



SMT Consulting

Melbourne

Suites 1-3

131 Bulleen Road

North Balwyn Vic. 3104

Australia

Sydney

Suite G05

25-29 Berry Street

North Sydney NSW 2060

Australia

www.SMT-TOC.com

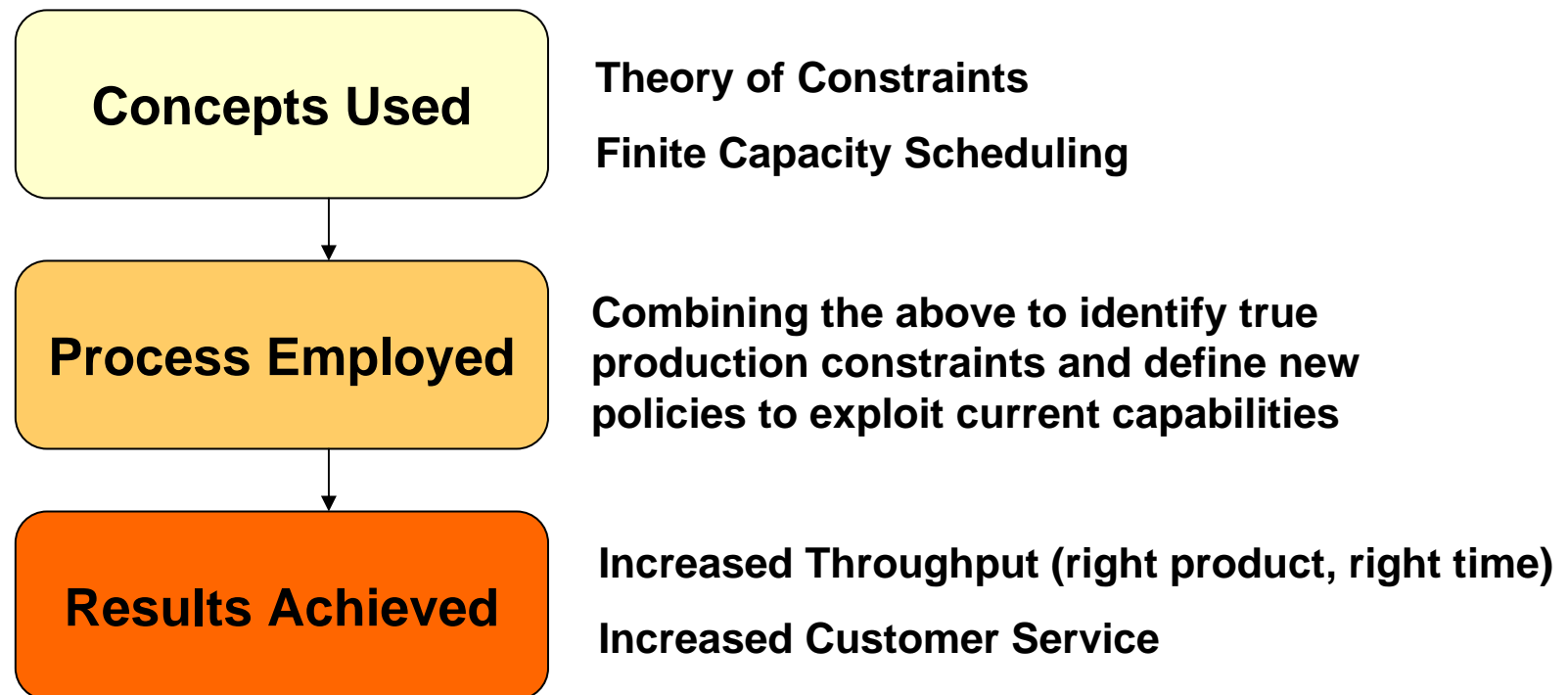
Applying Finite Capacity Scheduling and Theory of Constraints to Increase Customer Service at...

A Global Manufacturing Company, Australia

Project Objective



- Exploit the potential of existing manufacturing resources (Equipment and Labour) to eliminate customer backorders

