



Optimizing Materials Handling on the Cheap

How to Lean Your Workflow

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Defining Lean

Lean is a set of concepts, principles, and tools used to create and deliver the most value from the customer's perspective while consuming the fewest resources.



Value and Value-Add

Lean focuses on effectively delivering *value* to your customer

Value-add activities

- Are activities the customer is willing to pay for
- Transform the product or service
- Must be done correctly the first time



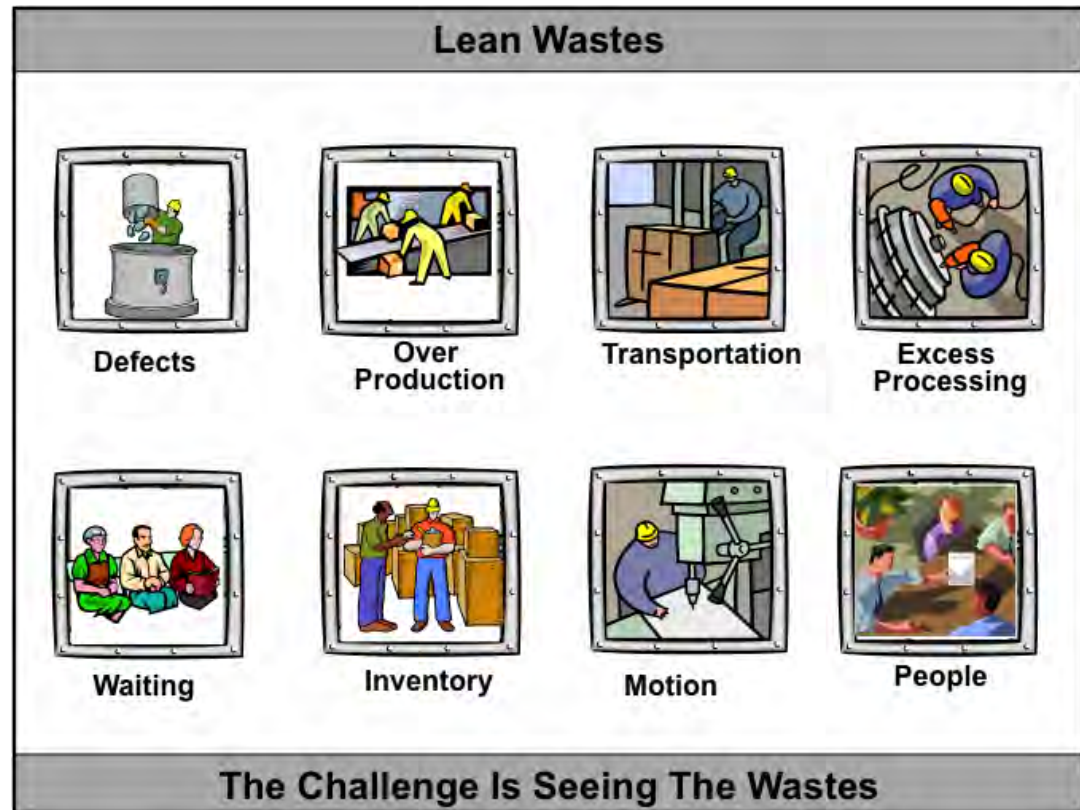
~~waste~~



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How Waste Happens

- Defects
- Inventory
- Transportation
- Extra Processing
- Waiting
- Motion
- Bureaucracy



Value Stream

All the activities, materials, people, and information that must flow and come together to provide your customer the value they want, when they want it and how they want it



