods
5	Debtors
6	Inventory Turnover (COS/(RM+WIP+FG)
7	Return on Investment
8	Current Assets/Current Liabilities
9	Cost of Quality (QA,+Scrap+Rework+Returns)
10	R&D as % Sales
11	On Time Deliveries (to customer requested date)
12	Time to Produce New products

25. Creative Flow Rules

1	Demand = Production = Supply	Being Introduced to supply
2	Continuous Flow (CONWIP)	Stephen understands principle.
3	The Magic of Pull	Not in place.
4	Maximize Value Added	Stephen understands.
5	Demand to Pacesetter	N/A
6	Prevention not Rework	Not practiced.
7	Use Statistical Process Control (SPC)	Not practiced
8	Use Single Minute Exchange of Dies (SMED)	Not practiced
9	Minimise Variation (Demand Amplification)	Not practiced
10	First in First Out (FIFO)	Some Evidence.
11	Minimise Inventory Hold Points	Understood
12	Link and Match Processes	Understood
13	Use 5S methodology	Not practiced
14	Load Levelling	Not practiced
15	Even Mix to Pacesetter	Not practiced
16	Equal Batches Every Time (EBET),at EPR	Not practiced
17	Shorten the Financial Reporting Cycle	Big Improvement
18	Team Up	Improving
19	Minimise Waste	Improving
20	Apply to the Whole of the Supply Chain	Not practiced
21	Remove need to sequence Products	Not practiced
22	Optimise Supply (RM)	Being Introduced.
23	Optimise Customer Response	Practised
24	Measure at the Source	Not practiced
25	Innovate Continuously	Product Innovation Strong

7. General Outcomes of the Program.

The participants found the first workshop hard going because of its duration and the lateral thinking that was needed to understand the application of the concepts. The feedback at the end of the workshop was positive and there was a real commitment among the participants to make it work. Some revision of the concepts at each stage was necessary, which, while aiding the learning process, slowed the progress by some companies.

The main objective of this CICP program is to see if the simpler version of the 25 Creative Flow rules and their application developed here, can improve the SME's as much as the larger companies like Feltex and Pirelli Cables.

All workshop agendas followed the general format given earlier, but extra time was devoted to understanding the application of the concepts and the participants were encouraged to present their findings back to the remainder of the group. It should be remembered that we are not dealing with public companies, so that there is a high degree of secretiveness amongst the group. This was a major problem. As a result the companies made the learning process harder for themselves than it should have been.

All companies participated well although the rate of progress has been variable and there were some minor problems requiring quick thinking. Some general comments of value are given below, whilst, specific achievements are given later.

7.1 Muir Engineering.

This company achieved a significant improvement in profitability at the same time as the inventory was reduced. John Muir, the MD and owner changed from someone giving tacit approval to a committed person and strong advocate of the program. Brent Hardy has now moved to a bigger job with a handsome increase in salary, Paul Hollingsworth has left the company, and the purchasing manager has resigned. Despite these drawbacks the program has succeeded. There is a strong recognition now that if Muir is going to succeed in Europe and the USA and compete with China in the small product area then it must implement more flexible systems with a rapid supply chain.

The model we have developed for Muir is only partially implemented but will reduce costs and improve competitiveness in the export market very significantly.

The main achievements may be briefly summarized as follows:

1. Improved profitability.
2. Reduced working capital.
3. Reduced inventory.
4. Recognition of a need to rationalize product components.
5. Recognition of the need to outsource and optimize.
6. Understanding of the need for continuous flow.

7.2 AMAX Engineering (Tasmania) Pty Ltd.

AMAX has improved dramatically particularly with the "T" screw project and the implementation of a more accurate, improved and faster financial system. This company is still at the mercy of its major customer, Comalco, who are very demanding in their approach to small players like AMAX. The offer to manufacture anode sections for Bell Bay is still under consideration. The CICP program has been used as a marketing tool to assist AMAX in gaining this business. Comalco is impressed. However, like all small engineering shops, the margins are tight and the profitability remains low. It is a business sector that is easy to enter and difficult to compete in. Robert is also experiencing problems with his workplace agreement and several workers have refused a pay increase despite the very good terms specified. The unions are making things difficult and this tends to blur the focus on the positive outcomes already obtained.
In all other aspects the company has embraced the principles and the work is progressing well.