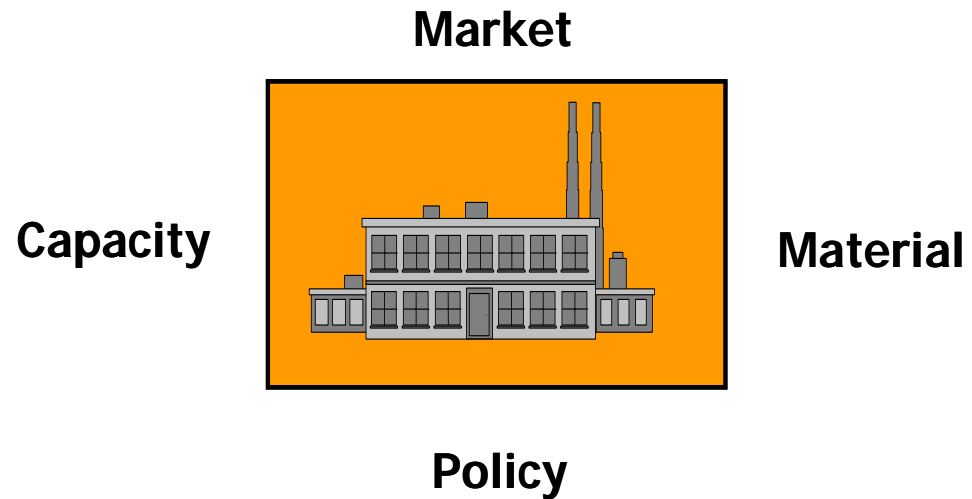


Concept

- Question:
 - What are Constraints/bottlenecks?
- Answer:
 - Anything that limits the throughput of an organisation
 - Anything that prevents the organisation from moving towards its GOAL of making more Money

Theory of Constraints

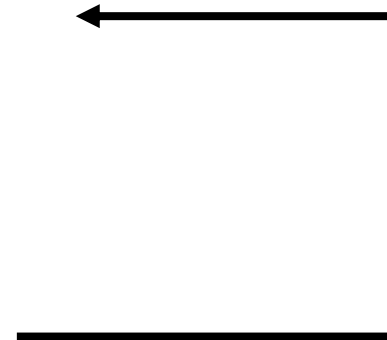
Concept



- A constraint can take the form of a:
 - *Capacity Constraint* - limited machine capacity
 - *Material Constraint* - limited material availability
 - *Market Constraint* - not enough sales
 - *Policy Constraint* - a management policy restricting throughput.
 - The policy constraint is the most common business constraint

Concept

- SMT Consulting applied the Five Focusing steps of Theory of Constraints to exploit current manufacturing capabilities:
- Five Focusing steps
 1. Identify the constraint
 2. Exploit the constraint
 3. Subordinate non constraints
 4. Elevate the constraint
 5. Go back to Step One
(and identify the next constraint)



