SUPPLY CHAIN SERVICES AUSTRALIA

Lean Warehousing

Eliminating Barriers to Warehouse Productivity by Embracing Lean Principles

Presented By: Avi Olender

Who is SCSA?

SCSA is the largest Perth-based supply chain and logistics consultancy practice. We specialise in providing support to companies through a wide range of services across the areas of people, process, technology and facilities – at both a strategic and operational level.

PEOPLE	PROCESS	TECHNOLOGY	FACILITIES
Strategy	Strategy	Strategy	Strategy
Roles and responsibilities	Supply chain management	Functional requirement	Logistics network design and site selection
Competency	Logistics management	Systems design and integration	Facility design - warehouse, workshop, manufacturing
Recruitment	Business management	Sourcing	Warehouse layout and fitout
Contract support	Process mapping, tools and re-engineering	WMS	Site design
Training	KPI	Warehouse storage and equipment	Capacity planning
Mentoring	Risk management	Route management	Utilisation optimisation
Change management	Tender compilation	MRP	Traffic management
Job descriptions	Tender response	RF/ barcoding	Safety
Lean logistics	Lean logistics	Lean logistics	Lean logistics
Project management	Project management	Project management	Project management

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Some of our clients

bhpbilliton

Rio Tinto

Freo GROUP LIMITED
CONNECTING PEOPLE, SERVICE AND EQUIPMENT

woodside

Barminco

Rand
REFRIGERATED LOGISTICS

WesTrac CAT

TEREX

THE laminex GROUP

ARG
A Company

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About the presenter – Avi (pronounced aa-vi) Olender

- ✓ 16 + years of practical Warehousing solutions development experience
- ✓ 6 + years in AU : 3.5 years with Dexion AU & 2 years with Toyota WA Autoparts (2010 winner of Award for Excellence at National Supply Chain & Logistics Awards)
- ✓ Present - Consultant with SCSA (10 months)

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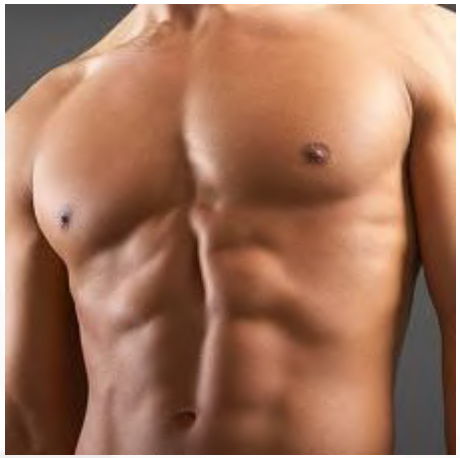
Contents / Agenda

1. What is LEAN?
2. Applying LEAN – Set of Tools
3. Case Studies – Practical Implementations
4. How to commence your Lean journey
5. Q & A

1. What Is LEAN?

We have been dishing up this commonsense in one way or another for years

New buzz words: LEAN THINKING, KAIZEN, KANBAN…etc



Eliminate / Remove Waste (Japanese - Muda)

1. What Is LEAN?

The Simple Goal of Lean Thinking – Provide what your customer orders, with the least amount of effort & resources

Sophisticated Quotes:

- "The holistic & general practice of time sensitive analysis of resource utilisation & process flow..."
- "It is defined as that which changes the focus of management from optimising separate technologies, assets, and vertical departments, to optimising the flow of products and services through entire value streams that flow horizontally across technologies, assets, & departments to customers."

It's Simple – Provide what your customer ordered, with the least amount of effort & resources

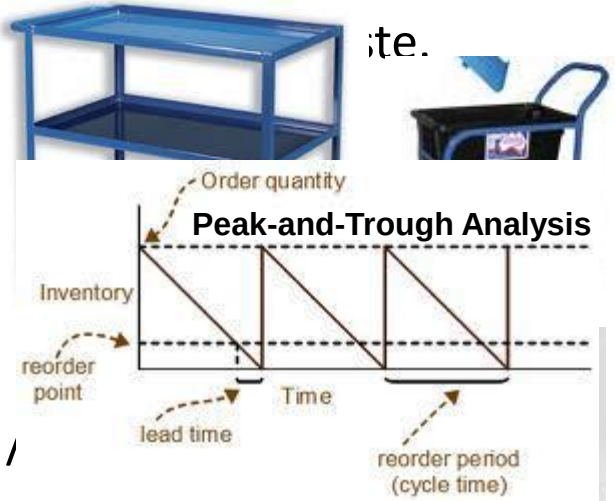
Keep It Simple & Straightforward – "KISS" (drop the stupid)

Simplify your operation

It's all about switching on the innovator in you & in your employees mindset – to remove waste, simplify & create efficiency

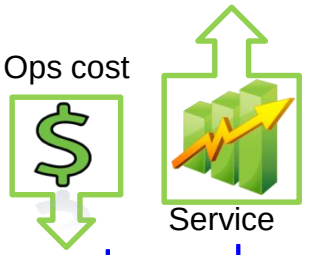
The Seven Wastes – "TIMWOOD" (warehousing application)

- Transportation – Each time a product is moved without added value.
  e.g. – relocation of excess stock to bulk / overflow stock.
- Inventory – Stock not being actively processed t ite.
  Represents wasted capital that has not yet produ
- Motion – Refers to your operator, storeman or M
- Waiting – Whenever operators are waiting on M
  and not being processed.
- Over processing – Occurs any time when double
  inbound or outbound product line.
- Over production – Occurs when more product is pi
  than is required by your customers.
- Damage – Whenever damage occurs, extra costs a
  reordering & reprocessing of the item.