The main general achievements are as follows:

1. Continuous flow process introduced for "T" Screws.
2. Time to produce financial information improved dramatically.
3. Quotation system rules modified.
4. Flow systems studied.
5. Supply rules modified.

7.3 Hazard Systems.

Brenton Heath, the Managing Director of Hazard is totally committed to the project and has made significant improvements to productivity, plant layout and supply and inventory control. As already stated, backorders held up in the system have now almost been eliminated. A method of control of the major sub contract supplier of printed circuit boards has been implemented to remove this as a bottleneck to improve control. Sales are increasing and this is putting pressure on the space and labour skills available. A method of improved and smooth control of raw materials has been implemented and has been exported to the USA for use by the new owners of Hazard.

The most significant outcomes are as follows:

1. Backorders almost eliminated.
2. New plant layout with continuous flow designed.
3. Main subcontractor control improved.
4. Improved ordering system introduced.
5. Productivity increased dramatically.

7.4 Novaris

Diane Thomson was always committed to and supporting of all aspects of the program. Improved methods of supply of raw materials have been implemented and this has reduced the lead- time through the factory and improved work-flow.
Initially, it was necessary to increase finished goods stock so that delivery on time could be met. Subsequently with improved scheduling and control, the total inventory was reduced as the on time deliveries improved.

All aspects of production control were analyzed and trimmed to incorporate the CF Rules. The external accountant has not been very helpful.

The most important improvements were as follows:

1. Reduced inventory even as on time deliveries improved.
2. Improved flow of work.
3. Improved ordering system.

7.5 Tasmanian Timber Engineering

Tasmanian Timber Engineering initially struggled to apply the principles, but with significant assistance from Andrew Richardson, a flow model for the whole of the production process has been designed. This will increase productivity by over 700% but does require significant capital injection. In addition, a new method of truss manufacture has been designed and is being implemented.

Added to these achievements, SMED, (CFR 8) has been applied and this has improved the quality of the gluing process and improved productivity. More improvements are in the pipeline.

The main outcomes are as follows:

1. Improved rationalization of product planning and scheduling model using the A,B,C analysis recognized.
2. New plant concept agreed and designed in principle.
3. SMED system successfully introduced.

7.6 Uniform City

Whilst Charles Cook, the Managing Director is committed, his processes and systems need further improvement. Raw material control and batch sizes and sequencing and customer liaison have all improved but a lot more improvement is needed. Waste has been significantly reduced. Two significant OH&S problems were solved.

The company continues to show significant improvements in basic systems but has a long way to go.

7.7 SERS

The major achievements were the development and partial implementation of a new plant layout using the existing floor space more effectively and improving workflow and increasing value added.

An additional benefit has been the faster preparation of accurate financial information and improved planning.

8. CICP Program - TAFE Observer Feedback

Introduction

This initial feedback from Ian James focuses on the learning strategies involved in the program and opportunities for improvement from two perspectives - **organization** i.e those participating in the program and the **system**.

Organization

The two key learning opportunities provided by the program were immediate improvement to business practices (short term) and the development of culture and capability so that continuous improvement is embedded in the organization (long term).

Improve business practice

The program focused strongly on the immediate improvement to the business and was driven, to some extent, by reporting and compliance requirements. The learning strategy used was a number of group workshops and individual consultations with each organization. The opportunities for learning could be enhanced by:

- Using the hands on exercise with the 'model' factory earlier to demonstrate key concepts and also using it in each organization;
- individual consultations with workshops that developed underpinning knowledge;
- greater use of case studies by way of videos etc from goods practice manufacturers such as Toyota would be helpful;
- scheduling the workshops in each of the participating organizations to bring both 'fresh eyes' to their problems and a better understanding of each others businesses.

Develop culture and capability

The program has made a contribution to developing the long term culture and capability by

- providing a vision of continuous flow;
- developing ownership by production staff of continuous improvement;
- raising awareness of the scope of improvement opportunities; and,
- empowering participants by being able to use their existing skills to improve practice.

It would be helpful to make explicit in the program the need and strategy to embed the development of culture and capability so that when the program finishes there isn't

backsliding. This includes, as well as the above, the capability of the organization to allocate time and resources to improvement activities as well as the need to 'standardize' improvements.

System

The three opportunities for development at the system level include the manufacturing industry in Tasmania more generally, the relationship to National Training Packages and the development of Registered Training Organization capability.