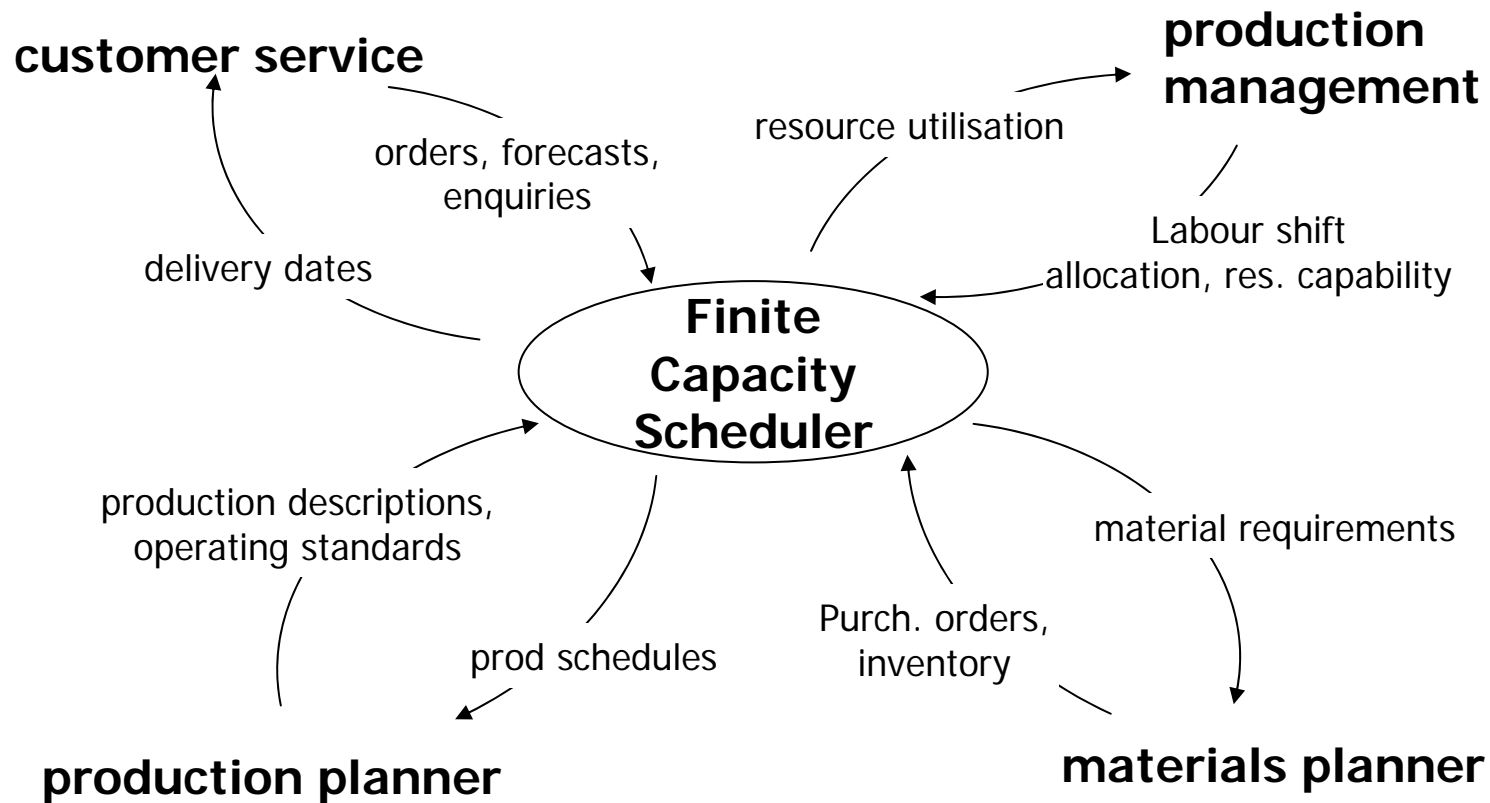
Concept

- The tool used to identify and exploit production constraints was a **Finite Capacity Scheduler**,
 - The process involved:
 - Building a detailed model of all the resources (including people) in the manufacturing plant
 - Passing material availability, WIP, and actual demand through the model to produce a model that recognises:
 - » Manufacturing constraints: resources and materials are not in infinite supply
 - » there are product interdependencies that affect the potential throughput of the facility
 - Using the model output, the production schedule and change management processes to drive a throughput increase on the constraint resource
 - Develop constraint focused KPIs to measure the performance of the plant

Role of Finite Capacity Scheduling

Concept

- The Finite Capacity Scheduler incorporates capacities and policies to replicate the real capabilities of the manufacturing system



