



CONSULTANCY
TRAINING
SUPPORT

Value Stream Mapping Workshop

28th November 2018

Dr. John R. Thomas

An Introduction to VALUE STREAM MAPPING

Delivered by: Dr John R. Thomas

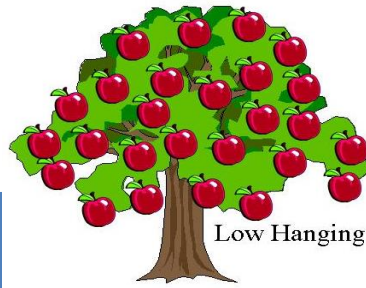
Location: SAIQ 103

Wednesday 28th November

Session Time	Duration	Activity
9:00-11:00	2hrs	Part 1: An overview of the process: Process Overview
11:00-11:20	20 mins	a.m. Break
11:20-12:20	1hr	Part 2: Part 1 A Study of the links in the supply chain: Activity Mapping and Layout Optimisation
12:20-13:00	40 mins	Lunch Break
13:00-14:00	1hr	Part 2 cont.
14:00-14:20	20 mins	p.m. Break
14:20-16:20	2 hrs	Part 3: A detailed examination of process efficiency: Value Stream Mapping

The structure of this workshop :

- 1. An overview of the process :
Process Overview.**
- 2. A study of the links in the supply chain :
Activity Mapping and layout optimisation.**
- 3. A detailed view of the process :
Value-Stream Mapping.**



Low Hanging Fruit

Process Overview

Activity Mapping

Value-Stream Mapping

Depth of analysis

Degree of return

Why is there a need to map processes?

Internal Forces

All processes evolve somewhat over time

Organisations can grow beyond their existing processes

What began as a 'good' process may deteriorate over time

What was the right process for the organisation at one time is no longer relevant

External Forces

All processes take place in a changing world

What was a 'good enough' process may no longer be sufficient to compete and win

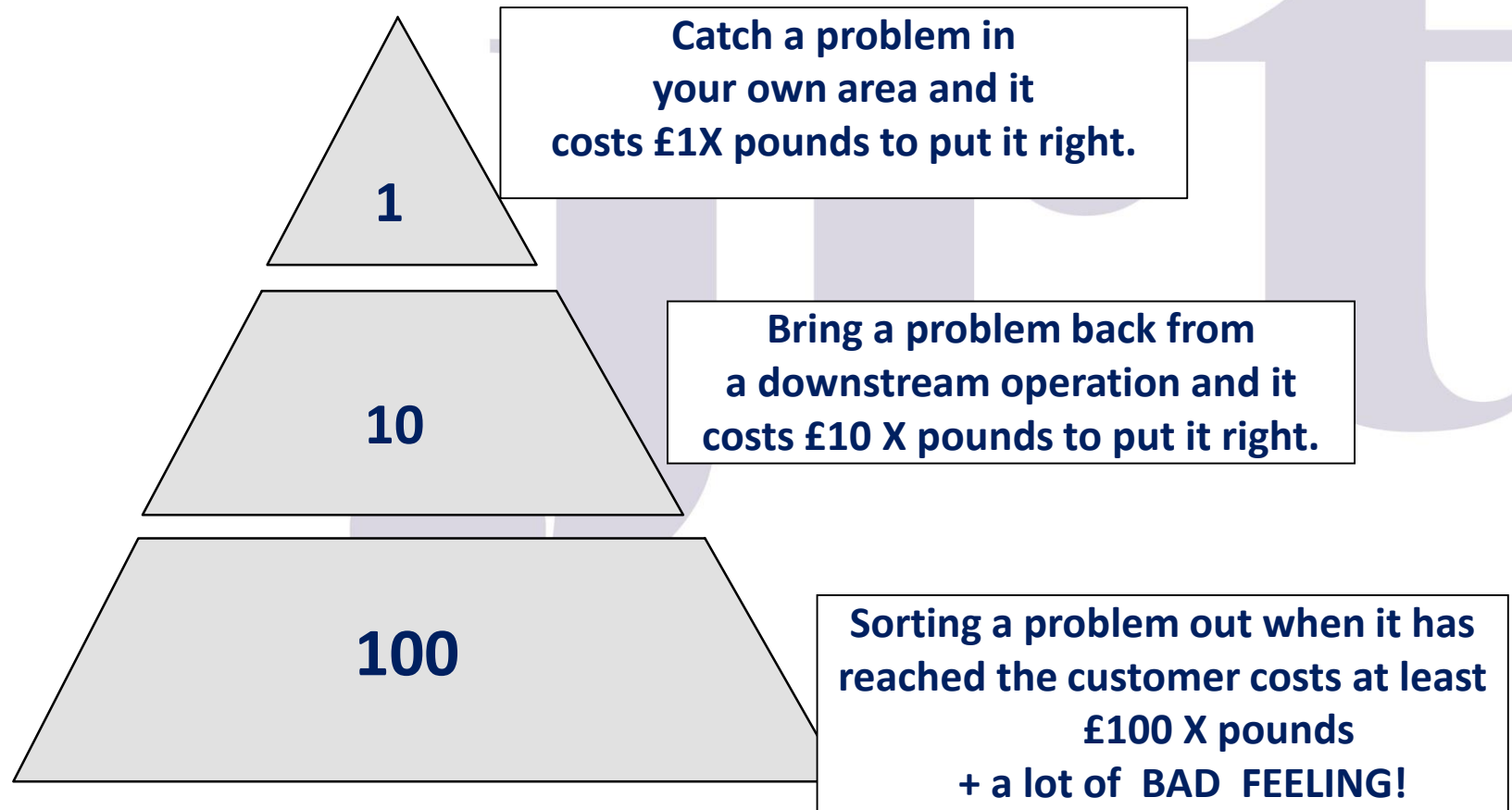


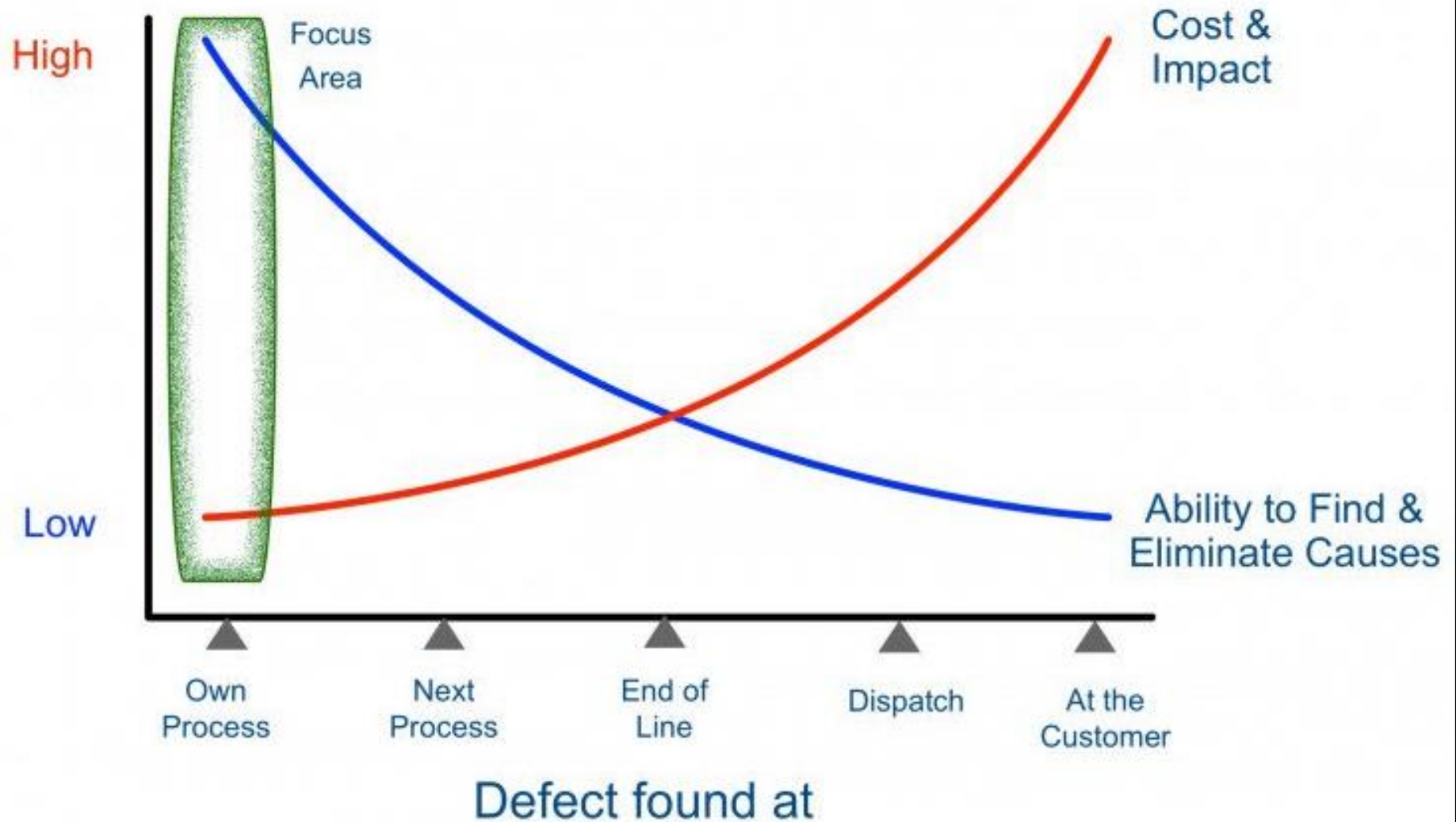
Some key principles of system analysis...

1-10-100 Rule

The 1-10-100 rule states that as material and information moves through a processing system, the cost of correcting an error multiplies by 10.

Remember the 1:10:100 Rule







What is the most common response when we ask **why
we do it that way?**

“...because we’ve always done it like that !”

- Think of any business as a chain
- Each link in the chain represents a separate function
- If one link breaks the whole chain fails
- It is the linkages that bear the strain
- It is the strength of the linkages that determine how well the chain works
- Improving some of the links does not improve the chain

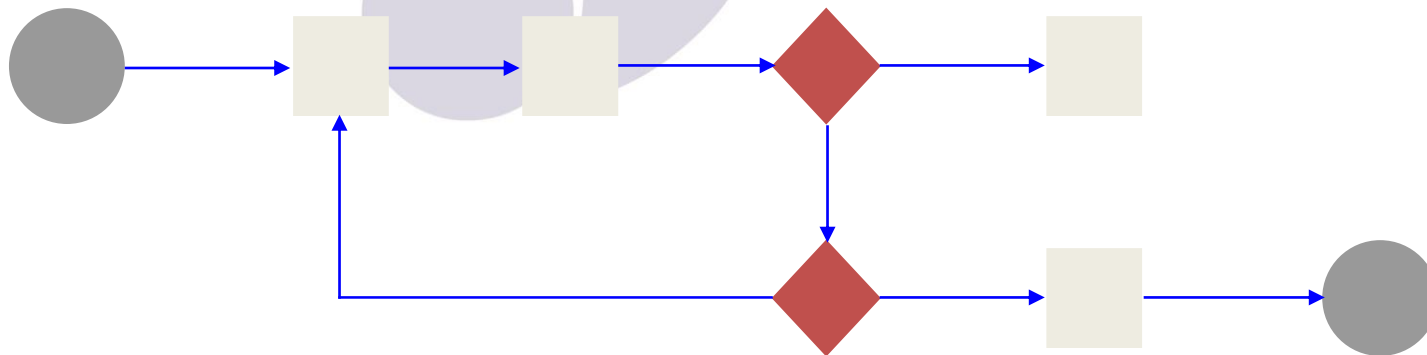


Process Mapping Stage 1 :

Taking an overview of the process

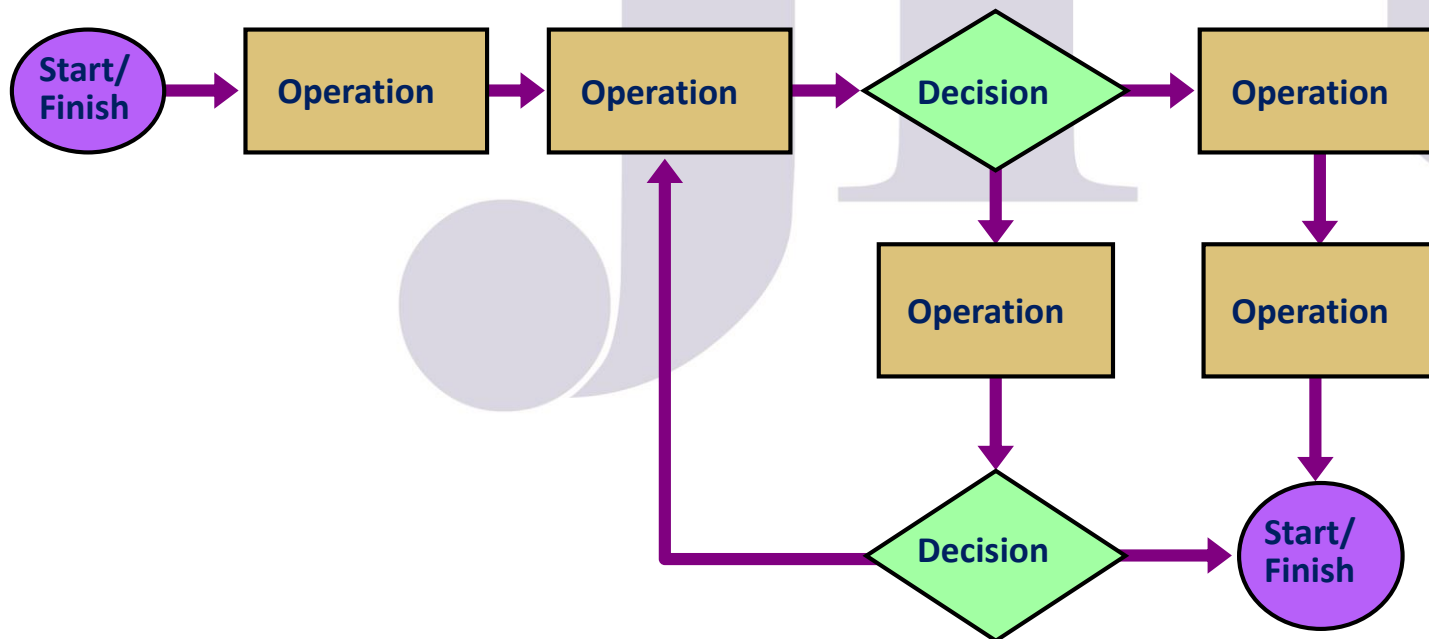
What is Process Mapping?

- Process mapping is a tool that is used to understand, analyse and document processes and activities in an organisation and assists in identifying opportunities for improvement
- A process map displays the sequential steps involved in converting a specific input into the required output

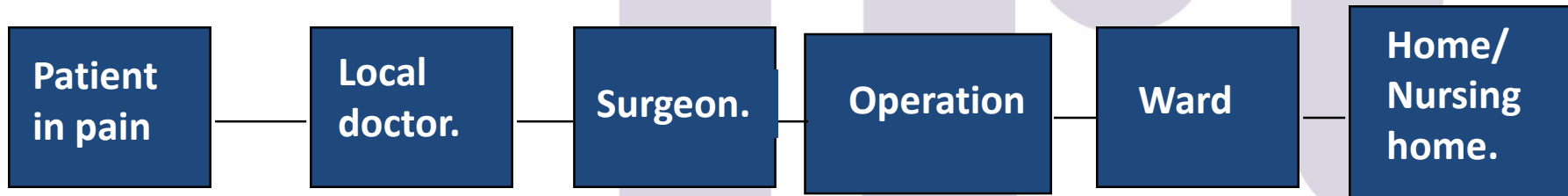


Process mapping using Flow Charts

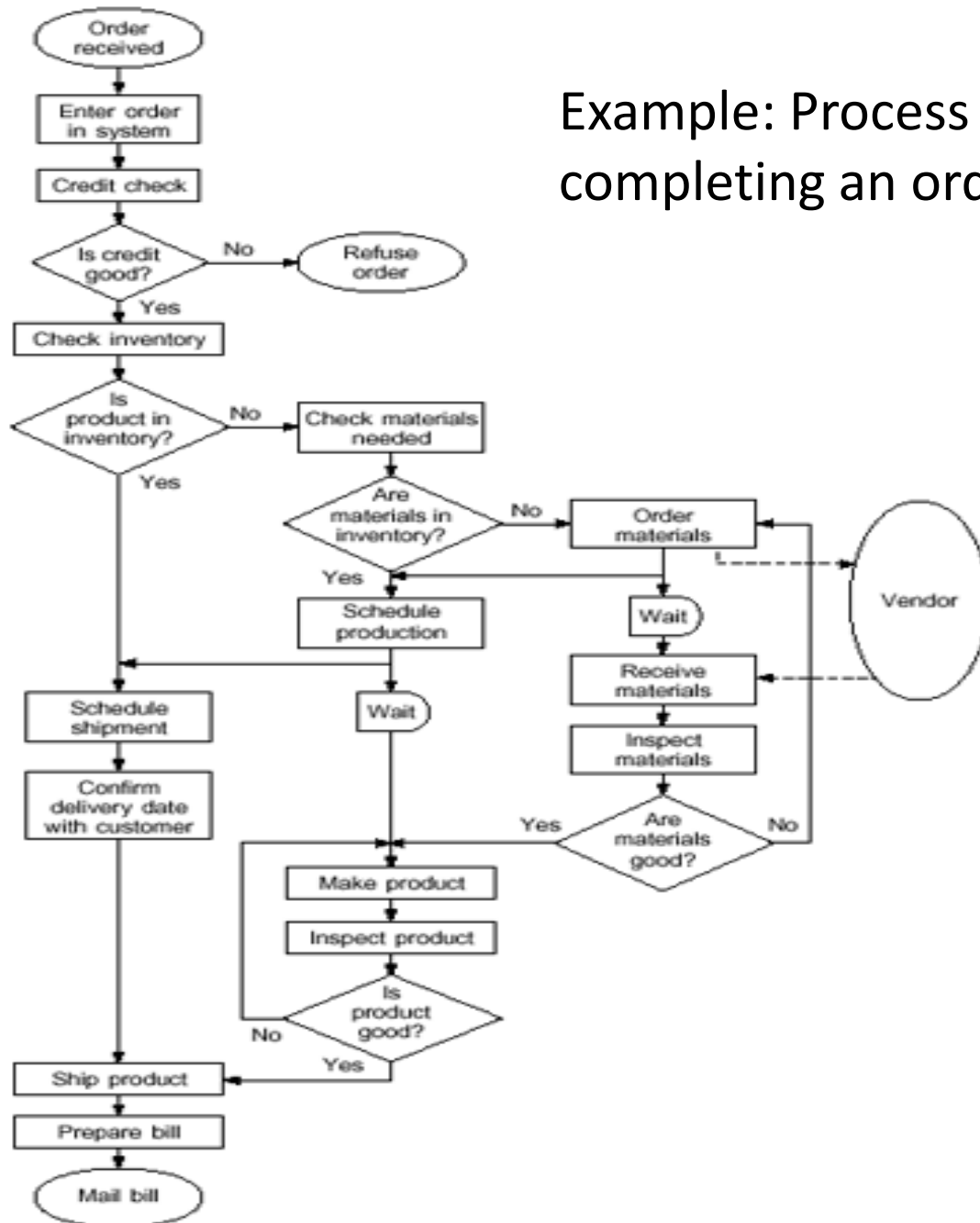
- Flow charts are graphical representations of steps involved in a process
- Flow charts detail the sequence of activities involved in the completion of the process
- They are an excellent means of documenting the steps that are carried out in a process



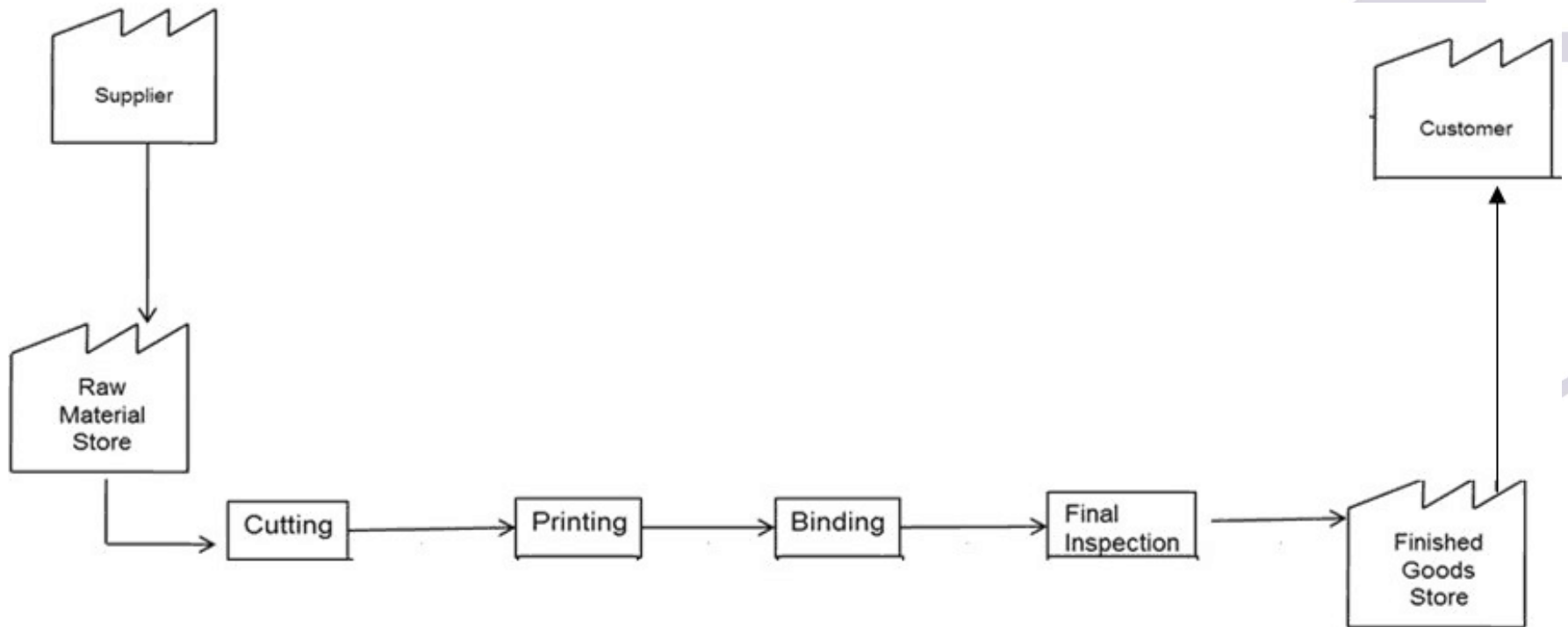
Flowchart of the management of hip and knee replacement patients



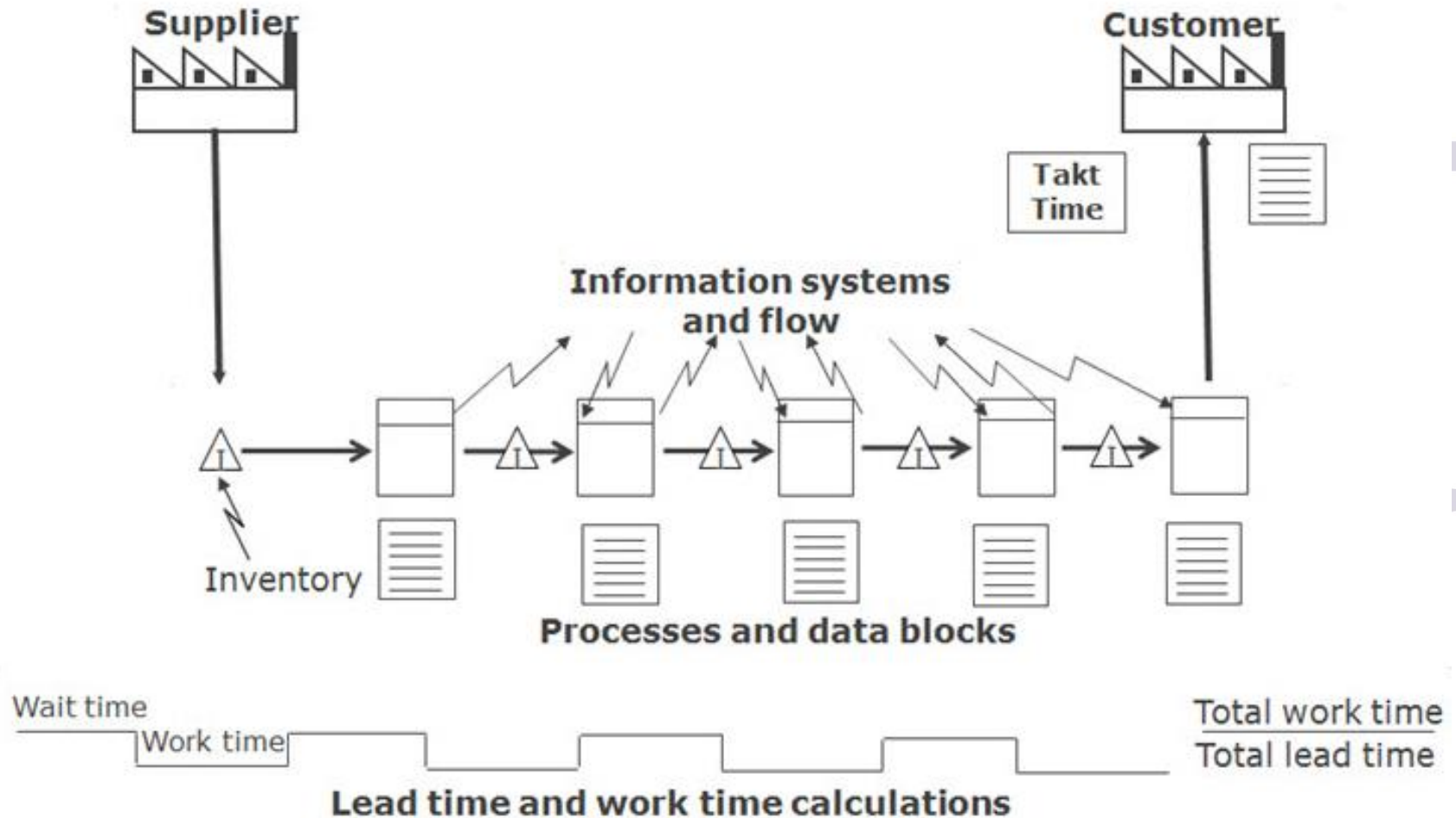
Example: Process of completing an order.



And that is the tool we use for visualising the Value Stream!

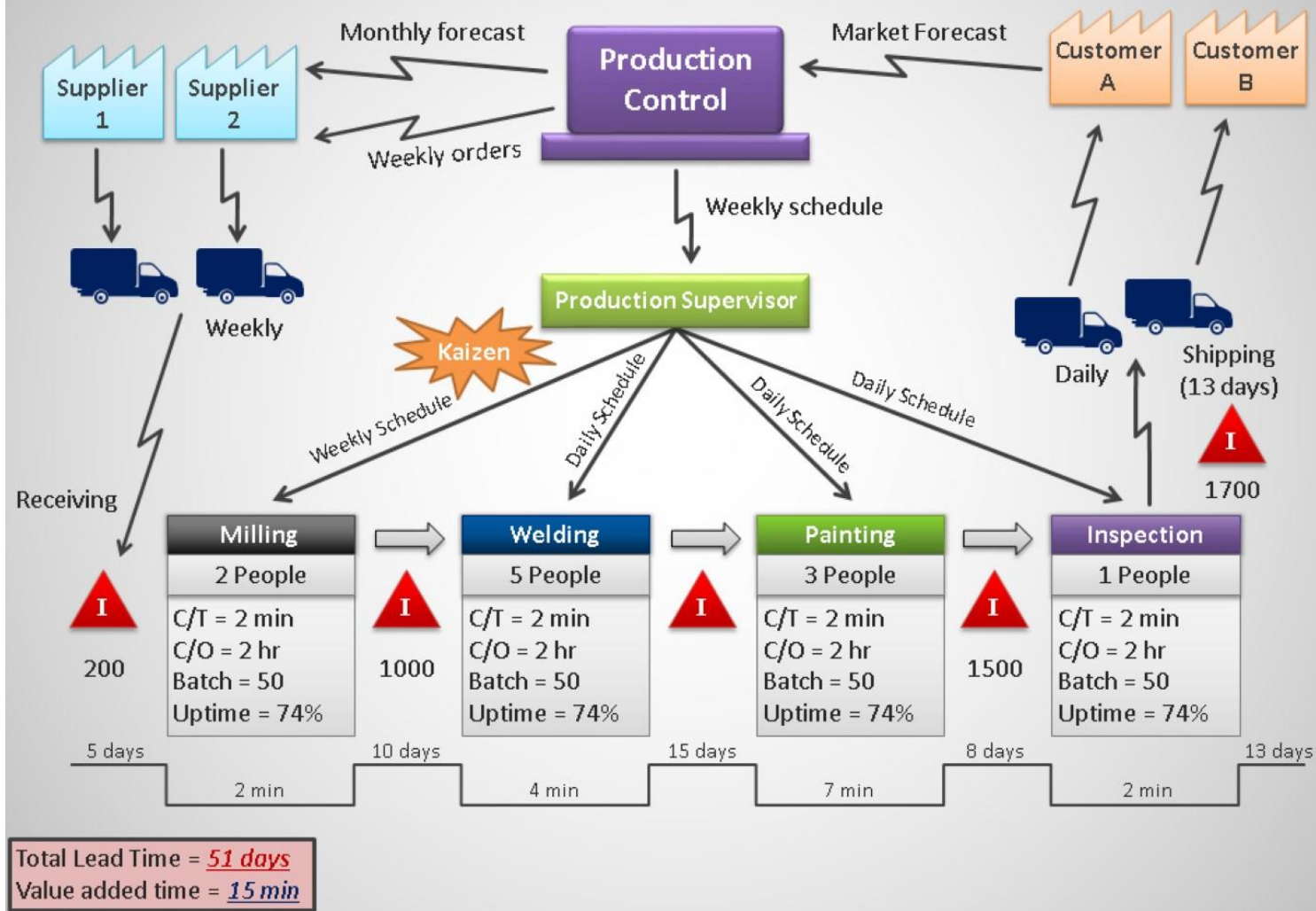


Typical layout of a VSM



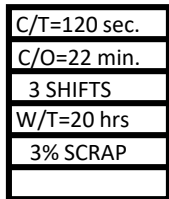
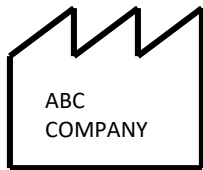
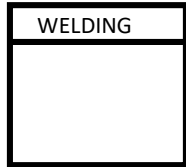
Basically it is a flow chart with lots of additional information!

Value Stream Mapping



The Material Flow Symbols

Material Icons



Represents

Manufacturing Process

Outside Sources

Process Data Box

Inventory

Truck Shipment

Notes

One box equals an area of continuous flow. All processes should be labeled. Box also used to identify departments such as production control.

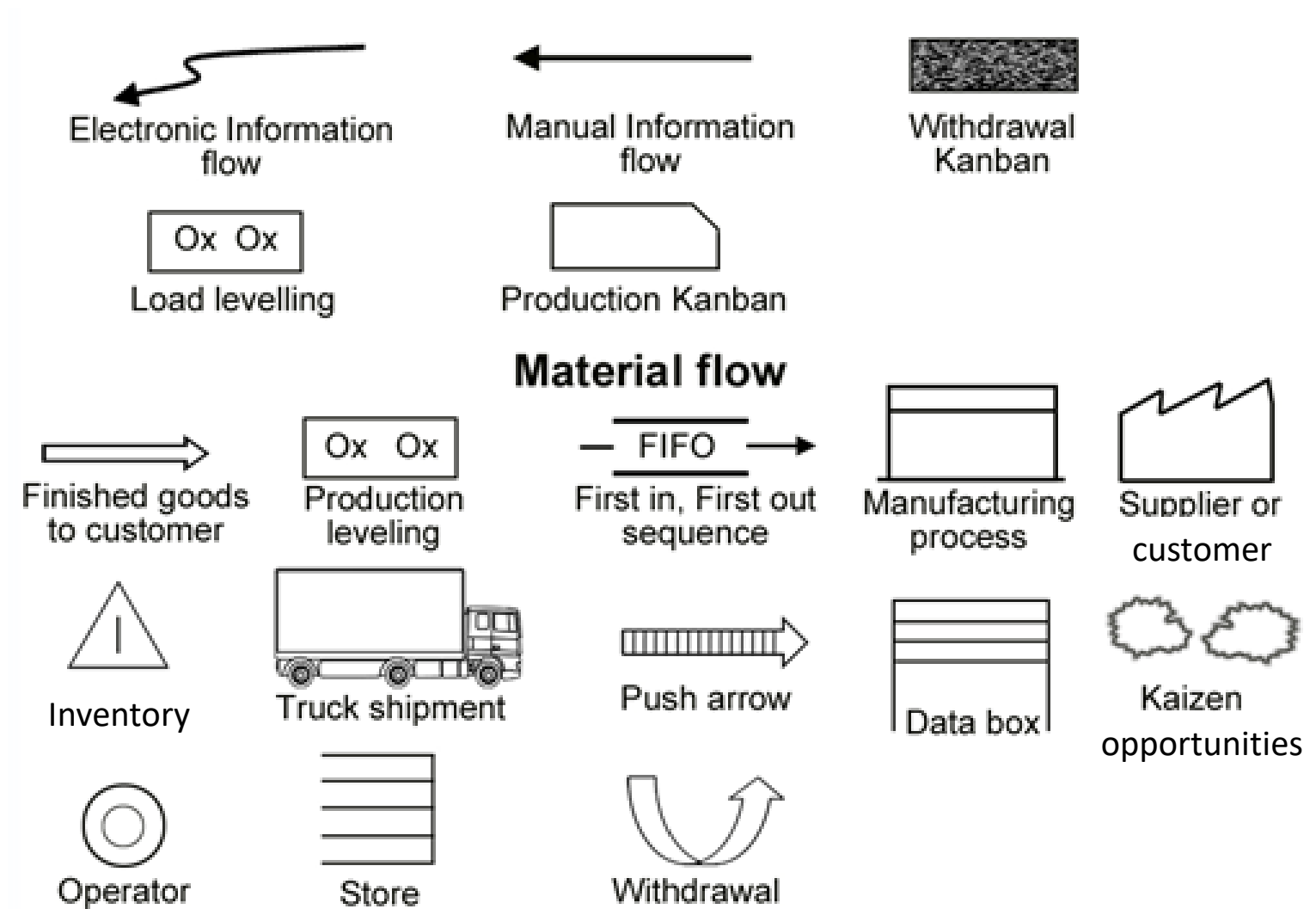
Used to show customers, suppliers and outside manufacturing processes.

Used to record information concerning a manufacturing process, department, etc.

Count and time should be noted.

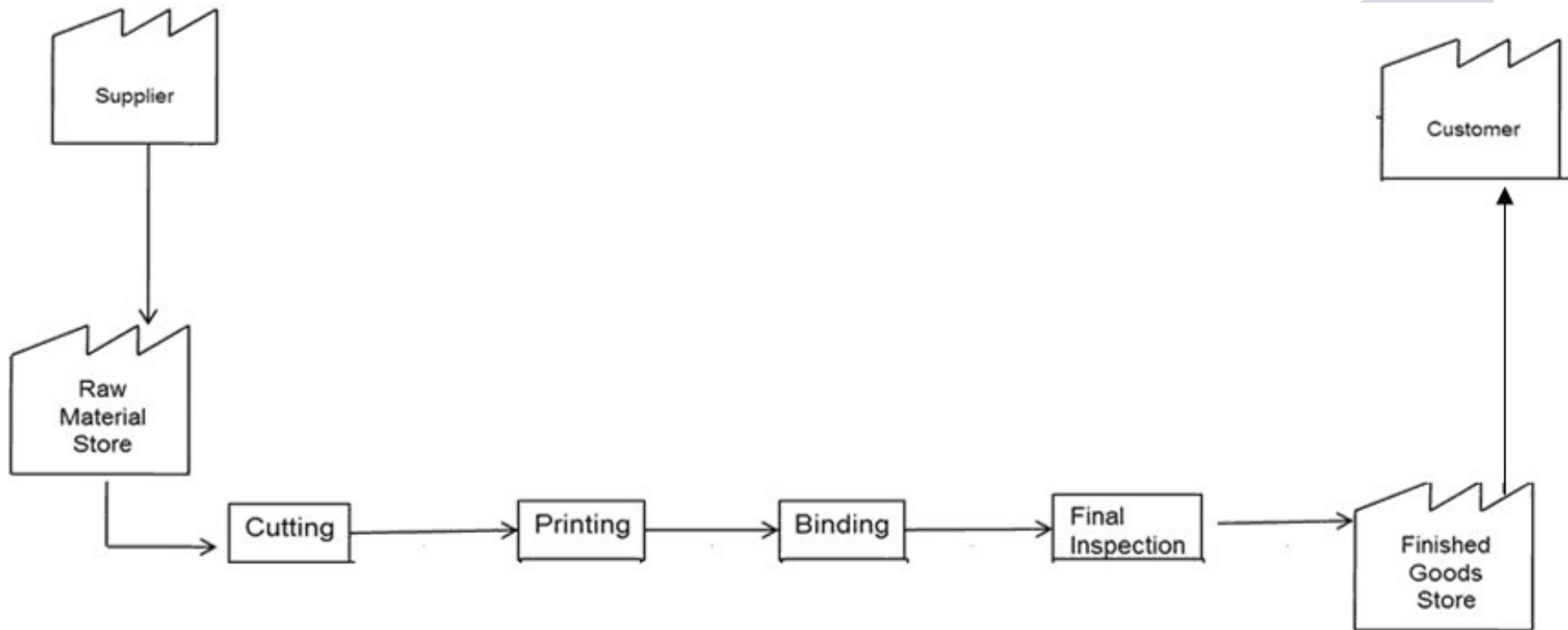
Note the frequency of shipments.