LEAN Thinking Assumptions:

- High rank champion will take the leadership role (sensei – teacher)
- We're not after people, we're going after the system (Why? not Who?)
- Obama's slogan: "yes, we can…" motivate & empower your staff
- People value visual effect/s of their work flow & performance
- Waste is the main restriction to a better bottom-line
- Many small improvements in a short time (simple quick wins) are extremely beneficial - be creative & not a big spender
- Minor bumps in an improved process will be resolved through refinement sessions on the fly - manage the change
- Lean improvement work teams involved adding value professionals & staff to achieve best results for the business & the way staff perceive their roles in the company



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2. Applying LEAN – Set of Tools

1. Kaizen Event (main tool) – Continuous Improvement

   A. **Small** or large scale – whole operation or one workstation (pain – bottlenecks, service levels & future projection)

   B. Secure CAPEX for Immediate implementation/s

   C. Assemble dedicated team, led by a high rank champion – internal & external (experience / open minded) Define current situation & Gaps

   D. Map, review & analyse route cause of problem / s

   E. Set objectives & responsibilities & communicate plan & vision to your workforce – respect your people

   F. Workshop, prototype & test the proposed solution/s

   G. Implement immediately!! (boost to staff morale)

   - Perfection : Repeat D – F until satisfactory

2. Applying LEAN – Set of Tools

In a Kaizen event the following tools should be applied:

1. Gather facts through Genchi Genbutsu - means "go and see for yourself"

2. Process Mapping
   - ✓ One of the first steps in gaining control over an operation is to know & understand the basic processes.
   - ✓ Mapping activities involved in a process & what the process does, who is responsible, to what standard/procedure the process follows & how the process success is being determined.

2. Applying LEAN – Set of Tools

What is a process?

Input → Set of actions which transform input to output → Output

Example: Receiving process

Input

Output

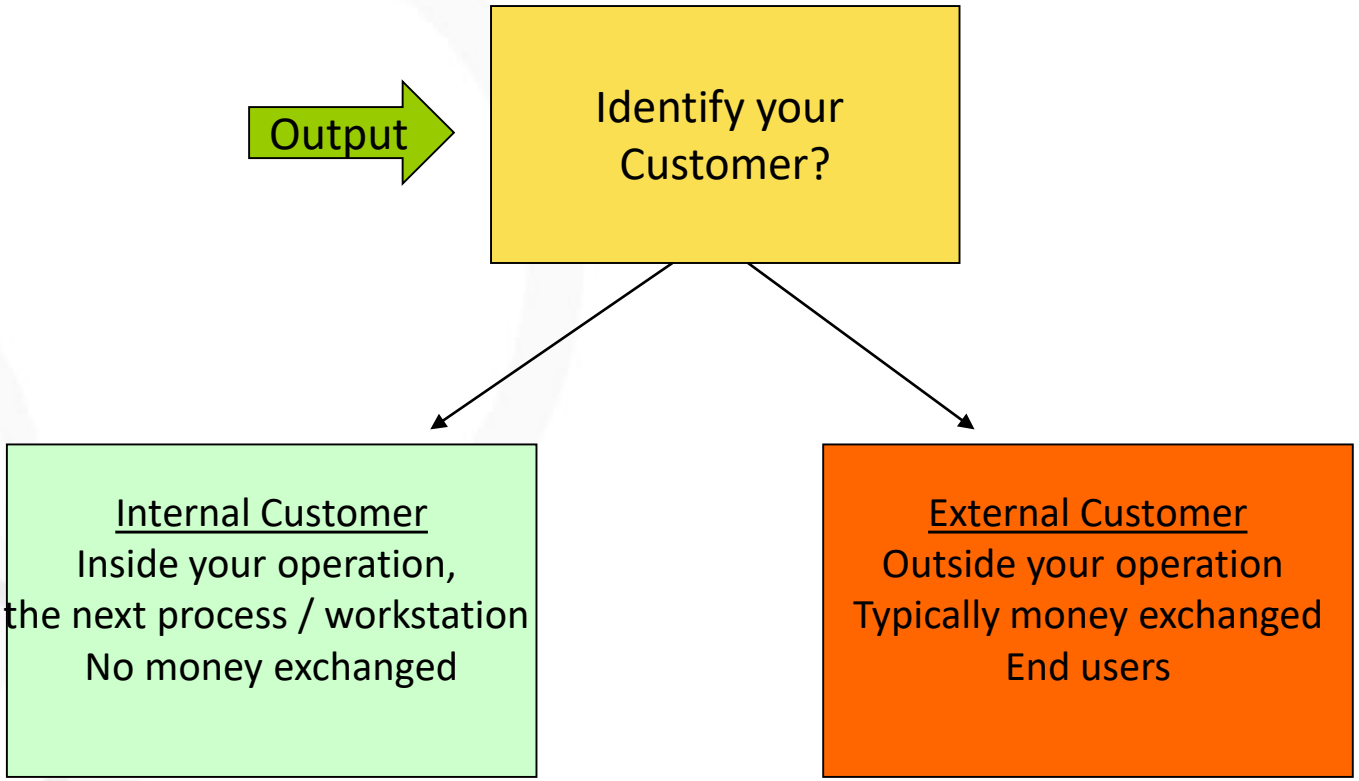
Put-away

2. Applying LEAN – Set of Tools

What happens to the output of a process?