The Schedule & Operational Performance



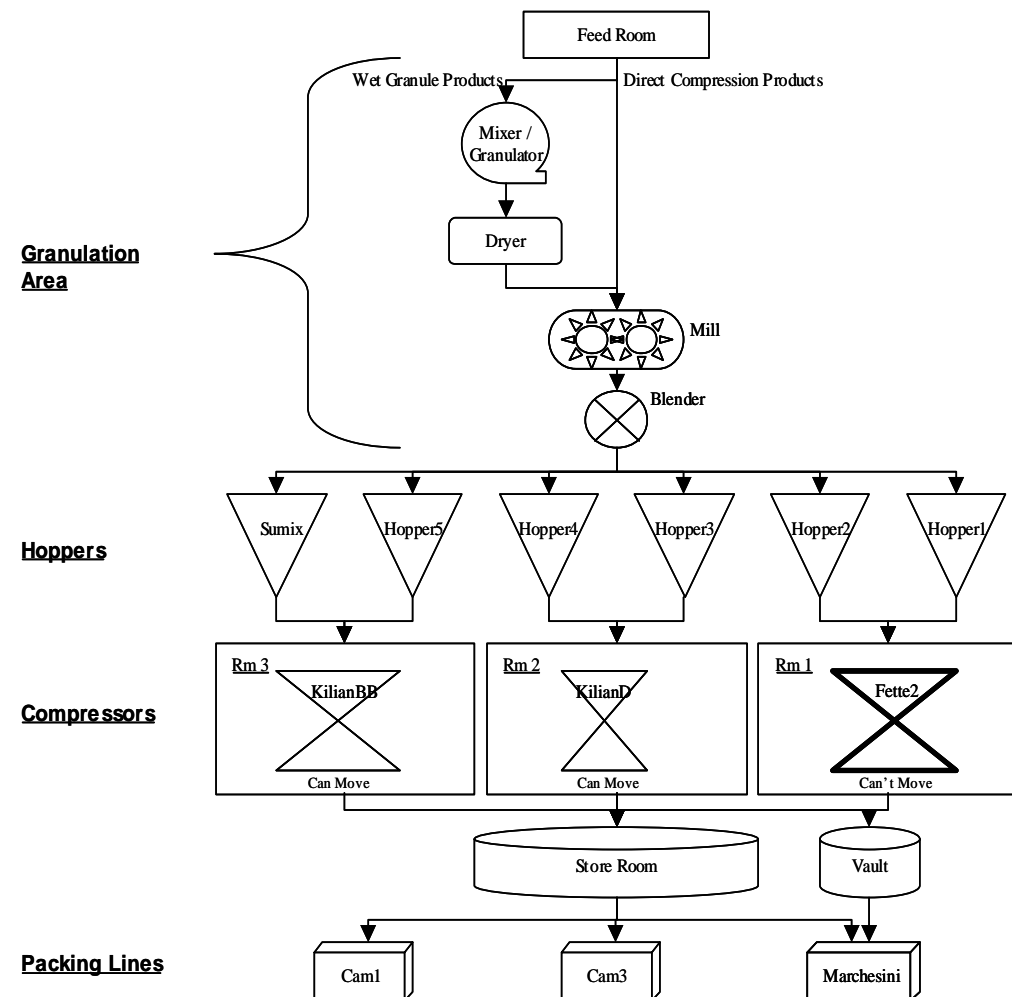
Concept

- The production schedule provides to management and the workforce a powerful & detailed statement of everything that has to be done to achieve the business throughput targets
- ❖ The finite schedule provides information on:
 - ❖ what tasks need to be done
 - ❖ what sequence the tasks need to be done in
 - ❖ when do the tasks need to be done
 - ❖ how long the tasks should take
 - ❖ what resources are needed
 - ❖ what will be delivered to the customer (& when)
 - ❖ what raw materials are needed (& when)
- ❖ Becomes the business performance “Drum”
- ❖ Achieving the scheduling becomes the “goal” of manufacturing

Modeling the Solid Dose Plant Capability

Process

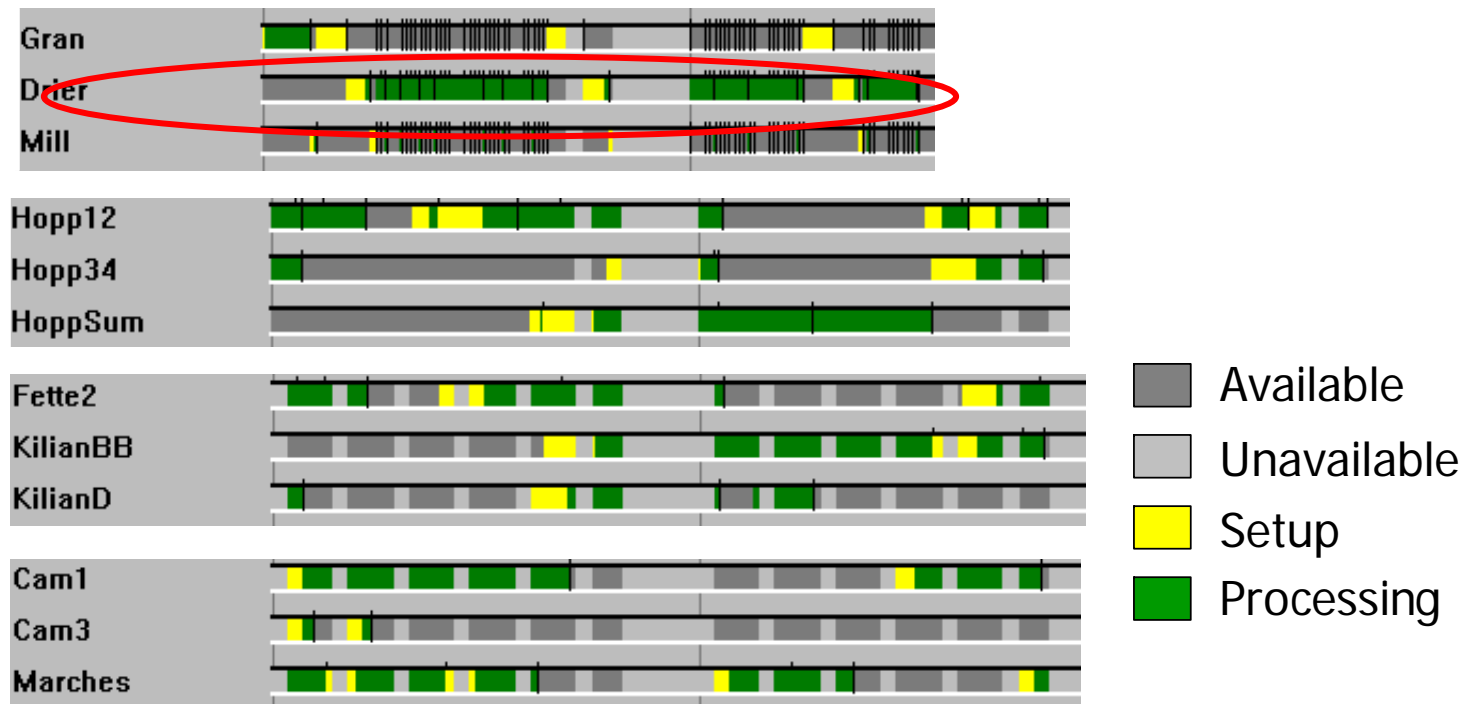
- The implementation process commenced by using the finite capacity scheduler to build a model of the production process
- Model building involved:
 - Process mapping product flows
 - Creating an 'as is' model
 - Validating model outputs
 - Applying the Theory of Constraints to the model
 - Use the model to test the benefits of proposed manufacturing improvements