The Information Flow Symbols

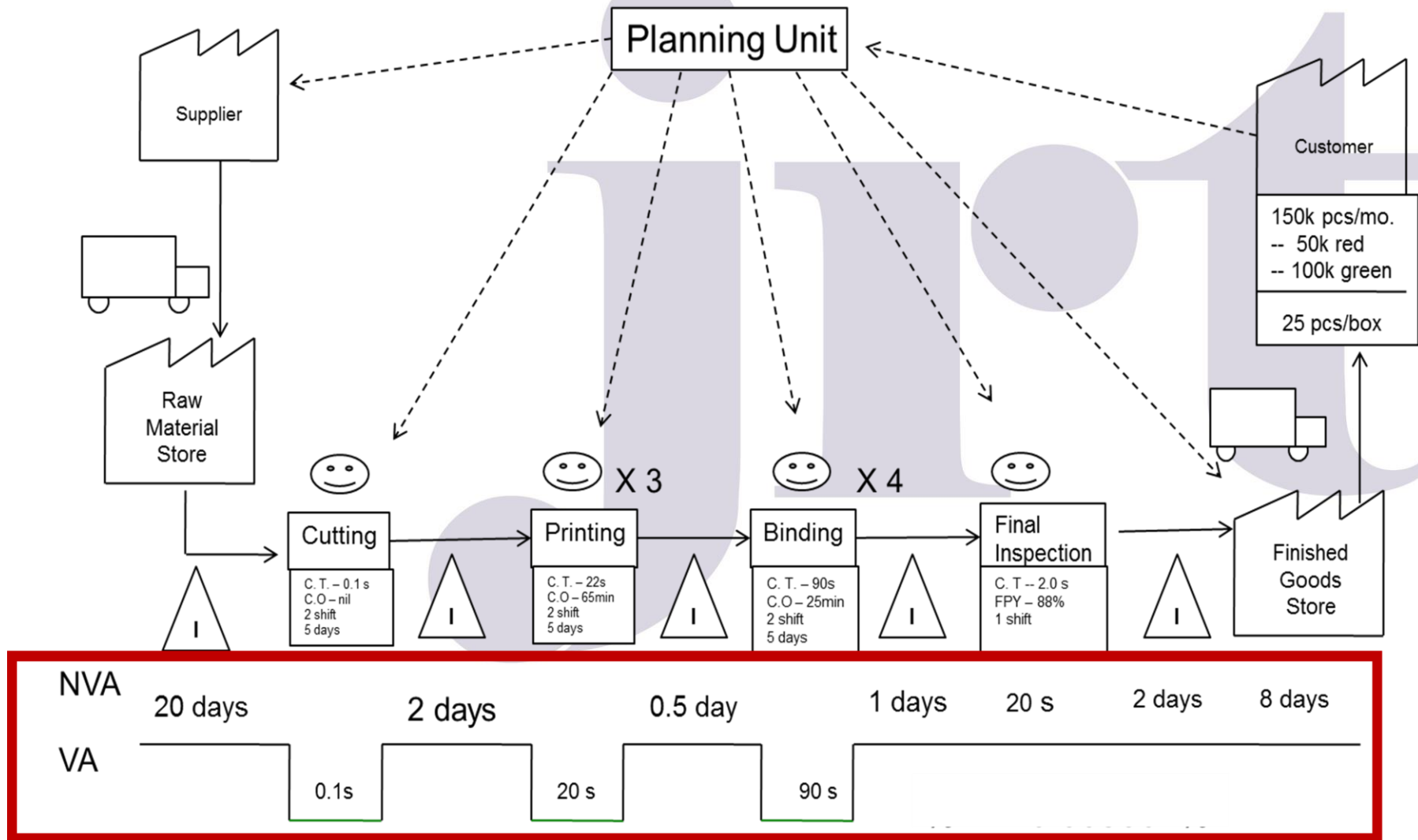


Steps to Complete a Value Stream Map

Define the basic Value Stream



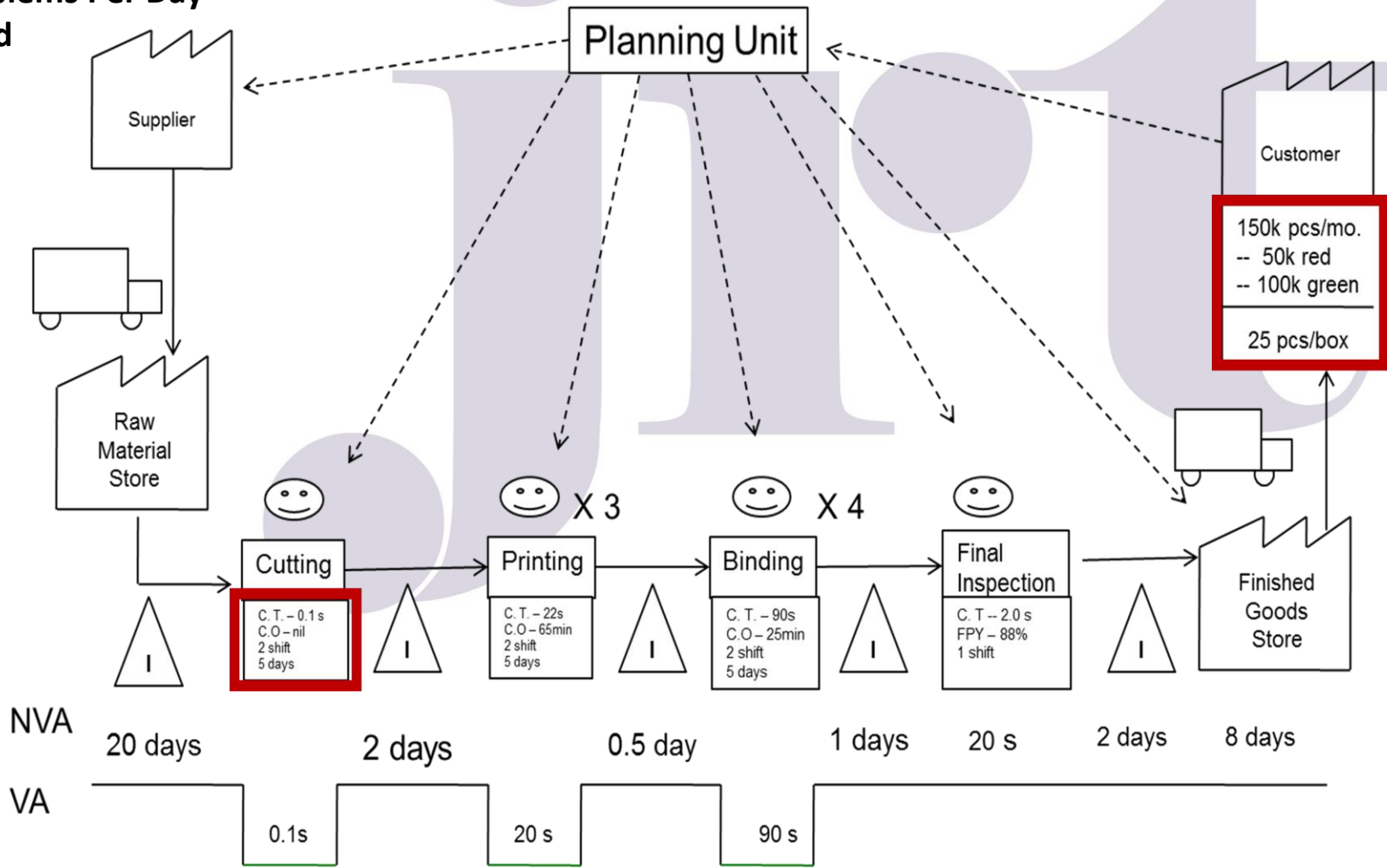
Fill in Queue Times



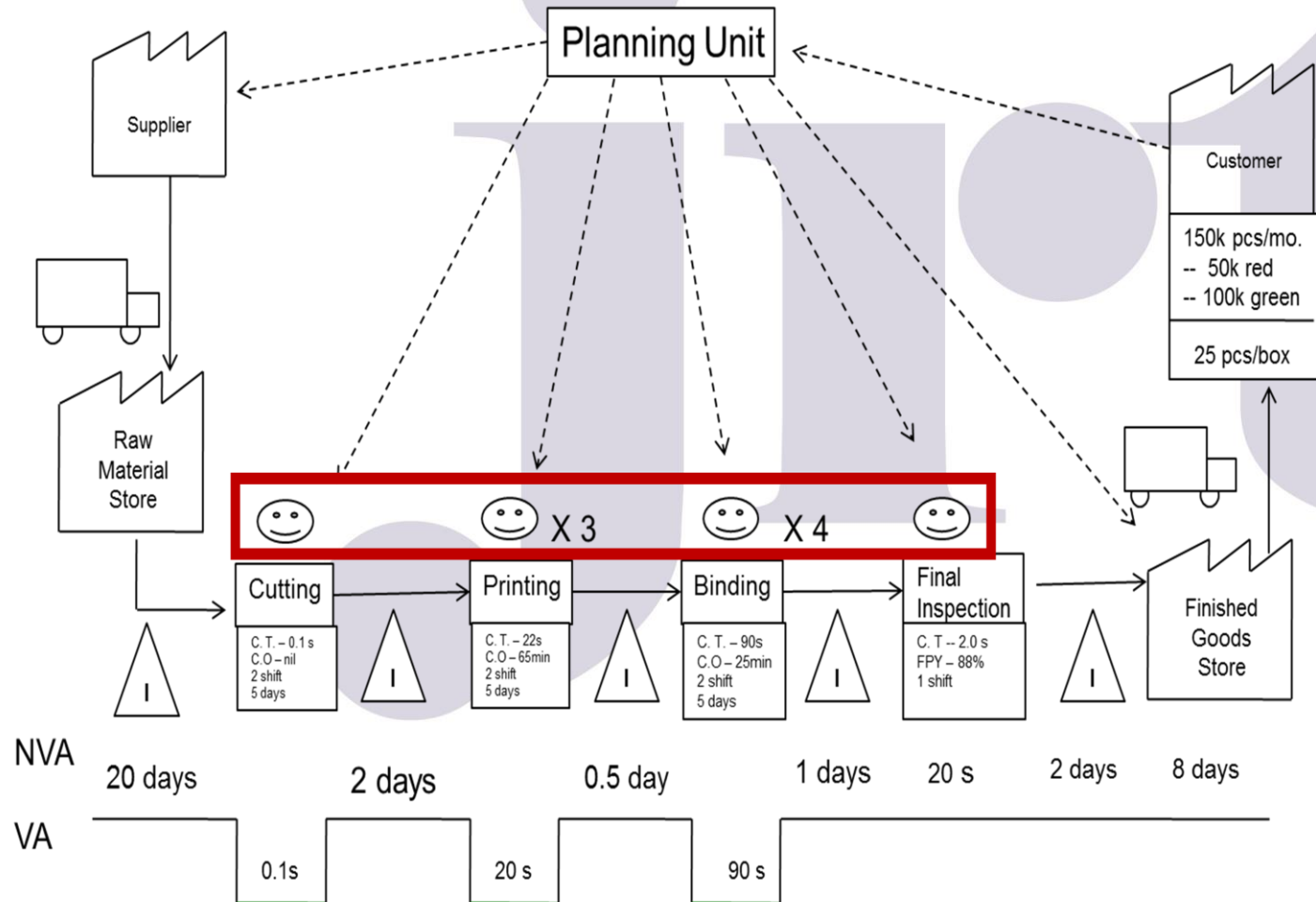
Examples of Process Data:

- Process Cycle Time
- Changeover Time
- Pace / TAKT Time / Rate
- Defects / Problems Per Day
- First Pass Yield
- Batch Size
- Shifts

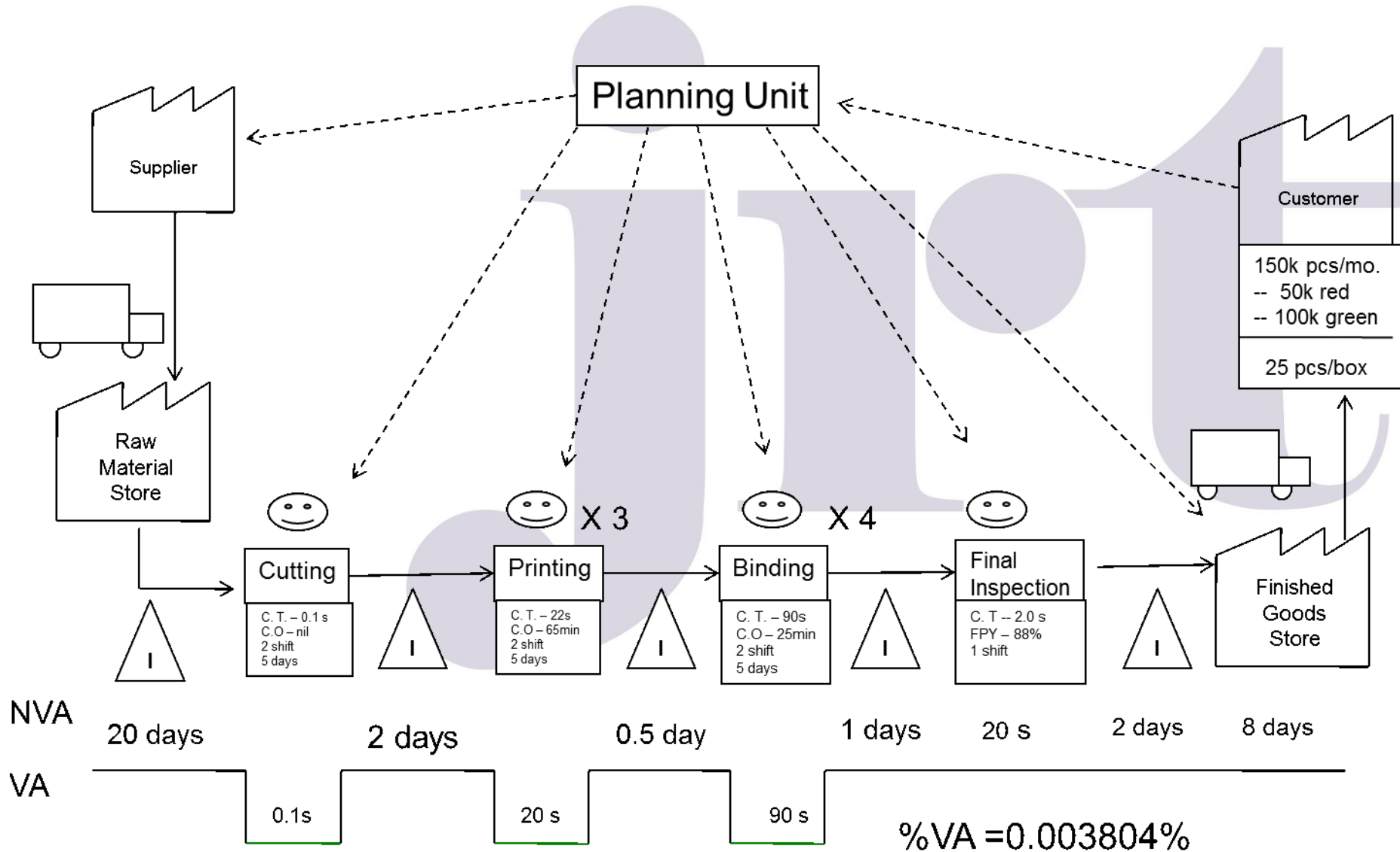
Fill in Process Data



It is important to understand the amount of capacity in labour at each process. When developing the VSM, you might see that a bottleneck exists because of an imbalance in labour.



Add the Value Added Percentage (%VA)



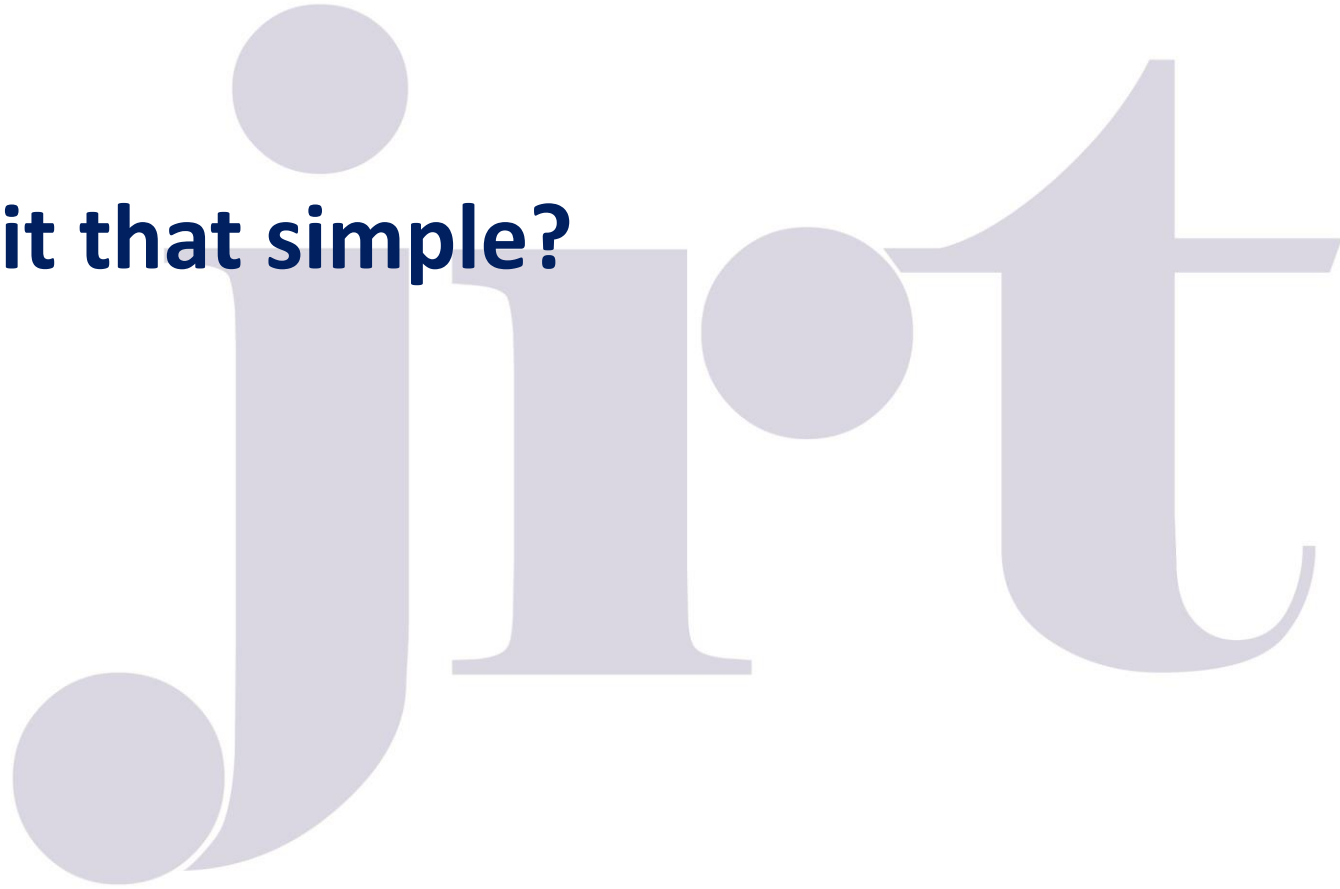
Interpret the VSM?

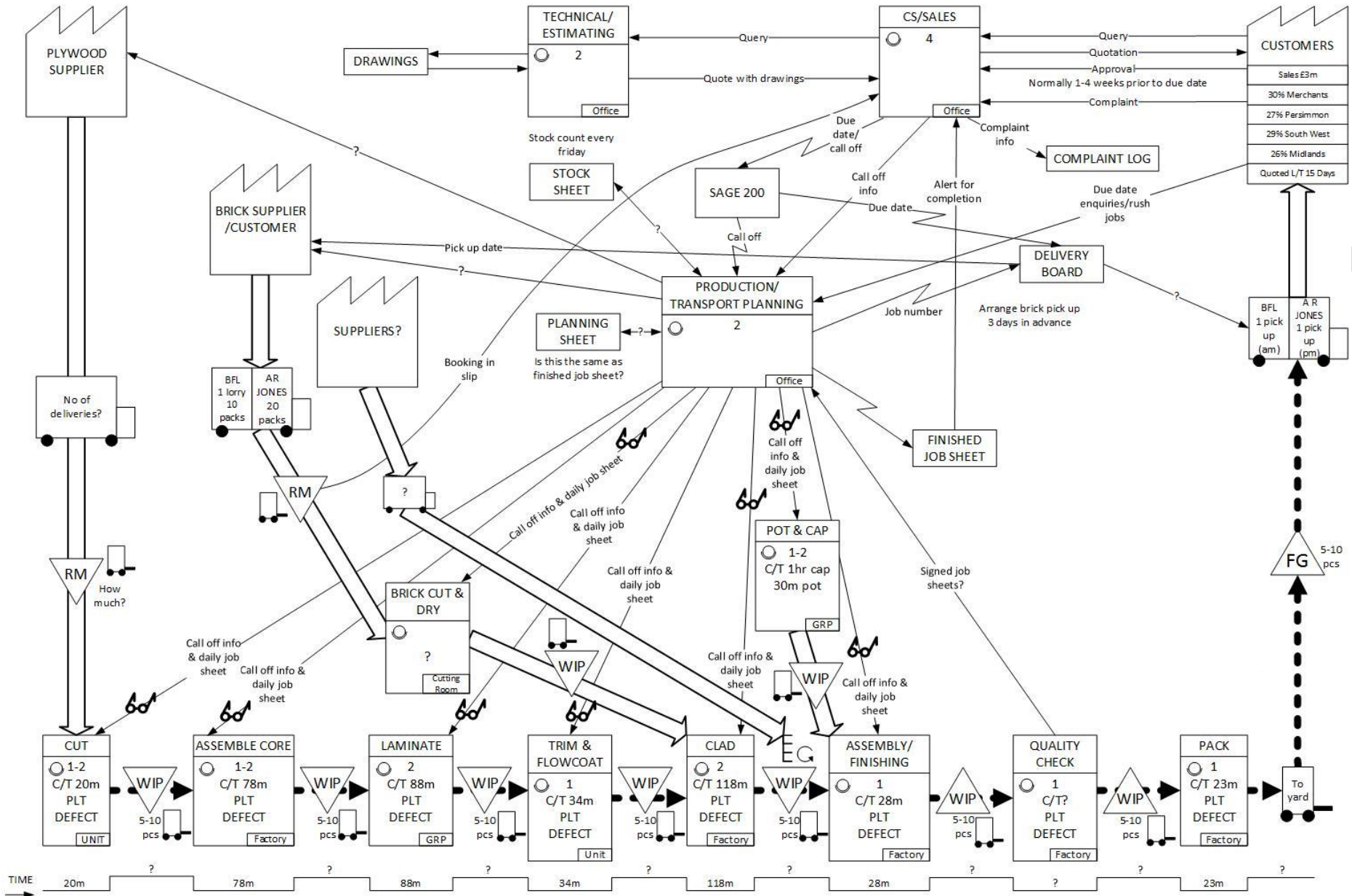
The VSM **should** now be a very pictorial view of the process and what has happened to that product or family of products.

We should be able to spot...

- Bottlenecks / Constraints
- Long Process Cycle Times
- Poor Uptimes
- Excessive Setup Times
- Poor Quality / Rework

But is it that simple?







We need to take a step at a time!

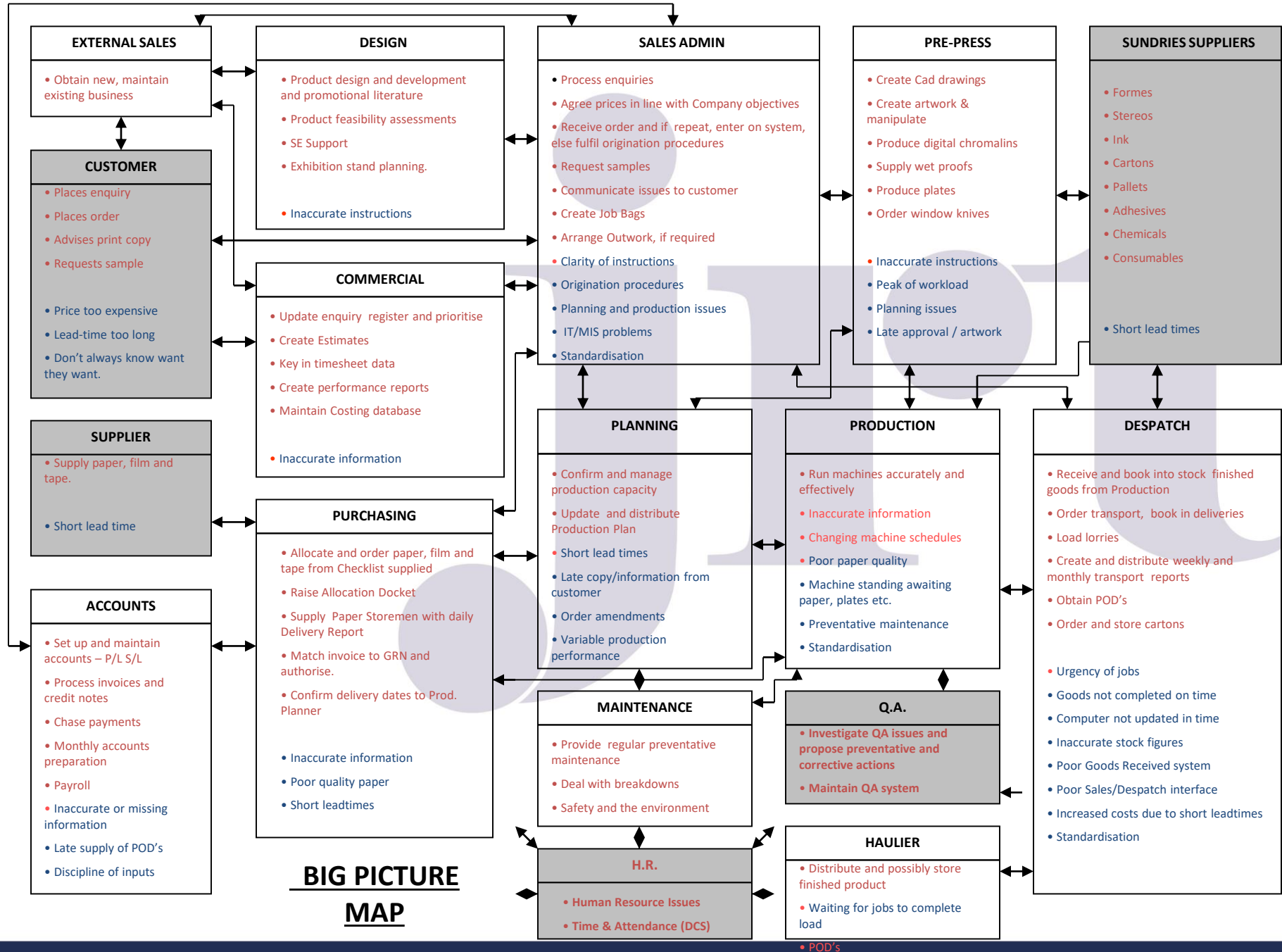
What are the links in a typical customer supply chain?

- Order capture system
 - Order processing system
 - New product development / Design system
 - Production planning system
 - Production system
 - Despatch and delivery system
 - Accounting system
- Etc.

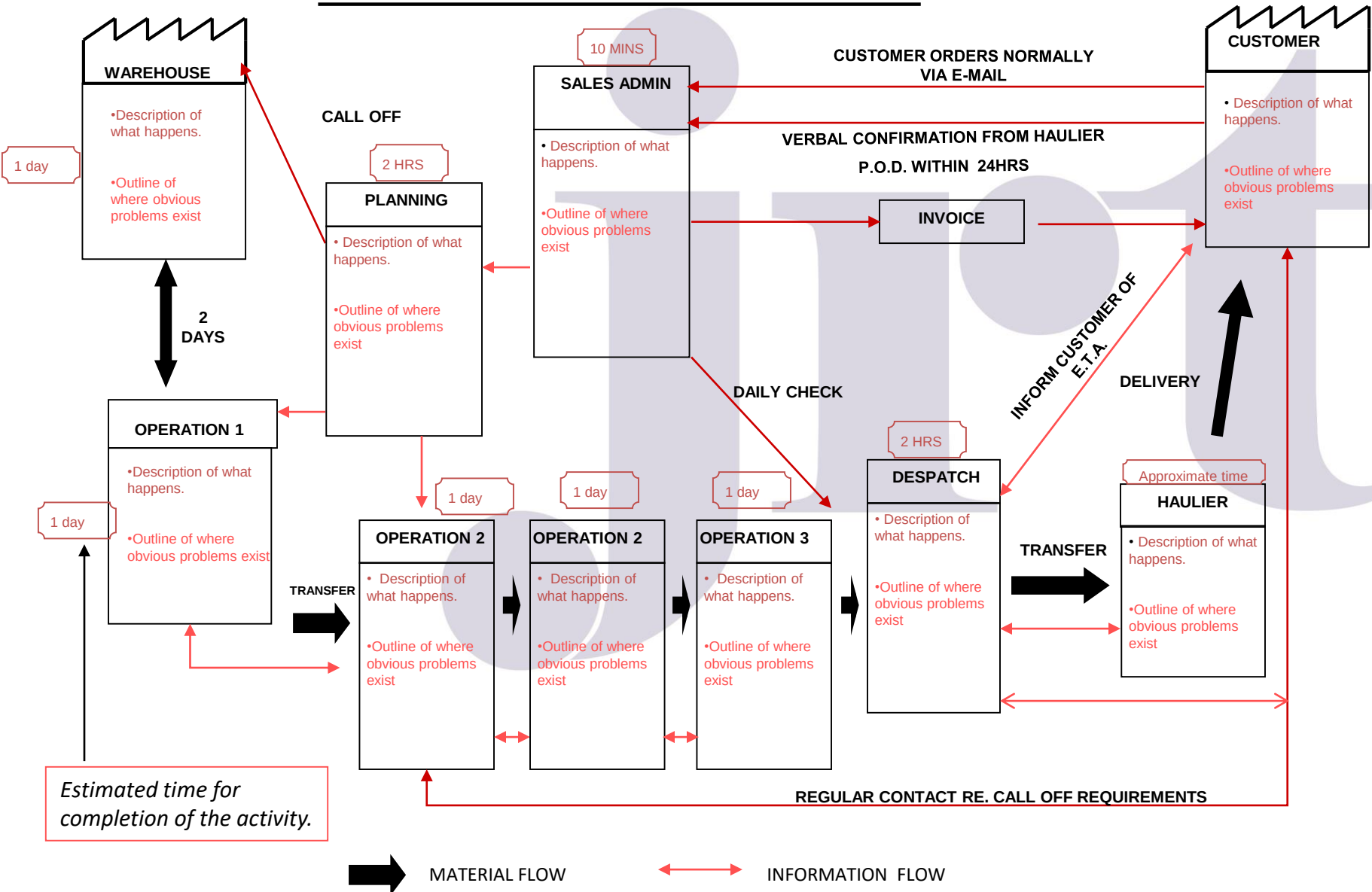


What do all these groups do?

Develop a Big Picture Map.

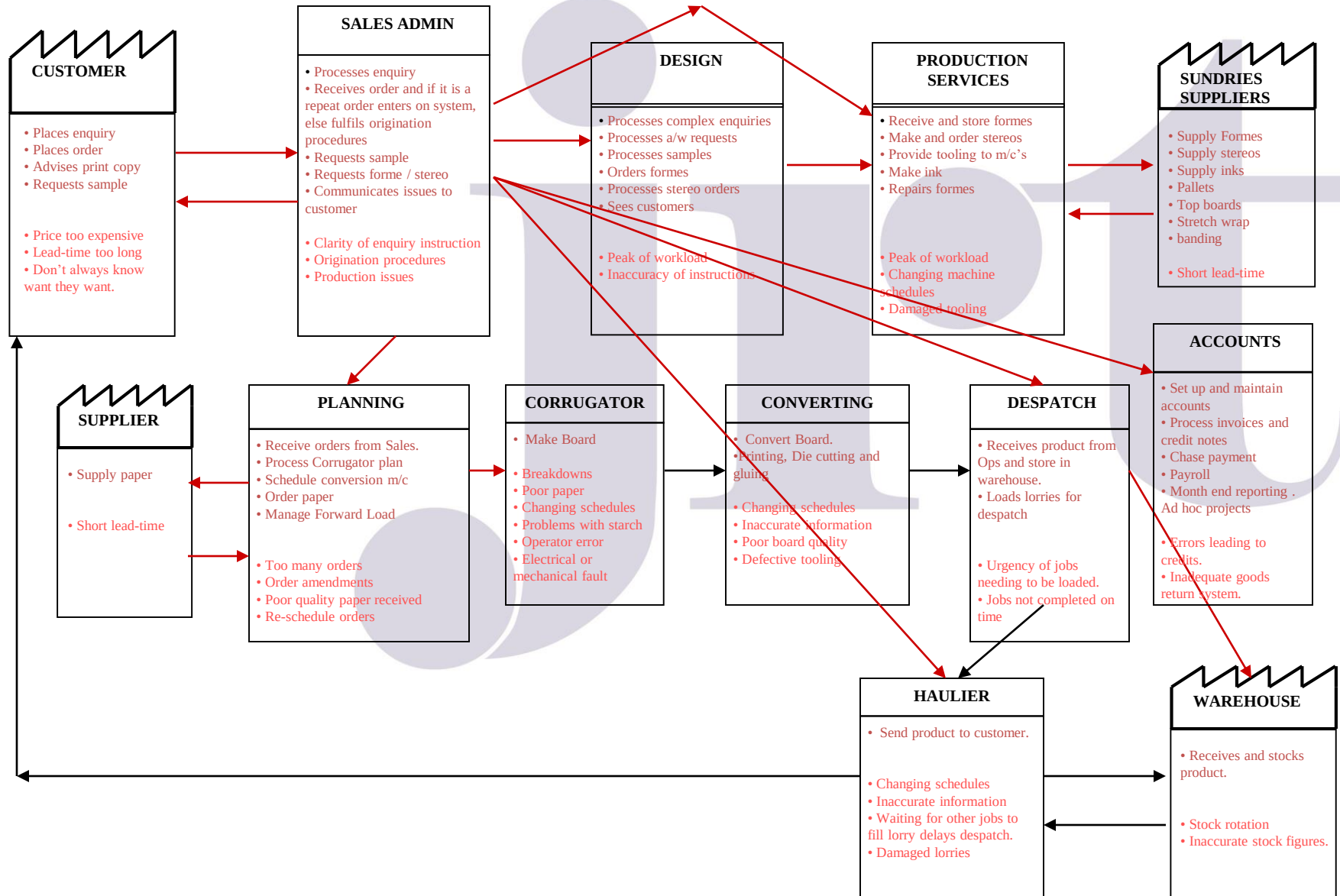


A TEMPLATE FOR A BIG PICTURE MAP



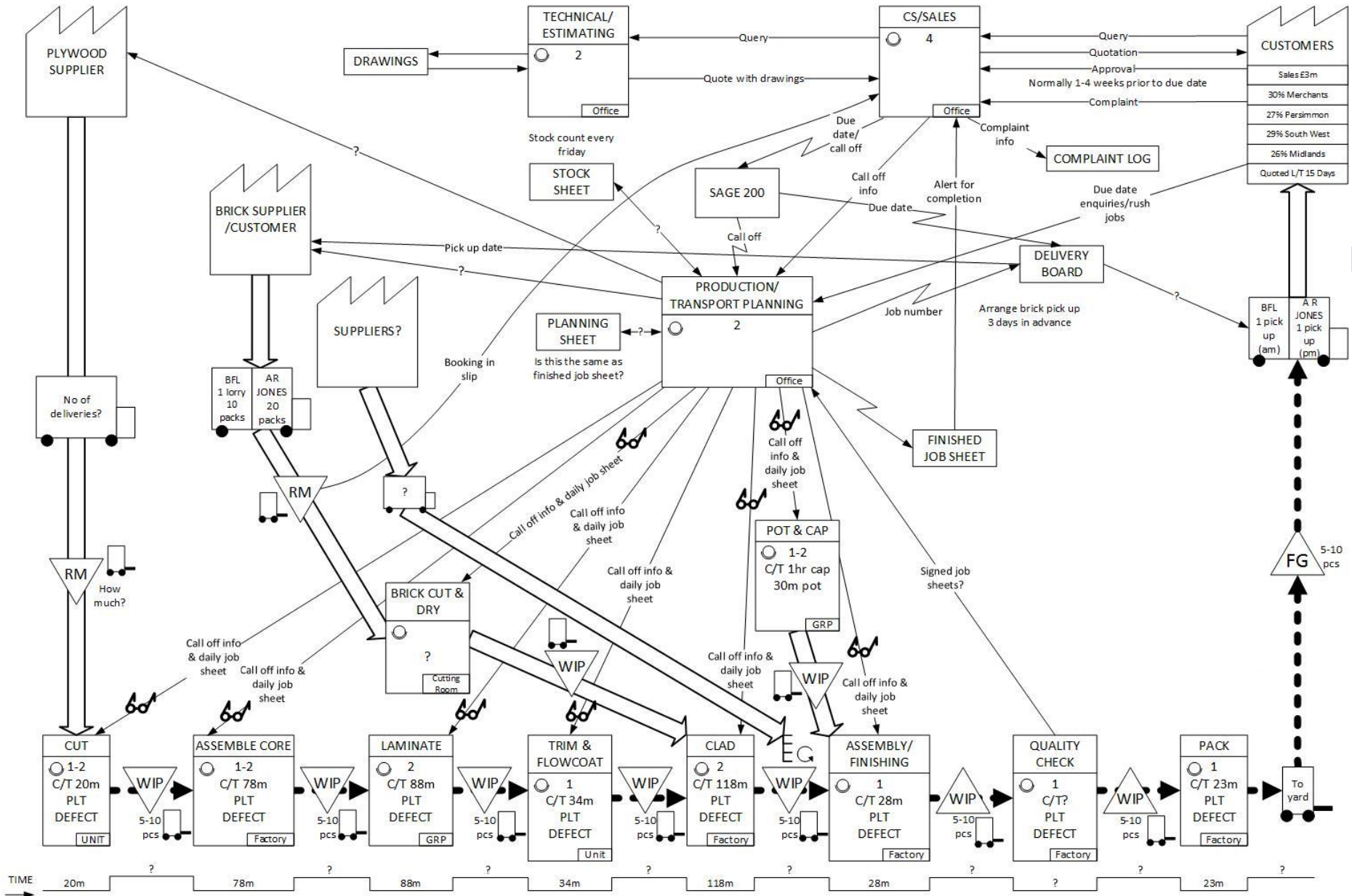
COMPANY X SUPPLY CHAIN

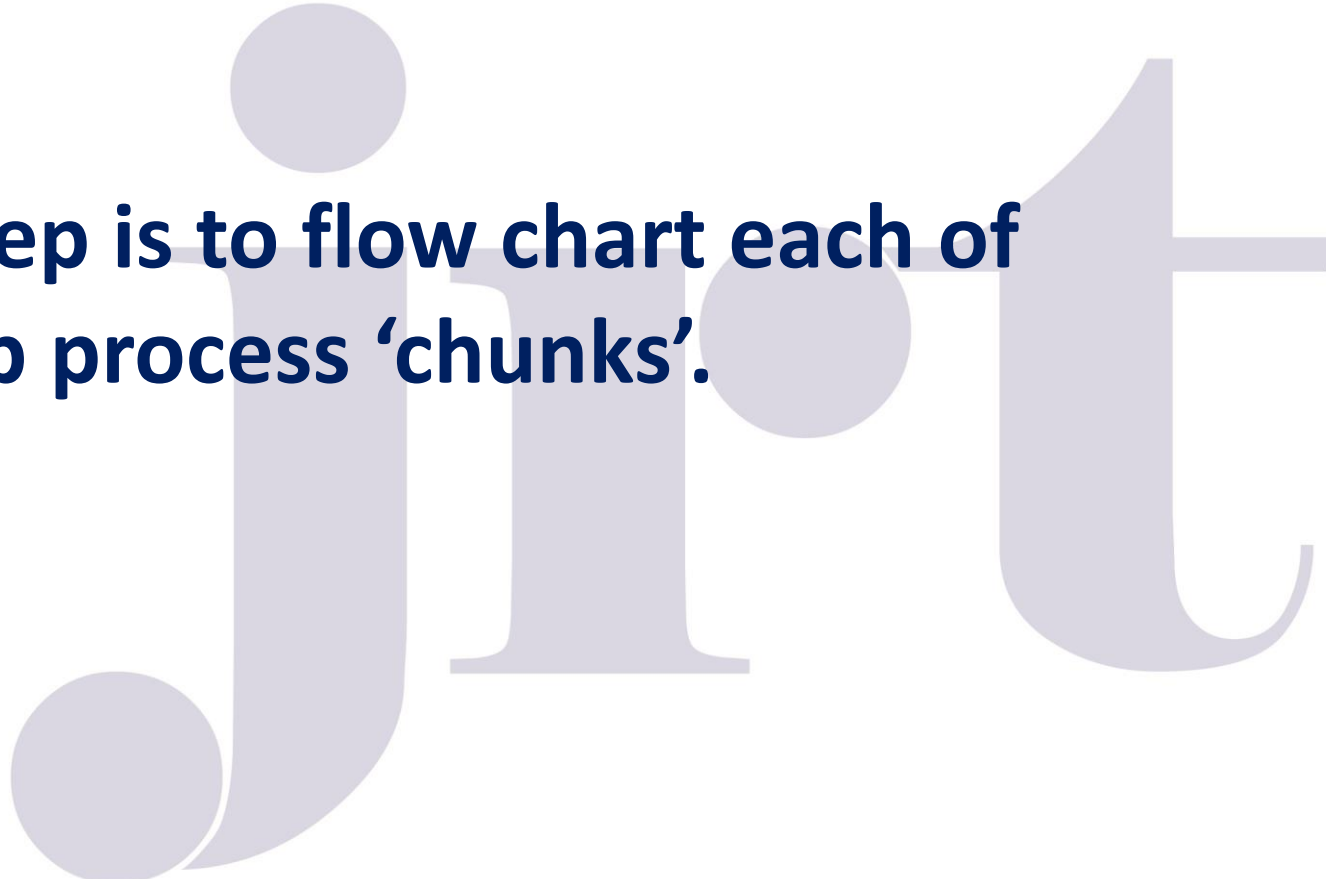
BIG PICTURE MAP :





Realistically we need to break these down into manageable 'chunks' which we can analyse in a systematic fashion.





The first step is to flow chart each of these sub process 'chunks'.

3 Simple 1st stage Mapping Practices

1. Go to the **Gemba!** - **Actual** place where the process is performed.
2. Talk to the **Actual** people involved in the process and get the real facts.
3. Observe and flow chart the **Actual** process.
 - Reality is invariably different from perception; Few processes work the way we think they do.
 - The purpose of value stream mapping is to identify waste, not to develop the perfect process map.

ORDER ENTRY/ Processing		
Process	Process Element	What happens at this stage of the process?
1	RECEIVE ORDER FROM CUSTOMER BY PHONE,POST,EDI & 'E' MAIL.	Check details of Order - Spec No., Delivery Date, Qty & Price. Check quoting date on planning screen in the Sales Office. Allow extra time if New Dies or if forme is required, check with Design/Pre-Press. If urgent order is required before planning date, Sales Co coordinator checks to see if there is anything in their Customer profile (stock orders) which can we moved back or checks alternative routes to accommodate urgent order. If there is nothing the Sales Co coordinator can move, the order request is then passed to Sales Office Manager to discuss with Planning Manager.
2	NEW ACCOUNTS NEEDS TO BE CREDIT CLEARED.	Check with Accounts Office if an account has been cleared, if not fax, email or post a credit application form to the customer. Accounts will then sort out terms with the customer.
3	ACCOUNTS SET UP CUSTOMER ACCOUNT ON CDM.	Once customer is Credit cleared and Terms and Conditions are signed, a credit limit is allocated to their new account. If a very urgent order is required the customer may choose to pay Pro-Forma for their first order. (Arrange this with Accounts)
4	ENTER DETAILS ONTO CUST RECORD CARDS IF NECESSARY	Write date order placed, delivery date and quantity. Check if Sample Approval has been signed off by Customer. If a New 0201 Plain case or a repeat order, the order can go on to the system. The system will also confirm best available delivery date against forward load. If Printed or New Forme required for Die Cutting, check with relevant departments regarding a delivery date before putting onto system. Any new addresses must be added to Amos, write delivery address onto Record Card. Write Machine Route and pallet quantity onto card.

	Process Element	What happens during this stage of the process? (Include notes on current problems)
1.	Check prod list for next job and locate job bag	A planning list is produced twice a day and issued during the morning planning meeting and again in the afternoon. Operators have to rely on the plan being brought to them on time : this can be a problem if there has been a change to the schedule.
ii.	Check job bag for inks board and plates	Operator has to walk down to outside the stores area to locate the job bag. This means that valuable operating time is wasted in going to locate the job bag.
iii.	Collect inks	Operator has to walk down to outside the stores area to fetch the ink. This means that valuable operating time is wasted in going to locate the ink. If the ink is not ready then further delays are seen. Additionally, there is no cover for the store-man when on holidays/sick : further significant delays could be caused.