Manufacturing Industry

The benefit for the manufacturing industry has at his stage been limited to the seven organizations participating in the program. However there is a more general awareness of it as it has been discussed a number of times at the Manufacturing Industry Council meeting. The opportunity also exists to showcase the outcomes of the program at the state's manufacturing conference later in the year. The program has been discussed at the Managed Implementation Network, the national group of State VET agencies, TAFE Institutes and one private provider, Texskills, progressing the implementation of the new Competitive Manufacturing Training Package (CMTP). NSW are now piloting a similar program based on the CICP at the Western Sydney Institute (Contact Kevin Clayton or Gordon McLean 02 8713 4418)

National Training Packages

When the program started CMTP was still under development. The 25 rules of Creative Flow, the core element of CICP, maps well to the new Training Package with the scope of the Training Package broader than CICP. The opportunity exists to recognize competence through the CMTP and/or more closely align and broaden the program to the competencies in the CMTP where this is considered beneficial.

Registered Training Organisation Capability

The program has provided a significant development opportunity for four staff from TAFE Tasmania increasing awareness, confidence and the knowledge and skills in being able to work with organizations implementing competitive manufacturing. The introduction of the program at a national level has begun. It has already been accepted with enthusiasm at the National TAFE Engineering Group meeting on 29 April, 2005 RMIT and the national conference in Ballarat in August 2005.

Summary of the TAFE Representatives Views on the Blakemore CICP program in Tasmania.

No	*Issue*	*Details*
1	*TAFE Representative*	*Len Bambridge*
2	*Company in Prgm*	*SERS*
3	*Value of CICP Training*	*Has given me a platform to base my learning of Lean Manufacturing Systems. This system of introducing the manufacturing method is ideal as it*
4	*Value of the Methodology*	*The model where a Lean manufacturing expert visits a company and recommends ways to improve manufacturing methods is good, however I wonder if the program will loose momentum in the future without that input. The workshops have been of value, as the companies have been able to feed off the successes or otherwise. The enthusiasm of the participants in the report back sessions is evidence of commitment to CICP.*
5	*Company Project Applicability of Method*	*This system of introducing the manufacturing method industry is ideal because it involves the management level of the company in the introduction of Lean. Working on a live project is probably the best way to introduce lean. There is also immediate feed-back.*
6	*Value of the Target Measurements*	*A good way to keep the project on track and to evaluate the results.*
7	*Value of Strategic Plan Proforma*	*The plan is a must, the proforma has assisted in standardising the data in each plan so that it is easier to make comparisons.*
8	*Value of the 25 creative Flow Rules*	*This is a great staring point for people who have no concept of Lean. However the philosophy behind Lean is more than a box a box of tools, it is very much about building a attitude of learning, continuous improvement and respect for all employees at all levels of the company*
9	*Value of the 7 step Method*	*This underpins the whole project and is the basis its success or otherwise.*
10	*Notes (Ideas on Dissemination method to TAFE (Ijames)*	*Not quite sure what is required here. I feel the initial introduction of Competitive Manufacturing by TAFE will be based partly on the CICP format, so any knowledge gained by practitioners will be invaluable.*

Summary of the TAFE Representatives Views on the Blakemore CICP program in Tasmania

No	*Issue*	*Details*
1	*TAFE Representative*	*Andrew Richardson*
2	*Company in Prgm*	*Tasmanian Timber Engineering*
3	*Value of CICP Training*	*The CICP program has given me the opportunity to return to industry in an area I left 14 years ago. This opportunity has allowed me reinforce and expand my skills for the benefit of my students.* *Lean manufacturing technology does not receive emphasis in current general engineering courses and I feel it would be of benefit to the country if it did.*
4	*Value of the Methodology*	*A key strength of this program is the methodology. It would be easy to attempt a lean program in a haphazard way with very little chance of success. The program forces the adoption of a scientific approach supporting the organization with clear steps in the process.*
5	*Company Project Applicability of Method*	*Tasmanian Timber is pursuing two projects one in the glue-lam plant, and the other in the truss plant. Both of these projects were approached using the 7 step method*
6	*Value of the Target Measurements*	*This is part of the methodology without written targets there can be no measurement of progress and justification of process improvements.*
7	*Value of Strategic Plan Proforma*	*As a TAFE participant I only had an over view of Tas Timbers strategic plan, however it was clear that the document forced the organization to document their current position and future goals. This process must be of great value to an organization.*
8	*Value of the 25 creative Flow Rules*	*The 25 creative rules provide mind triggers when investigating a process, not all will be applicable to all processes but considering each rule in the context of process will stimulate lean thought.*
9	*Value of the 7 step Method*	*Forces the adoption of the scientific method, which must control the whole lean process.*
10	*Notes (Ideas on Dissemination method to TAFE*	*Through the next National TAFE Engineering group Next meeting April 29th usually in Melbourne Contact Robert Squires on 03 6233 7406*