Identifying the Constraint

Process

- A variety of demand sets were run through the model to identify the manufacturing constraint
- Capacity utilisation outputs identified the **Drying process** as the constraining production resource
 - Drying Limited the throughput of the entire manufacturing system

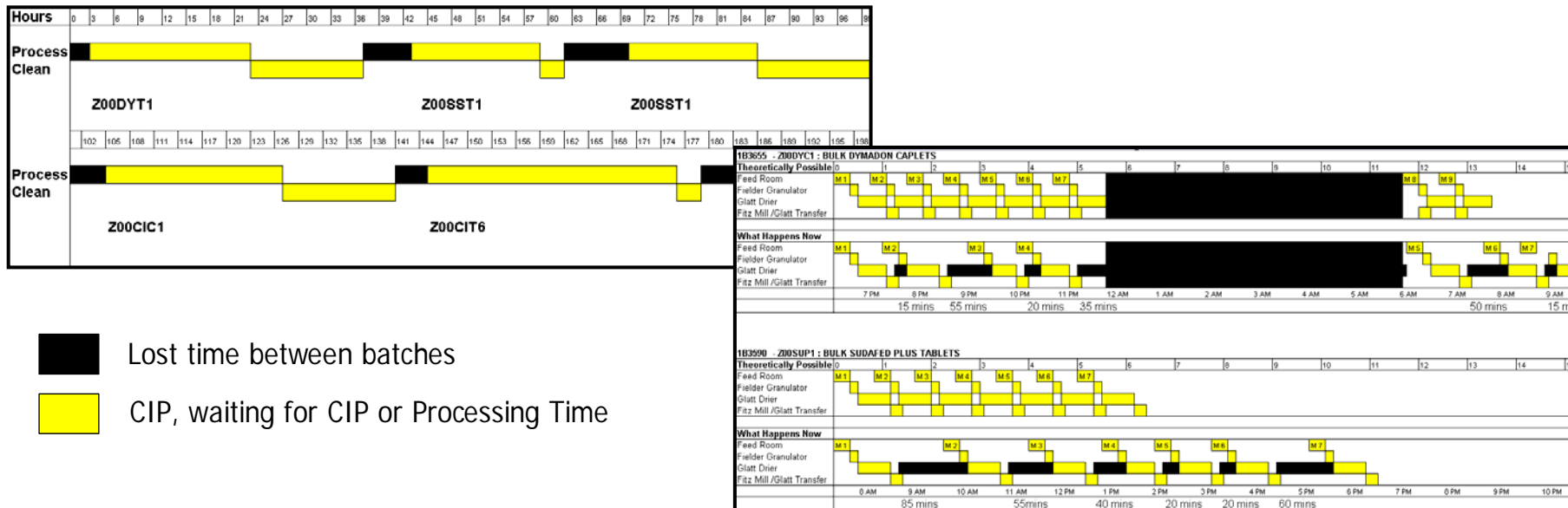


Focus on the Constraint



Process

- The next step was to identify how constraint throughput was being lost in the real manufacturing environment
 - Detailed shop floor analysis of activities within and between batches identified causes of difference between actual and model potential