Process : Accounts Customer Credit Control

Process	Process Element	What Happens at this stage of the process
1	Jobs automatically go into order credit hold	Customer is either on stop because they have not paid on time or are over the credit limit during a month. Most customers trade on their business limit, which is applied to their account at our discretion and is higher than their insured limit. This prevents large numbers of jobs going into order credit hold although there is still a problem at month end.
2	If jobs are put into credit hold because customer is over their credit limit during the month the Credit Controller manually clears the system about every 15 mins.	Jobs released to the planners as they are released out of credit hold. This is time consuming for the credit controller and when she is on holiday, sick or has gone home the system is slower with somebody else trying to cover
3	If a company is on stop it is usually the first few days of the month if they have not paid on time. A few customers do this every month.	Phone and tell the customer they are on stop. Copy of all customers on Stop to Sales and Exec. Jobs not released until they pay. Once paid the customer is released off Stop This procedure should never be bypassed unless agreed by the MD, as it can invalidate our insurance cover.

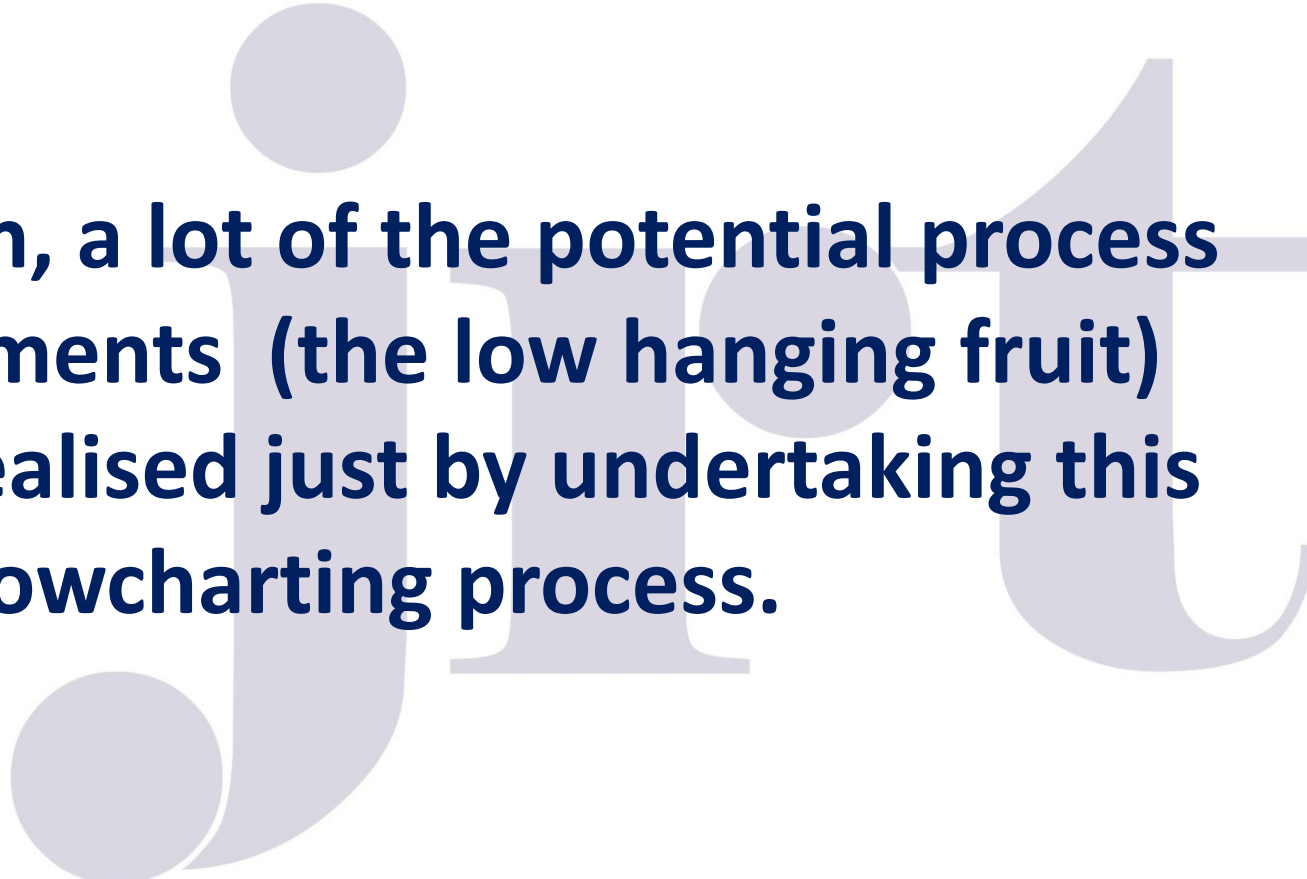
	Process Element	What happens during this process? (Include notes on what you observe a day and night)	What are the difficulties you have with this stage and what are the opportunities for improving it?
i.	Check plan for next job and locate	First we 'map' the system. ... plan being brought be a problem if there change to the schedule.	<i>Sometimes late changes not relayed to operators in time.</i> <i>Possible solutions:</i> <i>i. Access to plan on computer for operators?</i> <i>ii. Re-locate planner so that decisions are instantly relayed to operators.?</i>
iii.	Check job bag for inks board and plates	Then we examine it in detail. Operator has to walk down to ... area to locate ... This means ... wasted in going ...	<i>Possible solutions...</i> <i>... crew to check job bag contents are ... and deliver this to the machine.</i> <i>... could mean the job bag would need to be ... on the system and not altered by hand.</i> <i>Should a/c co-ordinator have access to change models?</i>
iv.	Collect inks	Operator has to walk down to outside the store area to fetch the ink. This means that valuable operating time is wasted in going to locate the ink. If the ink is not ready then further delays are seen. Additionally, there is no cover for the store-man when on holidays/sick : further significant delays could be caused.	Then we make recommendations for improvement. <i>Look to provide back-up cover for this function.</i>

	Process Element	What happens during this stage of the process?	What are the difficulties you have with this stage and what are the opportunities for improving it?
i.	Book in work originated in W Avenue into computer system.	Work is booked into computer system and is given an unique job number in order that staff can record the amount of time spent producing the work.	Not enough information given. Western Avenue staff do not have training on amount and type of information required to complete work. Print unit staff should be involved with training Western Avenue staff alongside ICT staff.
ii.	Check work and instructions given on job ticket	Check that pages are correct on electronic version (e.g. turn any landscape pages into portrait position etc). Place any additional blank pages on back of document to make sure document pages are in multiples of four. Check for any colour type which may be incorporated into document.	Missing fonts on PDF documents (fonts not embedded) from originator. Colour text being used in document when final version has to be produced black only. Forms not completed (eg expenditure codes incorrectly entered). All existing staff and new staff being given an induction of print requirements (eg producing documents specifically for print). Detailed training of Western Avenue staff to fill in required elements.
iii.	Pass electronic version to either Litho or Digital print for production process	Place electronic version of document into digital print folder or CtP system for litho print. Folders are available to view on desktop of PC. Assess best quality, urgency and price.	Assessing which piece of equipment is free and which would be the more financially viable option to produce the work. Occasionally work has to be moved from Litho print to digital and vice versa. Ensure work has been deleted from one or other process after its transfer.
iv.	When work is complete enter consumables and time sheets into system at beginning of each week	All consumables used to produce work and recorded production hours are entered into the computer using the unique job number. The work is then 'flagged' as finished. The computer totals the cost of the job and invoices are produced electronically to be sent to internal departments of the organization.	Incorrect expenditure codes are given from originators.
v.			

Element Label no.	Process Element	Detailed description of what happens at this stage of the process.	What opportunities exist for improving this element of the process ?
1	ORDERS RECEIVED INTO PLANNING SYSTEM	Orders are filtered to a machine depending on flute, size, grade, scoring and special instructions. Some orders go to credit hold and some go to planning exceptions.	•Scoring rules could be more sophisticated. •Too many special instructions and some are contradictory- needs refining
2	PLANNING EXCEPTIONS CHECKED	Large orders are passed to Paper Purchasing to order paper. Sample orders are accepted to machine with their link order. Tandem scoring jobs are accepted to the relevant machine or given back to Sales if not feasible	•Majority of orders that go to Exceptions are bespoke pallet orders. Pallets could be ordered more than the current once a day to keep exceptions clear. •Refine scoring rules
3	PLAN WORK	Orders sorted into deckles and paper grades to allow machines to run to their optimum. This involves down deckling, up deckling, upgrading and searching forward orders. If a machine is overloaded orders are manually moved to other machines. New work is coming into the system all the time, so it's an ever changing picture. We try to plan for least trim, least upgrades, least deckle changes, least paper changes and most narrow deckle due to cheaper paper costs.	•Paper costs and trim costs not built into the Planning system. •We make hundreds of decisions a day regarding the planning of orders, but we don't know the full cost implications of what we are doing. •System speed is a huge issue •Training for planners
4	FIX WORK	Work is fixed, order within program is sorted and a file is generated to send to the machine	•System speed needs improving •Refining planning rules, so that there are not so many manual changes after a program is fixed

These actions are then incorporated into a prioritised action plan – see later.





Quite often, a lot of the potential process improvements (the low hanging fruit) can be realised just by undertaking this simple flowcharting process.

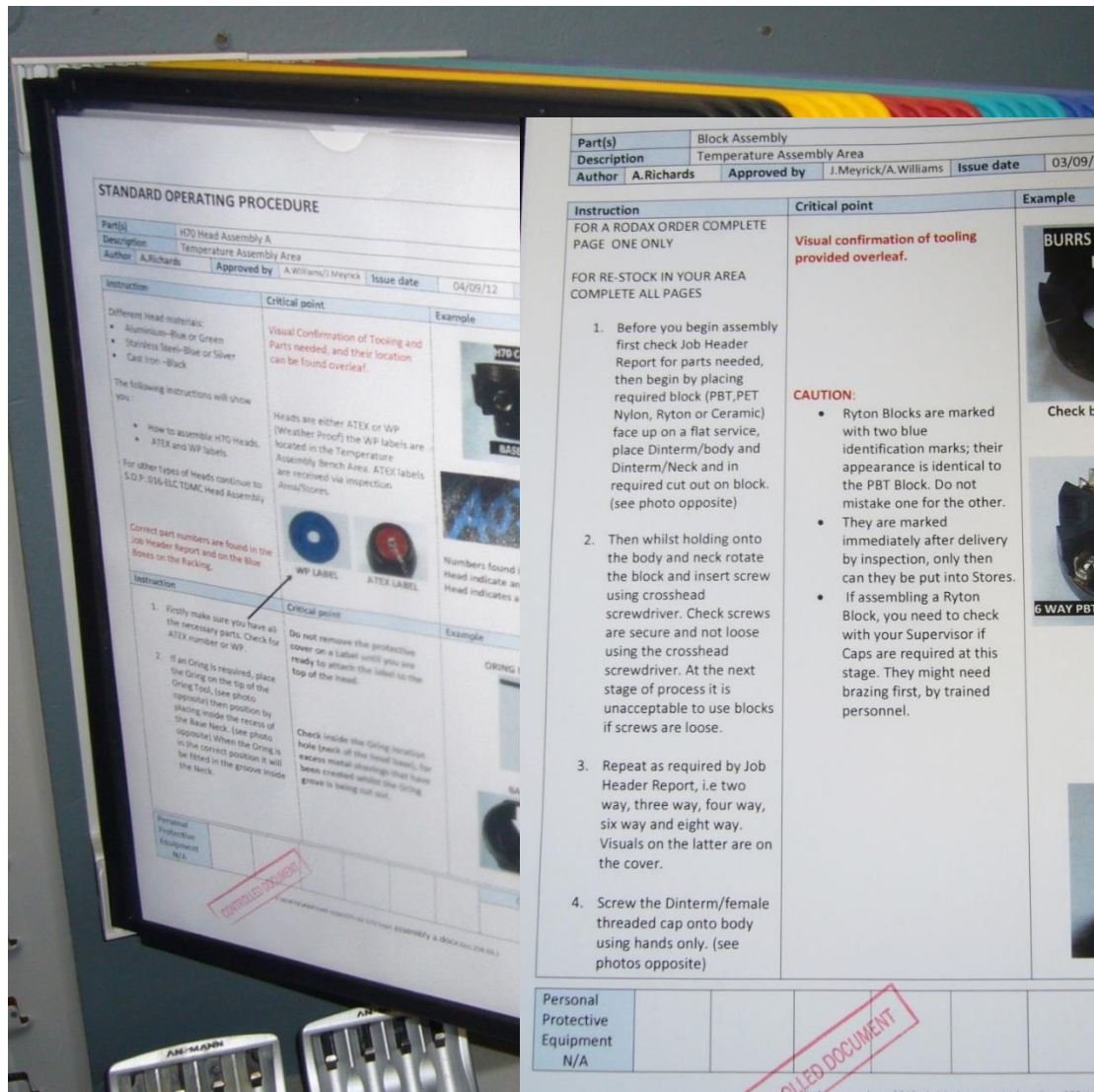
VISUAL MANAGEMENT

Using diagrams and photographs to:

- Communicate how things should be done properly
- Highlight key issues
- Re-enforce important points

Smart card for Every process

Colour-coded by Product group



Part(s)	Block Assembly			Issue date	03/09/12	Reference	012-ELC
Description	Temperature Assembly Area			Author	A.Richards	Approved by	J.Meyrick/A.Williams
Instruction				Critical point	Example		
FOR A RODAX ORDER COMPLETE PAGE ONE ONLY				Visual confirmation of tooling provided overleaf.			
FOR RE-STOCK IN YOUR AREA COMPLETE ALL PAGES				CAUTION:			
- Before you begin assembly first check Job Header Report for parts needed, then begin by placing required block (PBT, PET Nylon, Ryton or Ceramic) face up on a flat service, place Dinterm/body and Dinterm/Neck and in required cut out on block. (see photo opposite) - Then whilst holding onto the body and neck rotate the block and insert screw using crosshead screwdriver. Check screws are secure and not loose using the crosshead screwdriver. At the next stage of process it is unacceptable to use blocks if screws are loose. - Repeat as required by Job Header Report, i.e two way, three way, four way, six way and eight way. Visuals on the latter are on the cover. - Screw the Dinterm/female threaded cap onto body using hands only. (see photos opposite)				- Ryton Blocks are marked with two blue identification marks; their appearance is identical to the PBT Block. Do not mistake one for the other. - They are marked immediately after delivery by inspection, only then can they be put into Stores. - If assembling a Ryton Block, you need to check with your Supervisor if Caps are required at this stage. They might need brazing first, by trained personnel.			
 BURRS MUST BE REMOVED PBT BLOCK Check blocks for chips, cracks and any moulding faults.				 6 WAY PBT BLOCK NO CAPS			
 DINTERM FEMALE THREADED CAP				 8 WAY PET BLOCK WITH CAPS			
Personal Protective Equipment	N/A			COSHH assessment		Not applicable	

Quality approved sops/D12-etc block assembly.docx Doc. 258. Iss1

Process Mapping : Stage 2

Activity mapping

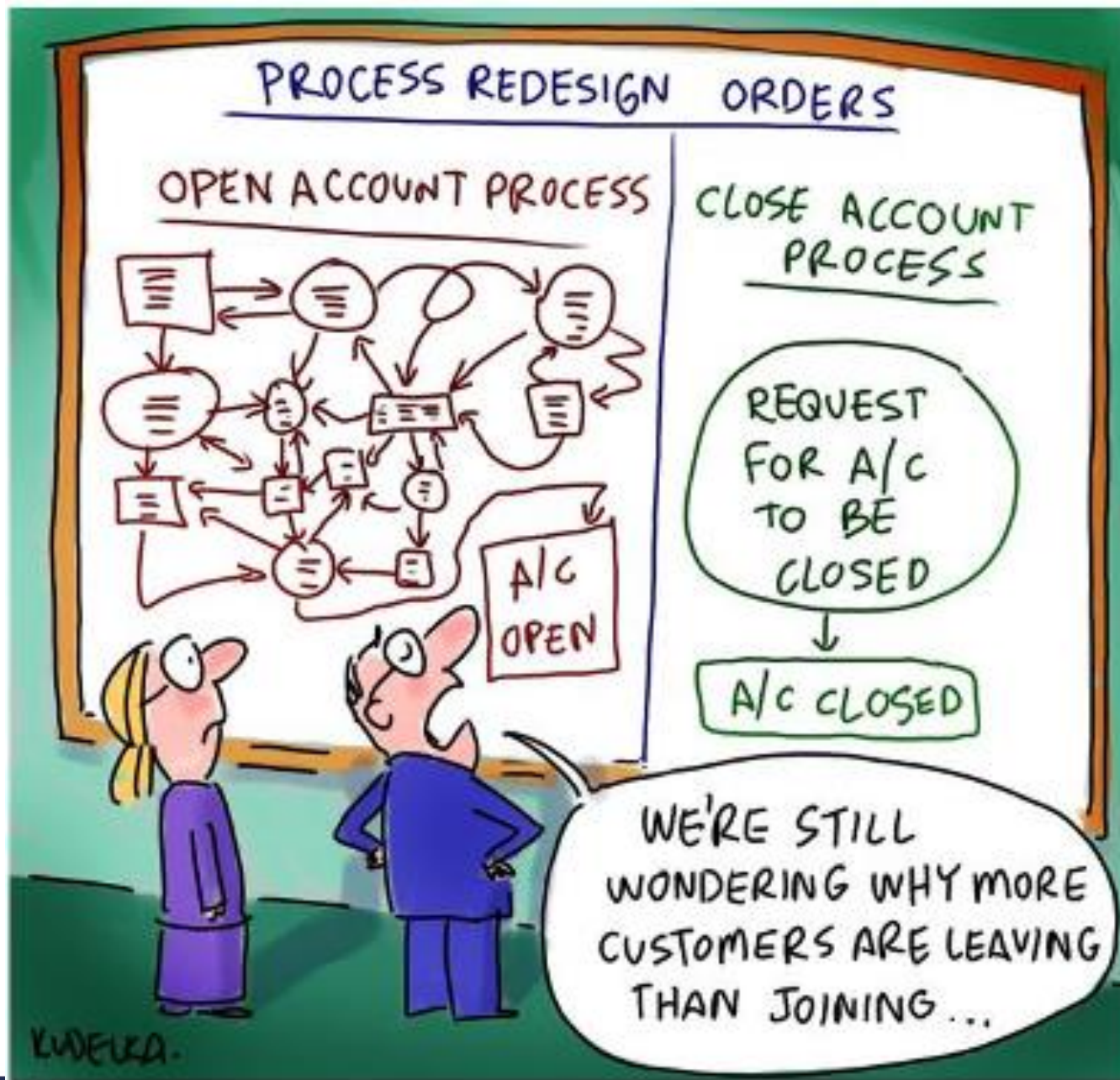
Mapping the supply chain as a process not as a series of separate functions.

Process Mapping Stage 2 : Activity Mapping

Map the supply chain from a process perspective to identify what happens and by whom this is done.

Try to identify the factors :

- That cause bottlenecks
- That may not be the best way of doing things



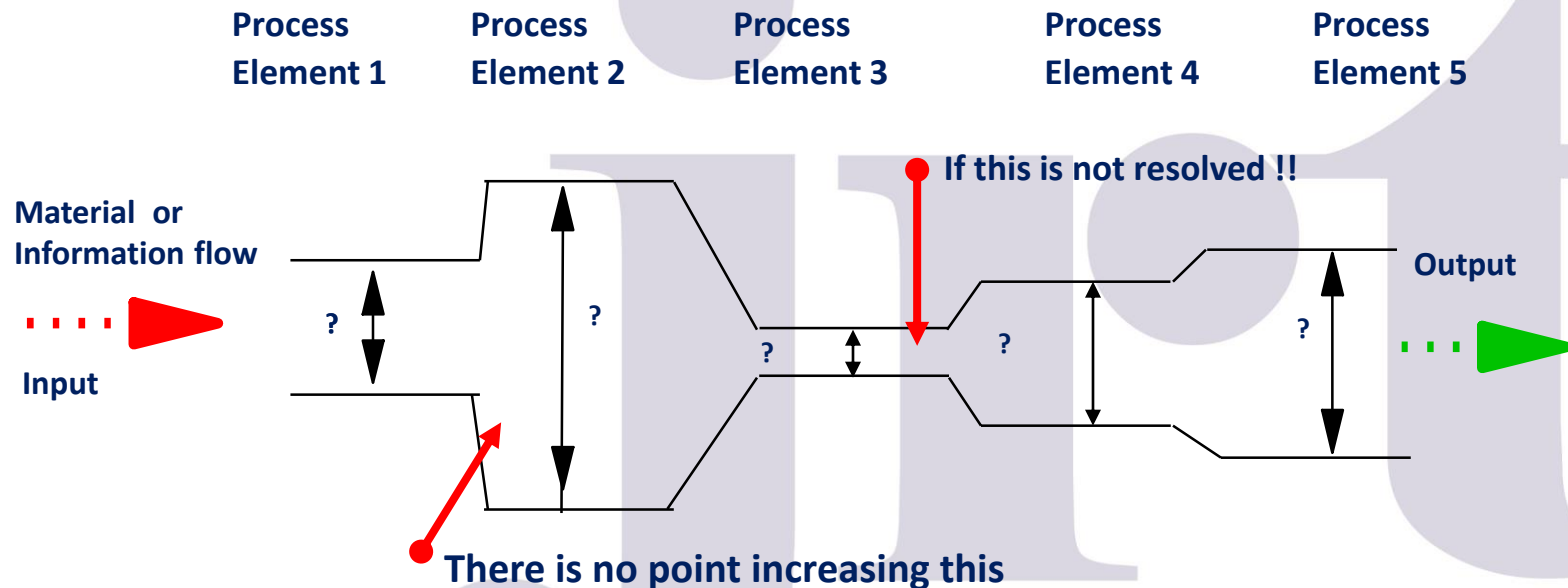


What are bottlenecks?

Introducing Constraint Theory



Operational systems can be considered as pipes with varying constrictions:

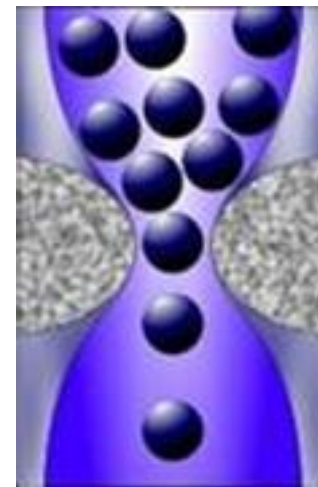


1. There is a need to understand the size of each of these bottlenecks !
2. Efforts must then be to reduce the impact of the most critical bottleneck by increasing the capacity of that part of the operation.

Cox, Jeff; Goldratt, Eliyahu M. (1986). *The goal: a process of ongoing improvement*. [Croton-on-Hudson, NY]: North River Press. [ISBN 0-88427-061-0](#)

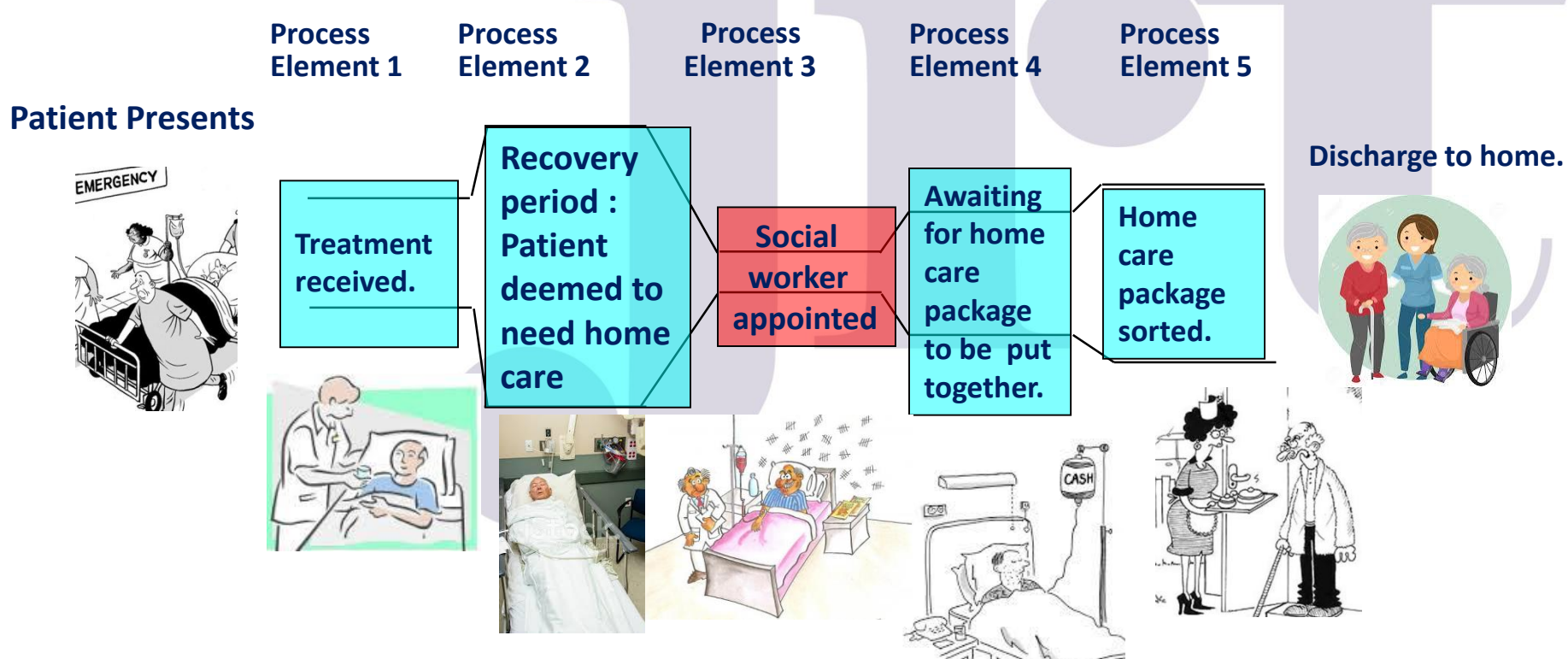
Significance of Bottlenecks

- **Maximum speed of the process is the speed of the slowest operation**
- **Any improvements will be wasted unless the bottleneck is relieved**



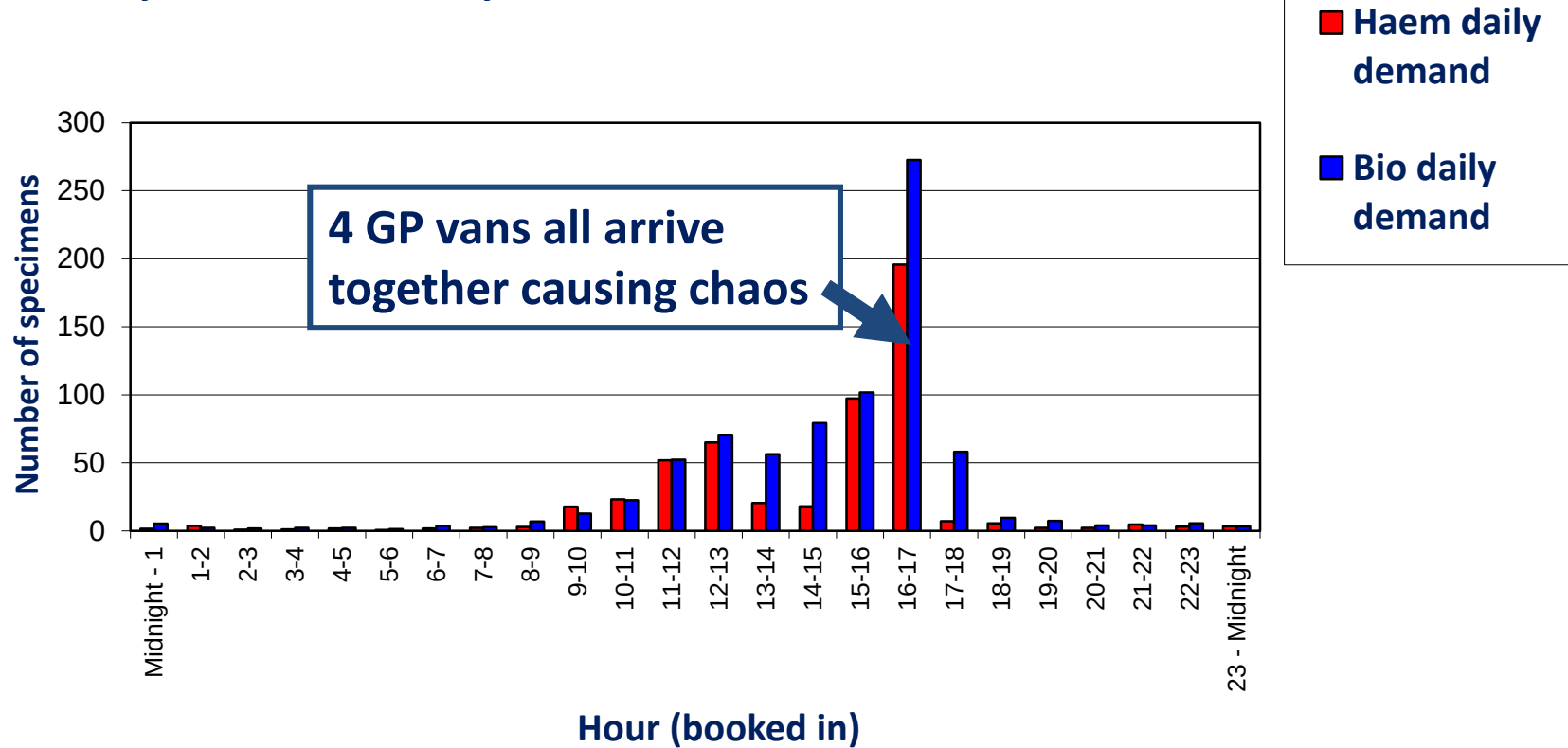
Take 3 very different processes :

Bottlenecks in the elderly patient treatment process :

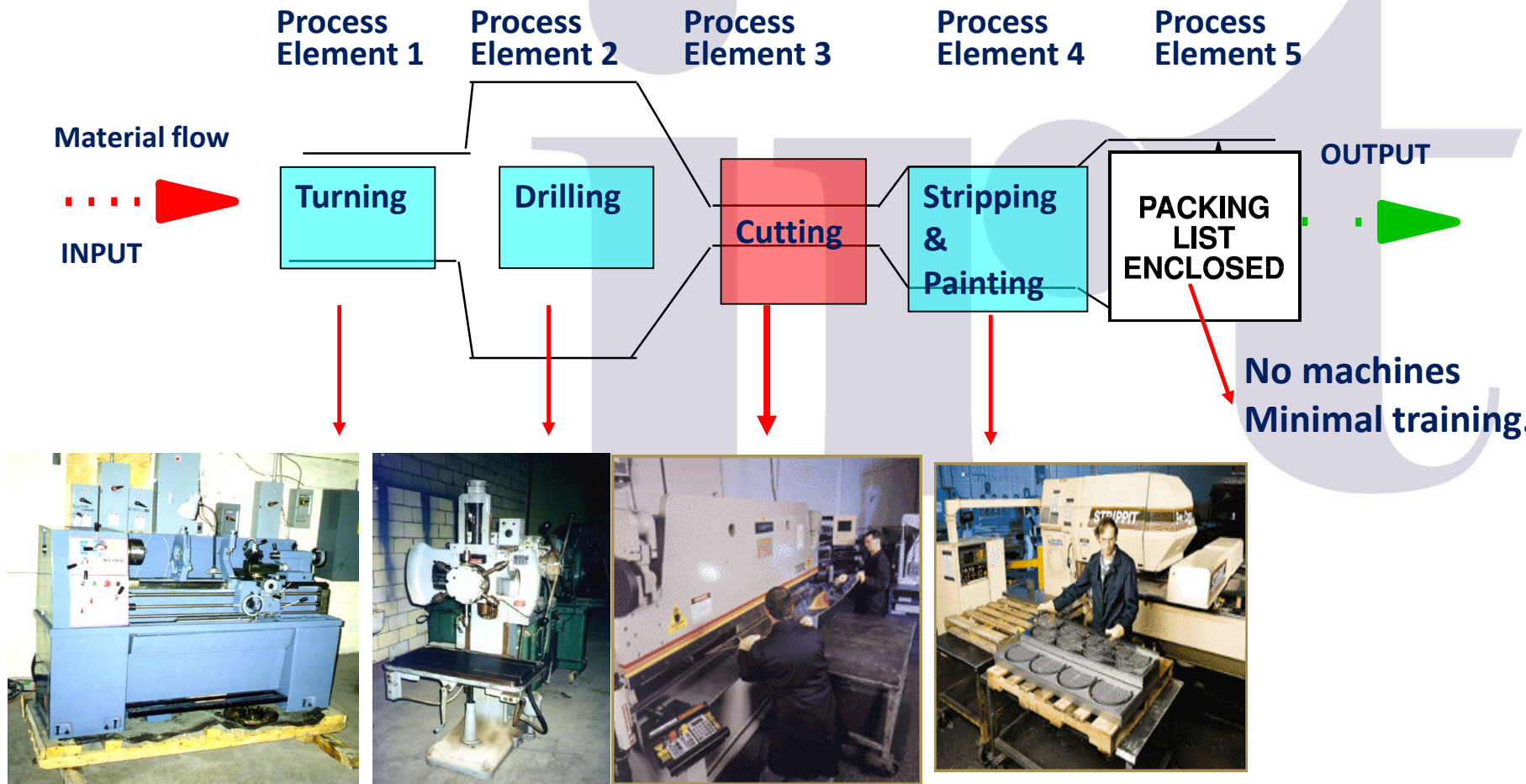


Bottleneck in a Biochemistry and Haematology Department

Hourly demand for analysis



An industrial example:



Many machines
3 trained Operators.

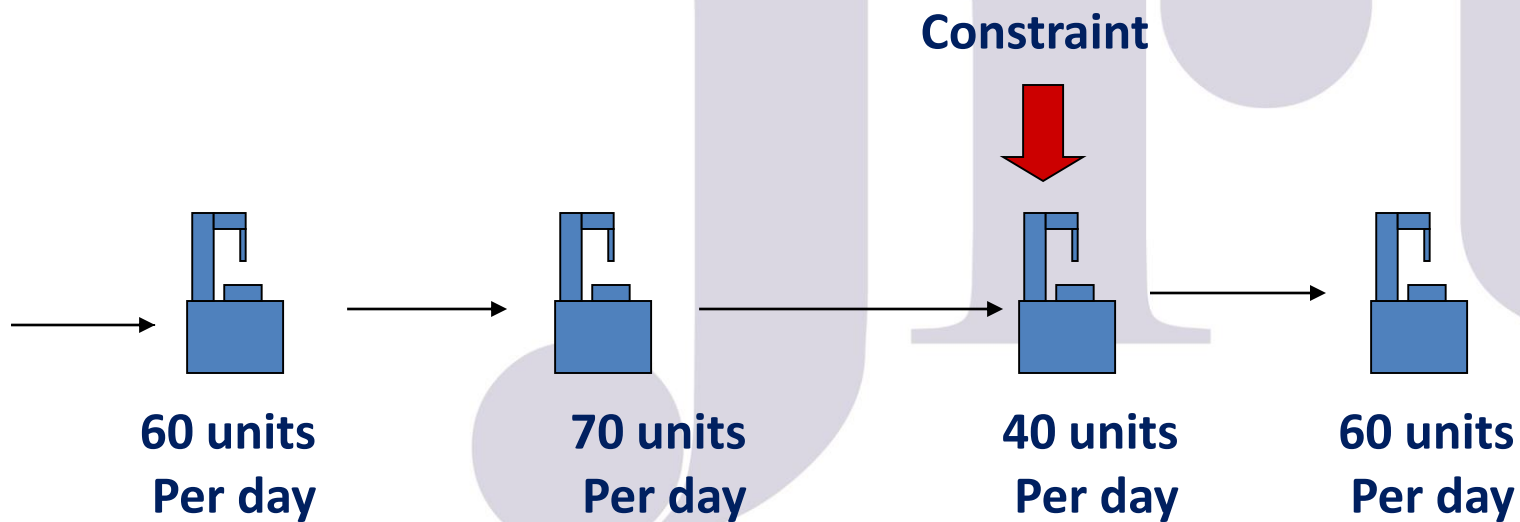
Many machines
6 trained Operators.

2 Specialist machines
2 skilled Operators.

No machines
Low training requirement.

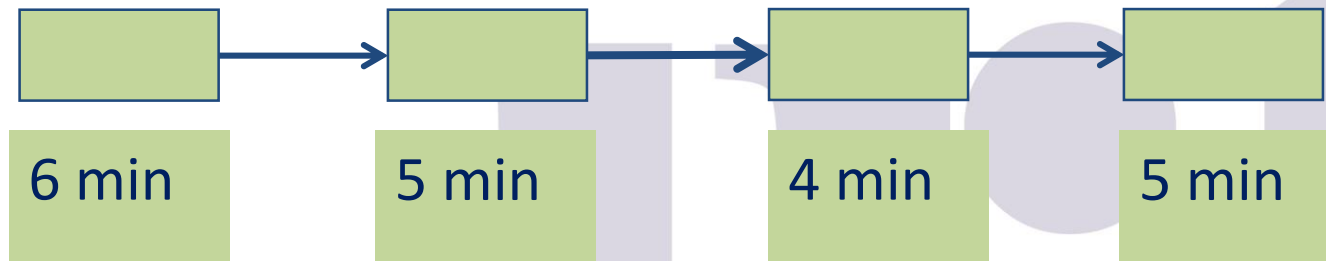
Any system can produce only as much as its critically constrained resource:

Take a sequential line process:

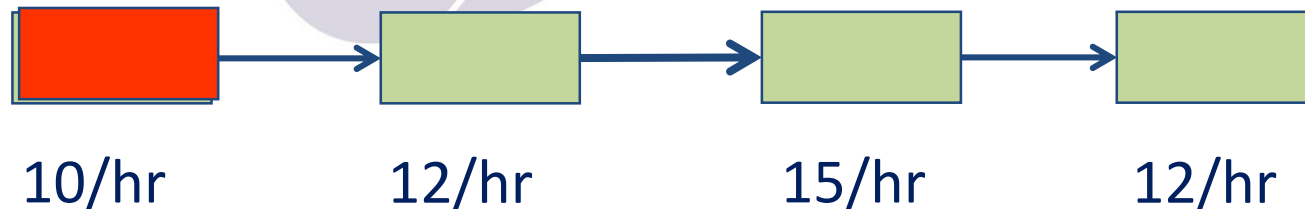


Maximum Capacity = 40 units per day

Maximum Throughput of a Process

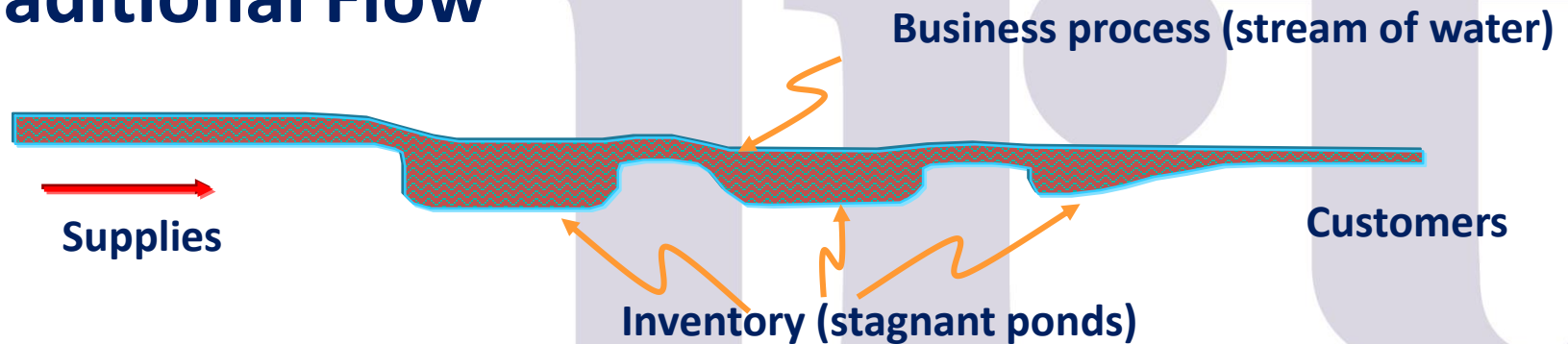


- What is the capacity of the system?
 - Convert to units / hr

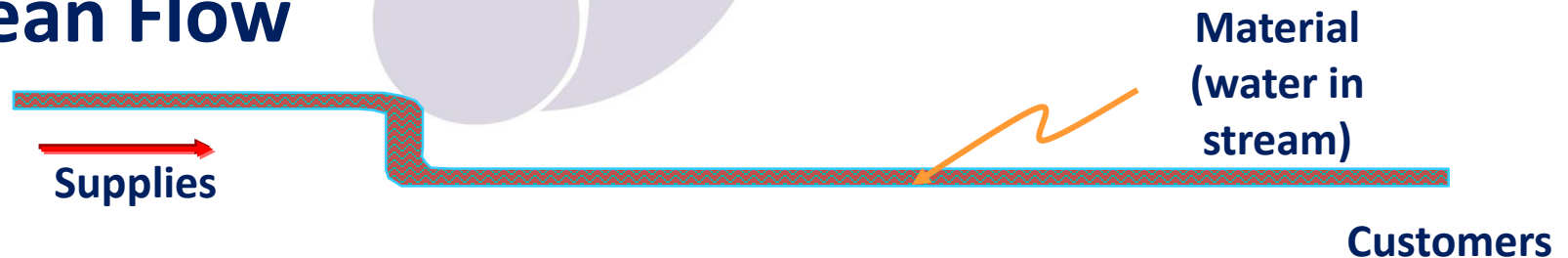


Streamlined Processes

Traditional Flow



Lean Flow



Contrasting Philosophies of Inventory management...

Push Method (traditional, non-JIT)

Deliver the materials as fast as you can : PUSH them to the next operation , whether they are ready or not!

Sometimes this meant that the operational area was clogged with components.

Pull Method (JIT)

Nothing is delivered until we get a “signal” from the line - thus, components are PULLED through the system as and when they are required.



Pull Control.