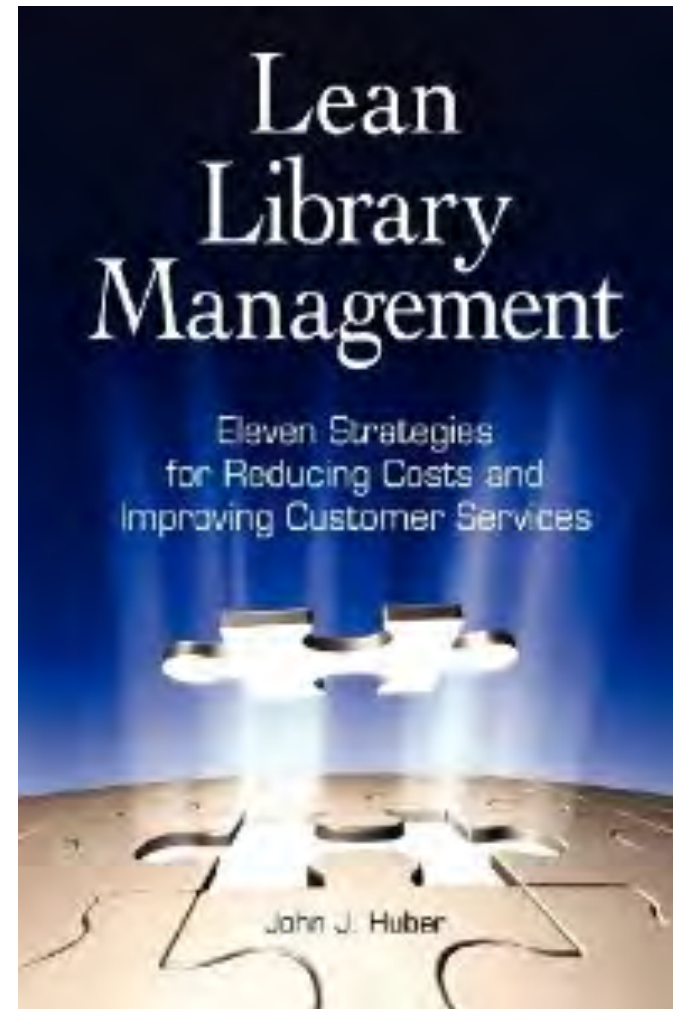
PDCA Improvement Cycle

Process of “leaning your workflow”

- **Plan:** determine goals and needed changes to achieve them
- **Do:** implement the changes
- **Check:** evaluate the results
- **Act:** standardize and stabilize the change or begin the cycle again

Lean Library Management by John J. Huber

- Excellent resource for applying Lean ideas to library workflows
- Provides step-by-step instructions



Huber Steps to Leaning Your Workflows

1. Form Team
2. Select Value Stream to tackle and set goals
3. Document the process (value stream)
4. Analyze the process to find waste
5. Design new workflow
6. Implement new workflow and analyze results (measure)
7. Continue to make adjustments (continuous improvement)

Lean is an Organizational Effort

- The people who do the work are the experts – they must be involved
- Management support critical
- Top Down and Bottom Up



Define Value Stream in Customer Terms

- Not a Value Stream: processing bookdrop
- *Value Stream*: shorten return to shelf time (RTS) for bookdrop returns