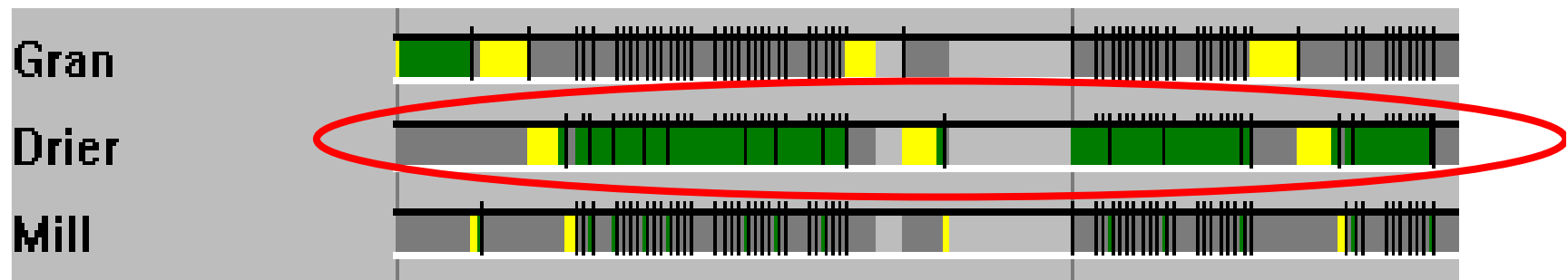


- ***45% of potential manufacturing throughput was being lost at this point in the process***

Elevate the Constraint

Process

- The physical capacity of the Dryer was being constrained by the dryer and the current cleaning cycles



- Focused Improvement Workshops facilitated by SMT were undertaken to improve dryer throughput
 - Involving the Engineering Manager, an Electrical and Production Engineer and Production Manager
 - Output were detailed actionable improvement initiatives
 - Benefits were built into schedule times and expectations

Process

- Applying Finite capacity scheduling and a constraint focused improvement methodology provided a short term opportunity to improve throughput of the current plant by up to 45%
- Opportunities revolve around focusing on fully utilising existing bottleneck capacity and subordinating non constraints
- The planning process also needs to ensure this capacity is used to make the right product at the right time