The purpose of pull control system is to deliver what is needed, when it is needed, and only as much as is needed. This eliminates overstocking at the lineside.

If nothing is consumed, nothing is produced !

For pull systems to work there must be :

- a. Short and reliable replenishment.**
- b. Small replenishment batches.**
- c. Regular frequency and use of parts.**



As material flow improves:

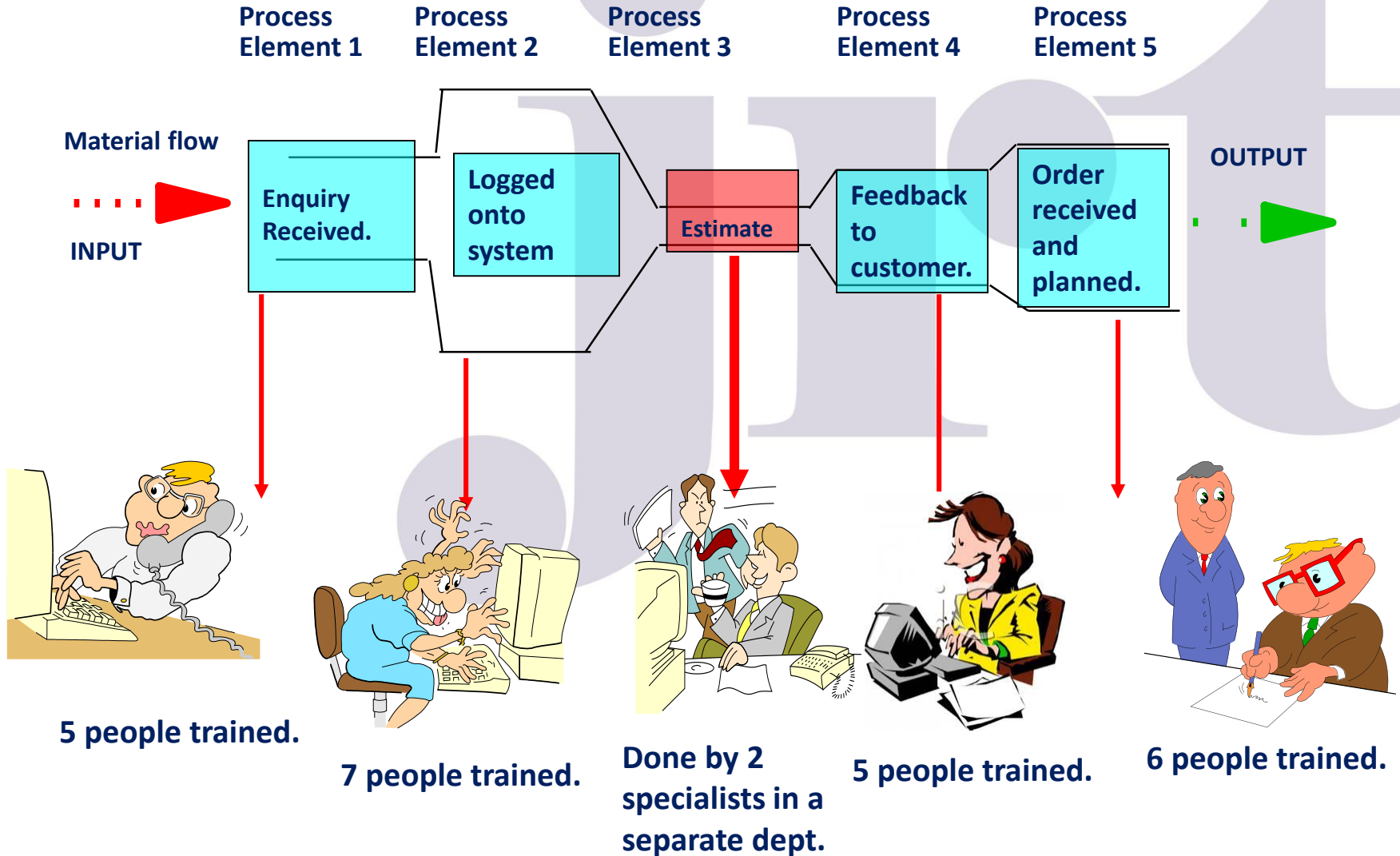
These items decrease:

- Inventory
- Space requirement

These items increase:

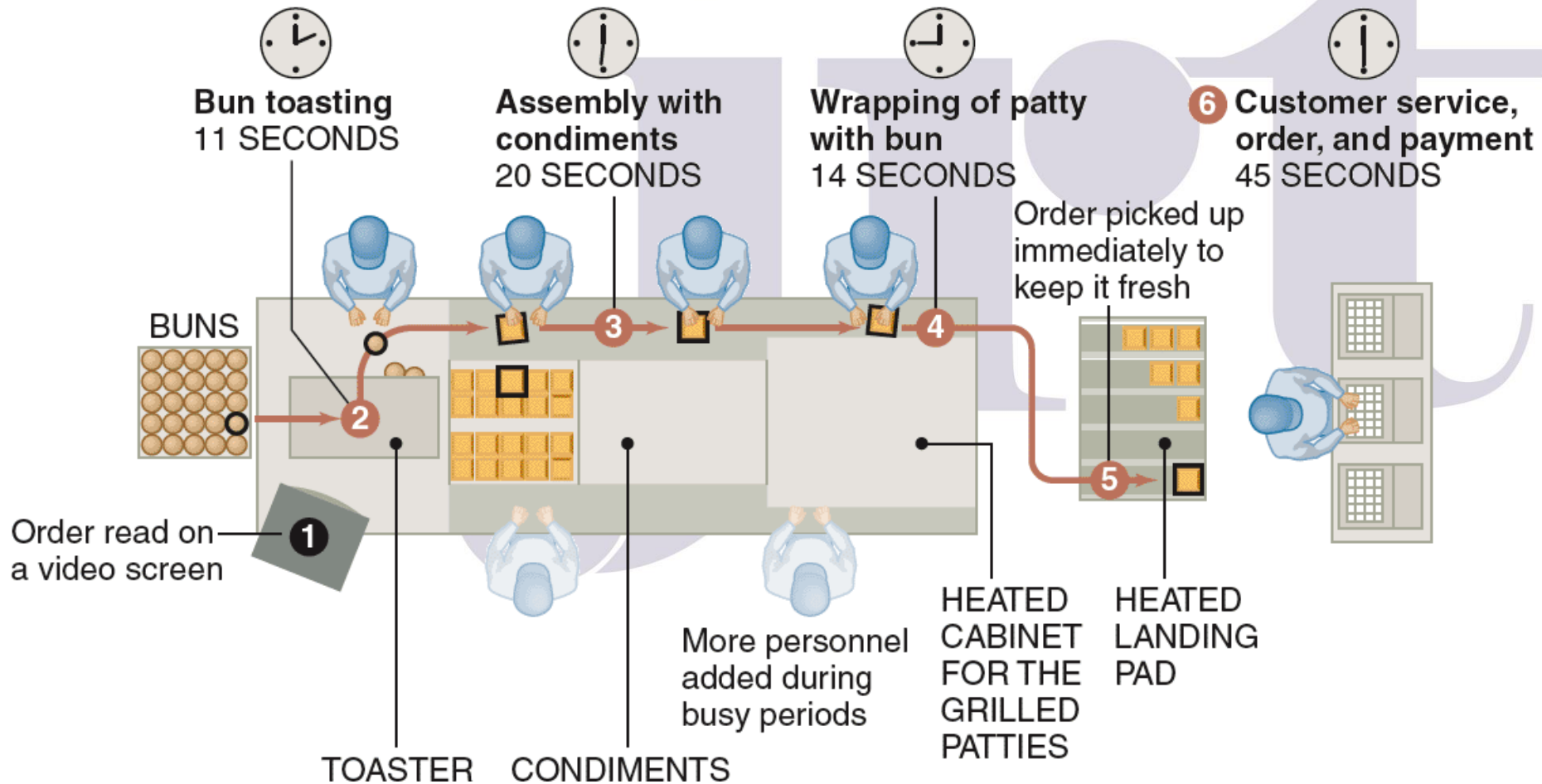
- Space
- Efficiency

An administrative example:



McDonald's Assembly Line

McDonald's Hamburger Assembly Line



Process Mapping : Stage 2

Activity mapping

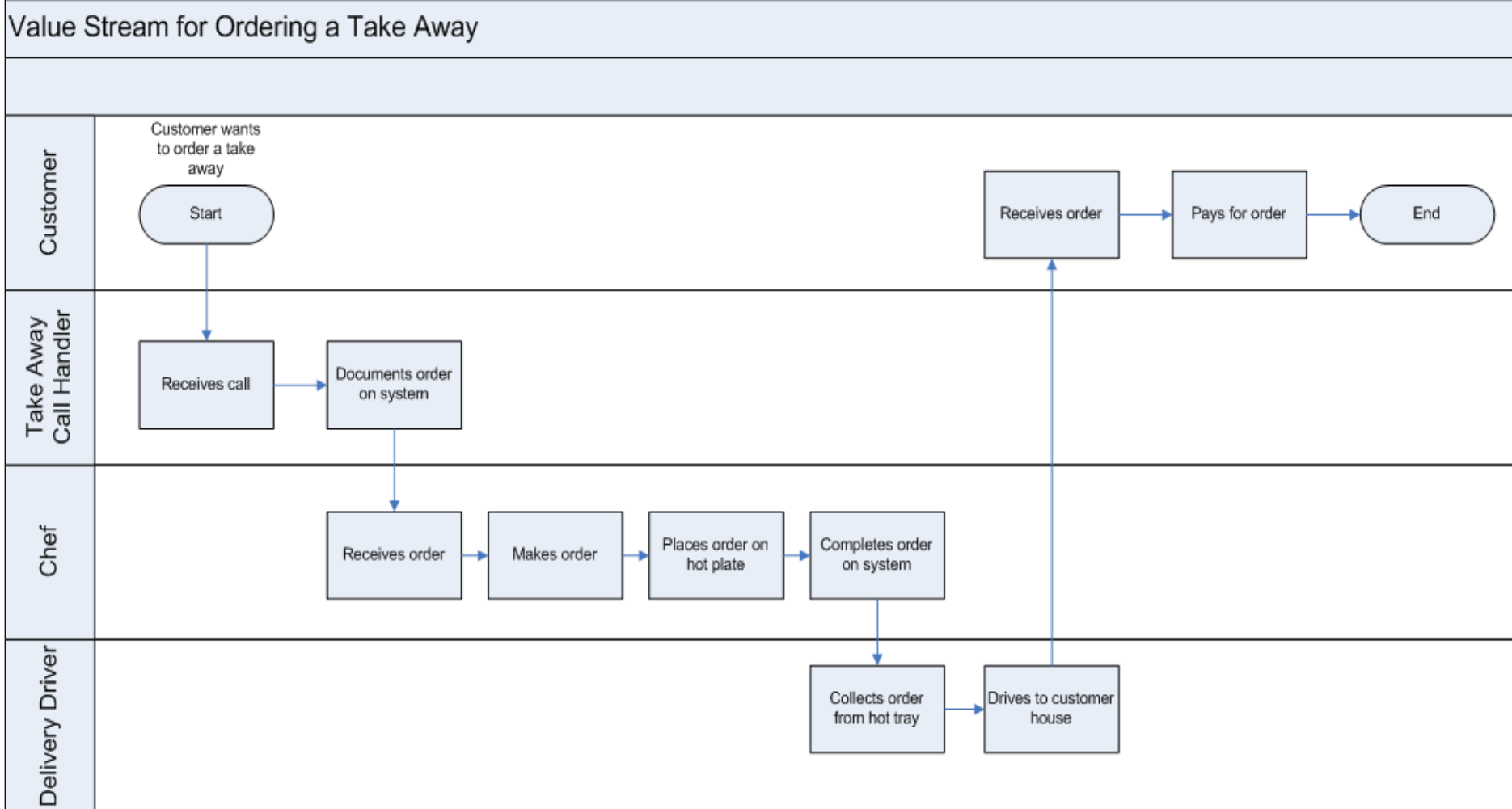
Mapping the supply chain as a process not as a series of separate functions.

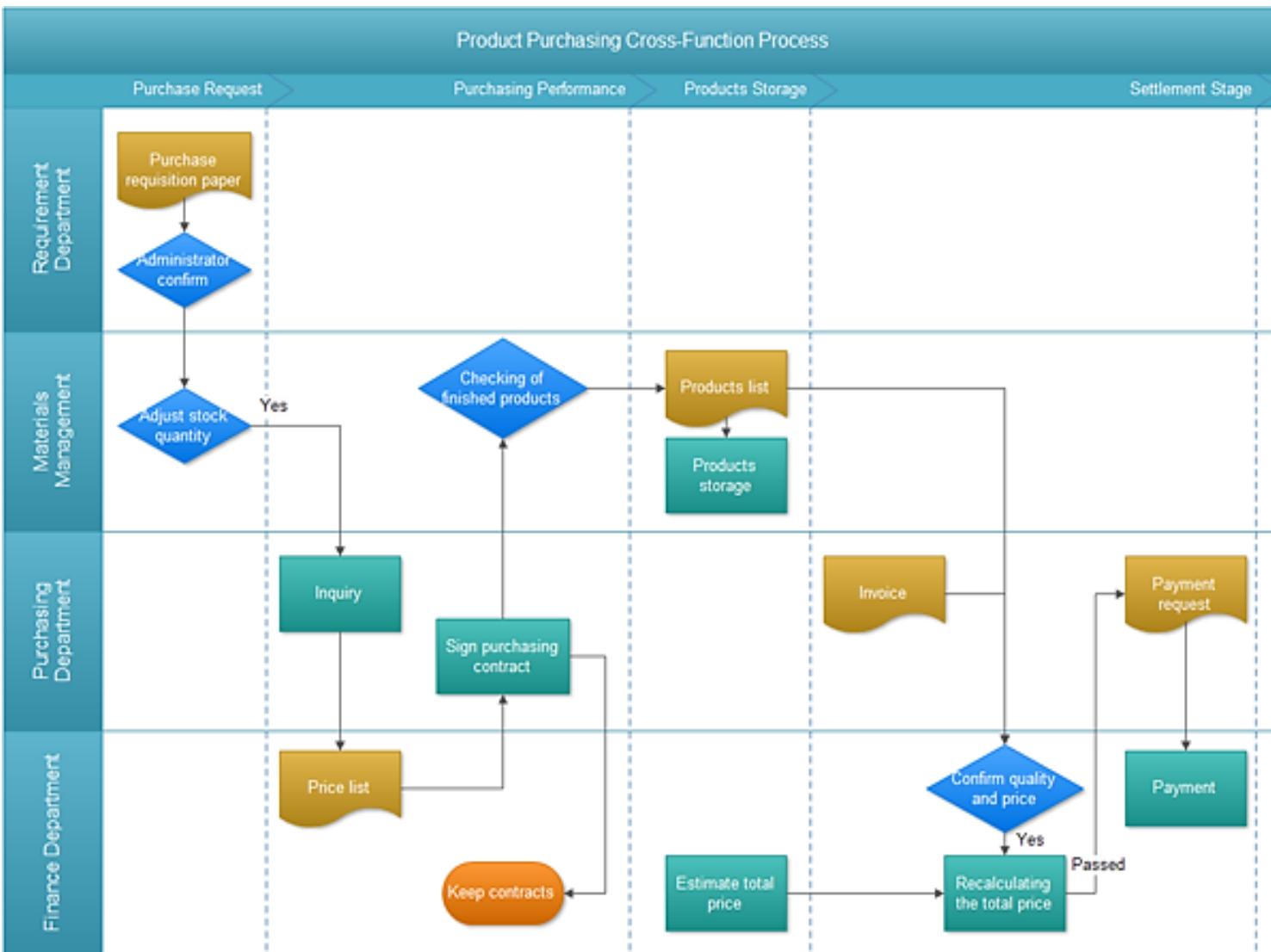
- Think of any business as a chain
- Each link in the chain represents a separate function
- If one link breaks the whole chain fails
- It is the linkages that bear the strain
- It is the strength of the linkages that determine how well the chain works
- Improving some of the links does not improve the chain



**Introducing the 'Swim lane' approach to activity mapping
: an excellent tool for examining the problems that can
occur when processes cross organisational boundaries
and to identify what different parties contribute to the
overall process.**

The 'Swim lane' approach to analyse what different parties contribute to the process

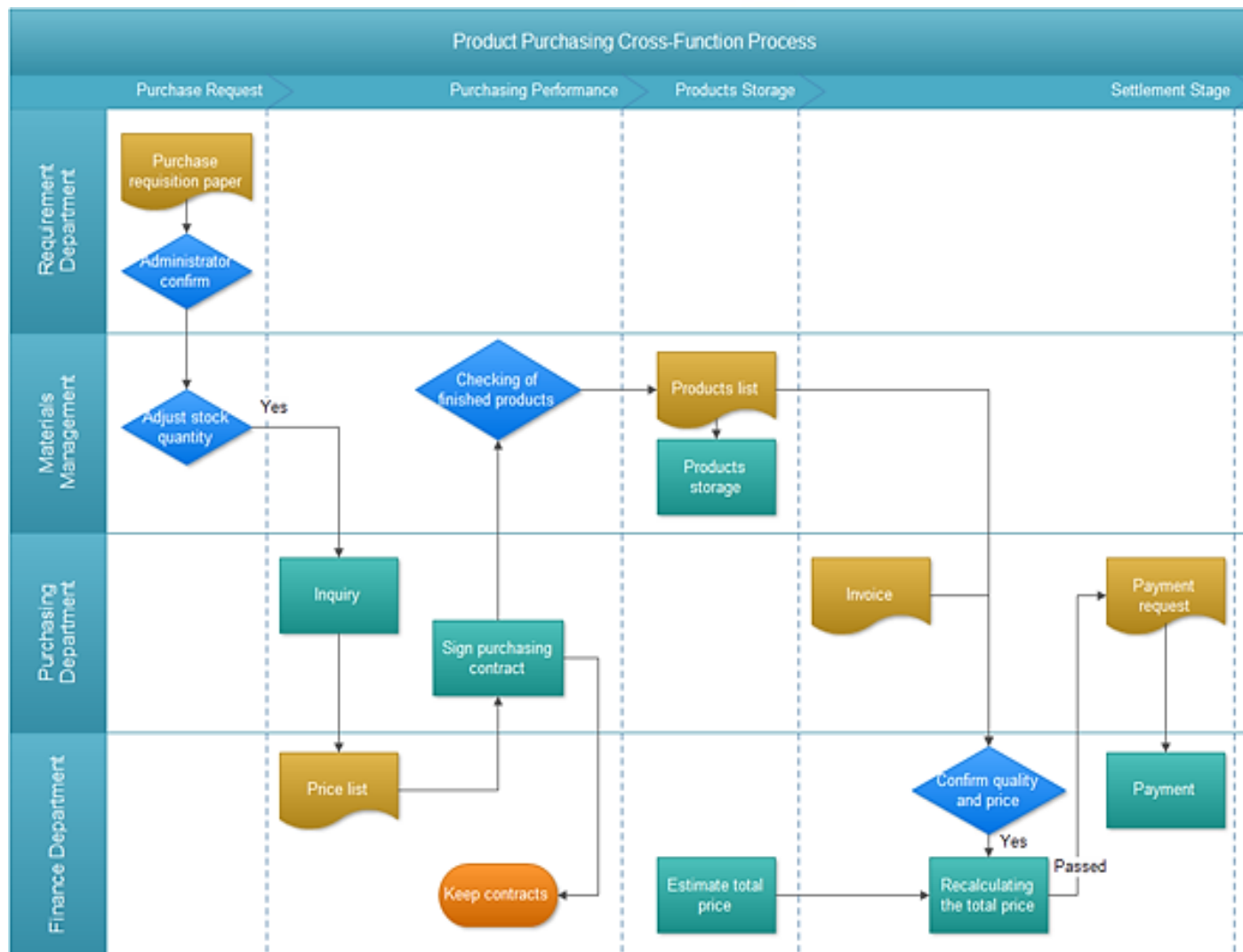




Purchase Request:

Starting with initial purchase request from **Customer** to **Requirement Department**

Purchase is processed by **Requirement Department** conformation and quantity is sent to **Materials Management**

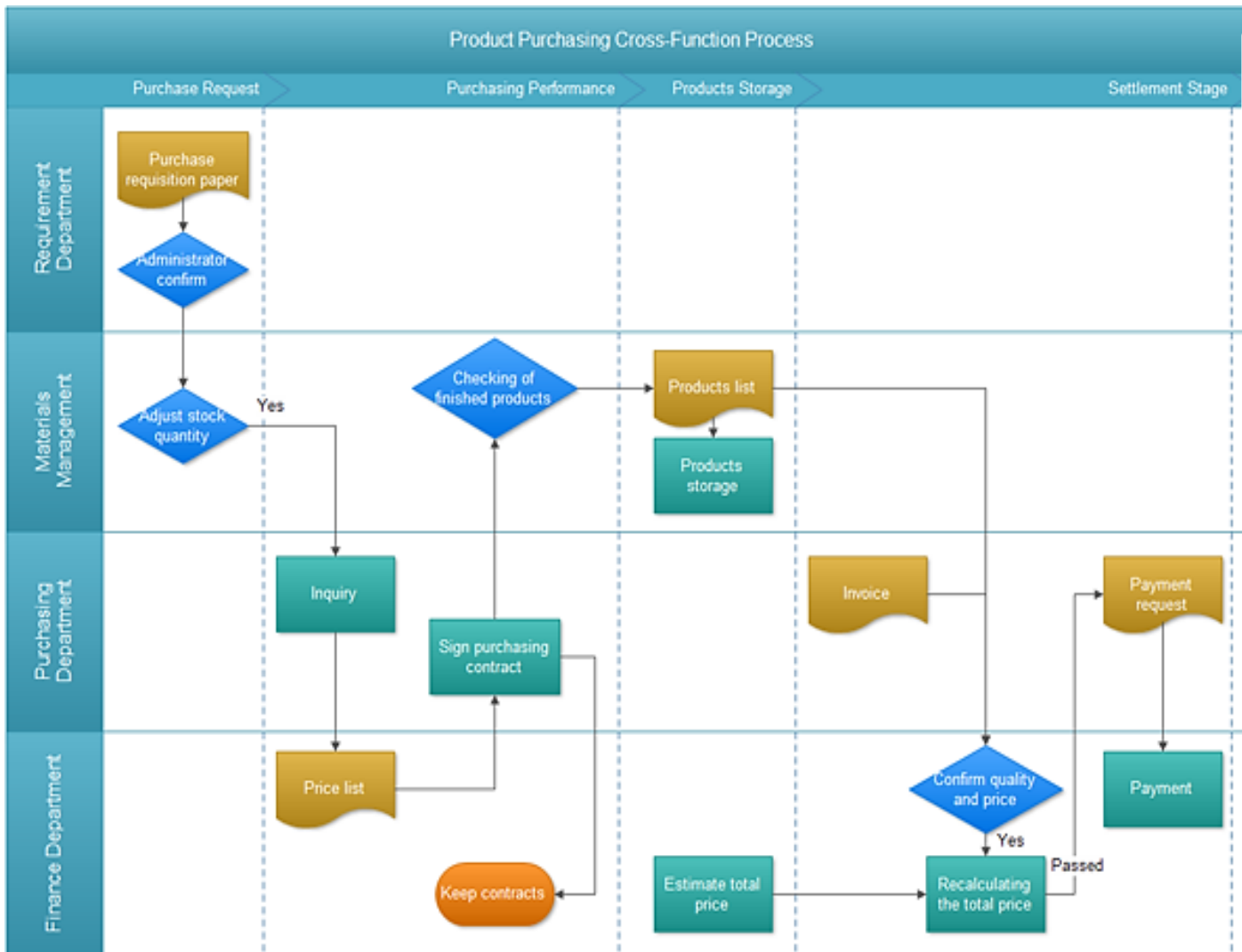


Purchase Performances

:

Materials Management then verifies quantity and adjust stock, this is then communicated/ investigated by **Purchasing Dpt.** for restocking/allocation of product analysis.

Finances Dept. sets price according to logistical interests: Cost, Overhead, Recoupment. Collaborating with **Purchasing Dpt.** to sign Purchase Contracts , while **Materials Management** checks off the finished product



Settlement Stage:

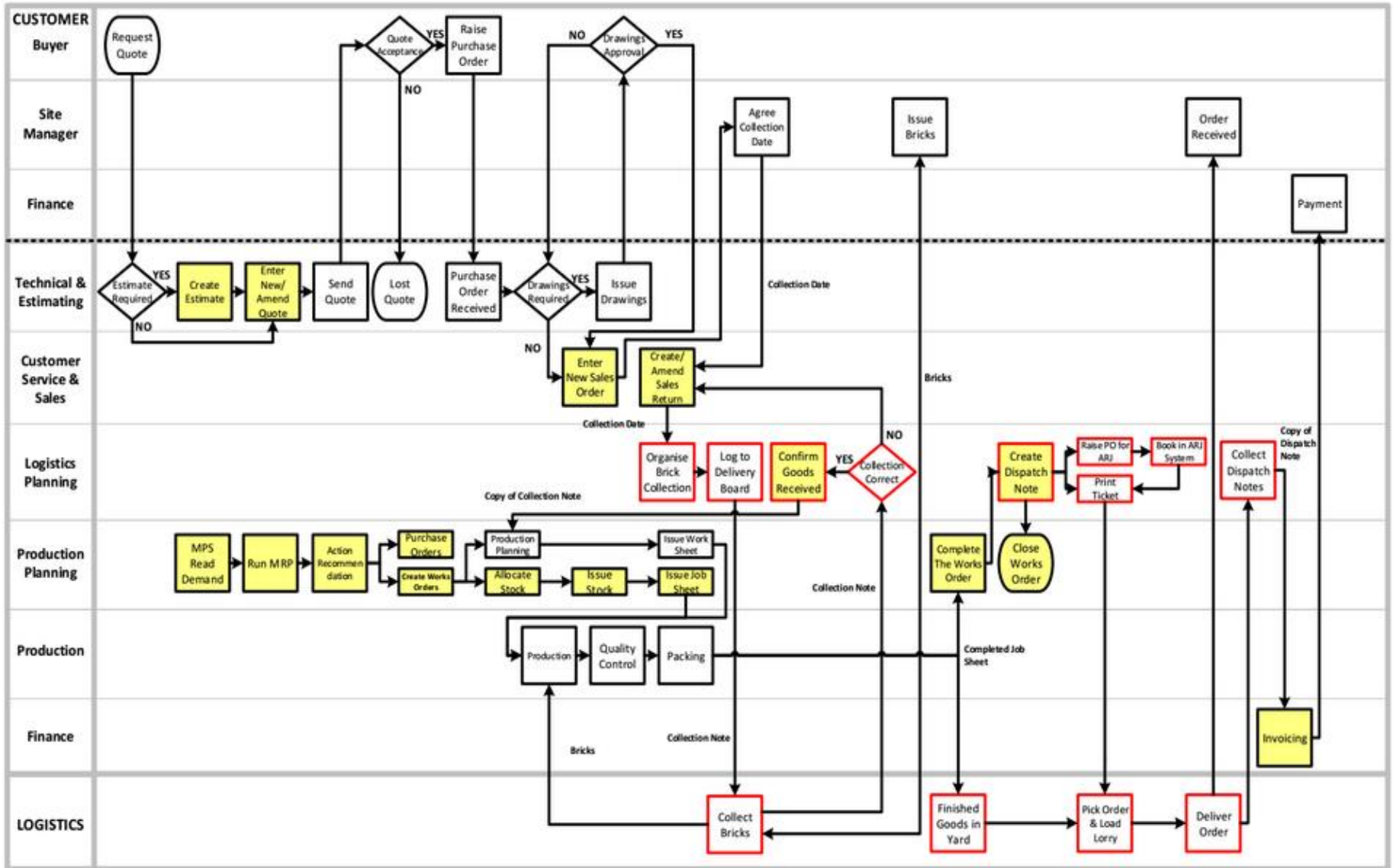
Materials Management produced all products, **Purchasing Department** has then accumulated and invoiced, providing payment request

Finance Department upon purchases conformation and prices, recalculates working with **Purchasing Department** to process final payment , recouping asset profit gain.



It is when these transactions have to cross departmental boundaries that gives rise to problems in the process chain.

Order Processing Map





**Let us turn the swimming pool around - it
makes it easier to analyse the process.**

This is the time this job should take.

This is how long it actually takes.

Step 1. The supply chain is mapped to identify what happens and by whom.

PROCESS ACTIVITY MAP FOR ESTIMATING

Number	Activity	Process Time no delays (mins)	Actual time taken (est. mins)	Area	SALES/TM	ESTIMATOR	ACCOUNTS	PAPER CONT	ART/DESIGN	COMM
1	Customer brief of requirement to T.M., E-Mail, phones, faxes or sends in enquiry - fill out Enquiry form with all relevant details required to supply the Customer with their order.	10	30	SALES/TM						Ensure unspecified requirements are met ensure expectations are fully met
2	Enquiry form to be completed by TM/Design or Sales Administrator (electronic enquiry form in place)	5	15	SALES/TM						s, sometimes lack of i
3	If new Customer, follow New Customer Credit Procedure. Fax Credit application form to the Customer for completion. Pass details to Sales Office Manager/Deputy to create on Consensus.	1	1	SALES						ts regarding using ele
4	If die-cut or requires a sample, Sales Administrator to obtain Spec No. from CDM and put enquiry on hold then pass to design.	5	30	SALES/DESIGN						s depending on design Admin first. Whereve
5	Enquiry passed to Sales department for processing	1	5	SALES						Could this be available electronically instantaneously?
6	If the enquiry is for Pre-Print, find out annual usages/contract, then pass to Graphics Manager to obtain Pre-Print costs with L. No.	30	720	DESIGN						Delays in obtaining Pre-Print prices Delay if more info is needed, heavy Delay if material does not exist - pro correct Pre-Print material.
7	Enquiry once completed and passed to the Sales Administrator will check if it is an existing board grade.	5	5	SALES						Delay if material does not 'down load
8	If new board grade, pass to Sales Office Manager to obtain authorisation to create new material on Central Server	5	30	SALES						Delays depending on work load
9	Sales Administrator to enter enquiry onto CDM system for quoting.	5	30	SALES						Possible delay if a large tender invol through
10	Pass enquiry to Estimator for quoting.	1	30	ESTIMATOR						Estimator instead of printing quotation to save time
11	Quotation printed by Estimator and passed back to Sales Administrator	1	1	ESTIMATOR						If delivered by TM - possible delay in to email quotations with terms & con
11	Sales Administrator will send quotation to the customer direct or through the T.M.	5	1440	SALES/TM						
TOTAL TIME		74	2337							

Flowchart the activity in 2 dimensions : what is done and by whom.

No.	Activity	Process Time (mins)	Delays at this stage (m)	Area	Customer Services	Reception	Logistics	Materials coordinator	Production Administrators
1	Client telephones customer relations coordinator with order	5	0	Customer Services					
2	Client faxes through official purchase order to Reception	0	5	Reception					
3	Place official purchase order in pigeon hole for customer relations coordinator and email to let them know it has arrived	3	5	Reception					
4	Pick up official purchase order from pigeon hole	2	6	Customer Services					
5	Cross check order on BPR list to allocate BPR	2	1	Customer Services					
6	Job number allocated from Job number book	2	3	Customer Services					
7	Order added to schedule on Access	10	0	Customer Services					
8	Logistics informed of new order on Schedule	1	5	Customer Services					
9	Capacity planner checked for adequate capacity to run job	5 (min) 30 (max)	5	Logistics					
10	Order entered into Access accounts and accounts month allocated	2	0	Customer Services					
11	Order passed to Customer Relations Manager	1	4	Customer Services					
12	Job data entered onto Access accounts (job number, BPR, quantity required)	5	2	Customer Services					
13	Transfer data to Excel spreadsheet	2	0	Customer Services					
14	Locate materials required for specific job(s) on spreadsheet and calculate stock deficits	5	0	Customer Services					
15	Fill in purchase requisition form detailing required order from suppliers	5	0	Customer Services					

Step 1. Map the supply chain to identify what happens and by whom this is done.

In doing so, try to identify the factors :

- That cause bottlenecks
- That may not be the optimal way of doing things

This is the time this job should take.

This is how long it actually takes.

9	Capacity planner checked for adequate capacity to run job	5 (min)	30 (max)	120	Customer Services				
10	Order entered into Access accounts and accounts month allocated	2		20	Customer Services				
11	Order passed to Customer Relations Manager	1		20	Customer Services				
12	Job data entered onto Access accounts (job number, BPR, quantity required)	5		30	Customer Services				
13	Transfer data to Excel spreadsheet	2		10	Customer Services				
14	Locate materials required for specific job(s) on spreadsheet and calculate stock deficits				Customer Services				
15	Fill in purchase requisition form detailing required order from suppliers				Customer Services				
16	Purchase requisition form passed to Logistics	1		5	Logistics				
17	Telephone supplier and discuss material order	5		50	Logistics				
18	Fax confirmation (if required by supplier)	2		30	Logistics				
19	Supplier phones or faxes confirming delivery date and price	1		0	Logistics				
20	Add materials details to Access accounts	5		0	Logistics				
21	Materials required from clients discussed with Customer Relations coordinator for specific client	5		4	Customer Services				
22	Components required from clients added to schedule	5		0	Customer Services				
23	Confirm material quantity on Access is accurate by phoning warehouse	2		0	Customer Services				
24	Phone customer to request additional materials and expected	15		0	Customer Services				
25	Check Goods Inwards spreadsheet for arrival of materials from client	1		0	Customer Services				
26	Telephone client if goods have not been received by expected date	10 (min)		0	Customer Services				
27	When all goods received, create Sales order processing form using template for BPR. Print and sign	5		0	Customer Services				

Analyse why there is such a difference!

May be delayed several days awaiting completion of this step on non urgent jobs

to Excel

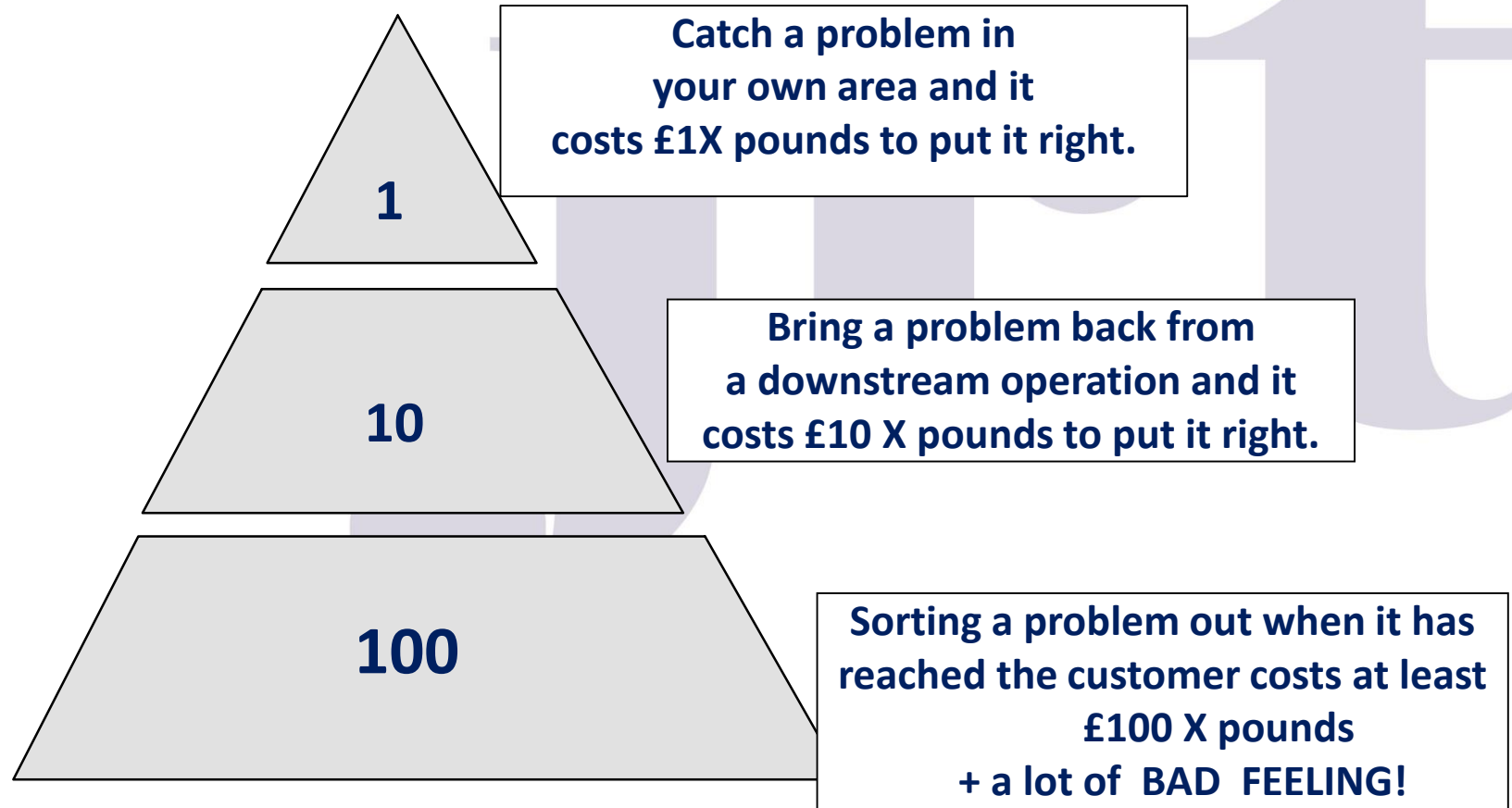
All jobs are on single spreadsheet. Difficult to locate relevant materials - depends on Customer Relations Manager familiarity with product

Can be significant (+) waiting for supplier confirmation of delivery date

Delay if Goods Inwards information has not been updated on spreadsheet Warehouse

Doc pack is not printed until 5 days before production

Remember the 1:10:100 Rule



STEP	ORDER FULLFILMENT PROCESS	Process Time (Mins)	Actual time taken (min)	Order receipt	Order Entry	Material moved to area	Storage before Processing	Processing	Despatch	Comments on delays and how they could be resolved
1	Order received in sales	5	10							Could order entry and order receipt functions be combined?
2	Transfer to order Entry	2	20							Orders can sometimes wait excessive times waiting to be entered.
3	Enter order	2	10							Job entered on system
4	All information transferred to technical.	2	12							Job transferred as a batch to grinding : does this need to be done in 1 go?
5	Specs and drawings have to be generated, printed and put on the order	2	5							Cannot this information be made electronic and be accessible from computer terminals in each area ?
6	Transferred to Processing	150	220							Material can wait for upto 2 hours waiting to be processed : we require a better system for alerting Processing.
7	Processing (4 stages)	75	450							4 stages involved in processing : could some of these be integrated and owned by the same people?
8	Moved from processing into holding area for checking	18	120							Excessive movement of material involved in the processing stage because of poor layout.
9	Checking book the product onto the system and reconcile with order records	5	10							Does this need to be done in a separate area : can it not be integrated into the processing operation?
10	Job moved to Final Checking	1	15							Despatch function are not aware of the order until it arrives in the Warehouse : this can cause delays.

What causes these delays?

- Inadequate information on what is required
- Mistakes caused by unclear instructions
- Excess delays and movement
- Lack of co-ordination between departments
- Materials not delivered on time

... and many more!

Our job is to identify and eliminate what causes these bottlenecks!



t



**These actions are then incorporated into a
the same prioritised action plan as
mentioned earlier – see later.**



How do we then use these activity maps?