They go to a customer!

What do we want to do to this customer? – Please him / her!



Customers also drive your input with their requirements.

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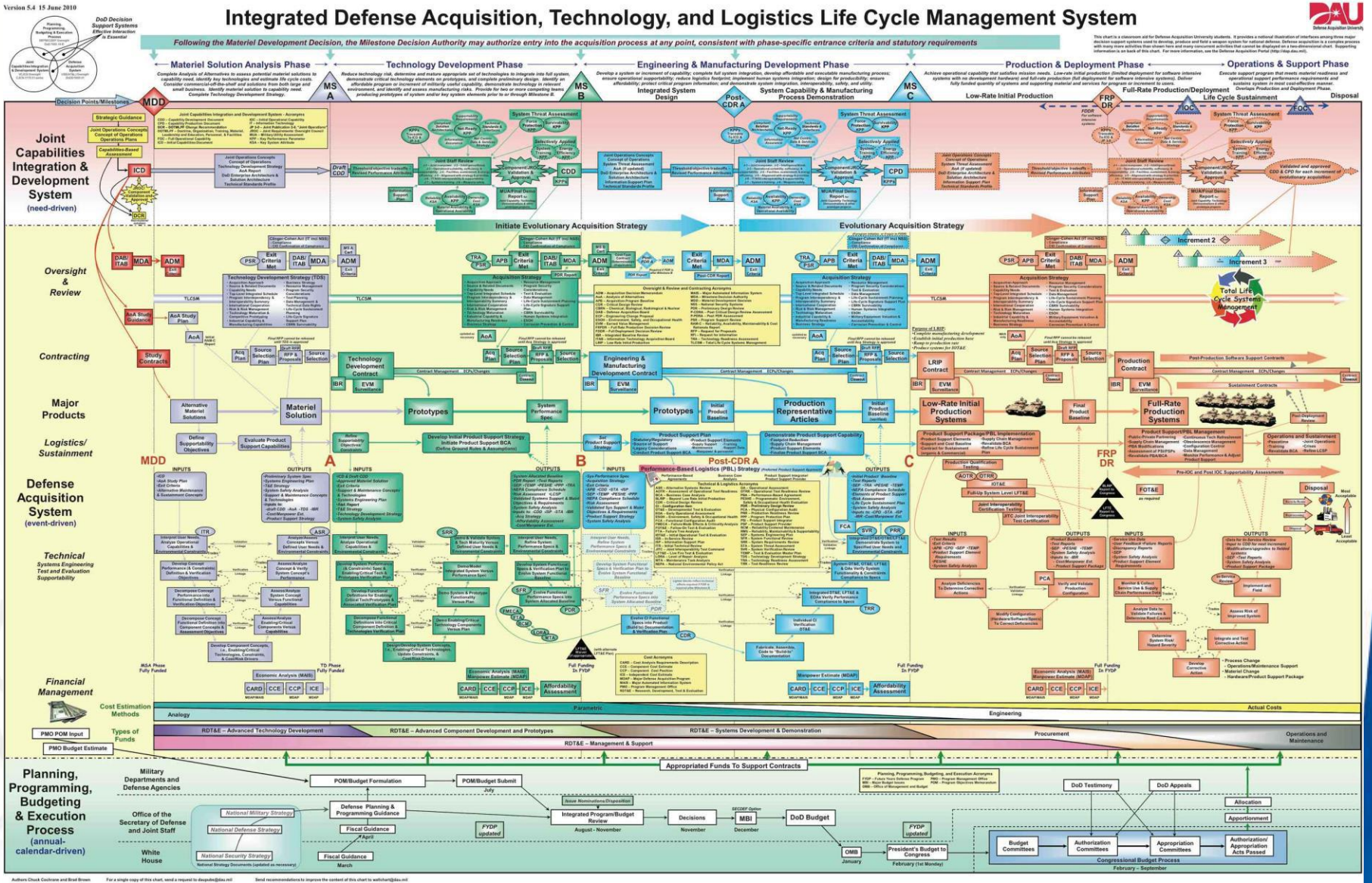
2. Applying LEAN – Set of Tools