Use Value Stream and Process Maps

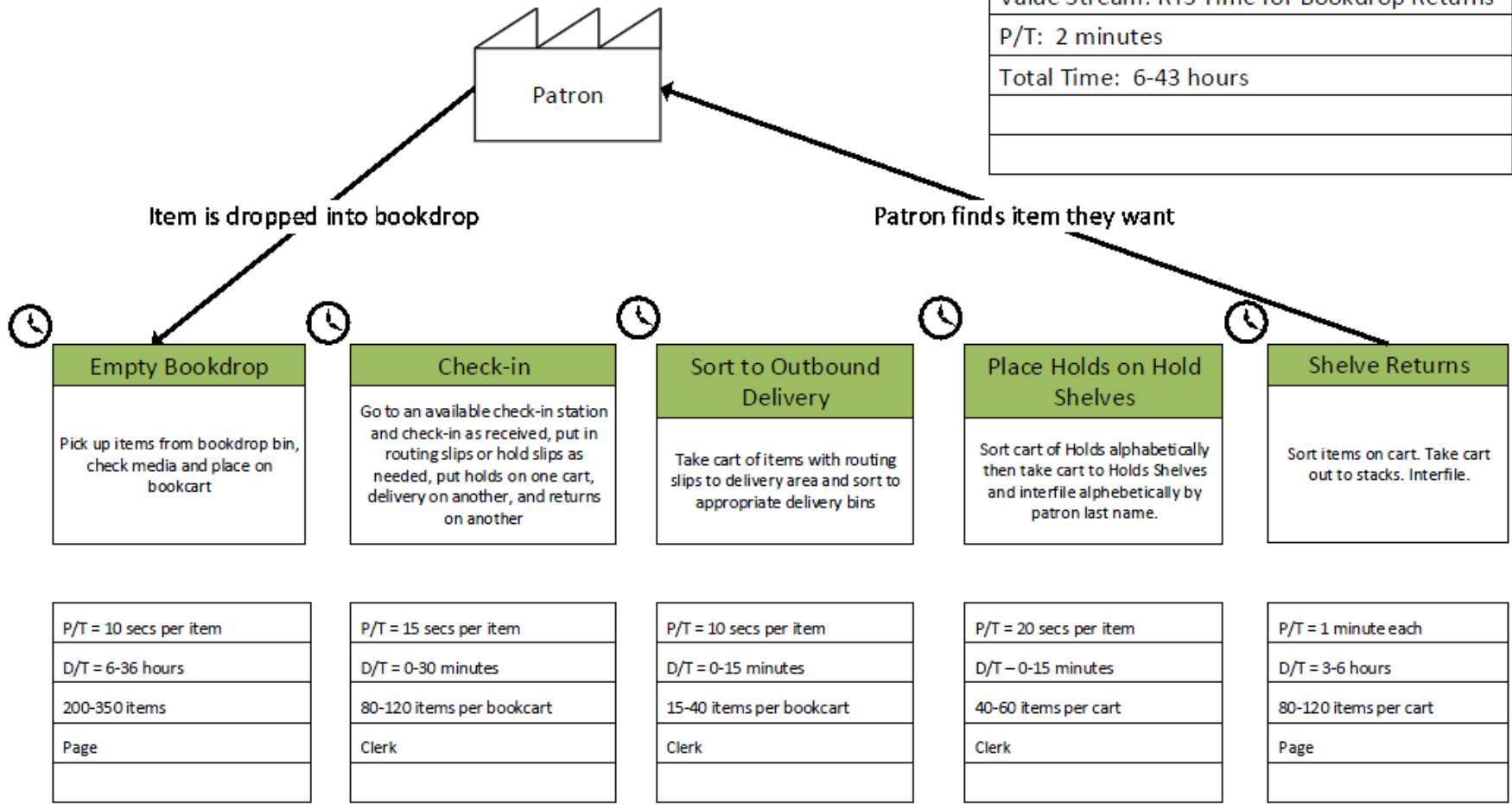
Value Stream Map – high level view

- Designed for leadership (people who can authorize changes)

Process Maps – micro view of each step

- Created by people doing the work
- Includes:
 - Each step of process
 - Person doing the work
 - Equipment used
 - Handoffs
 - All “wait times”

Value Stream: RTS Time for Bookdrop Returns
P/T: 2 minutes
Total Time: 6-43 hours



Empty Bookdrop

Pick up items from bookdrop bin, check media and place on bookcart

Check-in

Go to an available check-in station and check-in as received, put in routing slips or hold slips as needed, put holds on one cart, delivery on another, and returns on another

Sort to Outbound Delivery

Take cart of items with routing slips to delivery area and sort to appropriate delivery bins

Place Holds on Hold Shelves

Sort cart of Holds alphabetically then take cart to Holds Shelves and interfile alphabetically by patron last name.

Shelve Returns

Sort items on cart. Take cart out to stacks. Interfile.