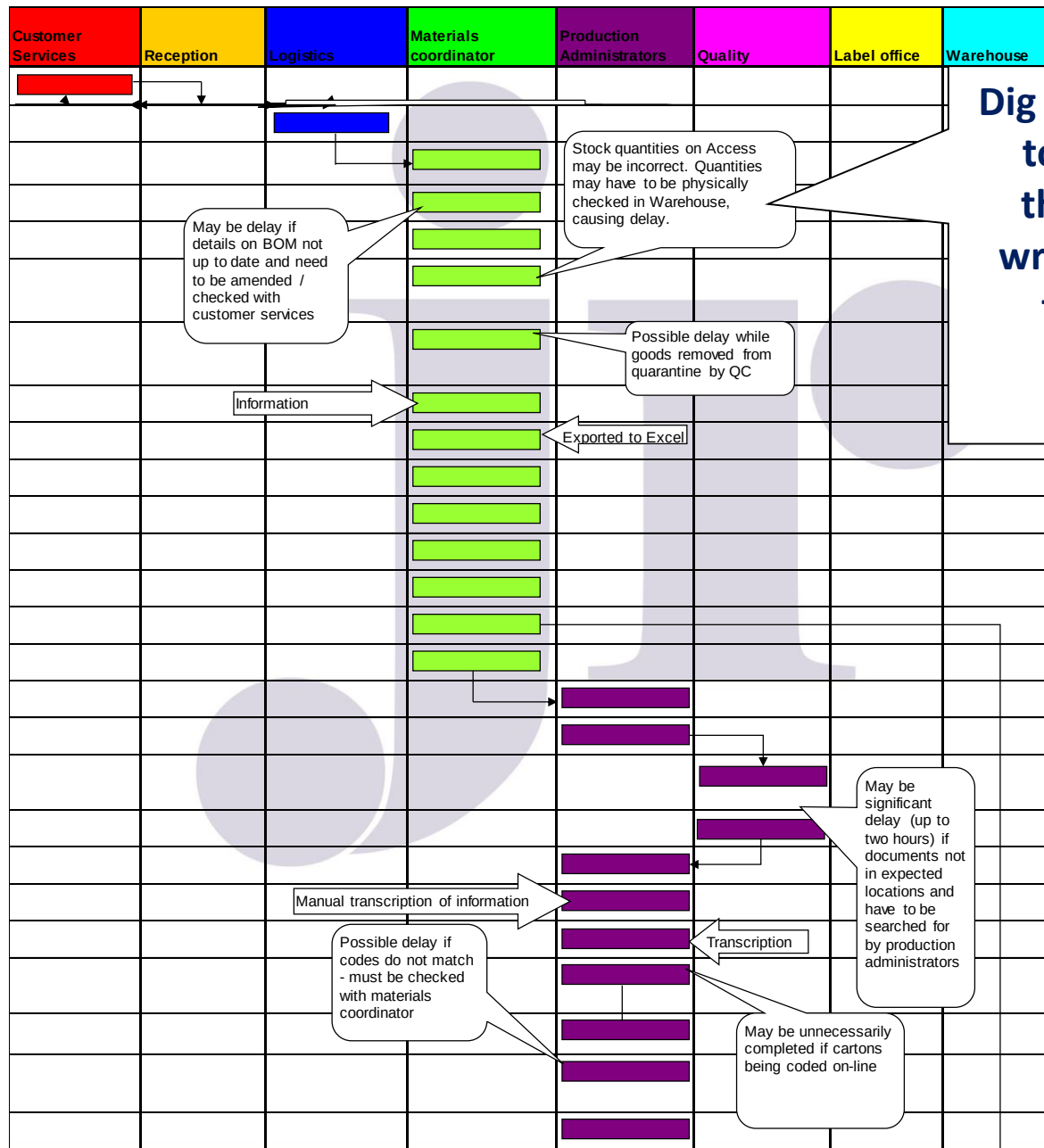
Process Activity Map
Corrugator Standard Order

No.	Activity	Process Time (Mins)	Actual Time (Mins)	Area	Planning	Corrugator Manager	Shift Manager	CDM	Clamp Truck	Wet End	Inserter	Checker	Starch	Comments
1	Corrugator Schedule Generated	30	60	Planning										Planning process needs to be mapped in detail
2	Schedule released on CDM with duplicated to the Escada	0.1	0.2	Planning										
3	Paperwork checked	15	15	Corr Control										Do we need all 3 paperwork systems?
4	Wet End and Dry End Report released	2	2	Corr Control Room										Could this be electronically delivered?
5	Stack and Pallet Specification is Pre Set	1	1	Inserters										Can the Escada system do this for us?
6	Starch is made	0	0	Starch Kitchen										
7	Correct paper reels sourced	5	10	Reel Store										RF- system would help locate and verify accuracy of reel.
8	Reels delivered to correct locations on the corrugator	15	30	Wet End										
9	Paper reels checked against the Wet End Report	2	10	Wet End										
10	Paper Reels are booked into the CDM system	2	15	Wet End										Would scanners improve the accuracy of this process?
11	Reels are put into the Reel Stands and the reel ticket with number is put on the reel stand arm	5	5	Wet End										Automated equipment?
12	Paper is set ready for splicing in the new job. Load tickets prepared along with the check sheets.	3	3	Wet End										
13	New order is spliced in. Inform and splice new order in	0	0	Wet End										
14	Pre set order change speed for the relevant paper takes place	0	0	Corr Control Room										
15	Paper travels through the Agnati Single Facer, Double Backer, Hotbeds and Slitter Scorer Knives	2	2	Corrugator Machine										

Step 2. Can any of the steps be removed/simplified/improved?

PROCESS ACTIVITY MAP									
No.	Activity	Process Time (mins)	Actual time (min.)	Area	Customer Services	Reception	Logistics	Materials coordinator	Production Administrators
1	Client telephones customer relations coordinator with order	5	10	Customer Services					
2	Client faxes through official purchase order to Reception	0	0	Reception					
3	Place official purchase order in pigeon hole for customer relations coordinator and email to let them know it has arrived	3	5	Reception					
4	Pick up official purchase order from pigeon hole	2	10	Customer Services					
5	Cross check order on BPR list to allocate BPR	2	5	Customer Services					
6	Job number allocated from Job number book	2	5	Customer Services					
7	Order added to schedule on Access	10	12	Customer Services					
8	Logistics informed of new order on Schedule	1	5	Customer Services					
9	Capacity planner checked for adequate capacity to run job	5	30	Logistics					
10	Order entered into Access accounts and accounts month allocated	2	5	Customer Services					
11	Order passed to Customer Relations Manager	1	4	Customer Services					
12	Job data entered onto Access accounts (job number, BPR, quantity required)	5	36	Customer Services					
13	Transfer data to Excel spreadsheet	2	7	Customer Services					
14	Locate materials required for specific job(s) on spreadsheet and calculate stock deficits	5	60	Customer Services					
15	Fill in purchase requisition form detailing required order from suppliers	5	20	Customer Services					
16	Purchase requisition form passed to Logistics	1	5	Customer Services					

Step 2. Can any of the steps be removed/simplified/improved?



Dig into the detail to see where things can go wrong and how this can be avoided.

Examples of Activity Mapping

- a) An estimating process.**
- b) A transportation process.**
- c) A production process.**

a) An example for an estimating process

Number	Activity	Process Time no delays (mins)	Approx time delays (mins)	Area	SALES/TM	ESTIMATOR	ACCOUNTS	PAPER CONT	ART/DESIGN	COMMENTS
1	Customer brief of requirement to T.M., E-Mail, phones, faxes or sends in enquiry - fill out Enquiry form with all relevant details required to supply the Customer with their order.	10	30	SALES/TM	■					Ensure unspecified requirements are gathered from the Customer to ensure expectations are fully met
2	Enquiry form to be completed by TM/Design or Sales Administrator (electronic enquiry form in place)	5	15	SALES/TM	■					Possible delays, sometimes lack of info.
3	If new Customer, follow New Customer Credit Procedure. Fax Credit application form to the Customer for completion. Pass details to Sales Office Manager/Deputy to create on Consensus.	1	1	SALES	■		■			Talk to accounts regarding using electronic version.
4	If die-cut or requires a sample, Sales Administrator to obtain Spec No. from CDM and put enquiry on hold then pass to design.	5	30	SALES/DESIGN	■				■	Possible delays depending on design work load. All enquiries should go through Sales Admin first. Wherever possible Sales to supply design with L. No.
5	Enquiry passed to Sales department for	1	5	SALES	■					Could this be available electronically, so that info. is passed on instantaneously?
6	If the enquiry is for Pre-Print, find out annual usages/contract, then pass to Graphics Manager to obtain Pre-Print costs with L. No.	30	720	DESIGN					■	Delays in obtaining Pre-Print prices from suppliers
7	Enquiry once completed and passed to the Sales Administrator will check if it is an existing board grade.	5	5	SALES	■			■		Delay if more info is needed, heavy work load or large tender involved. Delay if material does not exist - problems with CDM not recognising correct Pre-Print material.
8	If new board grade, pass to Sales Office Manager to obtain authorisation to create new material on Central Server	5	30	SALES	■					Delay if material does not 'down load' on CDM
9	Sales Administrator to enter enquiry onto CDM system for quoting.	5	30	SALES	■					Delays depending on work load
10	Pass enquiry to Estimator for quoting.	1	30	ESTIMATOR	■	■				Possible delay if a large tender involved or large amount of specs going through
11	Quotation printed by Estimator and passed back to Sales Administrator	1	1	ESTIMATOR	■	■				Estimator instead of printing quotation could email straight to Customer to save time
11	Sales Administrator will send quotation to the customer direct or through the T.M.	5	1440	SALES/TM	■					If delivered by TM - possible delay in arranging appointment. Looking to email quotations with terms & conditions.
TOTAL TIME		74	2337							

b) An example for a transportation process

Process Activity Map												
Palletise, Store, Pick and Load												
No	Activity	Process Time [Mins]	Approx Time Delays [Mins]	Palletiser	Railsman	Despatch Admin	AAG	Shunter	Loader	Logistics Manager	Comments	
1	Finish Product Process [conveyors]	0.3	1								Volume bottle neck	
2	Apply shrouding, pallet boards	0.5	5								Manual handling of top boards H & S concern	
3	Scan into CDM [SFDC]	0.1	0								Not all pallets are scanned in	
4	Move to strapper, auto	0.25	0								Conveyor old needs refurbishing / replacing	
5	Strap [according to code, auto]	0.3	2									
6	Move to wrapper, auto	0.25	0								Conveyor old needs refurbishing / replacing	
7	Wrap [according to code]	0.75	0									
8	Move along rails	0.8	0								Conveyor old needs refurbishing / replacing	
9	Take off rails, allocate stock location	0.5	0.5								stock locations needed before RF system is installed	
10	Delivery schedule obtained from CDM	30	0								Delivery schedule should be done prior to production meeting to give actual machine capacity's	
11	Raise AVL for outside stores	10	20								System will not allow 2 users on the same database	
12	Enter information in Production Requirement spreadsheet	15	0								Could be done from CDM machine run to list	
13	Issue "wish list"	1	0								SFDC conversion planning to replace this with failures recorded	
14	Obtain loading sheets, call offs [system]	2	0								RF screens on FLT	
15	Assess volume delivery areas to ensure trailer are utilised	90	30								AVL cubic capacity of trailers required for all trailers	
16	Email delivery schedule to Despatch	1	1								Schedule could be set prior to 09.30 meeting, confirmed by 13.30	
17	Book in with customers	60	30								Must receive delivery schedule by 15.00	
18	Create AVL loading list	45	20								System will not allow 2 users on the same database	
19	Pass picking list & Delivery schedule to Loader	2	0								Appear on RF screen on FLT	
20	Collect trailer	15	0								RF required in shunter, lack of trailers due to long distance work	
21	Pick and load	60	30								RF reduce the time looking for pallets [stock location on RF screen]	
22	Record pallet information for loaded products, check load	5	0								Scan on to trailer removing human error	
23	Close curtains and remove trailer from loading area	15	0									
24	Pass picked item list to despatch administrators	2	0								RF data transfer	
25	Raise delivery notes	5	25								Automatic with RF, IWT if in wrong warehouse	
26	Pass completed notes to driver	1	0								Print at AAG ?	
27	Receive POD from haulier, invoice	2	20160									
		365	20.325									

c)

An example for a production process

Process Activity Map				Corrugator Standard Order												
No.	Activity	Process Time (Mins)	Approx. Time Delays (Mins)	Area	Planning	Corrugat or Manager	Shift Manager	CDM	Clamp Truck	Wet End	Inserter	Checker	Starch	Hotbed	Slitter Scorer	Rotary Shear
1	Corrugator Schedule Generated	30	60	Planning												
2	Schedule released on CDM with duplicated to the Escada	0.1	0.2	Planning												
3	Paperwork checked	15	15	Corr Control												
4	Wet End and Dry End Report released	2	2	Corr Control Room												
5	Stack and Pallet Specification is Pre Set	1	1	Insertion												
6	Starch is made	0	0	Starch Kitchen												
7	Correct paper reels sourced	5	10	Reel Store												
8	Reels delivered to correct locations on the corrugator	15	30	Wet End												
9	Paper reels checked against the Wet End Report	2	10	Wet End												
10	Paper Reels are booked into the CDM system	2	15	Wet End												
11	Reels are put into the Reel Stands and the reel ticket with number is put on the reel stand arm	5	5	Wet End												
12	Paper is set ready for splicing in the new job. Load tickets prepared along with the check sheets.	3	3	Wet End												
13	New order is spliced in. Inform and splice new order in	0	0	Wet End												
14	Pre set order change speed for the relevant paper takes place	0	0	Corr Control Room												
15	Paper travels through the Agnati Single Facer, Double Backer, Hotbeds and Slitter Scorer Knives	2	2	Corrugator Machine												
16	Single cut on the Rotary Shear takes place to create gap from previous to present order	0	0	Rotary Shear												
17	Tail end of the previous order is removed	1	1	Dry End												
18	Specifications of the first board of new order through is checked against the Dry End Report	5	5	Checking Gantry												
19	Measurements of pallet size is input for the conveyor system	1	1	Pallet Insertion												
20	First stack(s) off go onto the pallet	2	2	Pallet Insertion												
21	Spec and count from the previous order passed to the Inserter	2	2	Pallet Insertion												
22	Load ticket inserted into pallet along with spec from previous order	1	1	Pallet Insertion												
23	Pallet removed from the take off rails and put into WIP in corrugator	3	3	Take Off												
TOTAL TIME		67.1	108.2													

An example for a production process

Process Activity Map														
Corrugator Standard Order														
No.	Activity	Process Time (Mins)	Approx. Time Delays (Mins)	Area	Planning	Corrugator Manager	Shift Manager	CDM	Clamp Truck	Wet End	Inserter	Checker	Starch	Comments
1	Corrugator Schedule Generated	30	60	Planning										Planning process needs to be mapped in detail
2	Schedule released on CDM with duplicated to the Escada	0.1	0.2	Planning										
3	Paperwork checked	15	15	Corr Control										Do we need all 3 paperwork systems?
4	Wet End and Dry End Report released	2	2	Control										Could this be electronically delivered?
5	Stack and Pallet Specification is Pre Set	1	1	Insertion										Can the Escada system do this for us?
6	Starch is made	0	0	Starch Kitchen										
7	Correct paper reels sourced	5	10	Reel Store										RF system would help locate and verify accuracy of reel.
8	Reels delivered to correct locations on the corrugator	15	30	Wet End										
9	Paper reels checked against the Wet End Report	2	10	Wet End										
10	Paper Reels are booked into the CDM system	2	15	Wet End										Would scanners improve the accuracy of this process?
11	Reels are put into the Reel Stands and the reel ticket with number is put on the reel stand arm	5	5	Wet End										Automated equipment?
12	Paper is set ready for splicing in the new job. Load tickets prepared along with the check sheets.	3	3	Wet End										
13	New order is spliced in. Inform and splice new order in	0	0	Wet End										
14	Pre set order change speed for the relevant paper take	0	0	Corr Control										
15	Paper travels through the Agnati Single Facer, Double Backer, Hotbeds and Slitter Scorer Knives	2	2	Corrugator Machine										

Using activity maps to improve the process

An example of Activity Mapping of a company's complaints process



Problem :

Excess time taken to process customers complaints.

PROCESS ACTIVITY MAP										
Complaints,collections and credit process										
No.	Activity	Process Time no delays (mins)	Approx. Time Delays (mins)	Area	Sales admin	External sales	Quality dept	PR receiver	Logistics	Accounts
1	Customer contacts Company by E Mail/fax/phone	5	0	sales or QA						
2	receiver raises Problem Report	10	5	sales or QA						
3	PR raiser passes to QA for logging in file with samples if received or photo's	5	30	QA						
4	QA carries out investigation to determine where fault occurred	30	30	QA						
5	QA raise quality alert if required in certain circumstance and pass to	10	10	QA						
6	QA logs PR with number and completes register	5	1440	QA						
7	QA raises collection note	5	30	QA						
8	QA passes collection note to Logistics	5	30	QA						
9	QA adds details to production minutes	2	30	QA						
10	Logistics arranges collection with Griggs/subbie	15	43200	Logistics						
11	Griggs/ subbie collects	5040	2160	Logistics						
12	Logistics offloads, labels and places into quarantine	10	1440	Logistics						
13	QA investigates quantities match, fault is as reported,whether rework needed	30	2880	QA						
14	QA passes logged PR to dept responsible for error with	5	1440	QA						
15	PR receiver does further investigation with personnel involved with error	30	6408	any dept						
16	PR receiver endorses PR with corrective actions	10	0	any dept						
17	PR receiver send back completed PR to QA	5	0	any dept						
18	QA log other details and send for credit where applicable or close off	5	30	QA						
19	Accounts dept raise credit according to rejects/collections	15	5760	Accounts						
20	Credit signed off by Financial controller	5	0	Accounts						
21	Accounts send PR back to QA	1	0	Accounts						
22	QA logs final details and closes off PR in log	5	30	QA						
23	QA removes from production meeting minutes	2	30	QA						
24	QA input all details into excel spreadsheet for analysis	5	30	QA						
	QA record rejects on AFD register for M+M purposes signed off by JC/SP or	5	0	QA						
25	QA respond to customer if required	30	1440	QA						
	Total	5235	66378							

STEP 1

Flowchart the activity in 2 dimensions : what is done and by whom

STEP 1
Flowchart the activity in 2 dimensions :
what is done
and by whom

PROCESS ACTIVITY MAP

Complaints, collections and credit process										
No.	Activity	Process Time no delays (mins)	Approx. Time Delays (mins)	Area	Sales admin	External sales	Quality dept	PR receiver	Logistics	Accounts
1	Customer contacts Company by E Mail/fax/phone	5	0	sales or QA						
2	receiver raises Problem Report	10	5	sales or QA						
3	PR raiser passes to QA for logging in file with samples if received or photo's if appropriate	5	30	QA						
4	QA carries out investigation to determine where fault occurred (SFDC/run sheets/print	30	30	QA						
5	QA raise quality alert if required in certain circumstance and pass to production	10	10	QA						
6	QA logs PR with number and completes register	5	1440	QA						
7	QA raises collection note	5	30	QA						
8	QA passes collection note to Logistics	5	30	QA						
9	QA adds details to production minutes	2	30							
10	Logistics arranges collection with Griggs/subbie	15	4320	Logistics						
11	Griggs/ subbie collects	600	2160	Logistics						
12	Logistics offloads, labels and places into quarantine	10	1440	Logistics						
13	QA investigates quantities match, fault is as reported, whether rework needed or scrap and QA passes logged PR to dept responsible for error with samples/photo's where applicable	30	2880	QA						
14	PR receiver does further investigation with personnel involved with error	5	1440	QA						
15	PR receiver endorses PR with corrective actions	30	6408	any dept						
16	PR receiver send back completed PR to QA	10	0	any dept						
17	QA log other details and send for credit where applicable or close off	5	30	QA						
18	Accounts dept raise credit according to rejects/collections	15	5760	Accounts						
19	Credit signed off by Financial controller	5	0	Accounts						
20	Accounts send PR back to QA	1	0	Accounts						
21	QA logs final details and closes off PR in log	5	30	QA						
22	QA removes from production meeting minutes	2	30	QA						
23	QA input all details into excel spreadsheet for analysis	5	30	QA						
24	QA record rejects on AFD register for M+M purposes signed off by JC/SP or deputies	5	0	QA						
25	QA respond to customer if required	30	1440	QA						

For example :
Far longer delays
seen than would
be expected for
this step

STEP 2
The team
identifies
what 'proce
areas' coul
be improve

For example :
Far longer delays
seen than would
be expected for
this step

STEP 2
The team
identifies
what 'process
areas' could
be improved

PROCESS ACTIVITY MAP									
complaints, collections and credit process									
No.	Activity	Process Time no delays (mins)	Approx. Time Delays (mins)	Area	Sales admin	External sales	Quality dept	PR receiver	Logistics
1	Customer contacts Company by E Mail/fax/phone	5	0	Sales or QA					
2	receiver raises Problem Report	10	5	Sales or QA					
3	PR raiser passes to QA for logging in file with samples if received or photo's if appropriate	5	30	QA					
9	QA adds details to production minutes	2	30	QA					
10	Logistics arranges collection with Griggs/subbie	15	43200	Logistics					
11	Griggs/ subbie collects	600	2160	Logistics					
12	Logistics offloads, labels and places into quarantine	10	1440	Logistics					
13	QA investigates quantities match, fault is as reported, whether rework needed or scrap and gets	30	2880	QA					
14	QA passes logged PR to dept responsible for error with samples/photo's where applicable	5	1440	QA					
15	PR receiver does further investigation with personnel involved with error	30	6408	any dept					
16	PR receiver endorses PR with corrective actions	10	0	any dept					
17	PR receiver send back completed PR to QA	5	0	any dept					
18	QA log other details and send for credit where applicable or close off	5	30	QA					
19	Accounts dept raise credit according to rejects/collections	15	5760	Accounts					
20	Credit signed off by Financial controller	5	0	Accounts					
21	Accounts send PR back to QA	1	0	Accounts					

STEP 3
Identify the actions required to do this

Result :

Many of the 'lack of ownership' bottlenecks removed and the process significantly improved in terms of customer response time.

Process Activity Map

This has an additional section detailing the distance moved at each process step

Order fulfillment process

No	Glazed order frame to follow (Tray NO 1394)	Process Time (Mins)	Actual Time Mins	Distance moved in this activity	Responsible function	Traying Up	Order Entry	Surfacing	Comments on delays and how they could be resolved
1	Traying up	1	20	2mts	Function 1				Unpacked job and trayed up at 7.31
2	Transfer to order Entry	2	2	20mts	Function 2				Tray taken as one of a batch to order Entry
3	Enter order	2	15	1mts	Function 2				Job entered on system at 8.58
4	Transfer order to Surfacing	5	32	10mts	Function 2/3				Batch of jobs transferred to surfacing and scanned in 9.33
5	Lens Blanking	5	10	0mts	Function 3				Lenses selected job docket printed out, batch of jobs moved to Taping
6	Taping	3	15	3mts	Function 3				Pair of lenses taped and identified moved as a batch to Blocking
7	Blocking	5	15	3mts	Function 3				Lenses scanned in blocked and allowed to cool,
8	Generating job log	2	15	3mts	Function 3				Batch of jobs moved to Generating job logged on generator at 10.34
9	Despatch	10	58	10 mtrs					Despatch at 11.32
	Unaccounted time		59						
	TOTAL TIME	35	241						

PROCESS ACTIVITY MAP FOR BRICK SPECIALS ORDER TO PRODUCTION

#	Activity	Process Time no delays (mins)	Actual Process time with typical delays (mins)	Area	SALES	T&E	PRODUCTION	FINANCE	TRANSPORT	CUSTOMER	COMMENTS and SUGGESTIONS FOR IMPROVEMENT
1	Order received by email, fax or telephone	1	2	Sales	↓						
2	Acknowledge order by email	3	5	Sales	↓						
3	Check if existing customer	3	5	Sales	↓						
4	If new customer, check credit rating and set up account on SAGE	5	240	Finance	↓			↓			Delay could be due to having to get a credit reference
5	Print order for in-tray	1	2	Sales	↓						
6	Check product types on order received	5	15	Sales	↓						
7	If brick specials, check for purchase order to match call off	1	10	Sales	↓						
8	If no purchase order exists, contact customer for one	5	240	Customer	↓					↓	Delay due to waiting for customer to get back to us
9	Confirm brick types	2	120	S/C	↓					↓	Delay due to waiting for customer to get back to us
10	Enter new sales order on SAGE	10	30	Sales	↓						
11	Calculate amount of bricks needed to fulfil order	2	20	Sales	↓						
12	If bespoke codes, get Technical & Estimating to generate B.O.M	10	60	S/T&E	↓	↓					Delay due to obtaining accurate B.O.M from Production
13	Create sales return on SAGE	5	10	Sales	↓						
14	Check yard stocks with production	5	120	S/P	↓		↓				Delay due to waiting for confirmation
15	Contact site manager to confirm bricks are available and on pallets	5	240	S/C	↓					↓	Delay due to waiting for customer to get back to us
16	Print copy of sales order and sales return and pass to transport	5	20	Sales	↓						
17	Receive sales order and sales return	1	10	Transport					↓		

PROCESS ACTIVITY MAP FOR GRP ORDER TO PRODUCTION

#	Activity	Process Time no delays (mins)	Actual Process time with typical delays (mins)	Area	SALES	T&E	PRODUCTION	FINANCE	TRANSPORT	CUSTOMER	COMMENTS and SUGGESTIONS FOR IMPROVEMENT
1	Order received by email, fax or telephone	1	2	Sales	↓						
2	Acknowledge order by email	3	5	Sales	↓						
3	Check if existing customer	3	5	Sales	↓						
4	If new customer, check credit rating and set up account on SAGE	5	240	Finance	↓			↓			Delay could be due to having to get a credit reference
5	Print order for in-tray	1	2	Sales	↓						
6	Check product types on order received	5	15	Sales	↓						
7	If GRP, check for purchase order to match call off	1	10	Sales	↓						
8	If no purchase order exists, contact customer for one	5	240	Customer	↓					↓	Delay due to waiting for customer to get back to us
9	Check brick sample has been approved with customer	2	5	Sales/T&E	↓	↓				↓	
10	If sample has not been approved, contact customer for brick sample	5	240	Customer	↓					↓	Delay due to waiting for customer to get back to us
11	Make colour sample	960	2400	Production	↓		↓				Delay if gel colour needs to be ordered
12	Create SAGE code for new colour match	10	240	Production	↓		↓				Delay if waiting for colour recipe information
13	Enter new sales order on SAGE	10	30	Sales	↓						
14	Check codes on SAGE	2	10	Sales	↓						
15	Print drawing and sales order	5	20	Sales	↓						
16	Print copy of sales order and pass to transport	5	20	Sales	↓						
17	Receive sales order	1	10	Transport					↓		



**These actions are then incorporated into a
the same prioritised action plan as
mentioned earlier – see later.**



Effective examples of process simplification

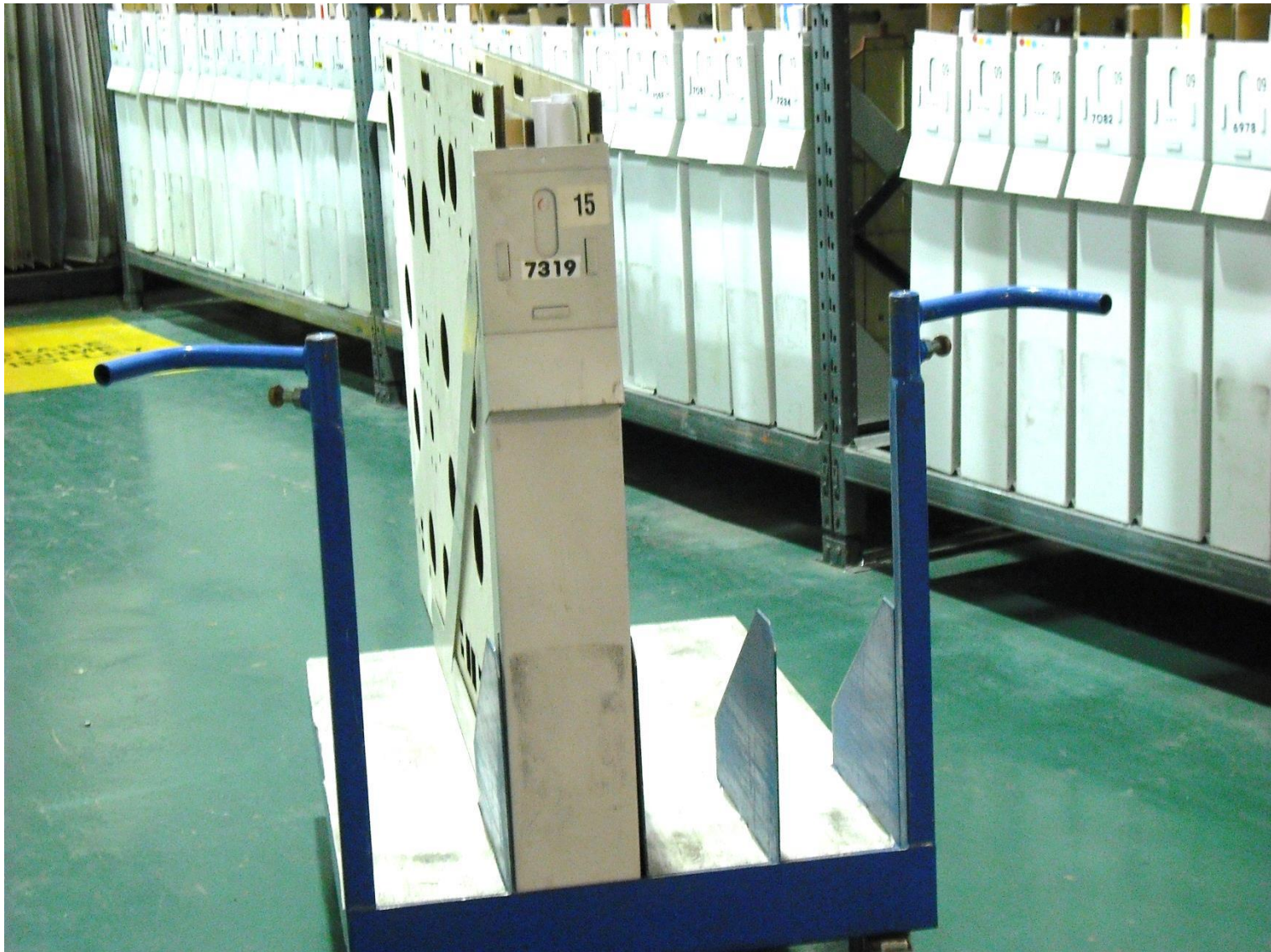
Can the need for multiple journeys be reduced?

From...



to...

Case
study 1











What causes these delays?

- Inadequate information on what is required
- Mistakes caused by unclear instructions
- Excess delays and movement
- Lack of co-ordination between departments
- Materials not delivered on time

... and many more!

Our job is to identify and eliminate what causes these bottlenecks!

Process Mapping : Stage 2 appendix

Layout modifications

Now that the activity mapping has been completed...

... does the layout of the work area need to be modified?

Layout Improvement

Looks at the relationship between the process activity and the workplace layout/organisation.

- **How much time does it take to process an item?**
- **How much distance does it have to travel?**

Spaghetti Diagrams



- Spaghetti diagrams are a representation of the distance a person or part travels on the shop floor.

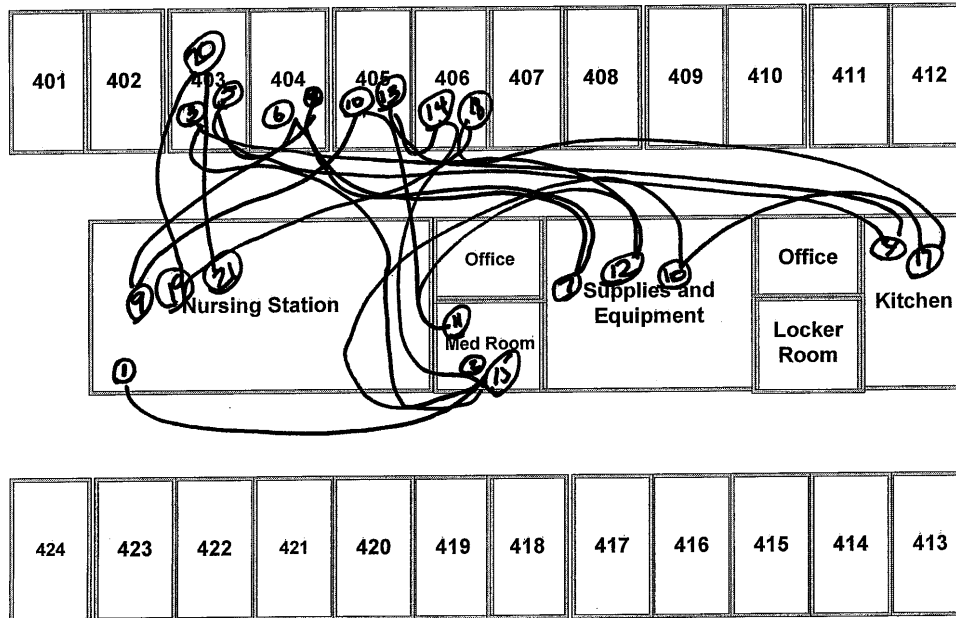
Spaghetti Diagram

Date: 9-2

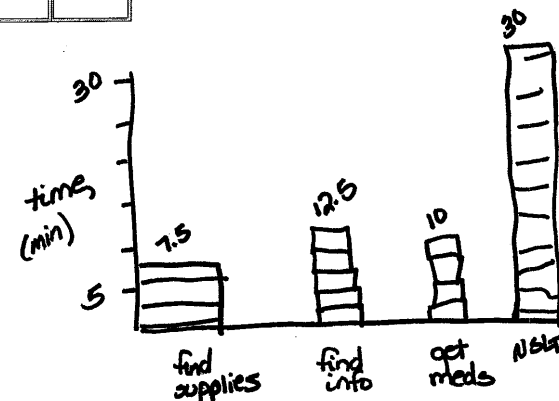
Time: 1-2 pm

Observed: Jane Smith

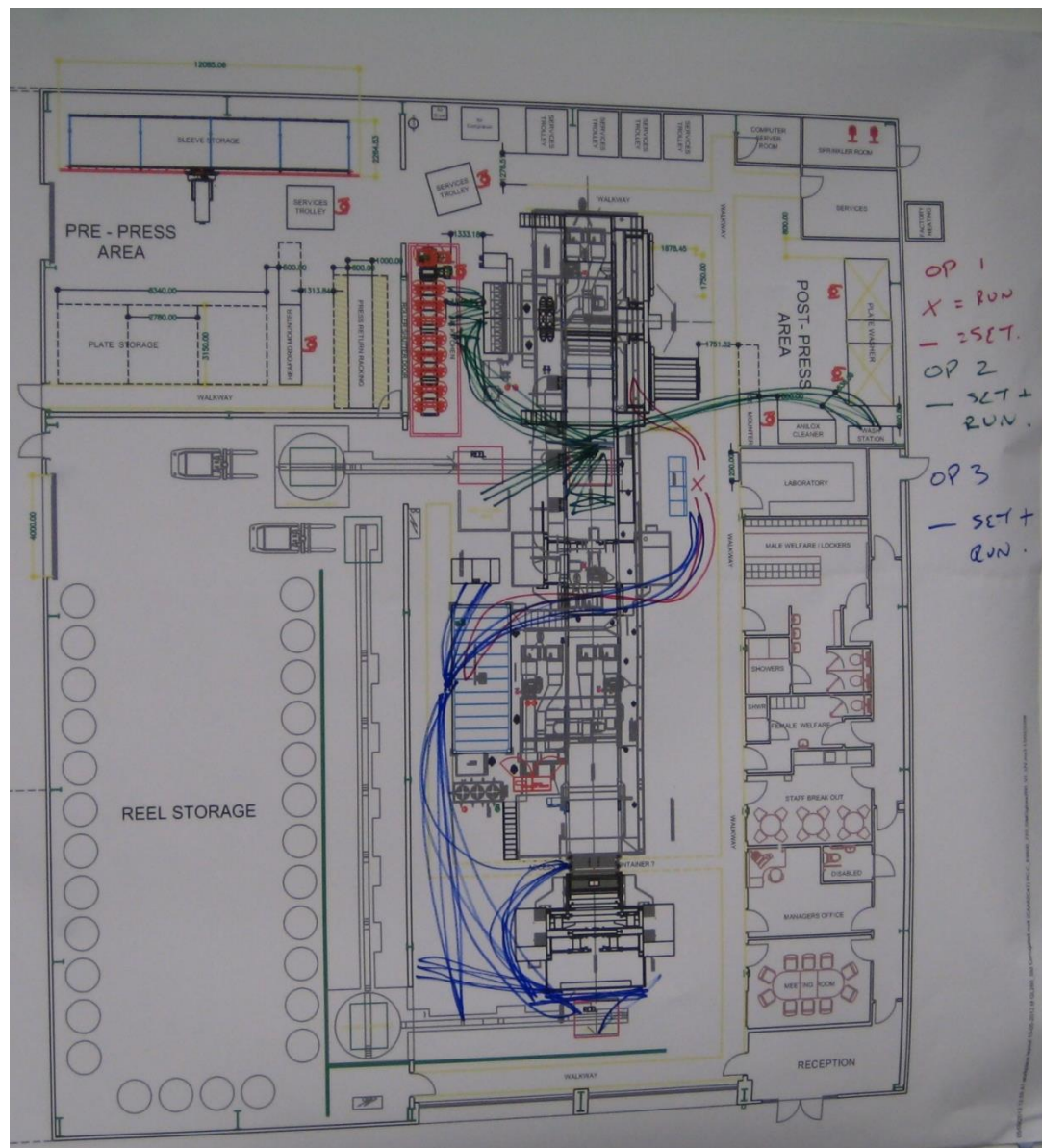
Observed by: Mary Jones + Kathy Swanson

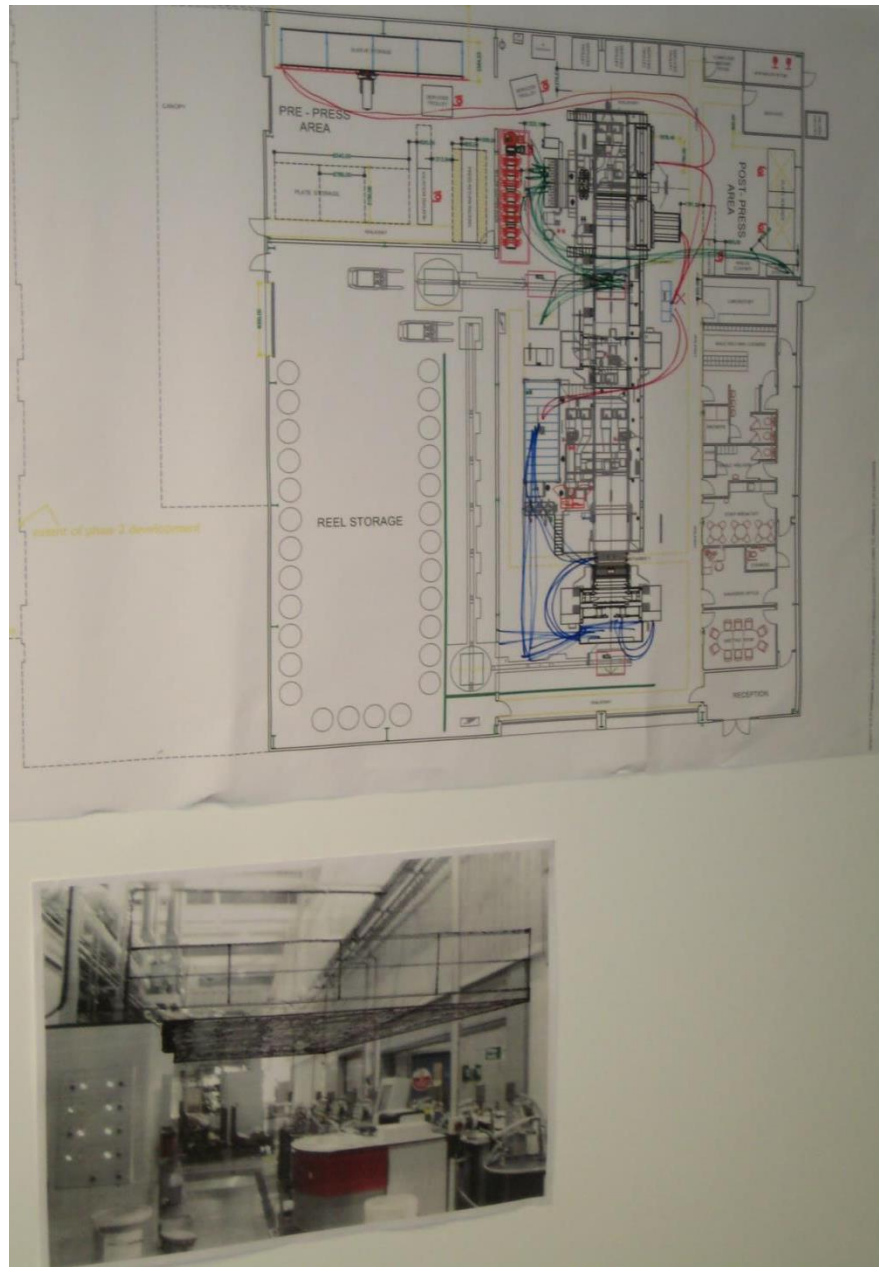


Notes: 21 position changes
multiple trips to supply room
multiple trips to med room
search time (supplies + paperwork)



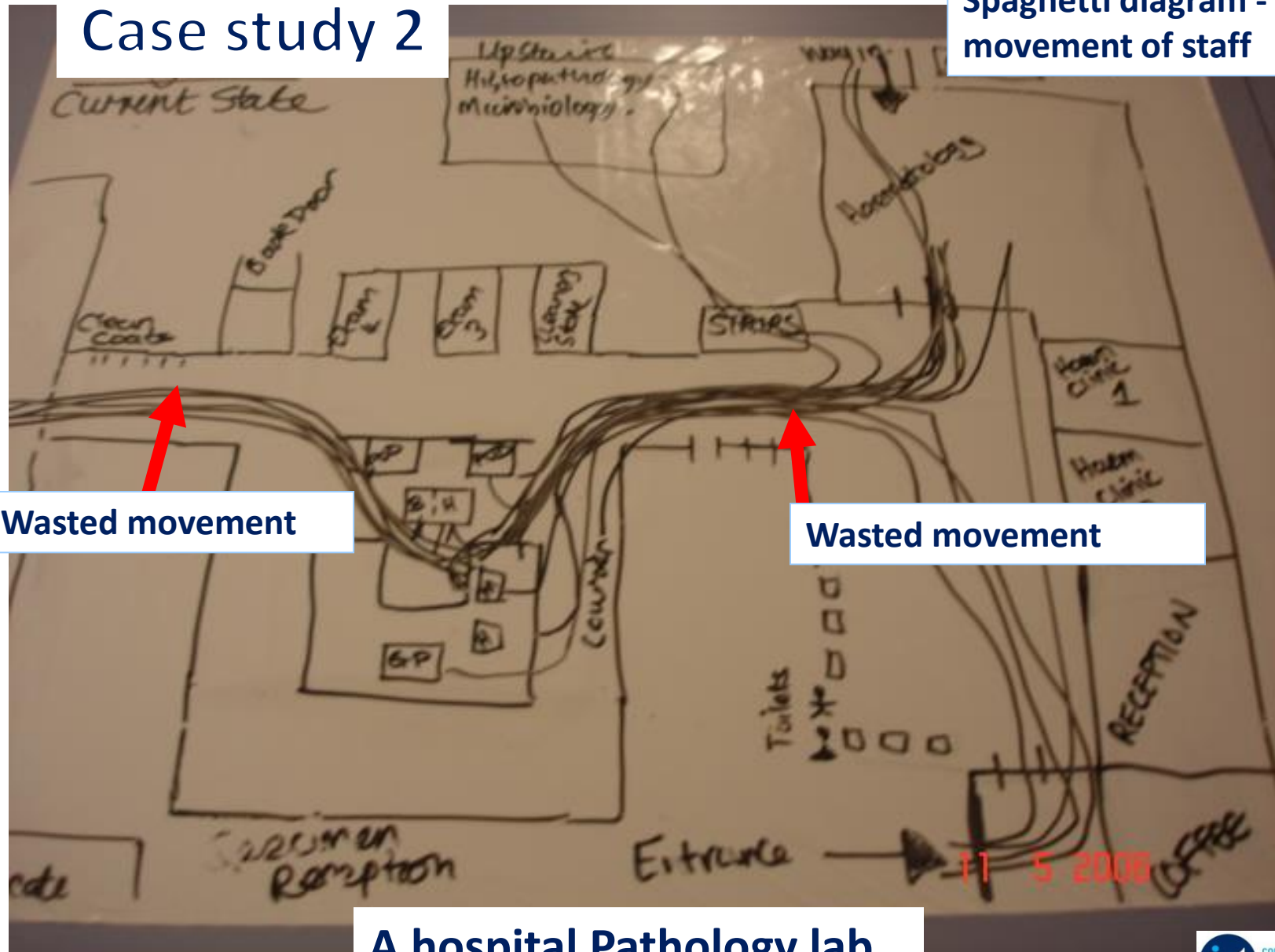
Case study 3





Case study 2

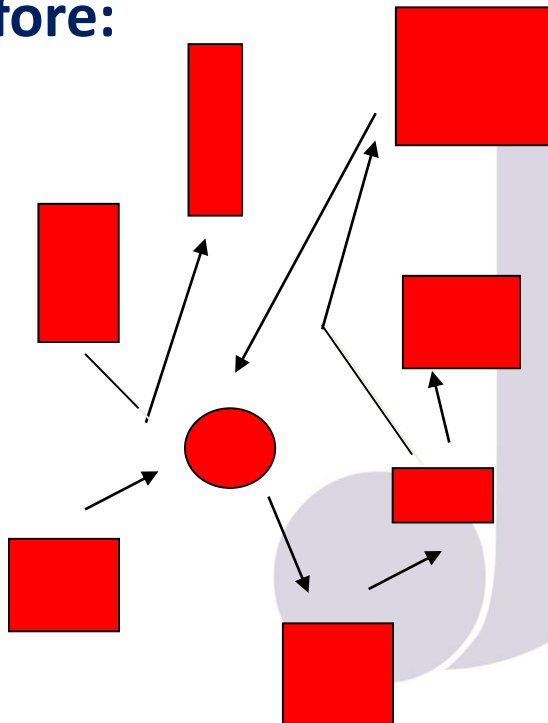
Spaghetti diagram -
movement of staff



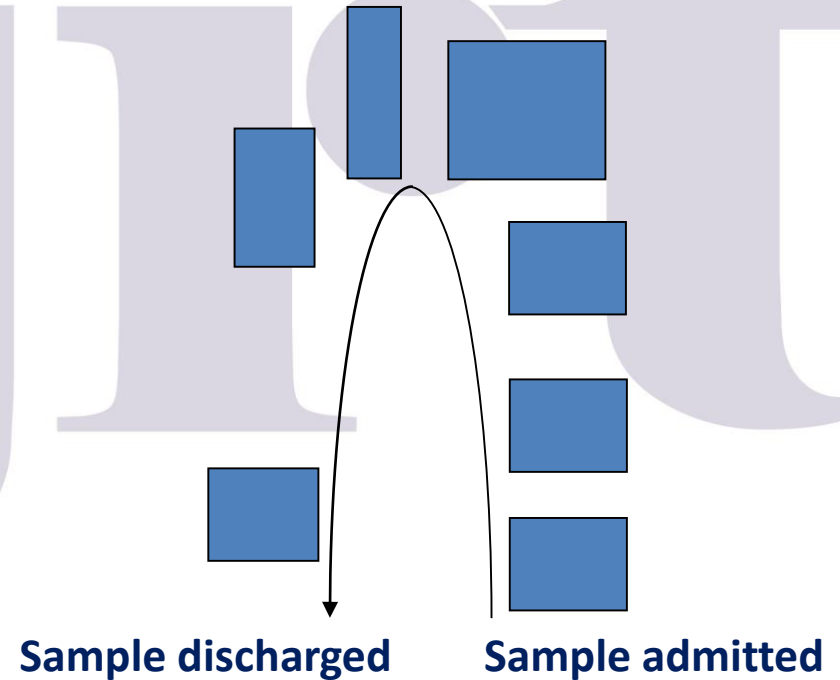
A hospital Pathology lab.