Summary of the TAFE Representatives Views on the Blakemore CICP program in Tasmania.

No	*Issue*	*Details*
1	*TAFE Representative*	*Michael Mohr*
2	*Company in Prgm*	*Amax*
3	*Value of CICP Training*	*To see the gains that will be made for the companies involved backs up the theory behind the process. The results prove the concept*
4	*Value of the Methodology*	*The workshops gave an overview of what was required it also allowed all participants to make contacts and discuss their projects and feed off each other. The method of where John visited the participants industry to help identify the project and identify where gains could be made was a great help.*
5	*Company Project Applicability of Method*	*I feel that by identifying real projects within their industry has shown them the value of the program and they are getting something back from the time put in. The project has been selected to suit the program and put the lean manufacturing process in place.*
6	*Value of the Target Measurements*	*This helps to keep the project on task and schedule and gives the company an idea of what can be achieved.*
7	*Value of Strategic Plan Proforma*	*Identifies the objectives, what they are aiming for, how to get there, the time to achieve it, and adding value to their company. Reviewing the strategic plan helps to keep the project on track.*
8	*Value of the 25 creative Flow Rules*	*The 25 flow rules are the methods of making the changes to achieve outcomes that will help solve a problem.*
9	*Value of the 7 step Method*	*The 7 step method underpins the whole project.* *Sets the goals, measures the current situation, analyze the information, identify opportunities,* *Identify options, implement change, and control and monitor.* *Make achieving the outcomes possible.*
10	*Notes (Ideas on Dissemination method to TAFE (I. James)*	*The notes and information have been available and been valuable. Information was initially given at the workshops and by email.*

8. General Comments on the Competitiveness of Small Australian Manufacturers.

This program was born from a Keynote Speaker address I gave in Hobart. After numerous discussions with ManSA and The Department of Economic Development, it was decided to introduce the 25 Creative Flow Rules into a group of Tasmanian SME's. In principle, at the time, I saw no problem with this even though my consulting skills were always aimed at companies where the financial accounts are audited and therefore are reasonably accurate, and where the companies are large enough that adequate resources can be made available to do much of the data collection needed. Companies of the size of the 7 SME's in this program, are not in the target consulting range normally focused on. Despite this the 25 Creative Flow Rules are totally applicable. However, as I have now discovered, SME's have special needs.

The most significant characteristic of all the 7 small businesses in this program is the need to implement good business systems and control and understand process innovation. They operate in a market where their market share is very small but their systems and equipment and use of IT software is very poor. They do not understand process innovation. They do not need new products at their present stage of development in a large majority of cases. The real need is process innovation. There is no point in introducing new products if the company can't make them at a competitive price and quality.

I have now become aware of the newly proposed "Commercial Ready" program to be introduced into SME's. This program will not address the major need of the SME based on my observations as detailed above. They do not need new products but they do need more systems and they do need to innovate their processes and machinery and systems urgently. Injecting a new product into a poor system will make all processes less efficient and will not address this problem. A change to the "Commercial Ready" program is needed if this program is to truly make SME'S more competitive.

9. Creating a Competitive Advantage for Australian Manufacturers

Australia's Current Account Deficit (CAD) at approx 6% of our Gross Domestic Product (GDP) and terms of trade (T of T), and our total private net debt of approx 65% of GDP are of great concern. Generally, our whole economy is based upon low value added products (raw materials, coal, iron ore, minerals, wool, wheat, etc) whilst world trade is predominantly about high value added products (Elaborately Transformed Manufactures). We should learn from Toyota and Microsoft. Australia's infrastructure to contribute to the manufacture and development of ETM is very poor. Intimately woven into this is our poor industrial R&D effort and record of innovation. This is due to the high preponderance of small businesses and their focus on the short term. This in turn is due to the low level of process control and innovation. It is not logical to push these firms into making new products since their processes are very poor but they do need to innovate and renew their business and manufacturing processes. They urgently need process innovation. This program in Tasmania has confirmed the above views.