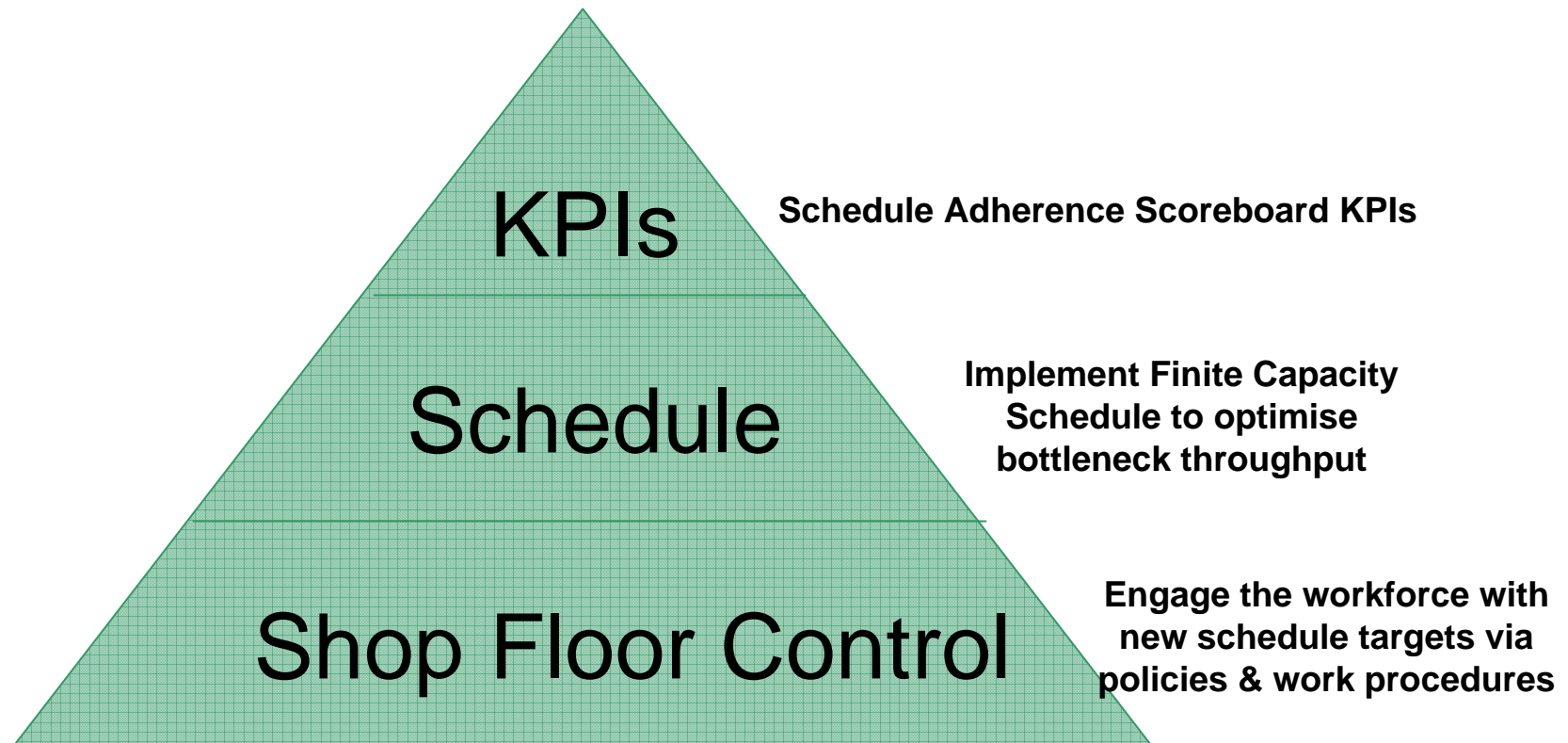
Service Excellence Supporting Structure



Process

- A 3 tiered implementation strategy was used to achieve customer service excellence