Layout of a Hospital Pathology lab.

Before:

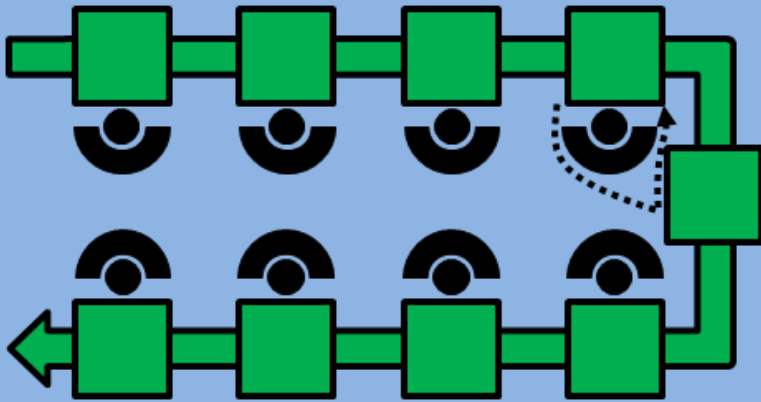


After:

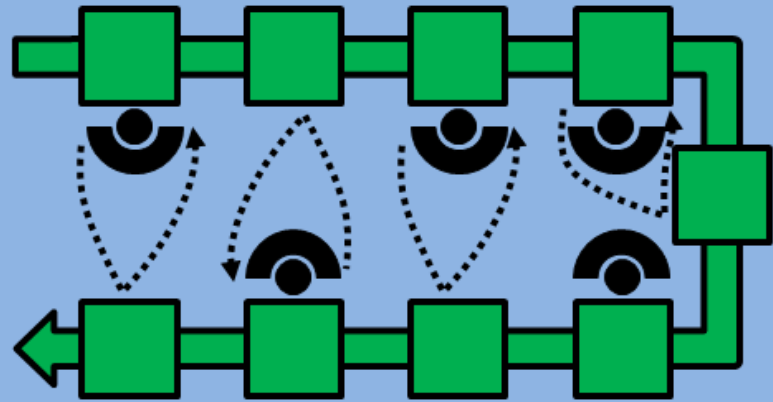




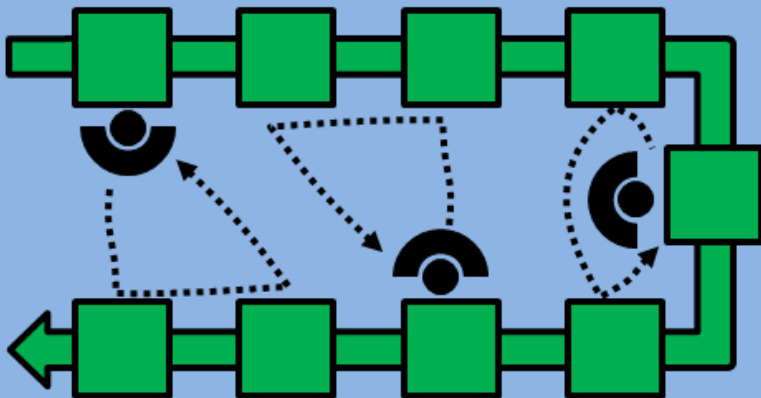
Very High Demand



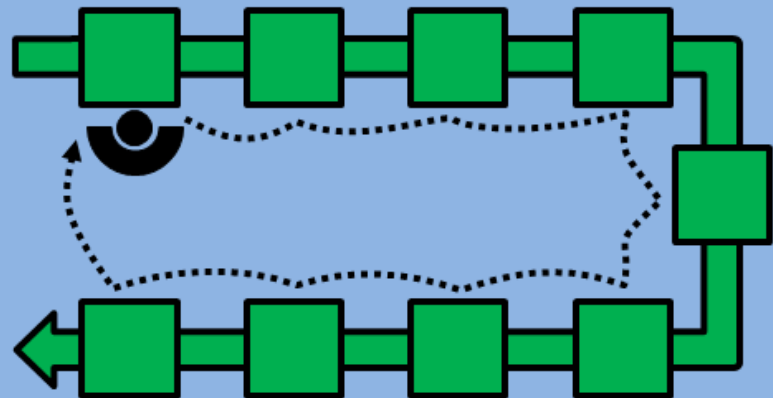
High Demand

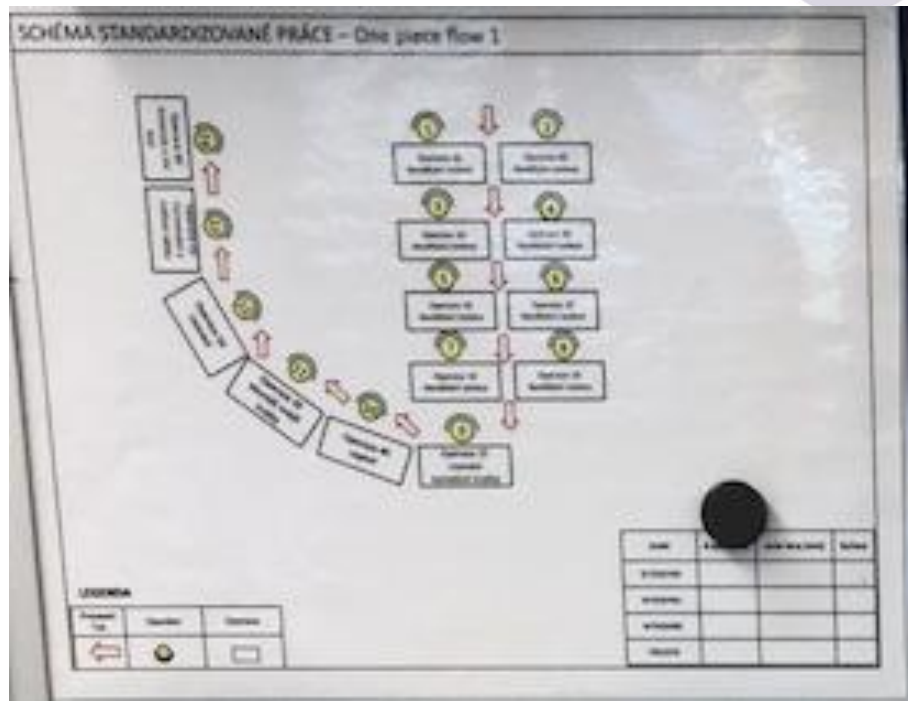


Medium Demand



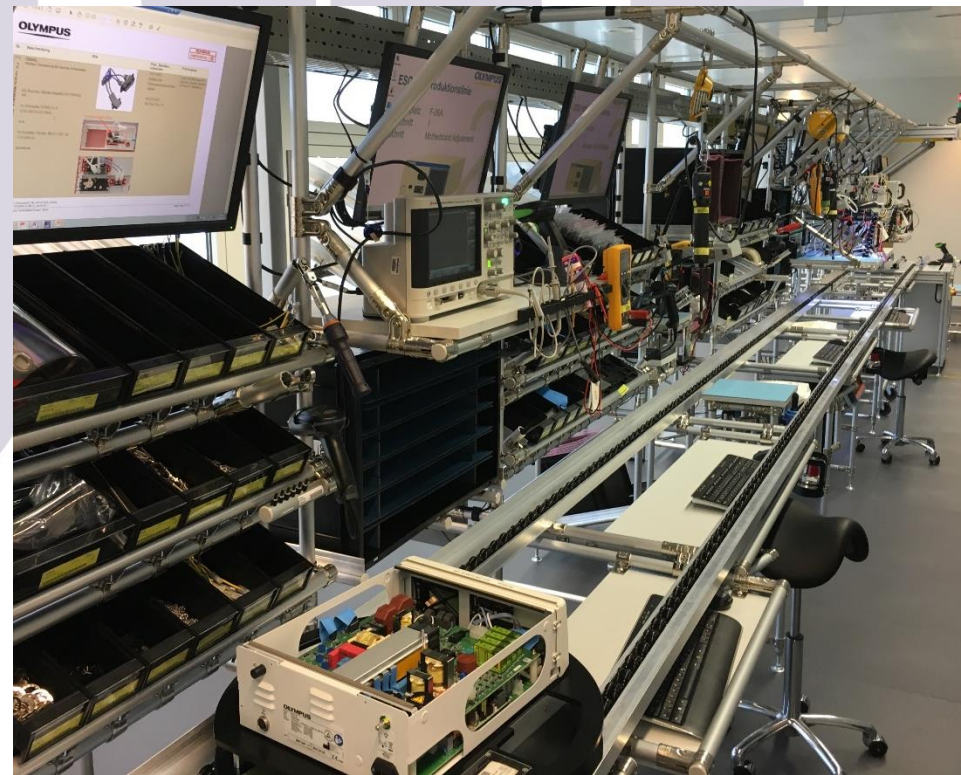
Low Demand





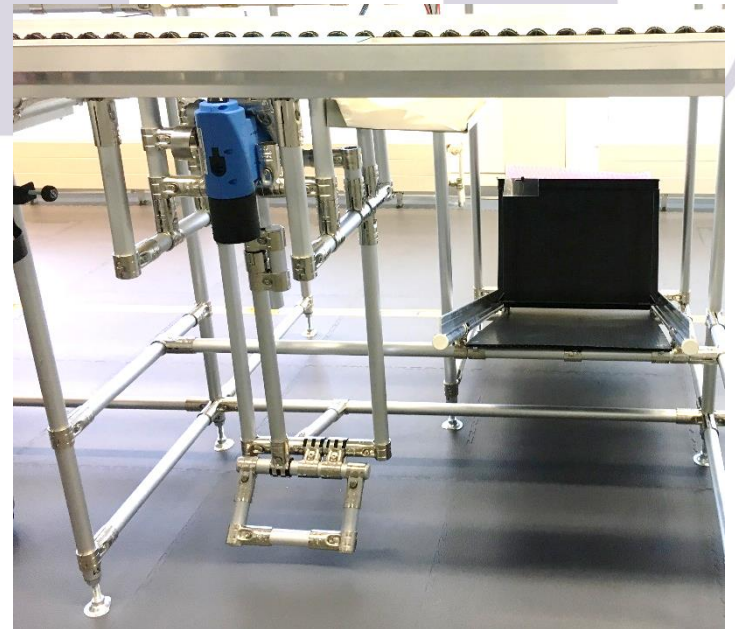
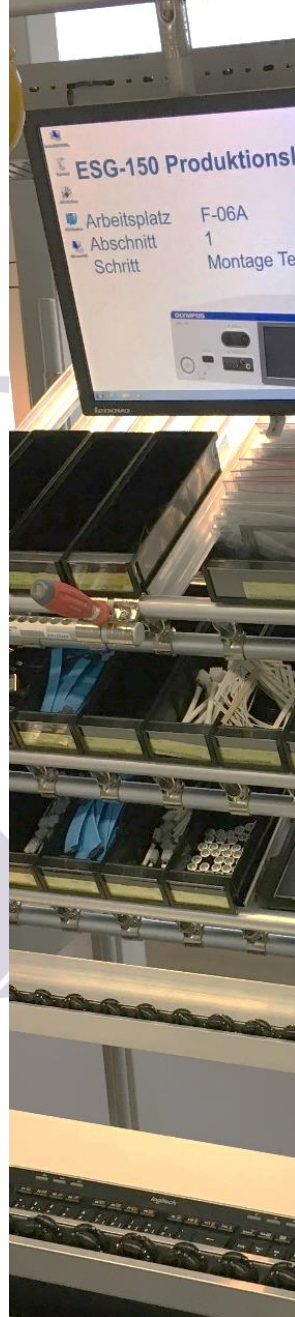


**Supplementary improvements that
enhance product flow....**



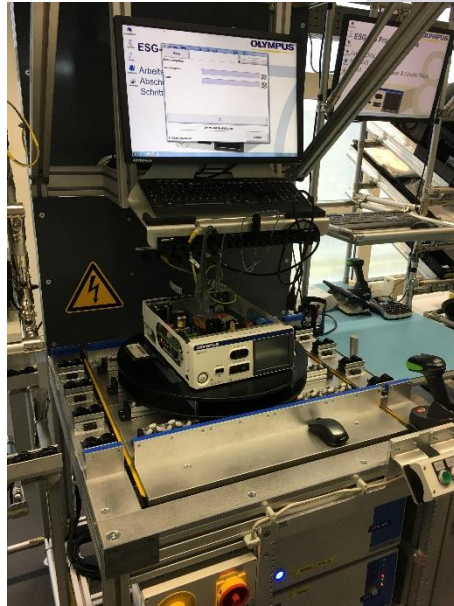
Typical Worksurface Height Ranges:
Sitting 27– 33" – Standing 36– 42"



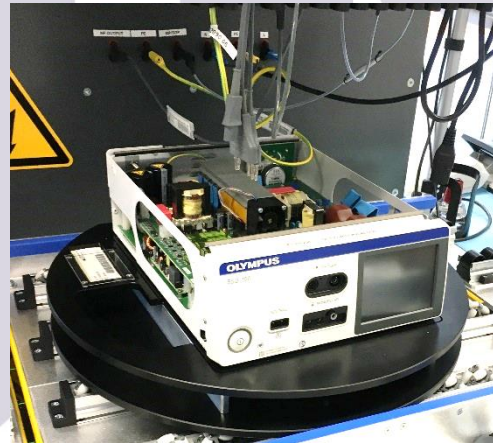




Unit raised to allow easier access to screw points.



Unit on turntable to allow 360 degree access to unit.



Auto dispensers negate need to handle fixings.



A pioneer in this field – Ronald McDonald.



Obsessing Over the Process

The McDonald brothers closed their store and took all of their team members to a local outdoor tennis court.

They used chalk to draw what they thought could be the ideal kitchen layout on the court. Then, they had the team members take their places on the full size kitchen layout to simulate the processes of making burgers, fries, shakes, and pouring soft drinks.

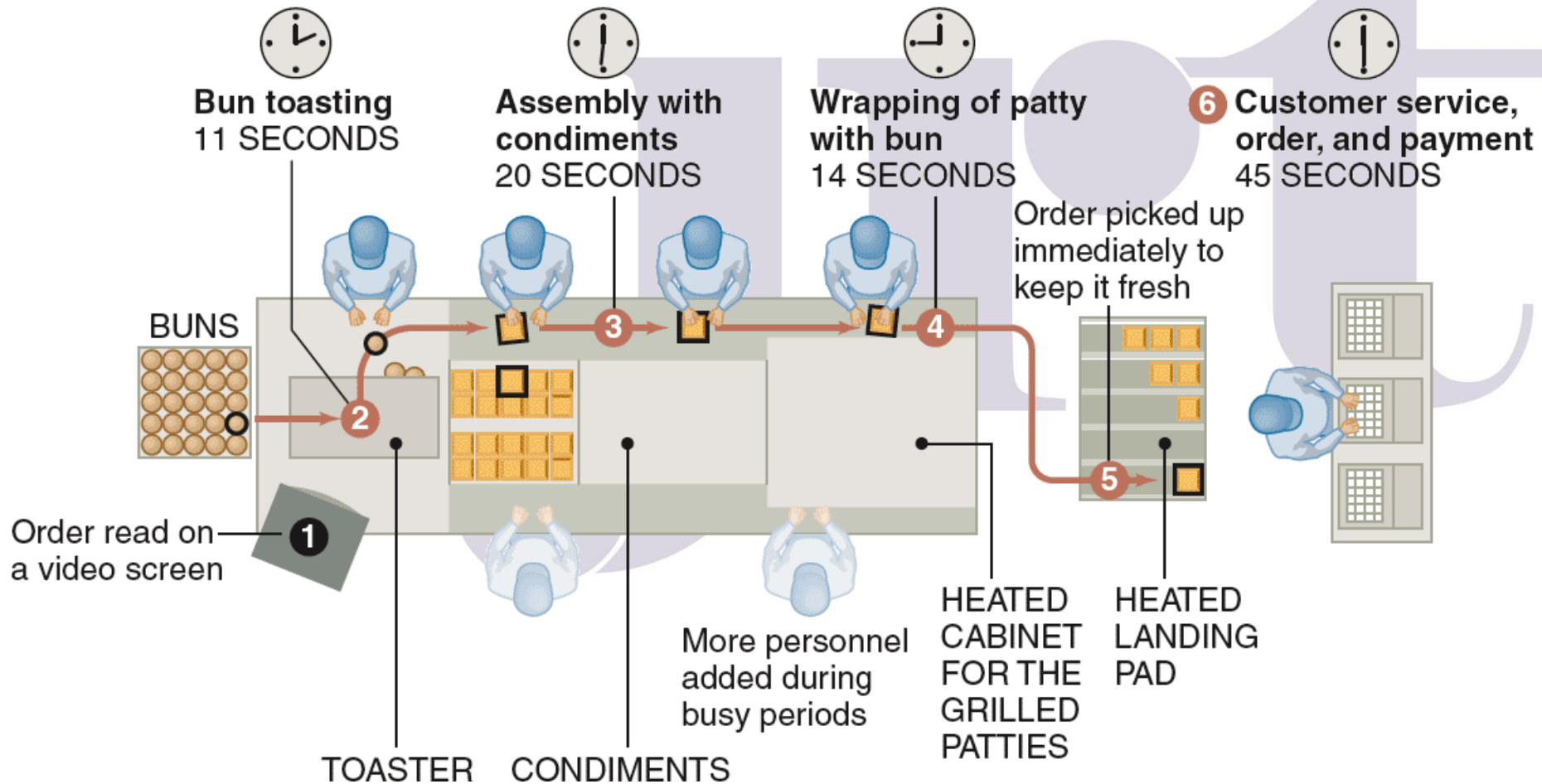
The simulations revealed problems that interfered with smooth flow. Over and over, they tried different layouts, discovering problem after problem. After about six hours on the tennis court, the team came up with a layout that supported flow.

Sometimes There Needs to be a Major Improvement

The next step in their Kaizen event was to tear down the restaurant and rebuild it to support the process. A few months later, they were back in business. This time they were serving burgers within 45 seconds and sales soared.

McDonald's Assembly Line

McDonald's Hamburger Assembly Line



Process Mapping : Stage 3

Value-Stream Mapping

Problems with basic Activity Maps:

- 1. They do not easily highlight improvement opportunities.
(This relies on expert knowledge).**
- 2. They do not highlight unproductive work.**
- 3. They do not highlight processes that are carried out
because of lack of confidence in previous processes.**
- 4. They cannot be used to visualise cost and quantity.**

A definition of Value-Added activity

Value-Added

Any activity that increases the market form or function of the production or service. (These are things that the customer is willing to pay for.)

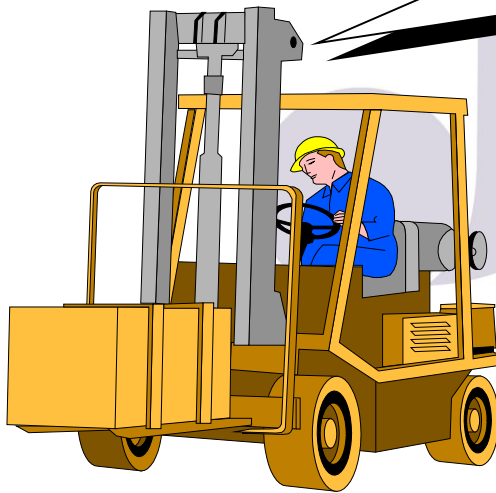
Non Value-Added

Any activity that does not add market form or function or is not necessary.

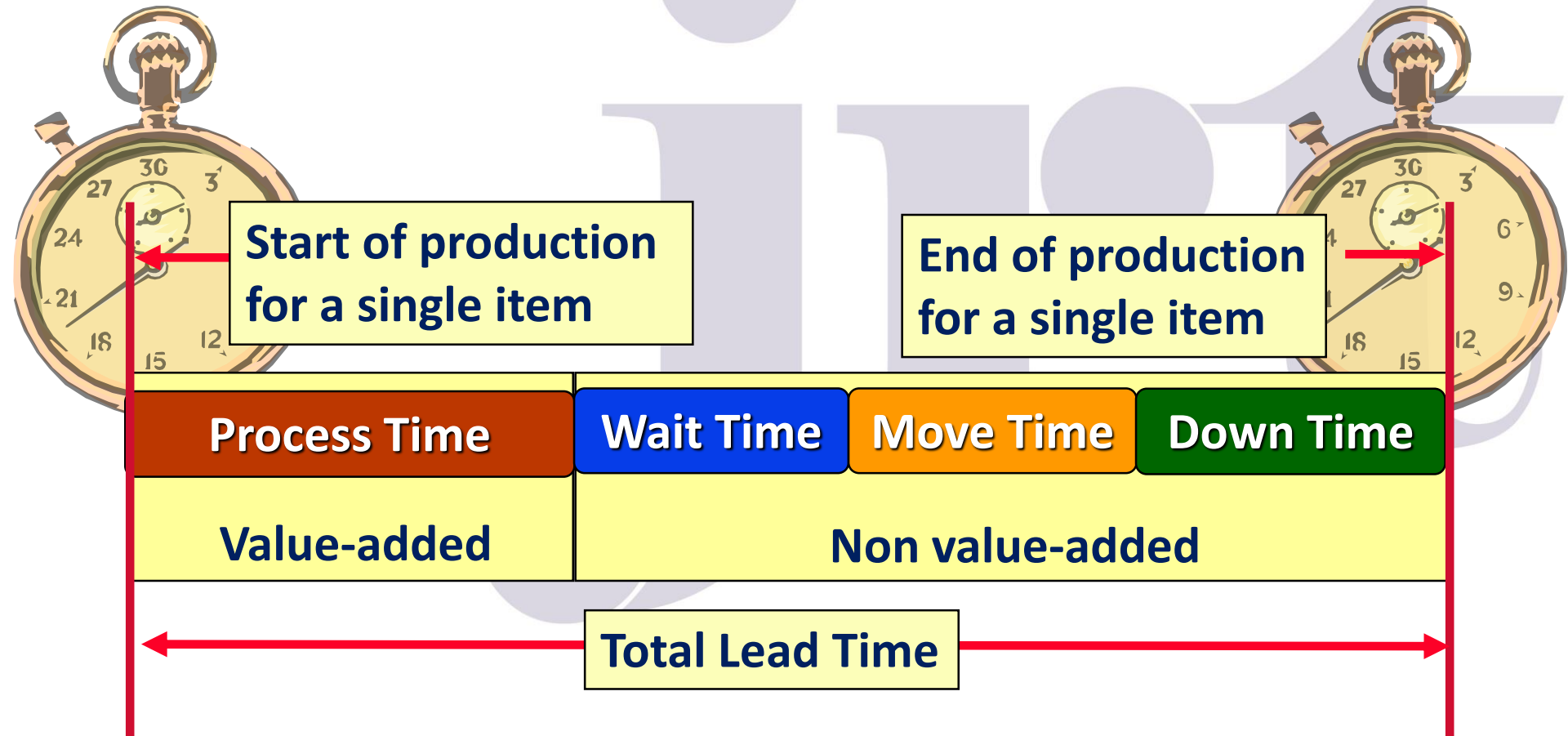
**Value-added lead time is
the time required to actually
manufacture an unit of a product.**



Non value-added lead time is the time that an unit of product sits in inventories or moves unnecessarily.



Components of Lead Time



Two Elements to Every Job

Value Adding



Valuable Effort



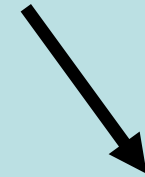
**Costs Time
Costs Money
Adds Value**

VALUABLE

Non-Value Adding



**Valueless
Effort**



**Obvious
Waste**



**Costs Time
Cost Money
Adds No Value**

WASTE

Value Added versus Non-Value Added

Value Added

Any activity that contributes directly to satisfying the needs of a Customer

Non-Value Added

Any activity that takes time, space, or resources, but does not contribute directly to satisfying the needs of a Customer



What is a Value Stream?

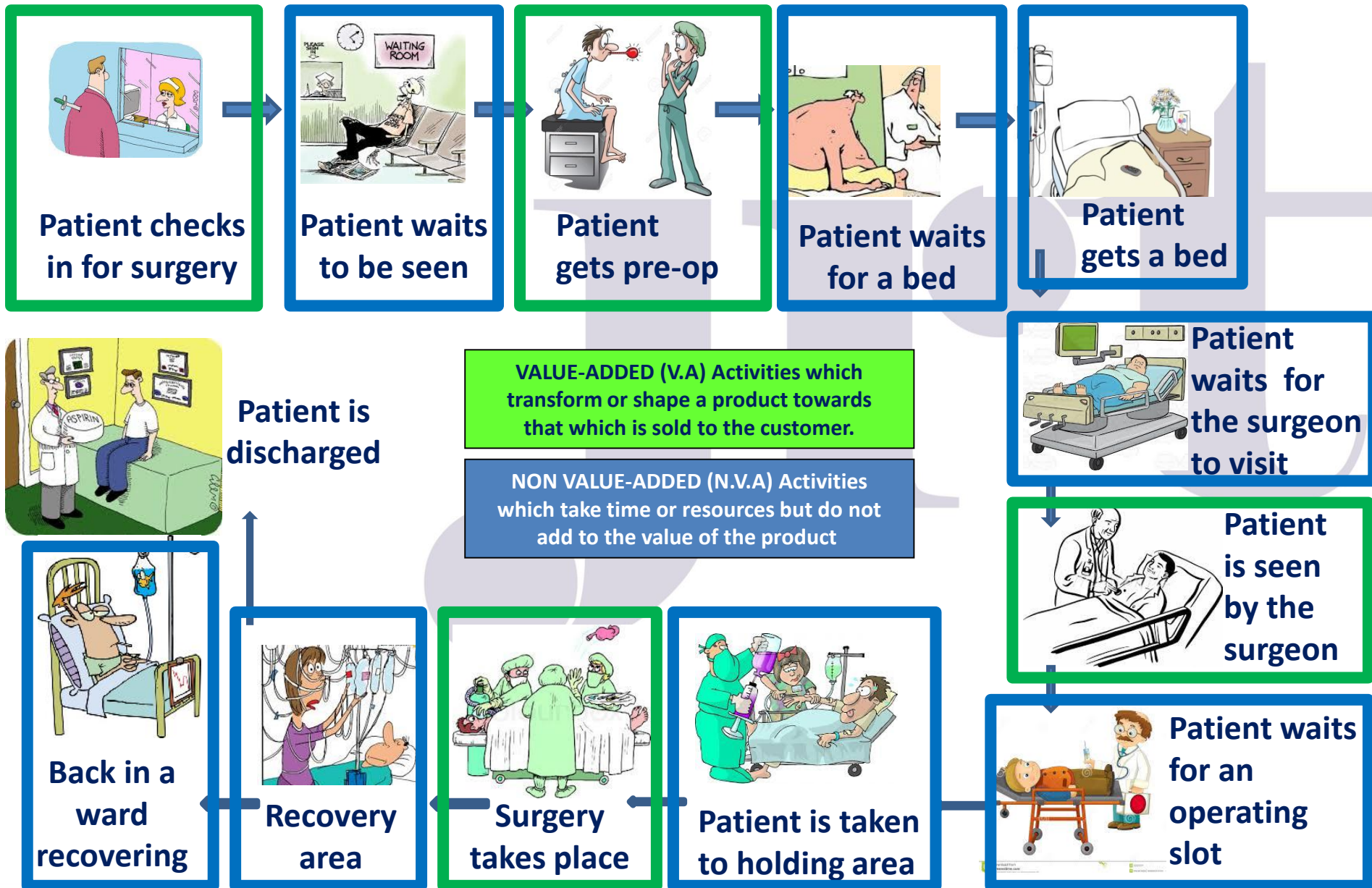
Definition :

A value stream is all the actions required (both value-added and non value-added) to bring a product or service through the process being considered.

For example:

- 1. The design flow from concept to launch.**
- 2. The production flow from raw material to the customer.**
- 3. The transaction flow from Order to Cash.**
- 4. The flow from check-in to discharge in a hospital.**

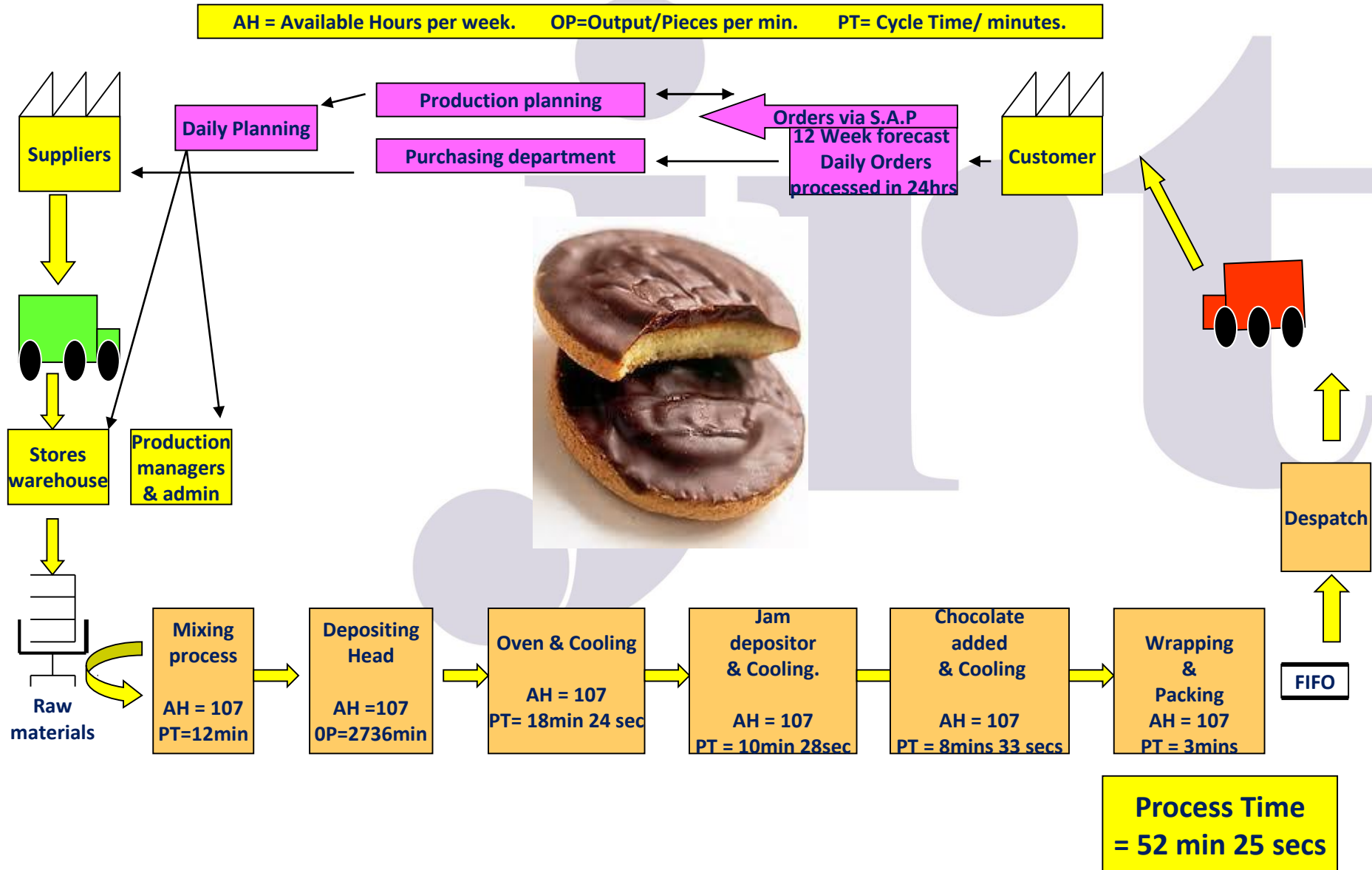
A Value Stream Map for an elective surgery process



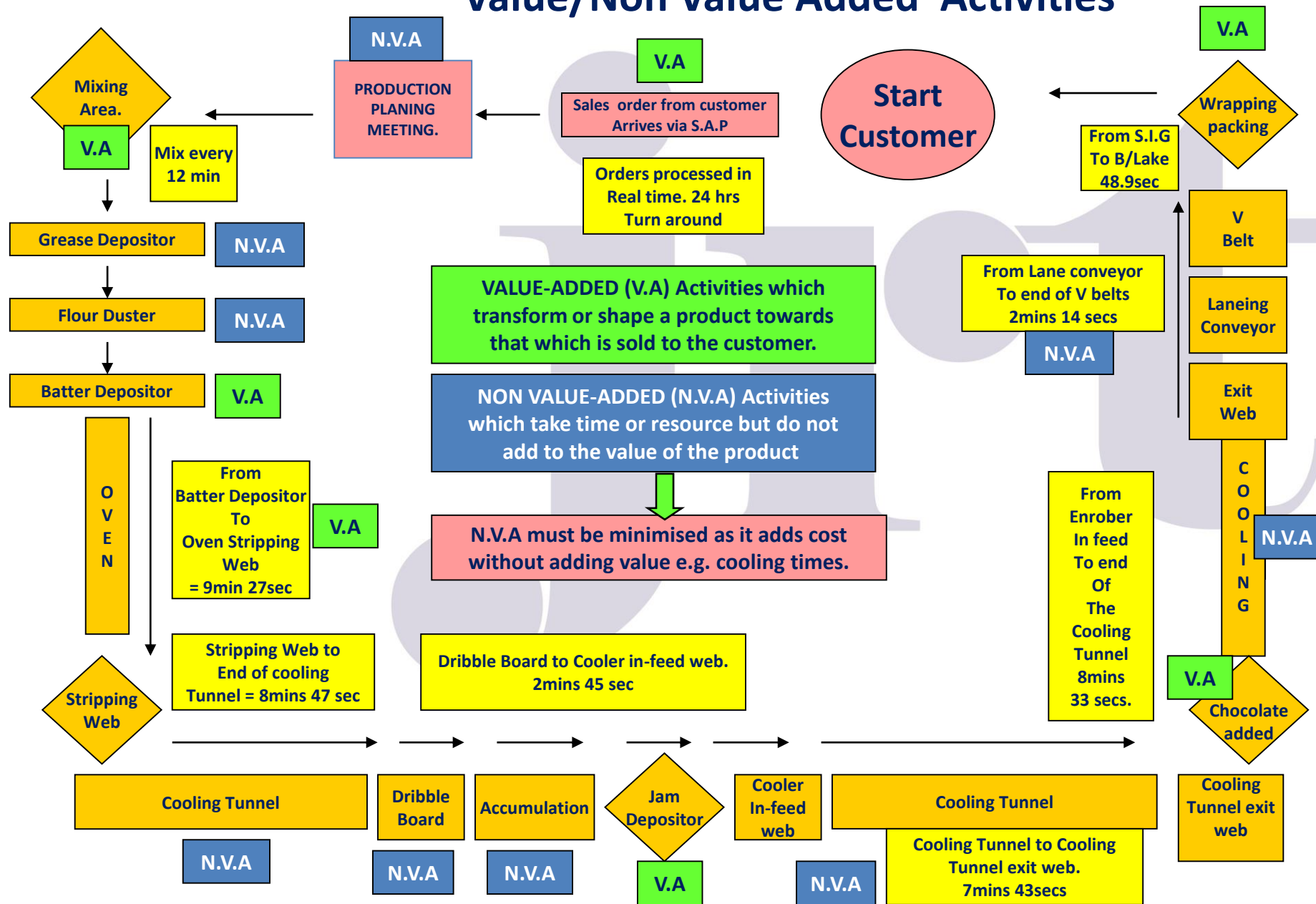


Case study

A Value Stream Map for Jaffa Cake production

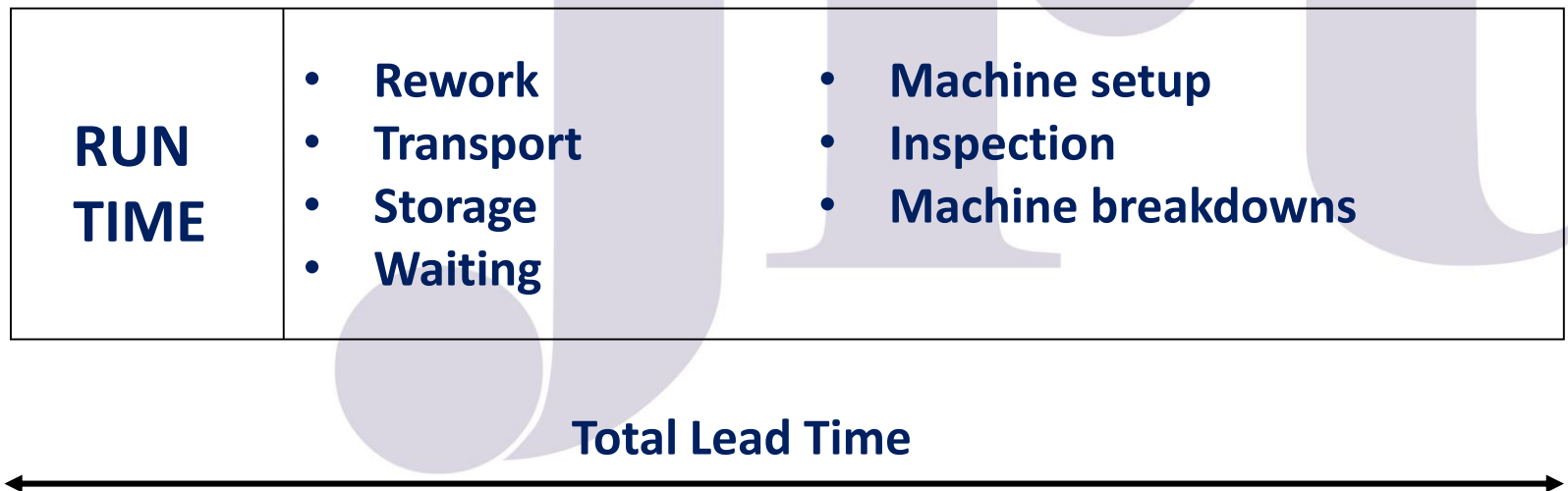


Value/Non Value Added Activities



Lean = Eliminating Waste

Typically 95% of Total lead time is Non-Value Added!