It is already clear from the very positive results obtained so far from the CICP program, that small manufacturers (less than $50M turnover) need special help which is not covered by existing support programs. The last thing they need at this stage is a new product. In addition, it is now recognized that 70% of the nation's new investment comes from its existing industry base. Hence, this is a good reason to expand it.

Manufacturing generally is not well represented at the professional level and small manufacturers appear to have no group representing them at all. During a discussion with the National President of Engineers Australia last September I was told that "manufacturing is not really engineering". This is borne out by the fact that they do not even have a college of manufacturing. General industrial engineering and operational process methods and knowledge are absent from almost all small manufacturers. Attempts to successfully use the continuous flow techniques (Toyota Production System), have most often failed because most companies, particularly SME's, cannot adapt the Toyota assembly systems to Australia's multi-product short run environment. American advisers cannot see past low variety long run supply and hence the methods that will be successful in Australia are significantly different from their perceptions. Australian innovations have already been developed and applied successfully under the SIP program and need to be diffused to small SME's.

Conventional manufacturing methods and planning systems in Australian SME's are highly inefficient but this problem can be rectified if the connection between process innovation and product development is made focusing on the creative flow techniques pioneered by Japanese car manufacturers. Process innovation is a precursor to good product development. These techniques can be applied to SME's. Current programs like "Commercial Ready" do not address this issue because in many cases new products are not what these organizations need. The Industry Cooperative Innovation Program may address some of these issues but this is unknown at the moment. The problem is not the immediate introduction of new products it is the creative innovation and development of the existing processes to manufacture all products. This includes the development process itself. At a recent forum in Sydney, Harvard Professors Sam Hayes and Warren McFarlan now recognize, belatedly, that the key to Japanese automotive success is process innovation and internal R&D and a strong link between process and product innovation, not acquisition, something not widely recognized.

One of the most significant development projects in Australian Industrial R&D was the development of Colorbond (Zincalume) by what is now Bluescope Steel. I was the Chief R&D Development Scientist leading much of this project. This achievement was a result of process innovation.

The secrets of the future development of manufacturing depend upon:

- Increasing competition and exposure to the international market (This is being addressed with existing Federal Government Policy)
- Removing restrictions to industrial productivity improvement by improving Industrial Relations (This is probably going to occur).

- Focusing on and utilizing industries (source and downstream) where we have a natural competitive advantage (energy, bauxite, iron ore, power, nuclear, agriculture etc)
- Completing the supply chain so that we add as much value to the raw materials as possible (consistent with demand and isolation)
- Concentrating on export.
- Continuous innovation of processes linked to products innovation.
- Utilization of patent know-how. (Colorbond).
- Process innovation by isolating the constraint and improving productivity and utilizing the appropriate technology.
- Introducing continuous flow techniques for all products.
- Rapid product and process development (R&D).
- Replacing labour with capital.
- Concentrating on the premium end of the market.

Examples of Process Innovation Achievements.

Innovation Access Program Tasmania 7 Companies. (All less than $50M turnover)

All the participants have common problems. They are under-capitalized, have difficulty raising money, and have a small market share, and very poor processes and higher than desirable manual handling and manufacturing costs.

In all cases the productivity gains so far achieved under this program are already significant but these gains are small compared with the potential improvements that can be made. In one case we can develop a process where one person can do the work of several.

Relationship Between Process Innovation and Product Development

New products must be developed more quickly but it is not sufficient to just develop a new product. The method of development and the processes used to manufacture them must be innovative as well. This is not currently recognized and as a result programs are supported by the R&D Board when they should not.

General

Many of the principles are well established in manufacturing plants in a wide range of industries, particularly in Japan for automotive manufacturers, and electronic manufacturers, These principles can be introduced successfully into any manufacturing plant in Australia but unlike the USA environment, we need to modify the methodology to suit the fact that Australian plants most often must make a very large variety of products. This means that the production runs are often short and there is a lot of

pressure put on the manufacturer to maintain high levels of finished goods inventory. In the USA often plants can be dedicated to low variety of products on very long production runs.

Good business practice aims for continuous and never-ending innovation and improvement. This means a continuous emphasis on new ideas in all parts of the business both in product and process but process innovation does not come naturally to all.