Process mapping



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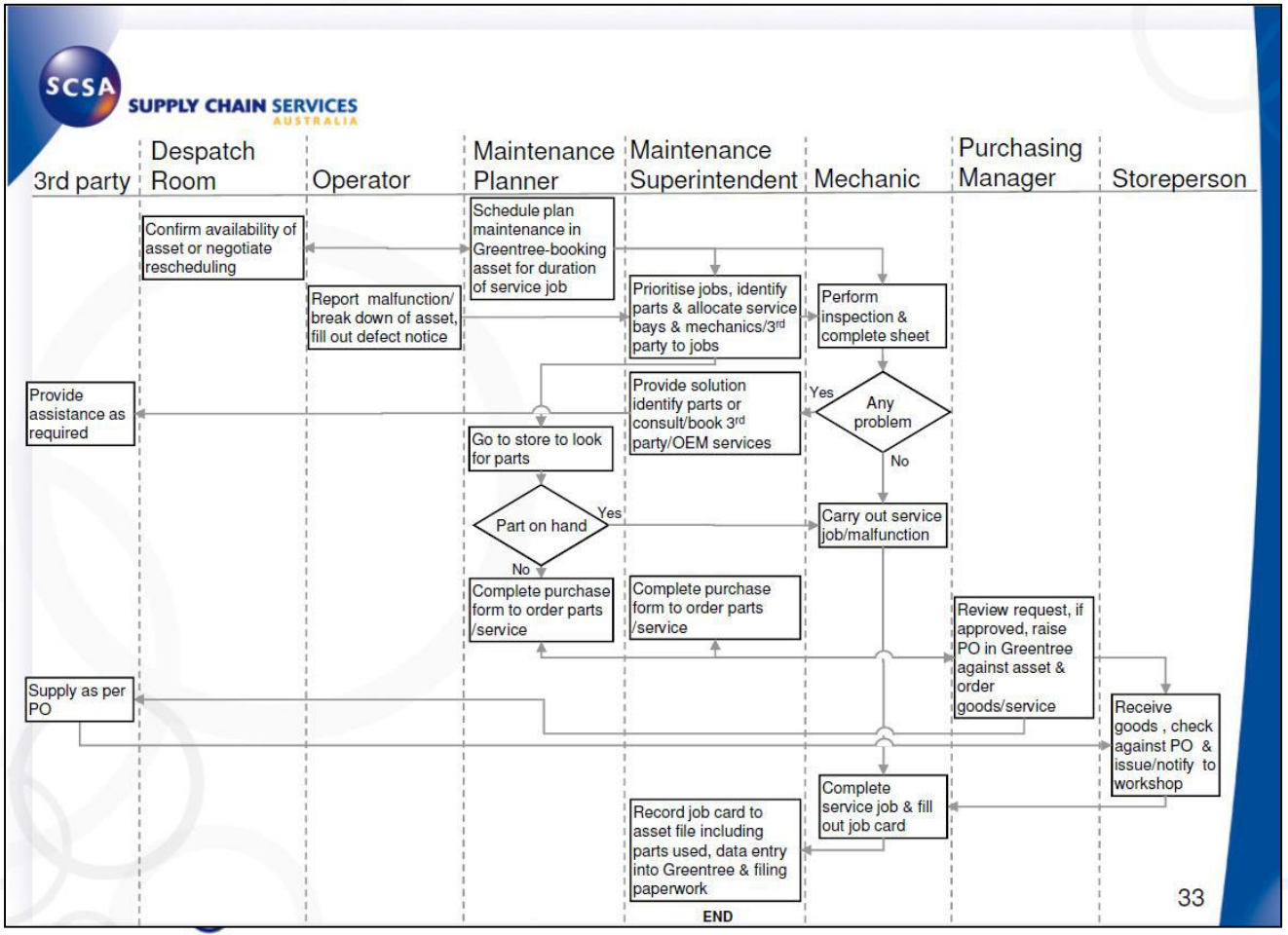
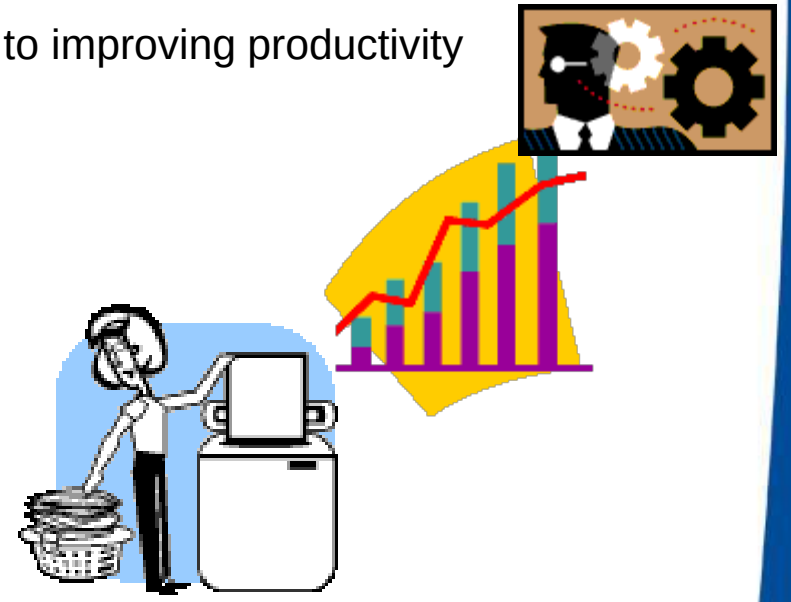
2. Applying LEAN – Set of Tools

- Only understood process can be improved
- Understanding a process is easier when it can be visualised
- A process map is an organised visualisation tool of all the interrelated activities / functions which combine to form a process



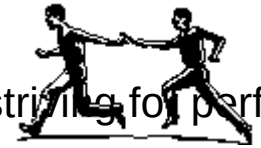
Process mapping

- Processes bring about everything we do – process driven
- Lean thinking (tools) provide the foundation to modern process improvement
- Understanding & improving processes is the key to improving productivity



Familiarise yourself with your processes

- Specify the Value – is defined by your internal / external customer (output)
- Identify your Value flow – in the most efficient way map out back-to-front linked actions, processes necessary for transforming input to output & eliminate waste
- The Boeing story – their output is delivering an airplane to a customer. They started to map backward all the processes / activities back to front & when they compared that to what they were actually doing they found that 50% of the activities are not adding any value in the eyes of their customers
- Design value flow continuously – having eliminated waste, make remaining value adding steps to flow in the most efficient way
- Get to a point that your customers (in/out) are pulling from you to enable just in time supply / production - relay racing (don't lose the baton!!)
- Pursue perfection – continuous process improvement striving for perfection
- Short & long term – no final solution, it's a journey



Map your process according to

Value added activity

- Transforms or shapes products / materials or information
- It's done right the first time
- The customer wants it that way