MUDA

MUDA is the Waste, work that does not add any value to the product



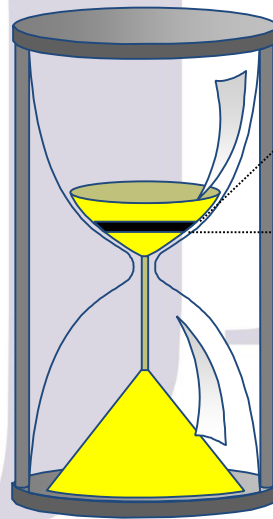
V: Value added product/services

W: Wasteful product / practices/services that does not add value

Waste in manufacturing

Non Value-Added

1. Defects
2. Overproduction
3. Waiting
4. Non-essential tasks
5. Transporting
6. Inventory
7. Movement
8. Expertise



Value-Added

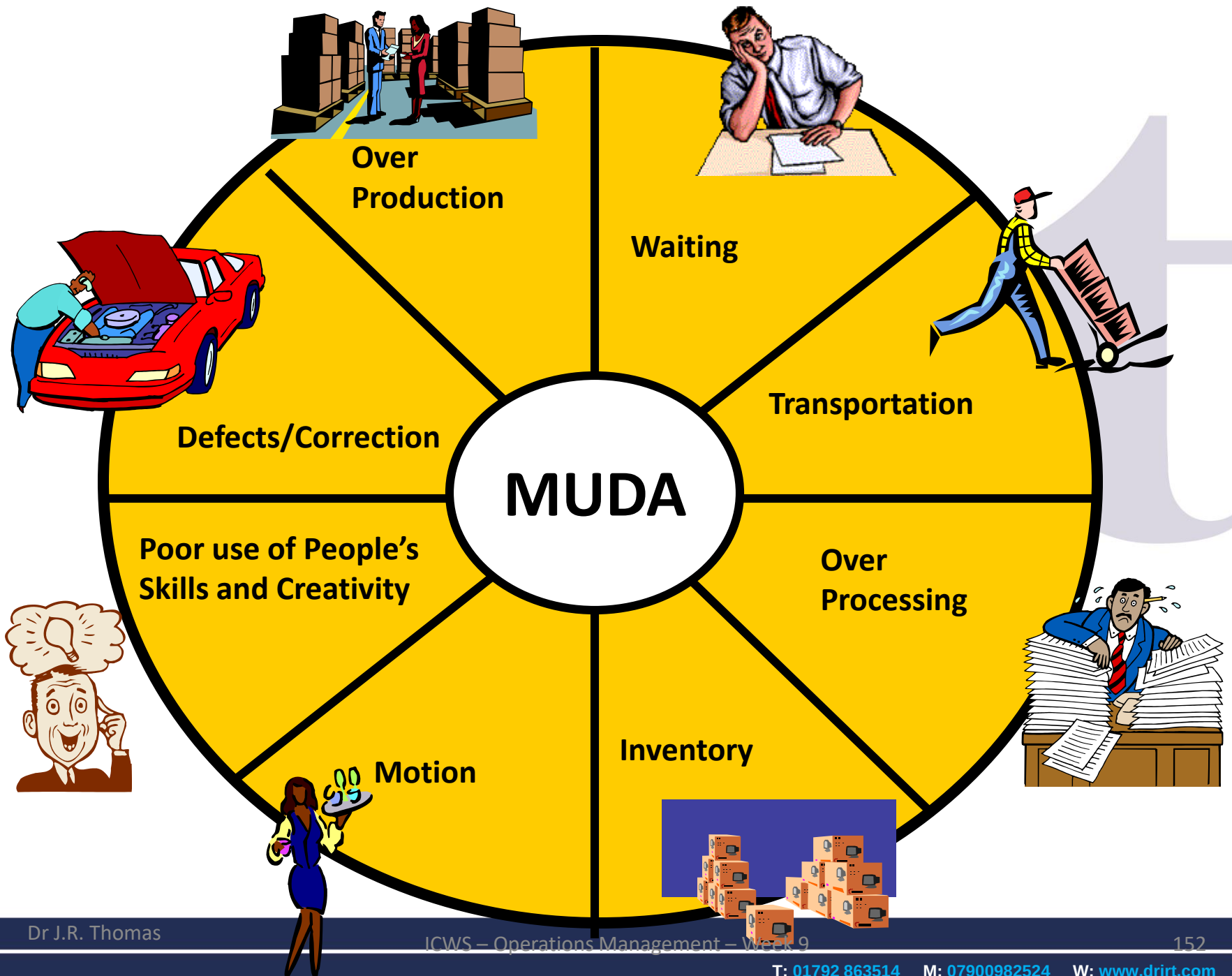
Customer requirements

Essential Non value-Added

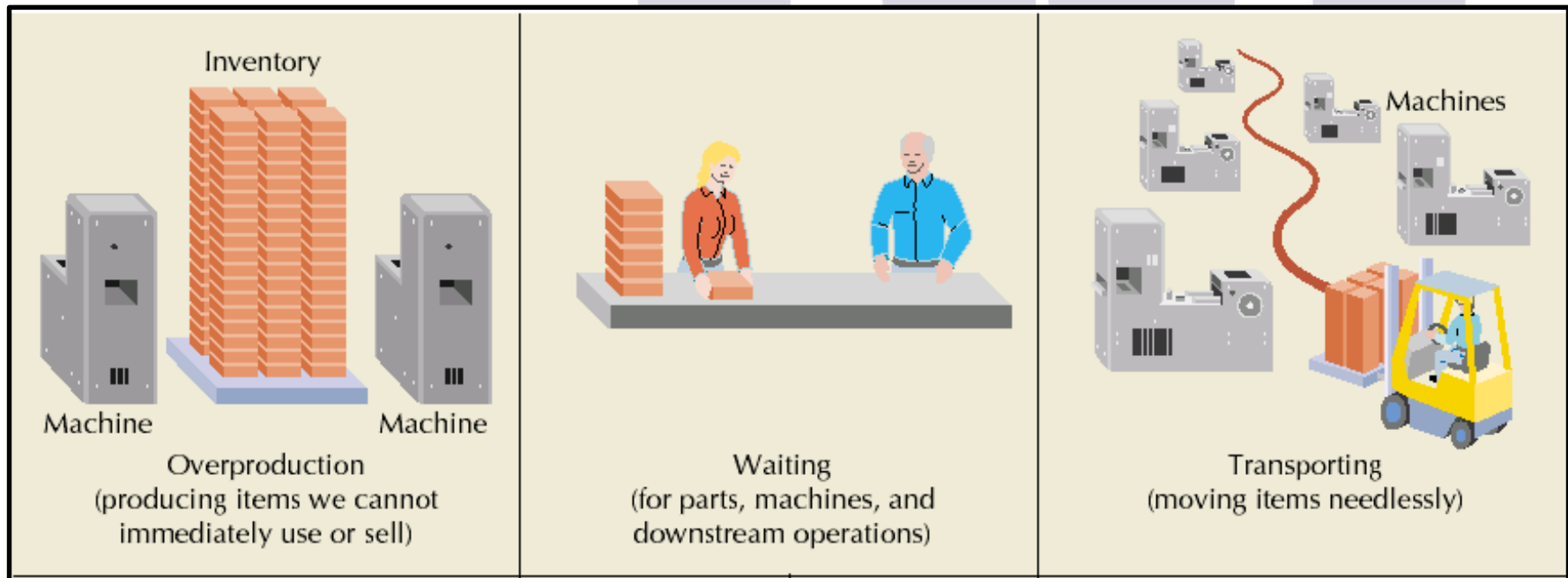
Legislative

Mandatory QA etc.

TYPICALLY 95% of Manufacturing Lead Time is NOT Value -Adding !



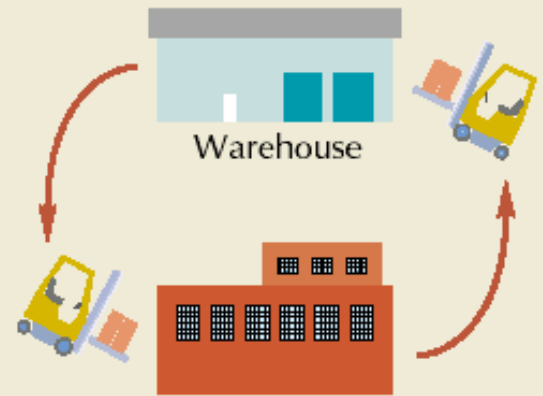
Waste in Operations



Waste in Operations (cont.)



Processing
(unnecessary steps that
do not add value)

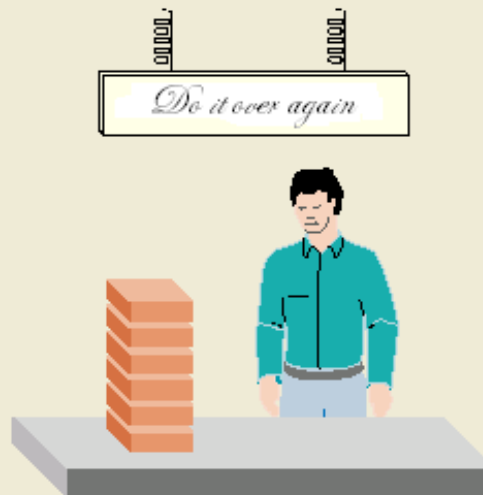


Inventory
(storing, retrieving, counting,
insuring, taking up space & money)

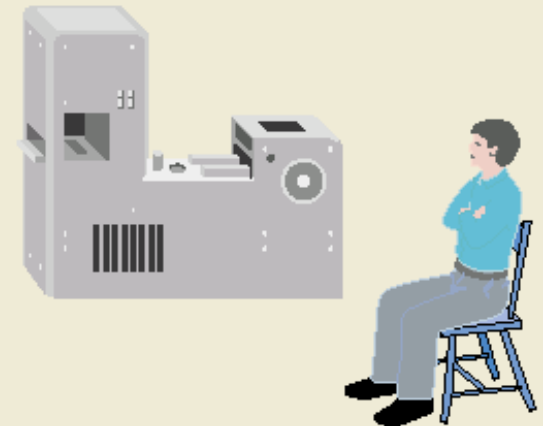
Waste in Operations (cont.)



Movement
(searching for tools, parts,
instruction, approval)



Defects
(rework and scrap)



Talent
(underutilization of worker
knowledge and skills)

[illegible][illegible]



**The same categories can be applied in a
non-production environment ...**

DEFECTS



OVER PRODUCTION



NON
STANDARD
PROCESSING



INTELLECT



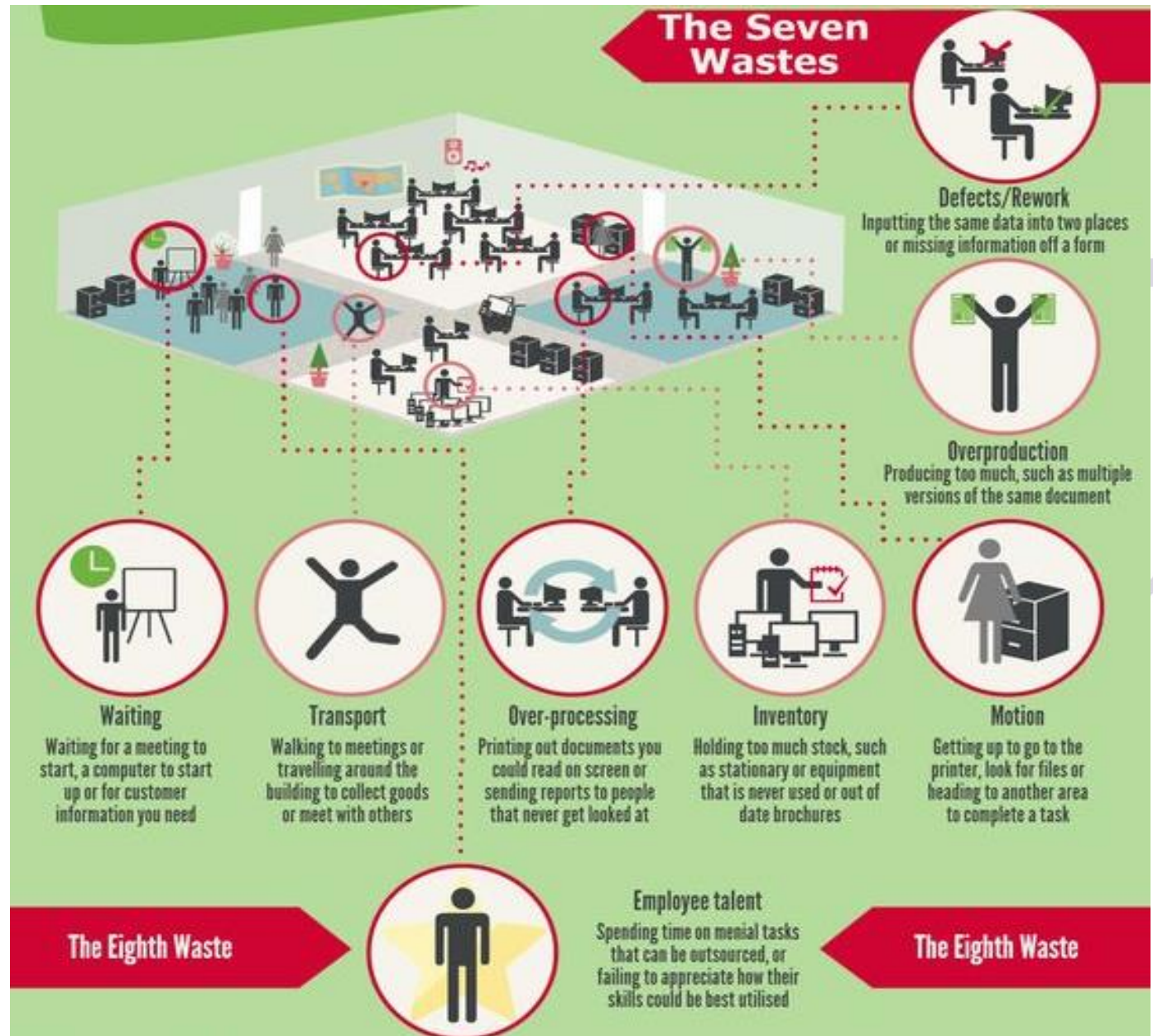
MOTION



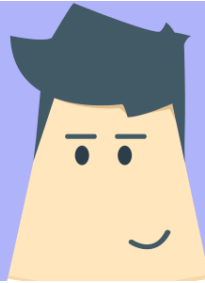
EXCESS
INVENTORY



The eight wastes in an office context :



MEET TIM WOODE



Transport The unnecessary movement of products
e.g Taking inefficient routes when delivering products



Inventory Any finished work, work-in-progress, or parts that are not being processed
e.g excess stock taking up space in a warehouse



Motion People or produce moving unnecessarily
e.g machine operators having to take additional steps due to poorly laid out factory floor



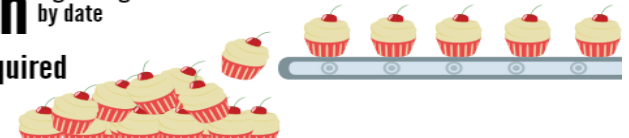
Waiting Time spent that does not add value to the process
e.g an unused machine waiting for the product to arrive from upstream in the process



Overprocessing Doing more than what is valued by the customer
e.g painting areas on a product that will never be seen by the customer



Overproduction Producing more than is required
e.g Baking more cakes than can be sold within sell-by date



Defects Providing incorrect, substandard, or faulty products
e.g Manufacturing 100 suitcases in the wrong colour



Employee talent Not using or investing in the talent, skills or creativity of people in the correct way



e.g Ignoring or failing to encourage suggestions for improvements from your employees

Reduction of Waste : examples of Muda identified from process mapping.

1



Over-production - 60% of computer generated post printed in the post room was discarded

2



Waiting - Post delivered by Royal Mail did not always arrive at 7:45 am

3



Transport - Post moved 500 metres before any value-added work was performed

4



Over-processing - Sorting post in 21 categories when 4/5 were enough

5



Inventory – 15+ days of work on shelves

6



Rework - Post transferred between offices; Frequent redirection due to mis-sorting

7



Motion - In post room the operator moved from desk to scales to measure a single item of post

No	The 7+1 Wastes	Definition	Few Examples of Office Wastes	Few Examples of Manufacturing Wastes	Few Examples of Supply Chain Wastes
1	Overproduction	Overproduction is the production acquisition hides the production problems. Overproduction must be stored, managed and protected.	• More information then the customer needs. • More information than the next process needs. • Creating reports that no one uses Making extra copies than what is actually needed	• Producing product to stock based on sales forecasts • Producing more to avoid set-ups • Batch process resulting in extra output	• Supplier and Factory start producing goods based on forecast without understanding the customer consumption. • Batch Size based upon Minimum Order Quantity and Standard Pack Qty.
2	Transportation	Each time a product is moved it stands the risk of being damaged, lost, delayed, etc. as well as being a cost for no added value. Transportation does not make any transformation to the product that the consumer is supposed to pay for.	• Retrieving or storing files • Carrying documents to and from locations • Taking files to another person • Going to get signatures from different people	• Moving parts in and out of storage • Moving material from one workstation to another • Moving products to and from	• Lead time involved in movement of goods from Supplier to Factory and to End customer. • Logistics Consolidation delays
3	Motion	As compared to Transportation, Motion refers to the producer or worker or equipment. This has significance to damage, wear, safety. It also includes the fixed assets and expenses incurred in the production process.	• Searching for files • Extra clicks or key strokes • Clearing away files on the desk • Gathering information • Manual entry	• Searching for parts, tools, prints etc . • Sorting through materials • Reaching for tools • Lifting boxes of parts	• Warehouse management of goods • Part picking based upon pick list. • Part sorting for inspection buyoff • Handling of Receiving, Shipping and Invoice document • PO and SO data transfer.

No	The 7+1 Wastes	Definition	Few Examples of Office Wastes	Few Examples of Manufacturing Wastes	Few Examples of Supply Chain Wastes
4	Waiting	Refers to both the time spent by the workers waiting for resources to arrive, the queue for their products to empty as well as the capital sunk in goods and services that are not yet delivered to the customer. It is often the case there are processes	• Waiting for ..Faxes, phone calls for the system to come back up • Copy machine • Customer or supplier responses • A handed –off file to come back	• Waiting for parts • Waiting for prints • Waiting for inspection • Waiting for information • Waiting for machine repair	• Waiting for Forecast and Response to Forecast from customer and Supplier • Waiting for parts • Waiting for PO/SO amendments. • Waiting for Delivery notes • Waiting for expedite • confirmation
5	Over Processing	Using a more expensive or otherwise valuable resource than is needed for the task or adding features that are designed in but unneeded by the customer. There is a particular problem with this item as regarding people. People may need to perform tasks that.	• Creating reports • Repeated manual entry of data • Use of outdated standard forms • Use of inappropriate software	• Multiple cleaning of parts • Paperwork • Over-tight tolerances • Awkward tool or part design	• Manual processing of PO and SO to Supplier and Customer • Repeatable execution of job due to communication issue. • Poor management of ERP software, tools and system integration
6	Inventory	Inventory, be it in the form of raw materials, work-in-progress (WP) or finished goods, represents a capital outlay that has not yet produced an income either by the producer or for the customer. Any of these three	• Files waiting to be worked on • Open projects • Office suppliers • E-mail s waiting to be read • Unused records in the database	• Raw materials • Work in process • Finished goods • Consumable suppliers	• Raw materials • Work in process • Finished goods • Safety Stock Buffer • Excess and Obsolete management of materials

No	The 7+1 Wastes	Definition	Few Examples of Office Wastes	Few Examples of Manufacturing Wastes	Few Examples of Supply Chain Wastes
7	Defects	Quality defects prevent the customers from accepting the product produced. The effort to create these defects is wasted. New waste management processes must be added in an effort to reclaim some value for the otherwise scrap product.	• Data entry error • Pricing error • Missing information • Missed specifications • Lost records	• Scrap • Rework • Defects • Correction • Field failure • Variation • Missing parts	• Incoming Parts Rejecting from supplier • RMA returns from Customer • Receiving and Outgoing documents error • Cycle Count variance • In transit damage, pilferage of parts
8	Skill/Talent (unutilized)	Knowledge disconnection - inhibition of knowledge, idea and creativity flows (Internal and External) results in unrealized or unutilized creativity, effort and talent.	• No Question: - Do what you're told & suppressing ideas and learning • Status-quo, Top-down – bureaucratic, strict hierarchy, many levels • Excessive manuals/Documentation/ • Procedures-low communication, disengaged, wait for decision • Minimal authority/responsibility for basic tasks (No Empowerment)	• How much walking to complete a Task/Operations • Ergonomic – Reaching, Bending, twisting • Errors due Workmanship lead to scrap • Mistakes related to handling that leads rework or scrap • Unutilized ideas and learning (no Multi – tasking)	• No Question: - Do what you're told & suppressing ideas and learning • Minimal authority/responsibility for basic tasks (No Empowerment) • Lack of initiative to response or change & feedback cycles leads Low ITO • No rapid diffusion of best practices • Excessive manuals/Documentation / Procedures • Low communication, disengaged, wait for decision

Process Performance Measure

The diagram illustrates the Value-Added Ratio formula. The text 'Value-Added Ratio' is on the left, followed by an equals sign. To the right of the equals sign is the fraction 'Value-Added Time' over 'Elapsed Time'. The fraction is underlined. A large, faint 'JIRA' watermark is visible in the background. A thought bubble labeled 'Increase' points to the 'Value-Added Time' numerator, and another thought bubble labeled 'Decrease' points to the 'Elapsed Time' denominator.

$$\text{Value-Added Ratio} = \frac{\text{Value-Added Time}}{\text{Elapsed Time}}$$

Value Stream Mapping



Value Stream Mapping (VSM) is a tool to visually show all the actions (both value-added and non value-added) currently required to bring a product or service through to the customer.



What is the most common response when we ask *why* ?

“...because we’ve always done it like that !”

Value Stream Mapping

VSM steps:

1. **Gather a team of process owners and ‘outside eyes’ to map the current state process.**
2. **As the team walks the process, they map the flows.**
3. **The team should talk to the employees actually doing the work to ensure the accuracy of all the data collected.**
4. **Map both the material flow and the information flow.**
5. **Multiple maps may be needed to understand the total process.**

For each step in the process ask:

- **Can this step be eliminated/combined/simplified?**
- **What is the core purpose of this step and how else could it be accomplished?**
- **What could be done 'upstream' that would allow this step to be eliminated?**
- **What effects do errors and variances at this step have on the rest of the process?**



Developing Value-Stream Maps

Some definitions:

Value-Added

1. Operations.

- **For Material Flows**

Any activity that changes form, fit or function of the product.

- **For Information Flows**

Any activity that creates or changes information for the first time.

Also

i. Statutory requirements.

ii. Health and Safety issues.

Non Value-Added

1. Transportation.

Movement of material, information or people.

2. Inspection.

Any physical checking or inspection activity.

3. Storage.

When material or information is no longer being worked on and is inactive.

4. Delay.

When material or information has stopped

Process Performance Measure

The diagram illustrates the Value-Added Ratio formula. The text 'Value-Added Ratio' is on the left, followed by an equals sign. To the right of the equals sign is the fraction 'Value-Added Time' over 'Elapsed Time'. The fraction is underlined. A large, faint 'JIRA' watermark is visible in the background. A thought bubble labeled 'Increase' points to the 'Value-Added Time' numerator, and another thought bubble labeled 'Decrease' points to the 'Elapsed Time' denominator.

$$\text{Value-Added Ratio} = \frac{\text{Value-Added Time}}{\text{Elapsed Time}}$$

Value Stream Mapping

- The flow of the process is categorised into its key steps
- The following are recorded for each activity :
 - Description of the activity
 - Distance moved
 - Time taken
 - Number of people involved

[illegible]

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[illegible]

O = OPERATION
T = TRANSPORT
I = INSPECTION
S = STORE
D = DELAY

PROCESS ACTIVITY MAP												
Print services												
Ref.no.	Activity	Dept.	Area	Dist (mtrs.)	Time (mins.)	No. People	O	T	I	S	D	Comments.
1	Receive orders from Planning (stereos)	Prepress	Plateroom	0	0	3						
2	Remove print cards from files	Prepress	Graphics	200	10	1						
3	Remove stereos from stereo store	Prepress	Mezz	3	1	1						
4	Check job specification change datestamps	Prepress	Plateroom	100	5	1						
5	Load stereos onto trolley	Prepress	stereo store	0	5	1						
6	Deliver trolley to machine	Prepress	Production	0	1	1						
7	Receive orders from Planning (inks)	Prepress	Plateroom	10	5	1						
8	Check ink references	Prepress	Ink room	20	2	1						
9	Dispense ink	Prepress	Ink room	5	2	1						
10	Transport ink to trolley	Prepress	Ink room	50	2	1						
11	Deliver trolley to machine	Prepress	Production	50	5	1						
12				0	1	1						
TOTAL				438	39							
Code.				Operating time								
				% value adding								
O = OPERATION T = TRANSPORT I = INSPECTION S = STORE D = DELAY												

Insert the time, distance and people information (Example 1)

PROCESS ACTIVITY MAP			Launceston													
Ref.no.	Activity	Dept.	Area	Dist (mtrs.)	Time (mins.)	No. People	O	T	I	S	D	Comments.				
1	Check Spec for next order obtain necessary tooling	Converting			1	1										
2	Arrange for next order to be brought to the machine when required	Converting														
3	Set Job on cutting plate whilst running previous job	Converting	Bobst platform		10	1										
4	Check spec matches the board specifications	Converting	Bobst platform	2	2	1										
5	Finish previous order and set new one	Converting	Whole Machine	10	15	2										
6	Set machine as specified via Smart Card	Converting	Bobst platform	2	2	1										
7	Run first off and check against spec / Smart card	Converting	Bobst	2	2	1										
8	Run order and eject pallet to the palletiser when correct pallet quantity is achieved continuing with process checks	Converting	Whole Machine	1	2	2										
9	On completion of order update SFDC. Start to set next order.	Converting	Bobst platform	1	2	2										
			TOTAL													
Code.				Operating time												
				% value adding												
O = OPERATION																
T = TRANSPORT																
I = INSPECTION																
S = STORE																
D = DELAY																

Insert the time, distance and people information (Example 2)

PROCESS MAPPING ACTIVITY - WAREHOUSE												
Ref.no.	Activity	Dept.	Area	Dist (mtrs.)	Time (mins.)	No. People	O	T	I	S	D	Comments.
1	Sales order prints in despatch office	Despatch	W/H	0	1	1	1					SOP print in batches possible every hour, no flow
2	Sales orders are sorted by supervisor. If no stock	Despatch	W/H	0	2	1					2	No stock allocated, out of stock = completion processed, start process again
3	Order is passed to picker	W/H	W/H	40	1	1		1				
4	Picker goes to get a pallet and truck	W/H	W/H	2	1	1		1				Could we use a pull type trailer ?
5	Picker begins to pick 1st order line	W/H	W/H	5	1	1	1					No Locations on picking note, no intellegant picking system (Random)
6	Picker configures the order - Repack operation	W/H	W/H	1	2	1					2	Sell in pack sizes
7	Picker modifies box details, Qty, Description	W/H	W/H	0	1	1					1	Sell in pack sizes
8	Picker tapes box, places box on pallet	W/H	W/H	0	1	1					1	Searches for a tape gun - could we fix to a picking trailer?
9	Picker throw s any waste packing aw ay	W/H	W/H	3	1	1		1				Could we use a bin fixed to a picking trailer ?
10	Picker goes to the next area to pick order	W/H	W/H	5	1	1	1					No Locations - Laminate small maps and fix to picking trailer ?
11	Picker begins to pick 2nd order line	W/H	W/H	0	1	1	1					
12	Picker configures the order - Repack operation	W/H	W/H	1	2	1					2	
13	Picker modifies box details, Qty, Description	W/H	W/H	0	1	1					1	
14	Picker tapes box, places box on pallet	W/H	W/H	0	1	1					1	
15	Picker throw s any waste packing aw ay	W/H	W/H	5	1	1		1				
16	Picker takes pallet into holding area - In despatch	W/H	W/H	40	2	1		2				
17	Picker gets another pallet	W/H	W/H	2	1	1		1				
18	Picker goes to the next area to pick order	W/H	W/H	10	1	1	1					
19	Picker picks order	W/H	W/H	1	1	1	1					
20	Picker goes to the next area to pick order	W/H	W/H	5	1	1	1					
21	Picker picks order	W/H	W/H	1	1	1	1					
22	Picker takes order to holding area - In despatch	W/H	W/H	20	2	1		2				
23	Picker staples sales order onto order	W/H	W/H	2	1	1	1					
24	Despatch labels all boxes and confirms qty and ad	Despatch	W/H	5	3	1	3					Unexamined Labels - can this be printed on carton?
25	Despatch book product out line by line, qty, weigh	Despatch	W/H	5	2	1	2					Introduce bar coding, data collection system?
26	Despatch stick carrier labels on all boxes and 1 inv	Despatch	W/H	0	2	1	2					
27	Despatch load cartons onto carrier.	Despatch	W/H	2	3	1	3					
28	Despatch move pallets into holding area for pallets	Despatch	W/H	2	1	1		1				
29	Green copy of the invoice is given at the end of th	Despatch	W/H	5	1	1		1				
30	Pink copy of the invoice is given at the end of the	Despatch	W/H	10	1	1		1				
31	Manifest hard copy is given to carrier at the end of	Despatch	W/H	0	1	1		1				
TOTAL				172	41	1	19	13	0	0	10	
CODE				Operating time		19	Mins					
O = OPERATION - Value Adding Activity				% Value Adding		46.34	%					
T = TRANSPORT				Total Cost		8.19	£					
I = INSPECTION				Value Adding Cost		3.79	£					
S = STORE				Waste		4.40	£					

Allocate the time to the respective value categories and total.

Calculate the value-added ratio.

PROCESS ACTIVITY MAP			BLANKET CHANGING 7 COLOUR									
Ref.no.	Activity	Dept.	Area	Dist (mtrs.)	Time (mins.)	No. People	O	T	I	S	D	Comments.
1	Wash blankets	Print	Press	1	3	1					3	Collect tools etc whilst wash cycle operating
2	Stop m/c using planned stop	Print	Press	0	1	1					1	Stop at consistent distance
3	Bring new blanket from store area	Print	Store	50	2	1		2				This should be carried out during wash cycle
4	Inspect new blanket	Print	Press	0	2	1			3			This should be carried out during wash cycle
5	Open guards	Print	Press	0	0.33	1					0.3	At the unit
6	Inch cylinder into position	Print	Press	0	0.5	1					0.5	
7	Remove blanket	Print	Press	0	3	2	3					Use correct tools etc.
8	Remove packing	Print	Press	0	3	2	3					Prepare in advance
9	Re build new packing	Print	Press	20	10.5	2		0.5			10	Prepare in advance
10	Refit packing to cylinder	Print	Press	20	4	2	3.5	0.5				Prepare in advance
11	Refit new blanket	Print	Press	20	3.5	2	3	0.5				Use correct tools etc.
12	Close guards	Print	Press	0	0.33	1					0.3	
13	Run in impression	Print	Press	25	5	1					5	
14	Stop m/c using planned stop	Print	Press	25	0	1					0	At the unit
15	Open guards	Print	Press	0	0.34	1					0.3	
16	Inch cylinder into position	Print	Press	0	0.5	1					0.5	
17	Tension blanket	Print	Press	0	1	1	1					To the correct torque
18	Close guards	Print	Press	0	0.33	1					0.3	
19	Recommence running	Print	Press	25	2	2					3	
20	Dispose of old blanket	Print	Skips	200	3	1		3				This could be done during run in impression
TOTAL				386	45.3	2	14	7	3	0	24	
Code.				Operating time	14							
O = OPERATION				% value adding	29.78							
T = TRANSPORT				Total cost (£)	404.34							
I = INSPECTION				Value adding	120.42							
S = STORE				Waste cost	283.92							

Identify how these elements could be made more effective.

8 Basic Questions to Answer During a VSM

1. Which steps do we need to stop doing?
2. Which steps do we need to do less of?
3. Which steps can be streamlined or combined?
4. Where is cycle time longer than the available (takt) time?
5. Where is lead time longer than promised time?
6. Where does inventory accumulate?
7. Where are the longest changeover times?
8. Where are the largest First Pass Yield losses?

LONG TERM TARGETS (5 YEARS)



Efficiency → +60%
Lead Time → -80%
Scrap → 1000 PPM
Inventory → -60%
WIP → -80%
Material Costs → -14%
Kaizen Engagement → 100%

Horizon Kaizen
Planning and Steering

CONCEPT



CONTINUOUS IMPROVEMENT ORGANIZATION



EDUCATIONAL PYRAMID



ROAD MAP



VALUE STREAM MAPING



TRACTORMOTIVE TRAINING



Complaint Processing

Per Customer Complaint

30/06/2011

Ref.no.	Activity	Dept.	Area	Time (mins.)	O	T	I	S	D	Comments.
1	Raise complaint in CDM	Sales	SA	1	1					
2	Transfer Complaint to Concern	Sales	SA	1		1				
3	Add further info in Concern	Sales	SA	1	1					
4	"Pass to" Quality	Sales	SA	1		1				
5	Automatic email notifying QA, SA	Concern		0		0				
6	Raise GRN if needed	QA	QA	10	10					Look up in CDM to establish qty/pallet for GRN (could be a new field in Concern, put on Wish List)
7	Seek clarification/further info if incomplete	QA	QA	2					2	Look up Operator/Shift in CDM. If Corr refer to calendar for Corr Mgr (another for the Wish List)
8	Wait for GRN to be actioned if inspection required	Desp	Desp	30					30	
	Chase up collections	Sales	SA	1					1	Information one-way, no feedback re collection dates
	Chase up collections	QA	QA	1					1	Ave 7.5 days to collect
9	Wait for samples/rejection qty to enable processing	Sales	TM/Cust	30					30	Delay dependant on TM
10	Prepare and issue Complaint for CAPA	QA	QA	5	5					
11	Chase outstanding complaints	QA	QA	15					15	
12	Chase outstanding complaints	Prod	Prod Mgr	5					5	Follows up in response to QA chasing
13	Chase outstanding complaints	Accounts	CC	15					15	Aim to clear credits for month end
14	Complaint returned to QA	Various	Process owner	1	1				1	Prod Mgr has both the fastest (ave 1 day Prod) and slowest (ave 15.75 days Despatch) responders
15	If QA Reject CAPA, repeat from step 9	QA	QA	1		1				
16	QA inspect & designate scrap/rework/stock to returns	QA	QA	20		10	10			
17	Record scrap status on Complaint	QA	QA	2	2					
18	Record credit quantity on Complaint	QA	QA	1	1					
19	Provide witten feedback to the Customer	QA	QA	20	20					
20	Check Complaint for errors, qty, credit etc & "Complete"			5	5					
21	Verification required if credit required	Accounts	Commercial Mgr	1	1					
22	CAPA Approval if credit not required	QA	QM	1	1					
23	Verification rejected, repeat from step 9	Accounts	Commercial Mgr	1					1	
24	QA elaborate or repeat step 9	QA	QA	2					2	
25	Verification accepted	Accounts	Commercial Mgr	5	5					
26	Credit processed in CDM	Accounts	CC	5	5					
27	Credit details transferred to Concern	Accounts	CC	5	5					
27	CAPA Approval	QA	QM	2			2			can be delays when I am away
TOTAL				221	63	33	12	0	103	

Code.

O = OPERATION
T = TRANSPORT
I = INSPECTION
S = STORE
D = DELAY

OPERATIONS	63
TRANSPORT	33
INSPECTION	12
STORE	0
DELAY	103
TOTAL	221
V-A %	29%

Total each of the types of activity.

09/03/2011

[illegible]

Time (mins.)	49	£140.87
Operating time	22	£63.14
Transport	18	£51.75
Inspection	4	£11.50
Store	0	
Delay	5	£14.37
Total	49	£140.87
% value adding	44%	

Code.

O = OPERATION

T = TRANSPORT

I = INSPECTION

S = STORE

D = DELAY

Calculate the value-added factor.

Case study 9 : Thermocouple assembly



CURRENT PROCESS A										
Ref.no.	Steps in the Manufacturing process	Where?	Dist (mtrs.)	Time (mins.)	No. People	O	T	I	S	D
1	Receive kit and check parts	Pressure	0	10	1			10		
2	Pass kit to kit to coring	Pressure	10	0.5	1		0.5			
3	Set up coring machine	Pressure	0	5	1					5
4	Cut Tube- Core block - Stamp block	Pressure	10	6	1	4	2			
5	Take tube to brazing area	Pressure	10	1	1		1			
6	Brazing tube and block	Pressure	0	3	1	3				
7	Acid dip and wire wheel	Pressure	3	4	1	4				
8	Pass to the welders	Pressure/Weld	12	0.6	1		0.6			
9	Assembly welded	Welding	6	20	1	20				
10	Welders return assembly to pressure section	Pressure	5	0.5	1		0.5			
11	Fit movement	Pressure	3	2	1	2				
12	Fit into case , locate dial, fit dial	Pressure	5	5	1	4	1			
13	Take to drill area	Pressure	10	1	1		1			
14	Drill case and fit point of stop	Pressure	0	2	1	2				
15	Take guage to callibration rig	Pressure	4	0.3	1		0.3			
16	Set up rig	Pressure	0	1	1					1
17	Calibration	Pressure	0	15	1	15				
18	Take to finish off bench	Pressure	5	0.3	1		0.3			
19	Finish off front of guage	Pressure	1	3	1	3				
20	Finish off back	Pressure	1	1	1	1				
25	Move from finish-off bench to label area	Pressure	4	0.3	1		0.3			
26	Labels/inspection	Pressure	0	1	1			1		
24	Booking off gauge on computer	Pressure	0	2	1	2				
25	Transferring to final inspection	Pressure	5	0.3	1		0.3			
31										
		TOTAL	94	84.8	5 parties	60	7.8	11	0	6
		CODE	Operating time	60	Mins					
		O = OPERATION - Value Adding Activity	% Value Adding Time	70.8	%					
		T = TRANSPORT	% Non productive	29.25	%					
		I = INSPECTION								
		S = STORE								
		D = DELAY								

Previous process :
94 meters distance moved.
84.8 minute cycle.
70% value added ratio.

Case study 9 : Electronics



PROCESS A : MODIFIED LAYOUT AND WELDING

Ref.no.	Steps in the Manufacturing process	Where?	Dist (mtrs.)	Time (mins.)	No. People	O	T	I	S	D
1	Receive kit and check parts	Pressure	0	10	1			10		
2	Collect assembled tubes and blocks	Pressure	2	0.3	1		0.3			
3	Fit movement	Pressure	0	2	1	2				
4	Fit into case , locate dial, fit dial	Pressure	2	4.5	1	4	0.5			
5	Take to drill area	Pressure	1	0.3	1		0.3			
6	Drill case and fit point of stop	Pressure	0	2	1	2				
7	Take guage to callibration rig	Pressure	1	0.3	1		0.3			
8	Set up rig	Pressure	0	1	1					1
9	Calibration	Pressure	0	15	1	15				
10	Take to finish off bench	Pressure	1	0.1	1		0.1			
11	Finish off front of guage	Pressure	1	3	1	3				
12	Finish off back	Pressure	1	1	1	1				
13	Move from finish-off bench to label area	Pressure	1	0.1	1		0.1			
14	Labels/inspection	Pressure	0	1	1			1		
15	Booking off gauge on computer	Pressure	0	2	1	2				
16	Transferring to final inspection	Pressure	5	0.3	1		0.3			
17										
		TOTAL	15	42.9	2 parties	29	1.9	11	0	1
	CODE		Operating time	29	Mins					
	O = OPERATION - Value Adding Activity		% Value Adding Time	67.6	£					
	T = TRANSPORT		% Non productive	32.40	£					
	I = INSPECTION									
	S = STORE									
	D = DELAY									

Modified process :
 15 meters distance moved.
 42.9 minute cycle.



Taking another process at the same plant..

CURRENT ELITE PROCESS										
Ref.no.	Steps in the Manufacturing process	Where?	Dist (mtrs.)	Time (mins.)	No. People	O	T	I	S	D
1	Receive kit and check parts	Pressure	0	10	1			10		
2	Pass kit to kit to coring	Pressure	10	0.5	1		0.5			
3	Set up coring machine	Pressure	0	5	1					5
4	Cut Tube- Core block - Stamp block	Pressure	10	6	1	4	2			
5	Pass to the welders	Pressure/Weld	12	0.6	1		0.6			
6	Assembly welded	Welding	6	20	1	20				
7	Welders return assembly to pressure section	Pressure	5	0.5	1		0.5			
8	Fit movement and block seal	Pressure	3	3	1	3				
9	Locate dial and fit point to stop	Pressure	5	2	1	1	1			
10	Fit assembly into case	Pressure	10	3	1	2	1			
11	Fit dial onto case	Pressure	0	1	1	1				
12	Take guage to callibration rig	Pressure	4	0.3	1		0.3			
13	Set up rig	Pressure	0	1	1					1
14	Calibration	Pressure	0	15	1	15				
15	Take to finish off bench	Pressure	5	0.3	1		0.3			
16	Finish off front of guage	Pressure	1	5	1	5				
17	Finish off internal/back	Pressure	1	5	1	5				
18	Leak test	Pressure	8	3	1		1			2
19	Fill case with glycerine	Pressure	2	10	1	1				9
20	Fit filler cap	Pressure	0	0.3	1	0.3				
21	Guage stands for 24 hours	Pressure	0	req. period	1					
22	Move from storage area to label area	Pressure	4	0.3	1		0.3			
23	Labels/inspection	Pressure	0	1	1			1		
24	Booking off gauge on computer	Pressure	0	2	1	2				
25	Transferring to final inspection	Pressure	5	0.3	1		0.3			
31										
		TOTAL	91	95.1	5 parties	59.3	7.8	11	0	17
	CODE		Operating time	59.3	Mins					
	O = OPERATION - Value Adding Activity		% Value Adding Time	62.4	%					
	T = TRANSPORT		% Non productive	37.64	%					
	I = INSPECTION									
	S = STORE									
	D = DELAY									

Previous process :
 91 meters distance moved.
 95.1 minute cycle.
 62.4% value added ratio.