The methodology promoted has already been tried in a complex multi-product environment which is far more complicated (5500 products, 7 plants. 16 machine types, 20 different processes) than most plants. (8,9,10,11).

Concept

The concept is to:

- Create continuous flow and so increase value added time %.
- Link process and product development
- Transfer the measurements to the Profit and Loss account and the Balance Sheet.
- Take the resultant working capital released and inject it into technology and new innovations to increase productivity and reduce labour.
- Continue the process by further increasing the value added time %.

Starting with the key principles of creative flow of products and services, operations research, the 14 Toyota Management Principles, the 14 Rules of Dr Deming and the key links between process and product innovation, a series of concepts have been developed and successfully applied. These need to be understood by all manufacturers, specifically those below $100M turnover. The concept introduced at Feltex with some principles applied at Pirelli and following the methods used on the Colorbond project, needs to be diffused quickly through Engineering schools at all levels. There has to be a continuous understanding that the value added percentage in all manufacturers must continuously increase.

The concept is to take these ideas and apply them through demonstration projects supported by Universities and TAFE following the basic scientific method, and transfer these measurements to all functions of the company, and measure them through the P&L and balance sheet.

The Innovation Access Program in place in Tasmania can be used as a showpiece. The specific achievements of the companies in the program are given below:

Specific Achievements of the Innovation Access Program in Tasmania

No	*Company*	*Achievements*
1	A	1. Identified and measured rework which was not not known to Owners. This was then reduced from 21% to 12% and is still falling. 2. Productivity gain of at least 10% 3. Two major health and safety issues solved 4. Poor quality proved to be related to procedures. 5. Removed much of the people blaming by proving they were not the cause of the problem. 6. Efficiencies improved but still poor. 8. Sales increased by 14%. 9. Working capital estimated to have been reduced from 365 days to 230 days. This represents a release of capital of approx $300k 10. Forecasting Method improved
2	B	1. Potential productivity gain of 600% in terms of output per person. 2. Partial implementation will lead to productivity gains of 150% with an associated cost reduction of 50%. 3. Introduced SMED to almost completely eliminate downtime.
3	C	1. Inventory decreased by $137,000 at the same time as on time deliveries improved from by 5% to 99% and turnover increased.
4	D	1. Recognition that the floor usage was low and flow could be improved 2. New layout to allow for new machine. 3. Reduction in time to produce accurate financial data.
5	E	1. Increase in productivity from 6 major units per day to 6 per hour. 2. Capability to supply larger orders increased by 100%. 3. Major Machine run time increased from 16% to 37%. 4. New Layout designed. 5. New raw materials supply system introduced.
6	F	1. $200,000 increase in net profit 2. Substantial reduction in inventory 3. Rationalization plan for small products. 4. New flow system for small products. 5. New planning procedure for large products.
7	G	1. Reduced time to prepare financial accounts 2. Flow system introduced for major product. 3. Improved quotation system.

Conclusions.

1. All small companies have similar operational problems. If these are not addressed then the company will continue to "firefight" and this will weigh heavily on its chances of reasonable success and growth.
2. The achievements in this 18 months program have been very significant but represent only the beginning of a major transformation that each participant company must continue to pursue to be globally competitive.
3. All companies demonstrated that they could operate more efficiently with less capital if they practiced the 25 continuous flow principles.
4. The 7 step problem solving method was also very successful.
5. The general secretive non-sharing of financial data hindered progress.
6. One company, which was ISO accredited to ISO9001, did not have one work instruction in place and as a result suffered a major quality recall. This is very poor situation and highlights the need for a rethink of the ISO system and the way it is audited.
7. SME's need help. Generally, small companies produce a variety of products but with poor flexibility and with short run lengths. Simply thinking that the Toyota production system will work in the Australian manufacturing environment without significant innovations and change, will lead to failure. However, as we have demonstrated in this 18month study, these problems can be solved.
8. The current "Commercial Ready" program encourages these companies to develop new products but new innovative processes are needed. The guidelines for "Commercial Ready" need to be broadened so that maximum benefits can be obtained from the allocated funds or alternatively funds should be diverted from this program so that the maximum national benefit is obtained. Process innovations for existing products must be considered to be competitive with innovations to produce new products.
9. The CICP program in Tasmania is showing the way.

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