Non – Value added activity – necessary waste

- No value is generated, but can't be eliminated based on current technology, policy or thinking
- Project coordination, law, regulation or company mandate

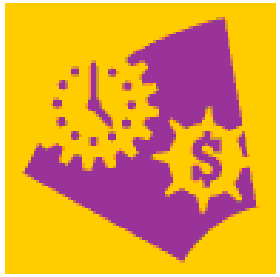
Non – Value added activity – pure waste

- Consumes resources, but creates no value in the eyes of the customer
- Examples: idle/waiting, inventory, reprocess & unnecessary check offs

2. Applying LEAN – Set of Tools

Process flow requires:

- Understanding of time & resource requirements
  - Cycle time / Takt time - used to promote a structured approach to reduce disruption that impacts efficiency & driving down time variation between process activities
  - In a warehouse environment we measure in line units
    - Receiving Lines / Picking Lines etc...
  - Takt time can be determined with the formula: T = Ta / Td
  - Where:
    T = e.g. [minutes of work / workstations / personnel]
    Ta = Net time available / require to work, e.g. [lines / day]
    Td = Time / lines demand (customer demand), e.g. [lines required / day]
  - $T_{(unload\ container)}$ = 444 min' in a day / 300 min' to unload container = 1.48 container can be unloaded in a day...
  - $T_{(receiving\ workstation)}$ = 1500 lines a day / 500 lines for one workstation = 3 stations are required at receiving...
  - Add factors like:
    - Sick leave
    - Public holidays & others



2. Applying LEAN – Set of Tools

- Process control – (We will look at a tool later on)
- Eliminating bottlenecks & stoppages
- Eliminating unplanned over-processing activities

Creating flow (try it yourself):

- Focus on the internal outputs that flow through your processes
- Don't limit yourself by technology, procedures, facility or people

2. Applying LEAN – Set of Tools

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Colour code:

Non – Value added activity – pure waste / Value added activity / Non – Value added activity – necessary waste

Client: Service Provider Site: Process: Customer Billing Date: Operator:	Billing	Motion	Quality Control	Waiting	Batching Paperwork	Elapsed time (days)	Note
Customer Billing							
Paperwork return to admin						0.3	
Collecting relevant paperwork						0.5	From operator
Collecting relevant paperwork						0.5	From other departments
Checking paperwork to job costing						0.2	
Manager sign off paperwork						0.2	
Sending paperwork to billing department						0.3	Billing department on off site location
Checking paperwork to job costing						0.2	
Manager sign off paperwork						0.2	
Sending paperwork to operation department to double check						0.3	
Manager sign off paperwork again						0.2	
Sending paperwork back to billing department						0.3	
Raising invoice						0.1	
Manager sign off invoice						0.1	
Invoice sent to customer						0.1	
Total (days)						3.5	

Production

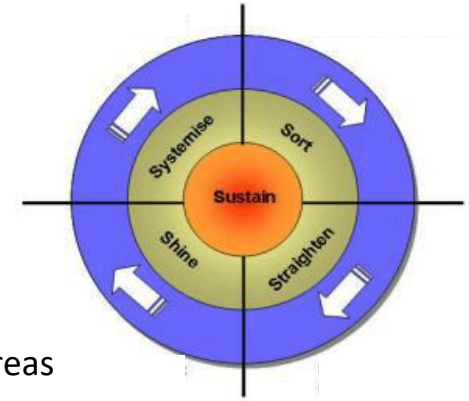
Transport

Over processing

-2.8 days improvement

3. 5'S / 8'S Principles

- ✓ **Sort** – Maintain essential stock in accessible locations, eliminate waste & prioritise tasks.
- ✓ **Streamline** – Simplify your operation setup & process e.g. - location for each SKU should be clearly defined & traceable. Storage layout should be arranged in a manner that promotes efficient work flow. Eliminate double / triple handling of product (cross-dock) .
- ✓ **Shining** – Maintain tidy & organised workplace. Keep cleanliness as part of the daily routine – not just when things get messy.
- ✓ **Standardise** – Procedures should be consistent and standard across the operation. Staff should know exactly their responsibilities (clear job description).
- ✓ **Sustaining** - Maintain focus on improving your operation.



- ➢ **Safety** – Review your OH&S procedure / traffic mgt
- ➢ **Security** – Consider CCTV system, mgt overview operational areas
- ➢ **Satisfaction** – Consider employee of the month scheme, incentive payment

4. The 5 Why? / Tree – Problem solving mythology

- The way to develop the W-Avi

From Horizontal storage

To Vertical storage

Why?

Why?

Why?

Why?

Why?

Why can't we have compartments in racking

No dividers exists for pallet racking

Why can't we create a divider for racking

Nowhere to place divider & can't punch beams / decks

Why can't we screw divider to a beam / deck

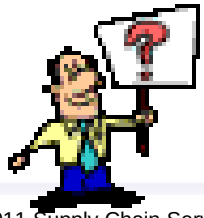
We want flexibility in our storage system

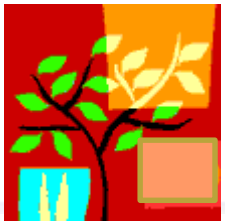
Why can't we stand up a divider on an angle