OUTSOURCED, NEW LAYOUT AND GLYCERINE TEMP CON

Ref.no.	Steps in the Manufacturing process	Where?	Dist (mtrs.)	Time (mins.)	No. People	O	T	I	S	D
1	Collect assembled tube and block from shelf	Pressure	2	0.3	1		0.3			
2	Fit movement and block seal	Pressure	0	3	1	3				
3	Locate dial and fit point to stop	Pressure	2	1	1	0.5	0.5			
4	Fit assembly into case	Pressure	2	2	1	2				
5	Fit dial onto case	Pressure	0	1	1	1				
6	Take guage to callibration rig	Pressure	2	0.3	1		0.3			
7	Set up rig	Pressure	0	1	1					1
8	Calibration	Pressure	0	15	1	15				
9	Take to finish off bench	Pressure	1	0.3	1		0.3			
10	Finish off front of guage	Pressure	1	5	1	5				
11	Finish off internal/back	Pressure	1	5	1	5				
12	Leak test	Pressure	0	2	1					2
13	Fill case with glycerine	Pressure	2	2	1	2				
14	Fit filler cap	Pressure	0	0.3	1	0.3				
15	Gauge stands for 24 hours	Pressure	0	req. period	1					
16	Move from storage area to label area	Pressure	2	0.2	1		0.3			
17	Labels/inspection	Pressure	0	1	1			1		
18	Booking off gauge on computer	Pressure	0	2	1	2				
19	Transferring to final inspection	Pressure	5	0.3	1		0.3			
19										

		TOTAL	20	41.7	2 parties	35.8	2	1	0	3
	CODE		Operating time	35.8	Mins					
	O = OPERATION - Value Adding Activity		% Value Adding Time	85.9	%					
	T = TRANSPORT		% Non productive	14.15	%					
	I = INSPECTION									
	S = STORE									
	D = DELAY									

Modified process :
20 meters distance moved.
41.7 minute cycle.
85.9% value added ratio.

Ref.no.	Steps in the Manufacturing process	Dept.	Area.	Dist (mtrs.)	Time (mins.)	No.people	O	T	I	S	D	Comments/Ideas for Improvement
1	Walk over to job bag racks - pick up next JB according to sched	Repro	Repro Office	6	1	1		1				Option 1: Have a digital Job Bag, instantly on Screen next to operator/ Option 2: move JB rack closer
2	check production date	Repro	Repro Office	0	1				1			Have Production Live on a screen between both operators
3	take back to desk to begin JB	Repro	Repro Office	6	1			1				Make Job Bags Digital (time saving 2 mins Ref no 1 & 2)
4	Read through job bag & print out Repro job bag check sheet	Repro	Repro Office	2	10		10					Make RCS digital (no need to print out saving paper) this could be linked to Digital JB
5	copy FGC & quantity to RJBCS and start filling the sheet out	Repro	Repro Office	0	30		30					Possibly time could be saved by reducing the amount of department checks
6	Retrieve profile from existing or pick up new cf2	Repro	Repro Office	0	5		5					This has to be done
7	Select cells within cf2 and apply correct FGC file	Repro	Repro Office	0	3		3					Ref no 7-10 can be automated by having Automation Engine (save 24mins per Job, this is free with our new upgrade (cost of training £3000 per operator)
8	Save file as JB number	Repro	Repro Office	0	10		10					Ref no 7-10 can be automated by having Automation Engine (save 24mins per Job, this is free with our new upgrade (cost of training £3000 per operator)
9	apply screening and make press pdf	Repro	Repro Office	0	10		10					Ref no 7-10 can be automated by having Automation Engine (save 24mins per Job, this is free with our new upgrade (cost of training £3000 per operator)
10	Apply pdf to nexus workflow	Repro	Repro Office	0	1		1					Ref no 7-10 can be automated by having Automation Engine (save 24mins per Job, this is free with our new upgrade (cost of training £3000 per operator)
11	add details of JB to database	Repro	Repro Office	0	5		5					This has to be done to keep a history of jobs/nexus routes/screening
12	Pass JB to colleague for second check	Repro	Repro Office	4	1		1					Currently done to check if anything is missed prior to releasing files to the plateroom
13	wait for nexus to process files into plate format	Repro	Repro Office	0	30						30	Nexus RIP Upgrade in process (Capex with Richard Caunt) £10,000. Could save processing time of files by half
14	2nd operator opens plate file, merge and begins following check	Repro	Repro Office	0	30	1					30	Currently a vital check before releasing files to plateroom
15	Once approved release files to plate room	Repro	Repro Office	0	5						5	Has to be done
16	Take JB to Plate room & return	Repro	Repro Office	400	10			10				Move closer to the plateroom/ give job bags to people passing through office saving 10mins (delivering/returning). Time saved could be spent on other work. Time saved by all if the Job bag was made digital? Less paperwork
			TOTAL	418	153	10 parties	75	12	1	0	65	
CODE				Operating time	75	Mins						
O = OPERATION - Value Adding Activity				% Value Adding Time	49.0	£						
T = TRANSPORT				% Non productive	50.98	£						
I = INSPECTION												
S = STORE												
The extra column allows												

The extra column allows improvement suggestions to be developed in a structured way.

PROCESS ACTIVITY MAP												
Ref.no.	Steps in the Manufacturing process	Dept.	Area.	Dist (mtrs.)	Time (mins.)	No.people	O	T	I	S	D	Comments/Ideas for Improvement
1	Weekly schedule appears on Wednesday morning from Mars	Commercial	Commercial Office		1		1					
2	Printed out on A3 printer	Commercial	Printer Office	20	3	1					3	Does it need to be printed?
3	From schedule decide what items are required and when	Commercial	Commercial Office	0	15	1	15					Could the printer be relocated?
4	Copy from model and create job bag	Commercial	Commercial Office	0	5	1	5					
5	Print job bag out	Commercial	Commercial Office	10	1	1					1	Do we need to print all job bags?
6	Check board situation and allocate material	Commercial	Commercial Office	0	5	1			5			
7	If need to order material,request delivery date	Commercial	Commercial Office	0	3	1					3	
8	Assume board available	Commercial	Commercial Office	0	0	1						
9	Check job bag to ensure foil and gluing speeds correct.	Commercial	Commercial Office	0	10	1			10			Foil and gluing speeds change by quantities - why is this happening? Is there a better way of doing this? Manual calcs have been put into the model to sort out the gluing speeds. Prism could possibly sort out the foil issue. Will be a cost.
10	Change split and delete codes if needed.	Commercial	Commercial Office	0	0	1	0					
11	E-mail Debbie telling her to plan job up with print dates	Commercial	Commercial Office	0	3	1	3					Why can we not do this on Prism automatically?
12	Wait for Debbie to acknowledge date	Commercial	Commercial Office	0	1	1					1	
13	Change date on Prism if new date is agreed	Commercial	Commercial Office	0	1	1	1					
14	Monitor subsequent schedules to confirm print date	Commercial	Commercial Office	0	10	1			10			
15	Find job box in tray	Commercial	Commercial Office	20	2	1					2	
16	Take colour standards from tray assuming they are there.	Commercial	Commercial Office	0	1	1					1	
17	Add board details to job bag plus any other instructions.	Commercial	Commercial Office	0	3	1	3					
18	Add board issue no. from Excel and put onto issue note	Commercial	Commercial Office	0	2	1	2					Does this need to be done? Keith needs issue note number for traceability
19	Add price to job bag on Prism.	Commercial	Commercial Office	0	1	1	1					
20	Copy job bag for QA and labels	Commercial	Commercial Office	10	4	1					4	
21	Fill in job bag price on Excel spreadsheet	Commercial	Commercial Office	0	1	1					1	
22	QA copy to go in QA pigeonhole	Commercial	Commercial Office	10	2	1					2	Does this need to be done? Work for either Q.A. or Commercial, as they still need copies
23	Labels copy/ issue note to go in tray to be taken to factory	Commercial	Commercial Office	2	1	1					1	
24	Job boxes to repro dept. put in tray and ticked off	Commercial	Repro Office	50	5	1		5				Alternative system ? Repro could collect from tray in Commercial office
25												
41												
			TOTAL	122	80	10 parties	31	5	25	0	19	
	CODE		Operating time		31	Mins						
	O = OPERATION - Value Adding Activity		% Value Adding		38.8	£						
	T = TRANSPORT		% Non product		61.25	£						
	I = INSPECTION											
	S = STORE											
	D = DELAY											

The extra column allows improvement suggestions to be developed in a structured way.

Case Study 10 : Speedometer clocks assembly



Before

Speedometer clocks – previous process

PROCESS ACTIVITY MAP											
Ref.no.	Steps in the Manufacturing process	Dept.	Area.	Dist (mtrs.	Time (mins	No. People	O	T	I	S	D
1	Look at Production plan and identify what today's production product	Planning	Clocks			1					
2	Walk to supervisors office to request Bill of materials	Planning	Planning Office	20	0.3	1			0.3		
3	Go to cupboard and retrieve components	Operator	Clocks	5	1	1		1			
4	Place board components into jig	Operator	Clocks	0	0.1	1	0.1				
5	Place components into board	Operator	Clocks	0	1	1	1				
6	Cut component legs to size	Operator	Clocks	0	0.25	1	0.25				
7	Solder components	Operator	Clocks	0	1	1	1				
8	Remove from jig	Operator	Clocks	0	0.1	1	0.1				
9	Assemble legs,spacer and washer to PCB board	Operator	Clocks	1	1	1	1				
10	Programme PCB	Operator	Clocks	0	0.1	1					0.1
11	Assemble light guide to PCB	Operator	Clocks	0	0.25	1	0.25				
12	Source cases	Operator	Clocks	10	0.5	1		0.5			
13	PCB to case assembly	Operator	Clocks	0	0.75	1	0.75				
14	Dial assembly - fetch dials from dial cupboard	Operator	Clocks	8	0.25	1		0.25			
15	Fetch pointers from cupboard	Operator	Clocks	0	0.1	1		0.1			
16	Drill pointers	Operator	Clocks	1	1	1	0.15				
17	Assemble pointers to clock	Operator	Clocks	0	0.5	1	0.5				
18	Test pointers to ensure they are not sticking	Operator	Clocks	0	1	1			1		
19	Bezel assembly	Operator	Clocks	1	0.75	1	0.75				
20	Bezel	Operator	Clocks	0	0.25	1	0.25				
21	Retest to ensure hands are free	Operator	Clocks	0	0.15	1			0.15		
22	Walk to labelling machine and print labels	Operator	Clocks	10	0.5	1		0.5			
23	Assemble packing box	Operator	Clocks	0	0.3	1	0.3				
24	Assemble label and rubber ring and insert	Operator	Clocks	0	0.3	1	0.3				
25	Assemble components in plastic bag and place into box	Operator	Clocks	0	0.6	1	0.6				
26	Print fitting instructions	Team leader		47	1	1		1			
27	Fold fitting instructions	Operator	Clocks	0	0.1	1					0.1
28	Close box and place on despatch table.	Operator	Clocks	1	0.2	1		0.2			
29											
41											
			TOTAL	104	13.35		7.3	3.55	1.45	0	0.2
CODE					Operating time	7.3	Mins				
O = OPERATION - Value Adding Activity					% Value Adding	54.7	£				
T = TRANSPORT					% Non product	45.32	£				
I = INSPECTION											
S = STORE											
D = DELAY											
Previous process :											

Previous process :
104 meters distance moved.
13.4 minute cycle.



After



Speedometer clocks process after redesign

Ref.no.	Steps in the Manufacturing process	Dept.	Area.	Dist (mtrs.)	Time (mins)	No. People	O	T	I	S	D
1	Look at Production plan and identify what today's production product	Planning	Clocks			1					
2	Walk to supervisors office to request Bill of materials	Planning	Planning Office	20	0.3	1			0.3		
3	Go to cupboard and retrieve components	Operator	Clocks	5	1	1		1			
4	Place board components into jig	Operator	Clocks								
5	Place components into board	Operator	Clocks								
6	Cut component legs to size	Operator	Clocks								
7	Solder components	Operator	Clocks								
8	Remove from jig	Operator	Clocks								
9	Assemble legs, spacer and washer to PCB board	Operator	Clocks	1	1	1	1				
10	Programme PCB	Operator	Clocks								
11	Assemble light guide to PCB	Operator	Clocks	0	0.25	1	0.25				
12	Source cases	Operator	Clocks	10	0.5	1		0.5			
13	PCB to case assembly	Operator	Clocks	0	0.75	1	0.75				
14	Dial assembly - fetch dials from dial cupboard	Operator	Clocks	8	0.25	1		0.25			
15	Fetch pointers from cupboard	Operator	Clocks	0	0.1	1		0.1			
16	Drill pointers	Operator	Clocks	1	1	1	0.15				
17	Assemble pointers to clock	Operator	Clocks	0	0.5	1	0.5				
18	Test pointers to ensure they are not sticking	Operator	Clocks	0	1	1			1		
19	Bezel assembly	Operator	Clocks	1	0.75	1	0.75				
20	Bezel	Operator	Clocks	0	0.25	1	0.25				
21	Retest to ensure hands are free	Operator	Clocks	0	0.15	1			0.15		
22	Walk to labelling machine and print labels	Operator	Clocks	10	0.5	1		0.5			
23	Assemble packing box	Operator	Clocks	0	0.3	1	0.3				
24	Assemble label and rubber ring and insert	Operator	Clocks	0	0.3	1	0.3				
25	Assemble components in plastic bag and place into box	Operator	Clocks	0	0.6	1	0.6				
26	Print fitting instructions	Team leader		47	1	1		1			
27	Fold fitting instructions	Operator	Clocks	0	0.1	1					0.1
28	Close box and place on despatch table.	Operator	Clocks	1	0.2	1		0.2			
29											
41											
			TOTAL	104	10.8		4.85	3.55	1.45	0	0.1
	CODE				Operating time	4.85	Mins				
	O = OPERATION - Value Adding Activity				% Value Adding	44.9	£				
	T = TRANSPORT				% Non product	55.09	£				
	I = INSPECTION										
	S = STORE										
	D = DELAY										

Modified process :
104 meters distance moved.
10.8 minute cycle.

Speedo Tacho previous process

PROCESS ACTIVITY MAP			OLD								
Ref.no.	Steps in the Manufacturing process	Dept.	Area.	Dist (mtrs.)	Time (mins.)	No. People	O	T	I	S	D
1	Look at Prod plan and identify quantity required										
2	Run and pick up BOM	Operator	Printer	24	1	1					1
3	Go to stores pick up pcb	Operator	Stores	42	1.5	1		1.5			
4	Program PIC	Operator	pic programer	50	2.3	1	2.25				
5	Assy pcb	Operator	speedo/tacho	0	2.5	1	2.5				
6	Assy odo to pcb	Operator	speedo/tacho	2	0.5	1	0.5				
7	Fetch decal from dial stores	Operator	speedo/tacho	12	0.5	1		0.5			
8	Fetch case from stores	Operator	speedo/tacho	12	0.5	1		0.5			
9	Fetch pointer from cupboard	Operator	speedo/tacho	1	0.25	1		0.25			
10	Assemble pcb /light guide/decal to case	Operator	speedo/tacho	2	1.5	1	1.5				
11	Assemble pointer to pcb	Operator	speedo/tacho	1	0.25	1	0.25				
12	Inspection	Operator	speedo/tacho	5	1	1			1		
13	Fetch bezel from stores	Operator	speedo/tacho	15	0.75	1		0.75			
14	Fetch glass from cupboard	Operator	speedo/tacho	10	0.75	1		0.75			
15	Assemble glass to bezel (clean glass)	Operator	speedo/tacho	2	1.5	1	1.5				
16	Bezel	Operator	speedo/tacho	1	0.25	1	0.25				
17	Inspect and test	Operator	speedo/tacho	1	0.3	1			0.3		
18	Fetch ident label	Operator	Printer	50	1.25	1		1.25			
19	Fetch packing from stores	Operator	stores	20	0.5	1		0.5			
20	Fix ident label / dress and pack	Operator	speedo/tacho	1	2.25	1	2.25				
41											
			TOTAL	251	19.35	1 party	11	6	1.3	0	1
	CODE			Operating time	11	Mins					
	O = OPERATION - Value Adding Activity			% Value Adding Time	56.8	£					
	T = TRANSPORT			% Non productive	43.15	£					
	I = INSPECTION										
	S = STORE										
	D = DELAY										
Previous process :											

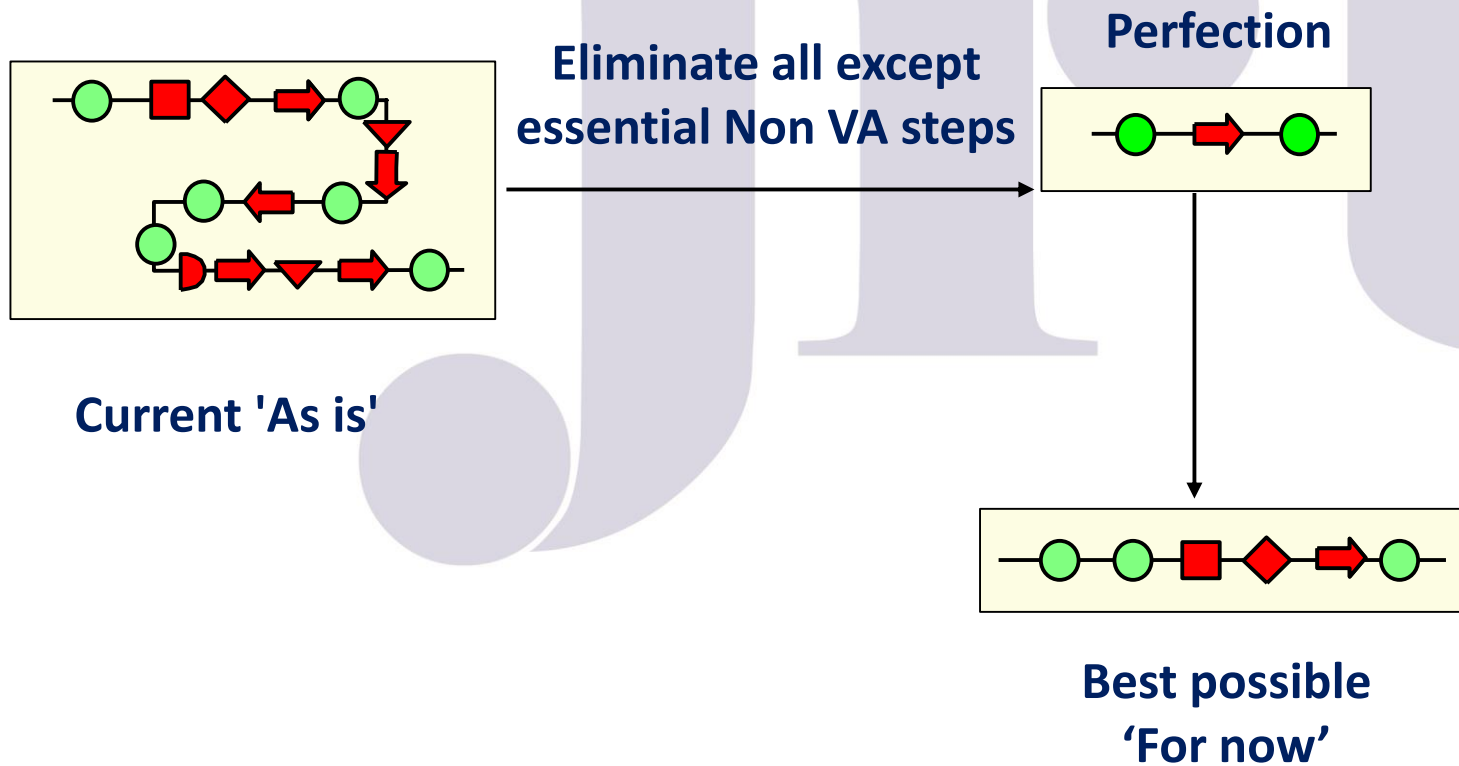
Previous process :
251 meters distance moved.
19.35 minute cycle.
56.8% value added ratio.

Speedo Tacho - redesigned process

PROCESS ACTIVITY MAP			NEW								
Ref.no.	Steps in the Manufacturing process	Dept.	Area.	Dist (mtrs.)	ime (mins	No. People	O	T	I	S	D
1	Look at Prod plan and identify quantity required										
2	Run and pick up BOM	Operator	Printer	14	0.5	1					0.5
3	Go to stores pick up pcb	Operator	Stores	20	0.3	1		0.3			
4	Program PIC	Operator	pic programer	0	0.5	1	0.5				
5	Assy pcb	Operator	speedo/tacho	0	2.5	1	2.5				
6	Assy odo to pcb	Operator	speedo/tacho	3	0.5	1	0.5				
7	Fetch decal from dial stores	Operator	speedo/tacho	12	0.5	1		0.5			
8	Fetch case from stores	Operator	speedo/tacho	12	0.5	1		0.5			
9	Fetch pointer from cupboard	Operator	speedo/tacho	3	0.3	1		0.25			
10	Assemble pcb /light guide/decal to case	Operator	speedo/tacho	0	1.5	1	1.5				
11	Assemble pointer to pcb	Operator	speedo/tacho	0	0.25	1	0.25				
12	Inspection	Operator	speedo/tacho	2	1	1			1		
13	Fetch bezel from stores	Operator	speedo/tacho	13	0.75	1		0.75			
14	Fetch glass from cupboard	Operator	speedo/tacho	8	0.75	1		0.75			
15	Assemble glass to bezel (clean glass)	Operator	speedo/tacho	2	1.5	1	1.5				
16	Bezel	Operator	speedo/tacho	1	0.25	1	0.25				
17	Inspect and test	Operator	speedo/tacho	1	0.3	1			0.3		
18	Fetch ident label	Operator	Printer	50	1.25	1		1.25			
19	Fetch packing from stores	Operator	stores	20	0.5	1		0.5			
20	Fix ident label / dress and pack	Operator	speedo/tacho	1	2.25	1	2.25				
41											
			TOTAL	162	15.9	1	9.25	4.8	1.3	0	0.5
	CODE			Operating time	9.25	Mins					
	O = OPERATION - Value Adding Activity			% Value Adding Time	58.2	£					
	T = TRANSPORT			% Non productive	41.82	£					
	I = INSPECTION										
	S = STORE										
	D = DELAY										

Modified process :
 162 meters distance moved.
 15.9 minute cycle.
 58.2% value added ratio.

Value-stream mapping summarised

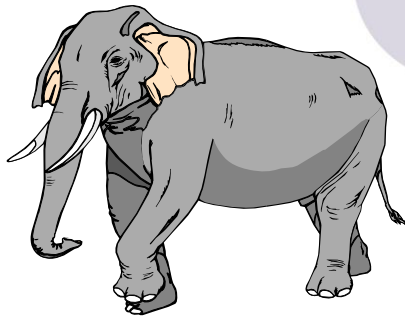


“The secret of getting ahead is getting started.

The secret of getting started is breaking your complex, overwhelming tasks into small, manageable tasks.

Then starting on the first one!”

Mark Twain.



The template for an Excellence model

What aspects of the Current System do we feel could be improved	Where are we now ?	What do we need to do?	Prioritising Criterion				Action
			NEED	COST	BENE	RPN	

SCORING THE EXCELLENCE MODEL:

Scoring system

Assessment criterion	1-2	3-4	5-6	7-8	9-10
Need category	No discernible difference from change.	Minor advantage from change.	Moderate advantage from change.	Major advantage from change.	Change is essential.
Cost category	Change can be achieved only with major cost.	Change can be achieved only at significant cost.	Change can be achieved at moderate cost.	Change can be achieved at little cost.	Change can be achieved at no cost.
Benefit category	Change would not be noticed by system.	Change may be noticed by affected parties.	Change would be positively received by all involved.	Change would give significant benefits to everyone involved.	Would significantly change the perception of the system.

Order Processing							
<u>Excellence Model</u>							
What aspects of the Current System do we feel could be improved	Where are we now?	What do we need to do?	Prioritising Criterion				Action
			NEED	COST	BENE	RPN	
Customers to confirm spec numbers with their orders	Some customers confirm spec numbers with their order.	Provide a list to customers confirming their reference and our specification numbers.	7	8	8	448	
Delivery availability - clearer machine availability for jobs.	Currently we have a board in the Sales Office quoting earliest delivery week and spreadsheet on display with machine availability during that week.	More detail required on manual spreadsheet.	7	8	8	448	
CDM system to control machine availability.	Manual spreadsheet produced by Planners	CDM system control.	7	5	9	504	
Credit Application posted with 'New Customer' quotes	Credit application form posted when New Customer requires their first order.	Send application form with first quote.	7	9	8	504	
Standard Form for Pro-Forma's	Accounts prepare Pro-Forma when required.	Standard form or Template required for Sales Admin or Accounts to fill in	6	9	8	432	
Specialist Paper required - Would help if CDM could flag a warning to Planning & Paper Stock Controller.	Sales Admin try to remember to check/inform Paper Stock Controller of special paper.	CDM to flag up a warning to Planning & Paper Stock Controller.	10	4	10	400	
More accurate tracking of W/O number through the factory.	SFDC partly used in conversion	All conversion machines to use SFDC	10	10	10	1000	
General post tray required for Acknowledgments & Quotes.	Acknowledgements & Quotes are currently sorted in the T.M's post trays.	Place all post going direct to the customers in to one general tray.	8	8	8	512	
Flagging system required from Pre-Press & Design department to inform Sales Admin when Die number & Forme Number is allocated.	Relying on Pre-Press & Design to email or phone administrator with go ahead.	CDM system to flag up when Die No. or Forme No. is set.	9	6	8	432	

Stage 1 :
All the actions are identified and prioritised

Highest score :
top priority item

Excellence Model

What aspects of the Current System do we feel could be improved	What do we need to do?	Prioritising Criterion				TIME-SCALE Sh/Med/L	Action	BY WHO?	BY WHEN?
		NEED	COST	BENE	RPN				
Order Processing									
Customers to confirm spec numbers with their orders	Provide a list to customers confirming their reference and our specification numbers.	7	9	6	378	Med	As suggested	Rachel W	3 mths - Aug
CDM system to control machine availability.	CDM system control.	10	5	10	500	Long	Conversion planning required. Need system to control correct work quantities are behind machibnes	Tony L / Kev D / Planners	6 mths - Nov
Credit Application posted with 'New Customer' quotes	Send application form with first quote.	10	10	10	1000	Short	This process needs automating	Shirley M / Nic T / Rachel W	1 mth - June
Pre-Print system	To include the CDM Pre-Print reference on any correspondance between Graphics & Sales						Complete		
Specialist Paper/Pre-Print required - Would help if CDM could flag a warning to Planning & Paper Stock Controller.	CDM to flag up a warning to Planning, Paper Stock Controller & Sales.								
Flagging system required from Pre-Press & Design department to inform Sales Admin when Die number & Forme Number is allocated.	CDM system to flag up when Die No. or Forme No. is set.	8	?				Andy C	Rachel W / Mike B / Andy C	3 mths - Aug

Stage 2 :
Action points for
top items
allocated

DESIGN ACTION PLAN

Sample labels to state:- Delay in approvals may affect the delivery date	Amendment to current labels after discussion with sales Manager	9	9	10	810	Short	New instructions required and made available for the customer following discussion	Jonaton C / Simon O / Rachel W / Shirley M / Andy G	1 mth - June
Drawings to be electronically viewable by machine managers	Pdf's need creating and posting on the Q drive	9	9	10	810	Med	Shift managers and machine managers to be taken through the process	Andy G / Shift M / Machine M	3 mths - Aug
Formes location on CDM	Use the CDM database to locate all formes	8	7	8	448	Long	Investigate possibility of this facility on CDM	Pre Setters / Andy G / Andy C	6 mths - Nov
Delivery of formes,	Goods inwards to inform presetters or have them delivered directly to Forme shop	10	?	10	100 ?	Long	Goods Inwards system to be investigated for improvement	Tony L / Steve P	6 mths - Nov

Excellence Model

Customer Order Processing

	What aspects of the Current System do we feel could be improved	Where are we now?	What do we need to do?	Prioritising Criterion				TIME-SCALE Sh/Med/L	Action	BY WHO?
				NEED	COST	BENE	RPN			
1	<i>Delays in processing Checklists</i>	Delays in being passed from SCC to Planner and back to CSE, which equals less time for production.	Agree deadlines and look at logistics of process.	9	9	8	648	Short	Michele to address situation with CSM/Planner/SCC/FC.	MT
2	<i>Proof approval - chase between CSE and customer</i>	Ad hoc chasing for approval (production led). A lack of CSE drive. New form/procedure has now been created.	Ensure CSE's communicate with customers to set deadlines to enable us to keep to schedule.	8	9	8	576	Short	New procedure to be implemented, and Kay to train CSE's in using the Calendar in Outlook	MP/PE/CM
3	<i>Paper information delays</i>	Potential delays when SCC not available e.g. month end stock count	Agree service level by SCC to CSE including contingencies.	8	9	8	576	Short	Look at previous system where CSE's would check material availability with mills, directly.	MP/PH
4	<i>Credit limits - existing customers</i>	Delays in signing credit limits.	Use e-mail requests and set time limits. Should this go through the Commercial Team?	5	9	6	270	Short	Check with SMT	NT/PH
5	<i>Customer Order Confirmation</i>	Don't always receive customer purchase order.	Ensure e-mail confirmation, if no P.O. No., enter contact name on Pecos, update when P.O. No. is received.	6	9	4	216	Short	Modify/tighten system (SOP), plus training (incorporate monitoring).	PE/NT
6	<i>Cost/benefits - cromalins for colour</i>	Where we need additional proofs, CSE's lack forward planning i.e. customers not advised if additional proofs required. We still need a cromalin for colour if not returned by customer. Is there justification to create two cromalins as standard?	Schedule to allow for additional charges e.g. customer artwork will also require cromalin charges.	6	7	5	210	Short	System review, training, monitoring. Evaluate cost/benefits of making two cromalins, one each for SPUK and customer, always charging for at least one.	MP/PE

What aspects of the Current System do we feel could be improved	What do we need to do?	Prioritising Criterion				TIME-SCALE	Action	BY WHO?	BY WHEN?
		NEED	COST	BENE	RPN				
Estimating									
Board grade list needs updating to incorporate the new papers 85 gsm fluting liners and hyflex liners	Standard board grade list needs updating, list to be reviewed	9	8	9	648	Short	Standard board grades being authorised by Brian Lister. Launceston standard board grade list to be reviewed and updated ASAP	SO	End Oct. 2011
When using CDM users are finding it very slow, especially moving from one programme to another	System needs investigating	9	?	10		Short	CDM working on the system a few weeks to clean up old data and new ser		
Review/monitor quotation turnaround	agree & measure spec/quotation turnaround	7	7	6	504	Med	Commercial team		
Order Processing									
Sort out minimum and maximum stocking levels	Minimum & Maximum stocking levels need to be agreed with TM's and customers	9	8	9	648	Short	Meeting required with Sales team to discuss stocking levels/current Customer agreements against estimated quantities	B/RW	End Aug 2011
Lead times for new work	Need to set a timescale for new work to ensure customer receives what he is asking for	8	9	8	576	Short	In place. Any new work Sales will check leadtime with Design/Pre-Press/Paper Stock Controller		
DESIGN ACTION PLAN									
Design to check Order Enquiry Foms to ensure palletisation requirements are filled out by TM	Design to make sure pallet configuration is fully optimized to help reduce transport and pallet cost	10	10	8	800	Med	There will be a memo issued to the TM's stating that we require all the palletisation information before processing the enquiry. Failure to do this will result in the enquiry being returned	Subject to commercial review/Senior team	
Tape drawing for Corrugator - why can we not have them electronically?	Investigate why we cannot have these drawings electronically in public folders	8	8	8	512	Short	Folder created in public folders with sub folders for new orders. Design now populating with the tape drawings. The drawings need to be protected from being deleted/changed. System required for existing orders that need tape.	KB/AG/KK	Ongoing
Waiver Forms not being filled out by TM's	Find a solution to ensure TM's fill this out at the start of processing order	7	10	7	490	Short	Situation much improved but when it occurs we will raise PR's when the information is not forthcoming.		

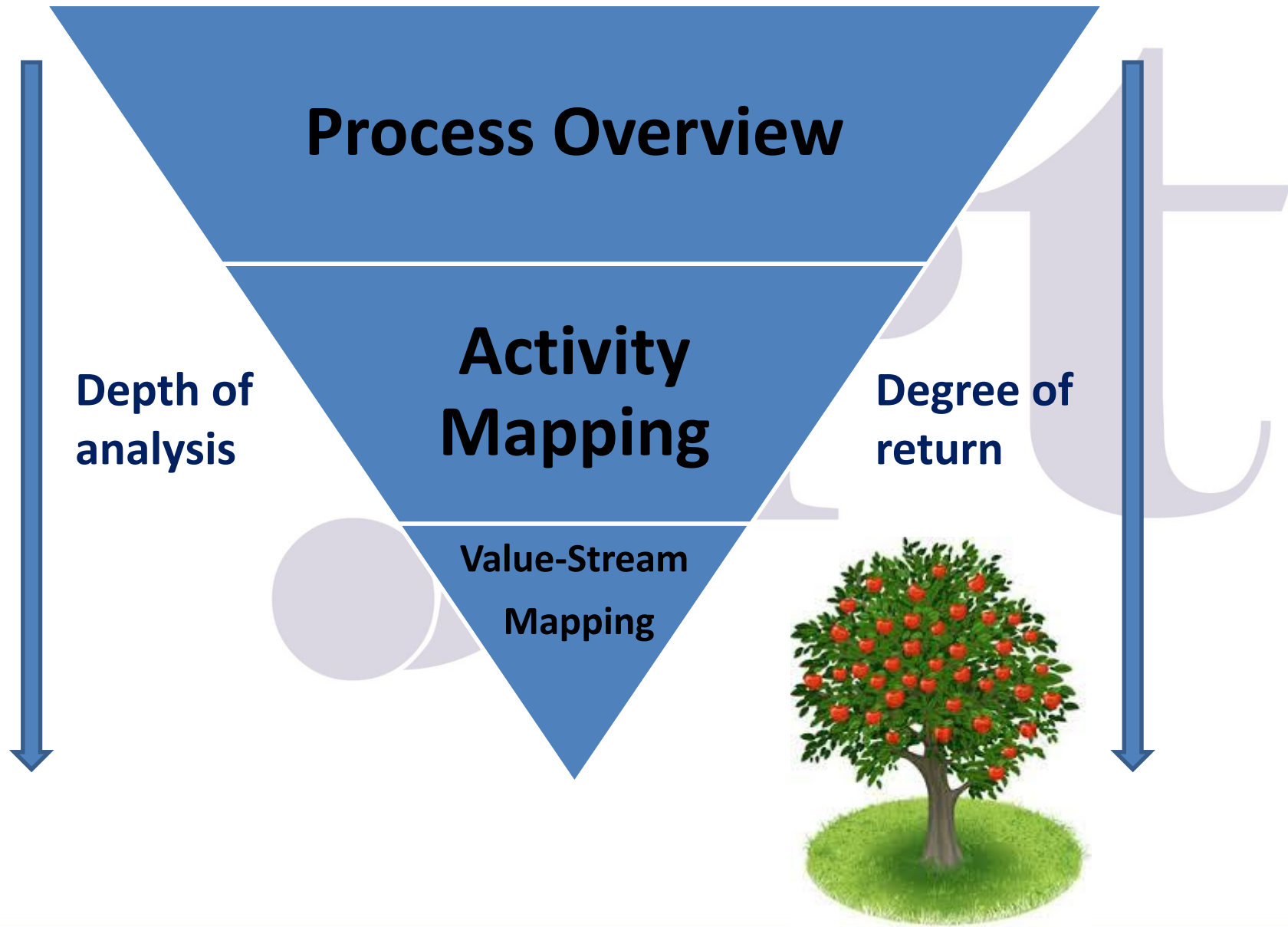
Stage 3:
Regular review of the action plan

	Process Map Action Plan					Colour Code =	Addressed & Considered Complete	Ongoing	No Progress	
What aspects of the Current System do we feel could be improved	What do we need to do?	Prioritising Criterion				TIME-SCALE	Action	dated Status - 11th September 20	BY WHO?	BY WHEN?
		NEED	COST	BENE	RPN	Sh/Med/L				
Estimating										
Ensure all details are accurate and completed in full on enquiry form	Try to enforce completion of all required information to be completed	10	9	10	900	Med	Derive a data sheet showing what incorrect information has been input on the Enquiry Form for analysis	In place and monitoring - Ongoing	Rachel W	Complete
Credit application form	Set up electronic version	10	9	10	900	Short	Need to liaise and organise - has been set up on Q drive	Rach W to speak with Sandra & Nicki to be put in place	Shirley M / Rachel W	Complete
Ensure all enquiries go through Sales Administrator first	Inform design, Sales & TMs	10	9	8	720	Short	As stated - in place and monitoring	Complete	Rachel W / Andy G	Complete
Any specs entered by Sales Admin & put on hold for design to provide more information, Design to complete spec on CDM. This would speed up the system.	Discuss with Design	9	8	10	720	Med	Sales & design to discuss with A. Cudmore	Ensure this is completed by August - A. Glover to feedback to R. Williams	Rachel W / Andy G / Andy C	Decided this was no longer
For CDM to recognise Coatings (manuel text used at the moment)	Raise with CDM	8	?	9	72 ?	Med	Discuss with Andy C	Upgrade required		
For CDM to recognise Pre-print jobs	Follow through with CDM	8	?	9	72 ?	Med	Discussion required	Some upgrades CDM - Need RW		
Order Processing										
Customers to confirm spec numbers with their orders	Provide a list to customers confirming their reference and our specification numbers.	7	9	6	378	Med	As suggested	Need help w to target all c		
CDM system to control machine availability.	CDM system control.	10	5	10	500	Long	Conversion planning required. Need system to control correct work quantities are behind machines - Ongoing			
Credit Application posted with 'New Customer' quotes	Send application form with first quote.	10	10	10	1000	Short	This process needs automating	Now available on Q Drive	Shirley M / Nic T / Rachel W	Complete
Pre-Print system	To include the CDM Pre-Print reference on any correspondence between Graphics & Sales						Complete			Complete
Flagging system required from Pre-Press & Design department to inform Sales Admin when Die number & Forme Number is allocated.	CDM system to flag up when Die No. or Forme No. is set.	8	?	10	80 ?	Med	Need to discuss with Andy C	R. Williams / A. Cudmore / M Bolt to investigate possibilities	Rachel W / Mike B / Andy C	Complete
DESIGN ACTION PLAN										
Sample labels to state:- Delay in approvals may affect the delivery date	Amendment to current labels after discussion with sales Manager	9	9	10	810	Short	New instruction required and made available for the customer following discussion	Changed date to August - A. Glover awaiting wording from S. Owens	Jonaton C / Simon O / Rachel W / Shirley M / Andy G	Complete
Drawings to be electronically viewable by machine managers	Pdf's need creating and posting on the Q drive	9	9	10	810	Med	Shift managers and machine managers to be taken through the process - Paul Clements is starting to show some of the Machine managers how this is done	New drawings being created on Q Drive. All drawings to be complete and on Q Drive by end of Sept	Andy G / Shift M / Machine M	Complete
Formes location on CDM	Use the CDM database to locate all formes	8	7	8	448	Long	Investigate possibility of this facility on CDM	Further investigation required - Is possible	Pre Setters / Andy G / Andy C	6 mths - Feb
Delivery of formes,	Goods inwards to inform presetters or have them delivered directly to Forme shop	10	?	10	100 ?	Long	Goods Inwards system to be investigated for improvement - Meeting has taken place. Finalising ideas - Ongoing	Another meeting scheduled 10/7/07 - Ongoing	Tony L / Steve P	Complete

Stage 4:
Expect some time before the completion of all actions.

A resumé of this course :

- 1. An overview of the process :
Process Overview.**
- 2. A study of the links in the supply chain :
Activity Mapping and layout optimisation.**
- 3. A detailed view of the process :
Value-Stream Mapping.**



After all this, where are you?

Stage 1 : Survivor. (Just!)

- Reactive , non-performance-based survival

Stage 2 : Yellow pages company.

- The company is neither sought nor avoided
- They have a reliable but uninspired operation
- They have a prevailing culture of “We’ve always done it like this.”

Stage 3 : You would recommend these.

- They have a reputation for meeting customers’ expectations
- Their operations are customer focused at all times
- A pro-active management looking for new ways to satisfy the customer

Stage 4 : World class company.

- Firm’s name is synonymous with service excellence
- They focus on delighting rather than satisfying customers
- They are continuously learning and seeking to improve their operations

Why is there a need to map processes?

Internal Forces

All processes evolve somewhat over time

Organisations can grow beyond their existing processes

What began as a 'good' process may deteriorate over time

What was the right process for the organisation at one time is no longer relevant

External Forces

All processes take place in a changing world

What was a 'good enough' process may no longer be sufficient to compete and win