Service Excellence



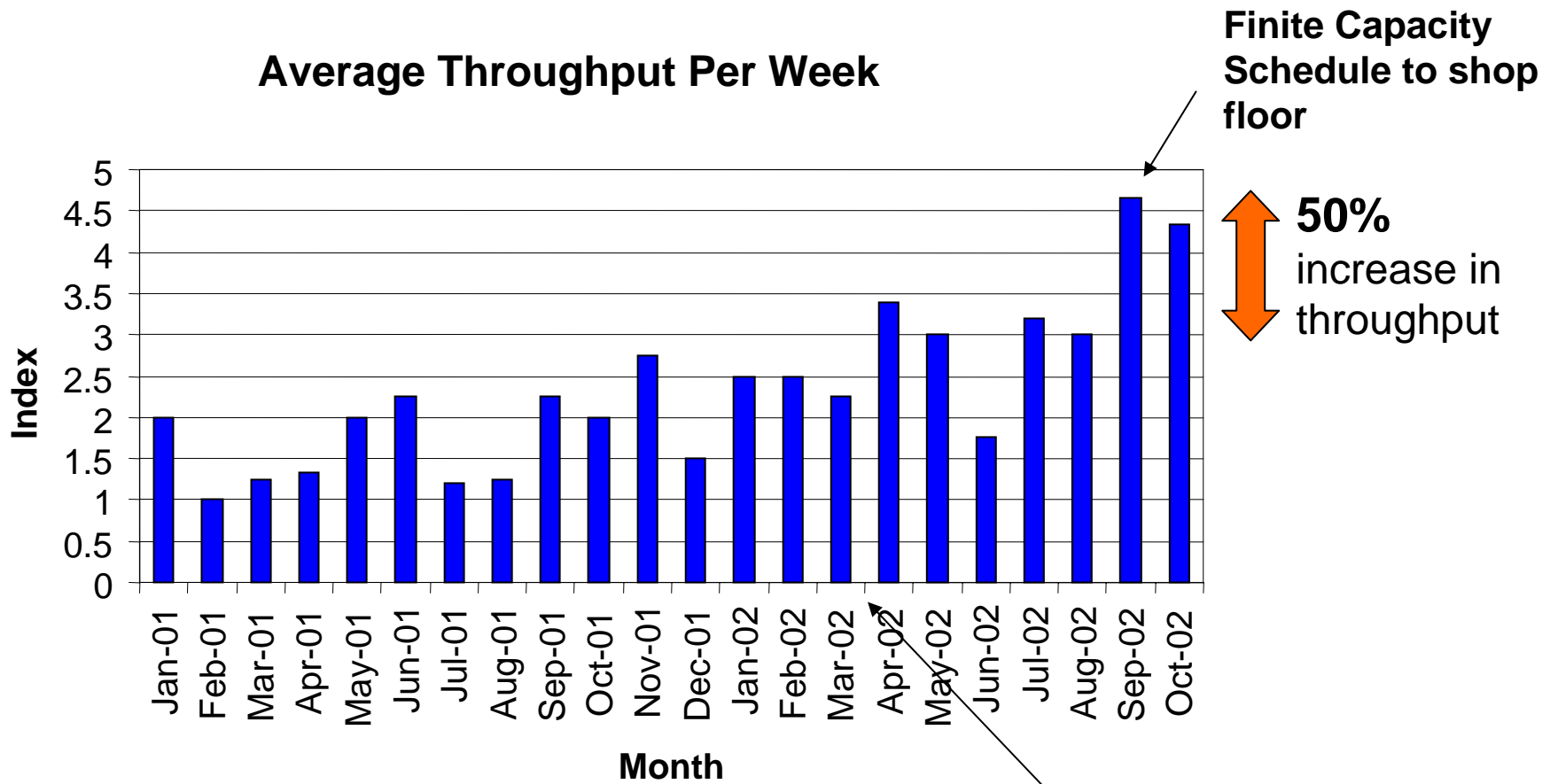
Throughput Increase



Results

↑ Throughput

Average Throughput Per Week



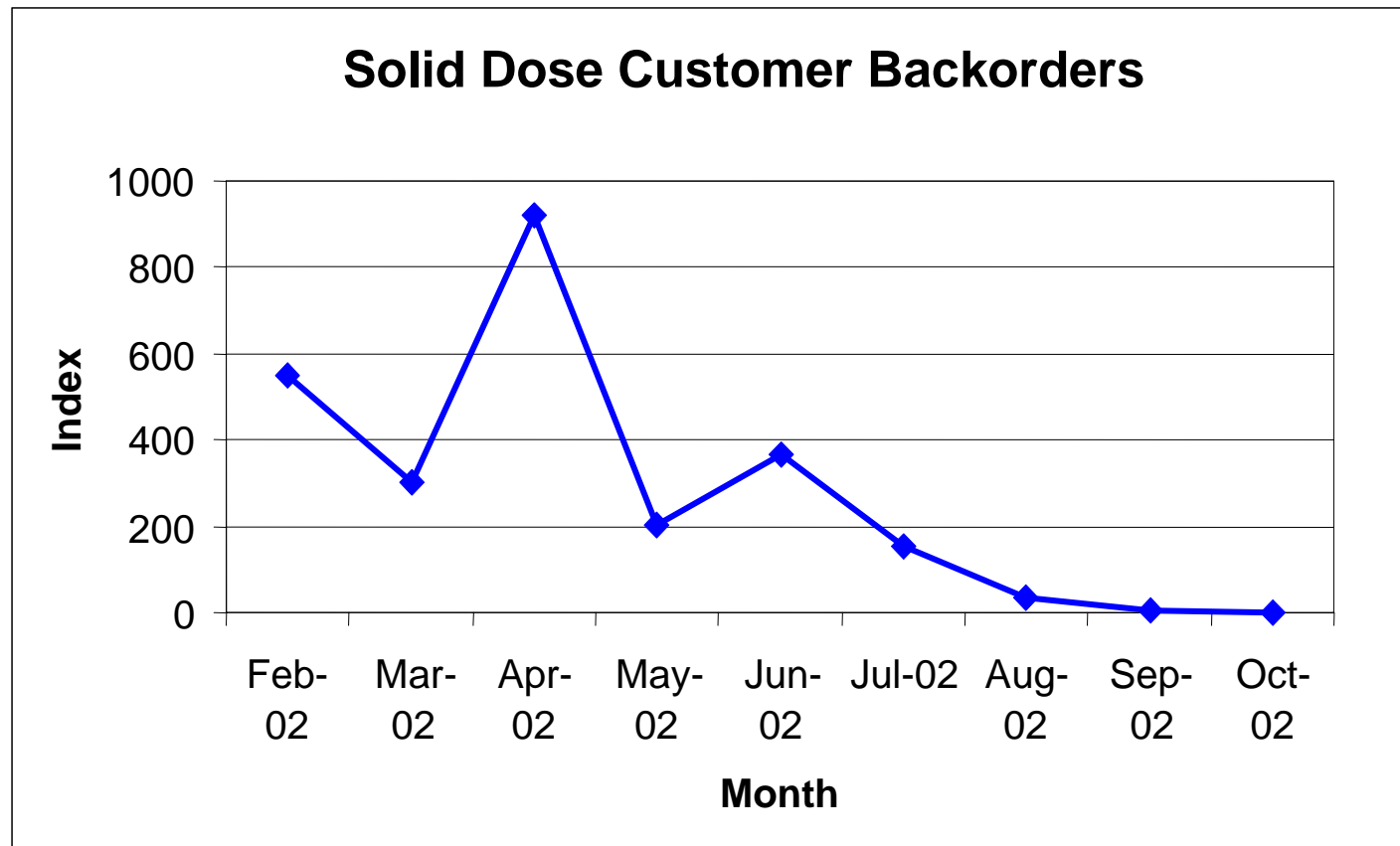
Project Commences

Customer Service Increase

Results



Customer Service



Appendix 1
About SMT Consulting

Appendix 1

About SMT Consulting

- Specialists in Supply Chain Solutions
- Leading Edge Products
 - Synchronous Manufacturing
 - Demand Planning
 - Production Planning
 - Production Scheduling
- Strong links with International Corporations
 - SAP & Manugistics
- Making a difference by
 - Gain operational control
 - Improved schedule adherence
 - Reductions in manufacturing cycle times
 - Lower inventory levels
 - More accurate forecasting