We need a rigid divider that stock can lean on

Why can't we clip on / hook on a divider

Eureka (pronounced yoo-ree-kuh) – solution insight



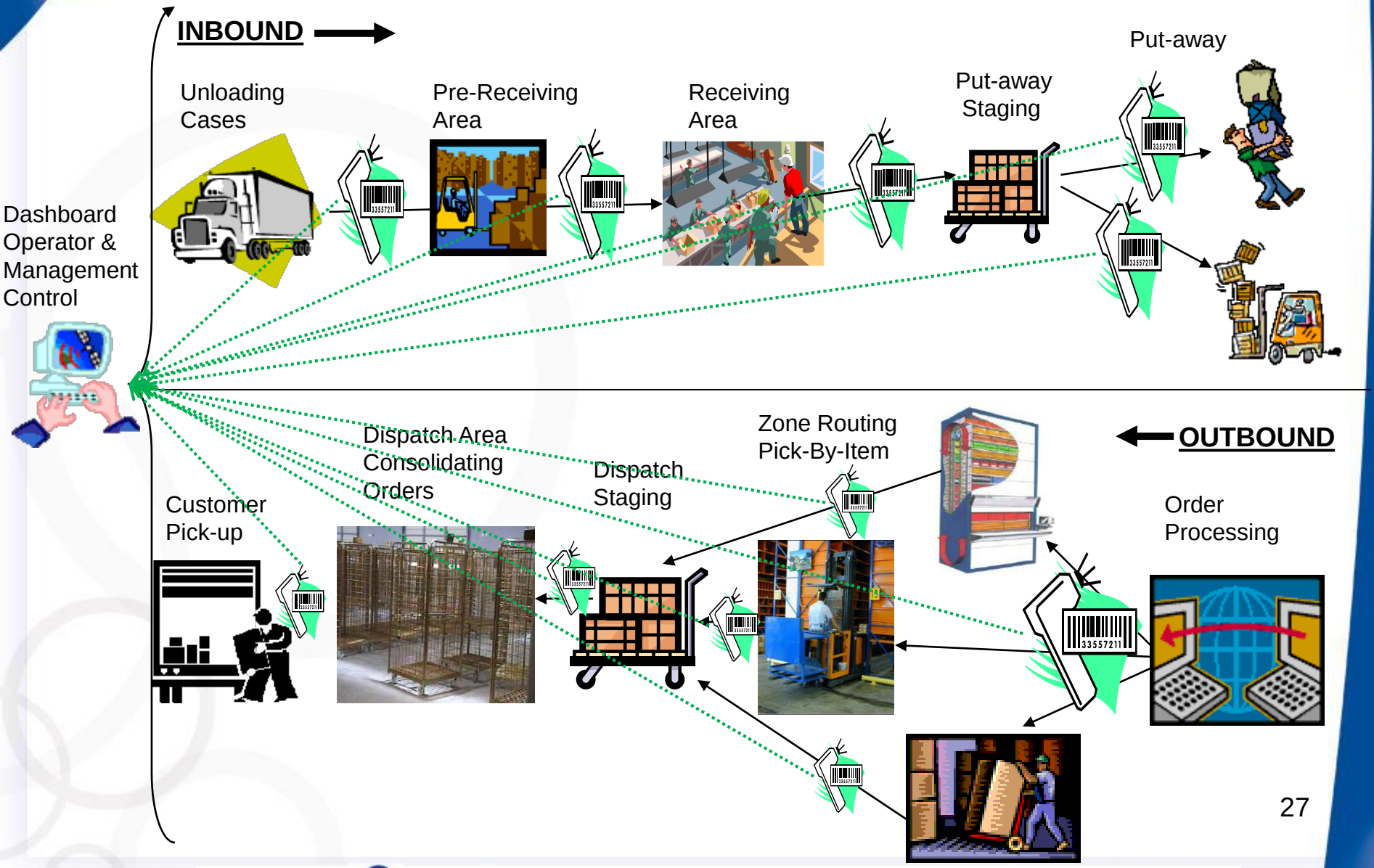


2. Applying LEAN – Set of Tools

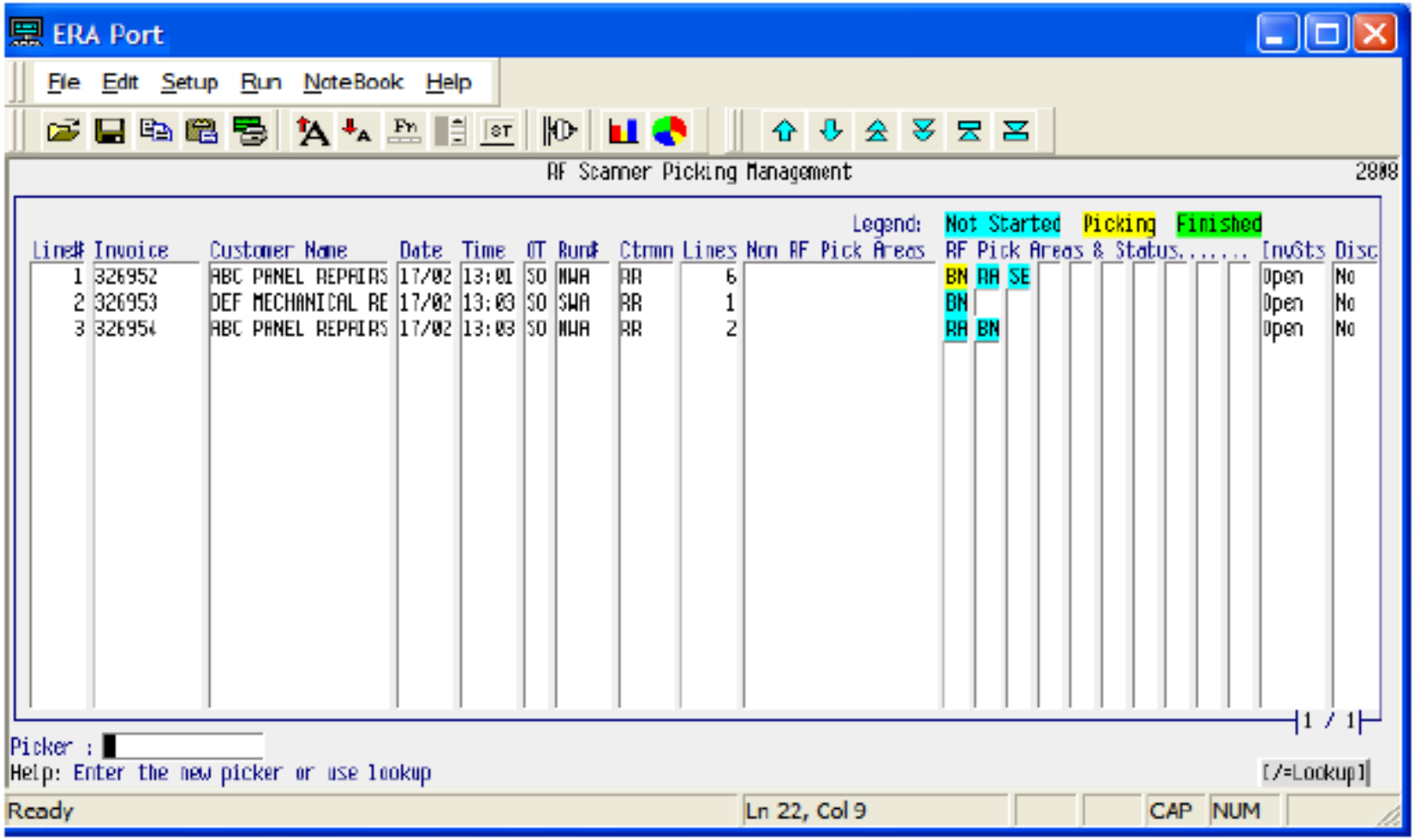
5. Dashboard Overview (real-time reporting tool)

- ✓ Achieving Mgt /Process Control – While keeping you on top of vital statistics & KPIs, dashboard capabilities help you visualise & track trends on every level of your operation & to align activities with key goals

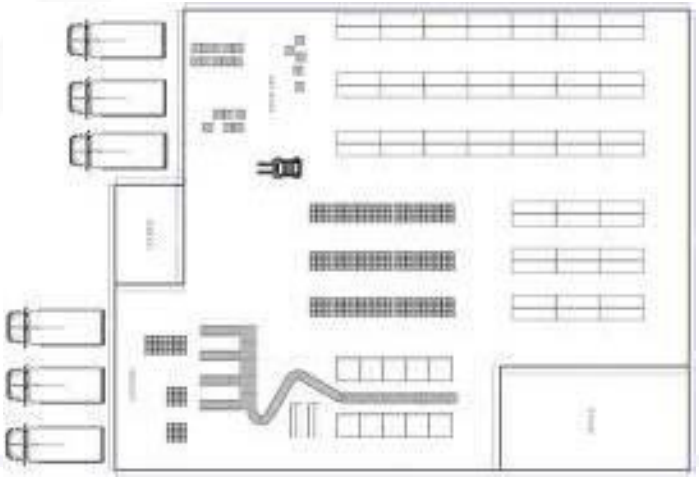
2. Applying LEAN – Set of Tools



2. Applying LEAN – Set of Tools



6. Heijunka – levelling Mura (Unevenness)
   - ✓ Concept created by Toyota for achieving a smoother production flow & activities in an operation. The ones that you have control of...
   - ✓ Leveling activity (simple example: digital boards in supermarkets / Medicare /bank which number is next and to which teller)
- Warehouse applications – Labour plan, receiving goods - leveling shipments
- Common use – leveling product velocity in zones or aisles to make sure no bottlenecks & leveling to pick up / despatch cut / train times
- Also, leveling set up time & batch / wave time in zoning



2. Applying LEAN – Set of Tools

7. Andon
   - System to notify management, maintenance, & other workers of a quality or process problem - lost the baton.
   - Some modern alert systems incorporate audio alarms, text, or other software displays. It gives the storeman the ability to stop a process when a defect / damage is found, and immediately report to receive assistance.
   - Warehouse applications – miss pick / shortages / quarantine - strict isolation imposed on delivery when there are discrepancies
8. Kanban
   - Kanban is one means through which Just In Time is achieved
   - Warehouse applications – workstations / inventory / feeding the next subsequent process / customer

2. Applying LEAN – Set of Tools

9. Benchmark
   - Internally
   - Industry (warehousing)

Case Study - Laminex

Before

After

- ✓ Sorting – Picking lists with designated despatch bay. Packed orders stored by customer / delivery route.
- ✓ Straightening – Despatch line marked & noticeable to all operators. Deliveries are stored according to the sorting principles, clearly labelled & ready to be loaded to despatch vehicles.
- ✓ Shining – The system is tidy & organised; Managers are maintaining cleanliness as part of the daily routine.
- ✓ Standardising – Bays standardised both in capacity & sizes.
- ✓ Sustaining – Improvements are being put forward to utilise the system further.
- ✓ Safety – Safer environment in this heavy traffic area.
- ✓ Security – The new system is leveraging the security level in the despatch area.
- ✓ Satisfaction – Satisfaction levels among the Laminex employees are high.

Goods – To – Man

- 5-8S’
- Heijunka
- Andon
- Kanban

3. Case Studies

Input

Output

3. Case Studies

3. Case Studies

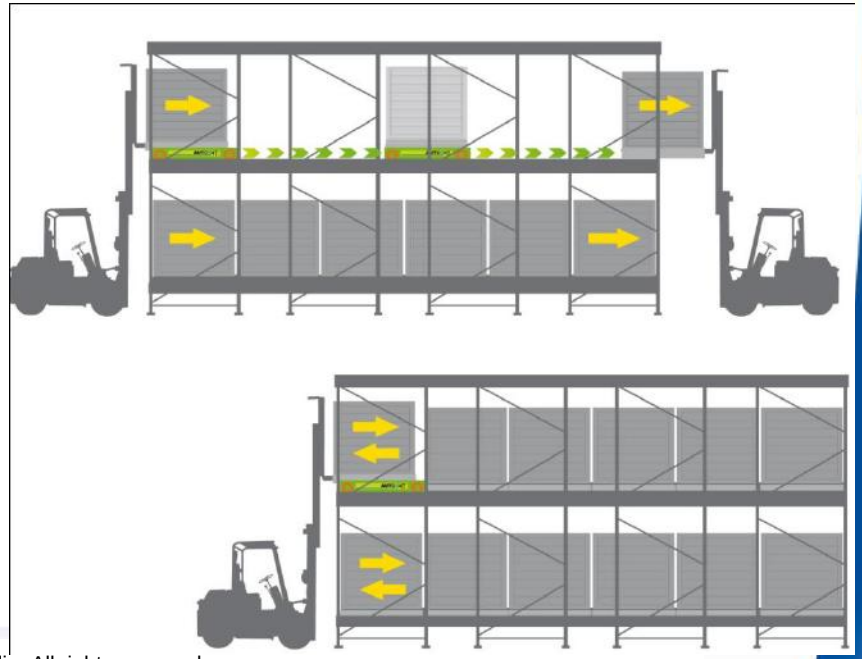
- 5-8S'
- Heijunka


ISUZU
DC
EA
DB

Transportation

3. Case Studies

3. Case Studies



3. How to commence your Lean journey

- Develop a high level strategy of operation blueprint - moving forward.
- Plan for its execution (business case).
- Provide resources for the implementation.
- Identify & break barriers to implement as they are encountered.
- Monitor & ensure that overall implementation is not adversely impacting current business performance – seamless transition.
- Coach your staff in Lean principles & tools.
- Facilitate Kaizen events & Lean projects.

Good luck on your endless journey.....

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SUPPLY CHAIN & LOGISTICS ASSOCIATION OF AUSTRALIA

THANK YOU

Gracias

Q & A

Merci

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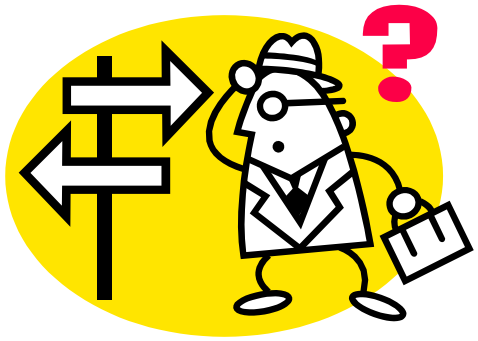

How SCSA adds value

CREATING VALUE IN SUPPLY CHAIN & LOGISTICS - EXAMPLES

	Client No:	1	2	3	4	5	6	7	8	9	10	11	12
	Client Sector:	Resources	Bldg products	Parts	Resources	Mining services	Health care	Mining equip	Mining equip	Parts	Aviation	Transport	Resources
	SCSA VALUE-ADD TO PAST CLIENTS												
1	Reduction in warehouse footprint	33%			50%		25%		25%				$2.0m
2	Increase in storage capacity (in same footprint)			80%				50%					
3	Improvement in order picking productivity		15%	135%						33%			
4	Reduction in total staff levels		10%	20%									
5	Reduction in capex of storage fixtures		25%	30%									
6	Improved site utilisation	23%									40%		
7	Reduction in capex of materials handling equip		15%										
8	Reduction in inventory					$1.6m							
9	Increased delivery fleet productivity											15%	

How SCSA adds value

Example of Value Add to SCSA Client

Assignment: Warehouse and Site Planning

	ORIGINAL REQUIREMENT ASSESSMENT - BASED ON CURRENT CLIENT METHODS		SCSA PROPOSED DESIGN - AGREED BY CLIENT			
	Total Sq. Metres	Total Lease Cost $ p.a	Total Sq. Metres	Total Lease Cost $ p.a	Savings M2	Savings Lease $
WAREHOUSE BUILDING	13,600	1,795,200	9,126	1,204,632	4,474	590,568
OFFICE / AMENITIES BUILDING	500	150,000	500	150,000	-	-
HARDSTAND / LAYDOWN AREA	22,400	1,075,200	15,700	753,600	6,700	321,600
ANCILLARY YARD AREAS - internal roads, car parking, landscaping, fire services tanks etc	17,600	-	16,126	-	1,474	-
TOTAL	**54,100**	**$ 3,020,400**	**41,452**	**$ 2,108,232**	**12,648**	**$ 912,168**
%					**23%**	**30%**