P/T = 10 secs per item
D/T = 6-36 hours
200-350 items
Page

P/T = 15 secs per item
D/T = 0-30 minutes
80-120 items per bookcart
Clerk

P/T = 10 secs per item
D/T = 0-15 minutes
15-40 items per bookcart
Clerk

P/T = 20 secs per item
D/T = 0-15 minutes
40-60 items per cart
Clerk

P/T = 1 minute each
D/T = 3-6 hours
80-120 items per cart
Page

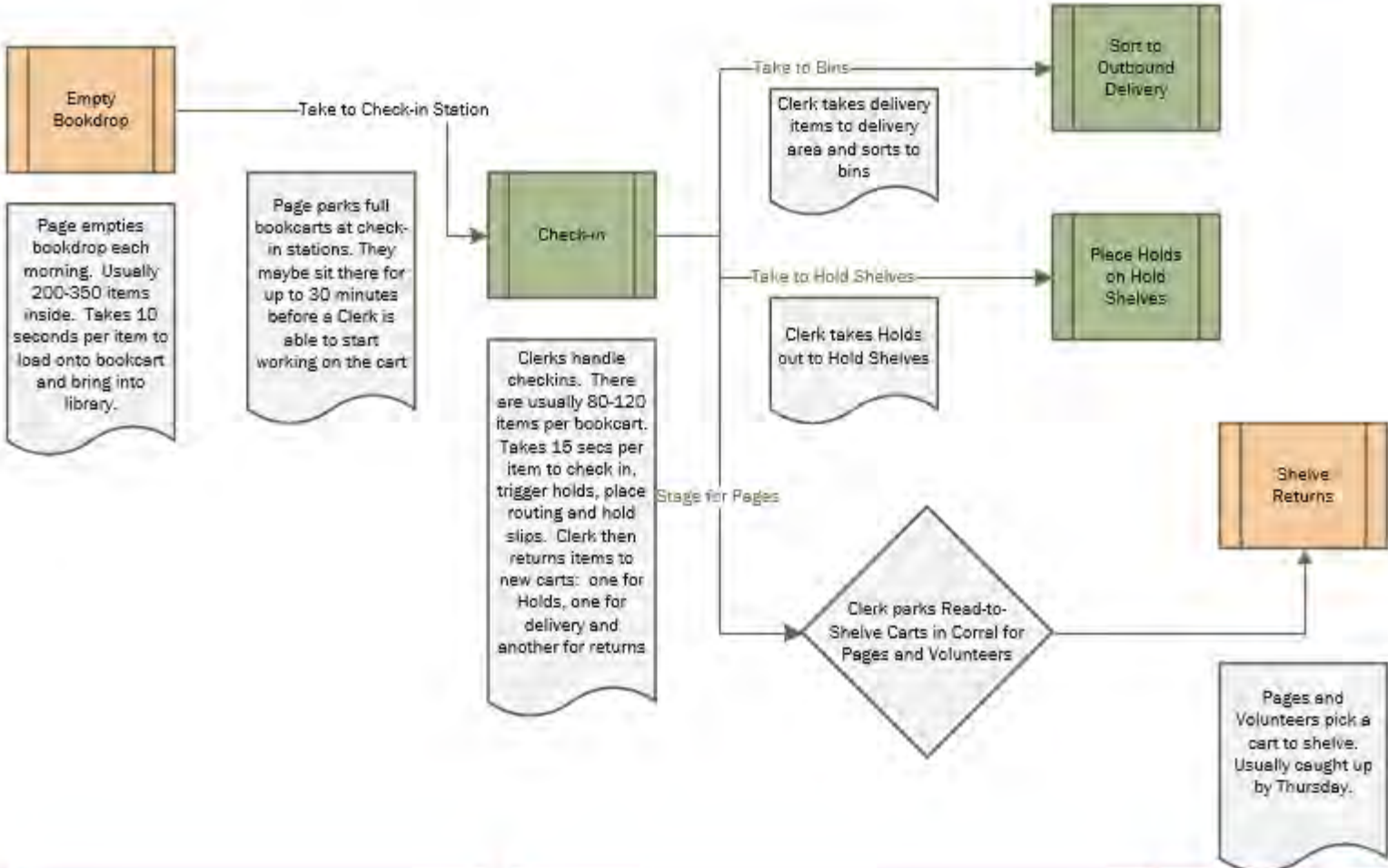
P/T	10 secs	15 secs	10 secs	20 secs	1 min
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D/T	2-36 hours	0-30 mins	0-15 mins	0-15 mins	3-6 hours
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Process Map

SEQ	Process Steps	Process Time (PT)	Lead Time (LT)
1	Page gathers 3 bookcarts and take them to bookdrop return area	3	3
2	Page picks up items off floor	30	30
3	if media, check disc and contents		
5	Arrange stacks on bookcarts	10	10
7	Take book cart to check-in workstation	3	3
8	WAIT (for clerk to be available)		60
9	Clerk scans each item to check-in	30	30
10	resensitize		
11	place on shelving bookcart		
12	if hold triggered, put slip in book and place on Holds bookcart		
	Clerk takes Holds cart to high priority shelving staging area	3	3
	WAIT (for pages who do shelving)		10
	Page shelves Holds	15	15
	Clerk takes outgoing delivery items to delivery bins	6	6
	Clerk sorts outgoing delivery to bins	8	8
	Clerk takes returns to low priority shelving staging area	10	10
13	WAIT (for pages who will do shelving)		120
15	Page shelves returns to Sorting Shelves	15	15
16	WAIT		2160
17	Page (or volunteer)loads books from Sorting Shelves to cart	5	5
18	Shelve	45	45
	TOTAL PROCESS TIME (per cart)	183	
	TOTAL LEAD TIMES		2533

Bookdrop Returns Workflow



9am-9:45am
45 minutes

8:00 AM - 9:00 AM
60 minutes per bookcart

9am-9:45am
2 hours - 3 days



**ANALYZE THE PROCESS AND FIND
THE WASTE**

Critical Questions for the Team



- What equipment changes would make a difference?
- Do we really need all these steps?
- How can we eliminate all delays and make this process flow?
 - adjust work assignments
 - plan around “peak” volumes
 - simplify!

Find Ways to Eliminate...

- Excessive walking, reaching, or bending
- Wait times and delays
- Errors and defects
- Handoffs between people
- Transfers of material



Implement New Workflow and Begin Monitoring Results

- Not as easy as it sounds
 - may require new equipment
 - may require training
 - will undoubtedly require workspace changes



- Make sure you are doing the measurements that will tell you how you are doing – in terms of value to the customer

***FOCUS ON LABOR EFFICIENCY AND
PRODUCTIVITY AFTER THE PROCESS
HAS BEEN STREAMLINED, BATCH SIZES
REDUCED AND LEAD TIMES REDUCED.***

(Huber)



**CONTINUE TO MAKE
ADJUSTMENTS**

Continuous Improvement

- An important Lean principle because...
 - Conditions change
 - Always room for improvement
- Everyone should be looking for those improvements every day
- Many Lean tools to support continuous improvement

Goal: status of system can be understood at a glance for everyone

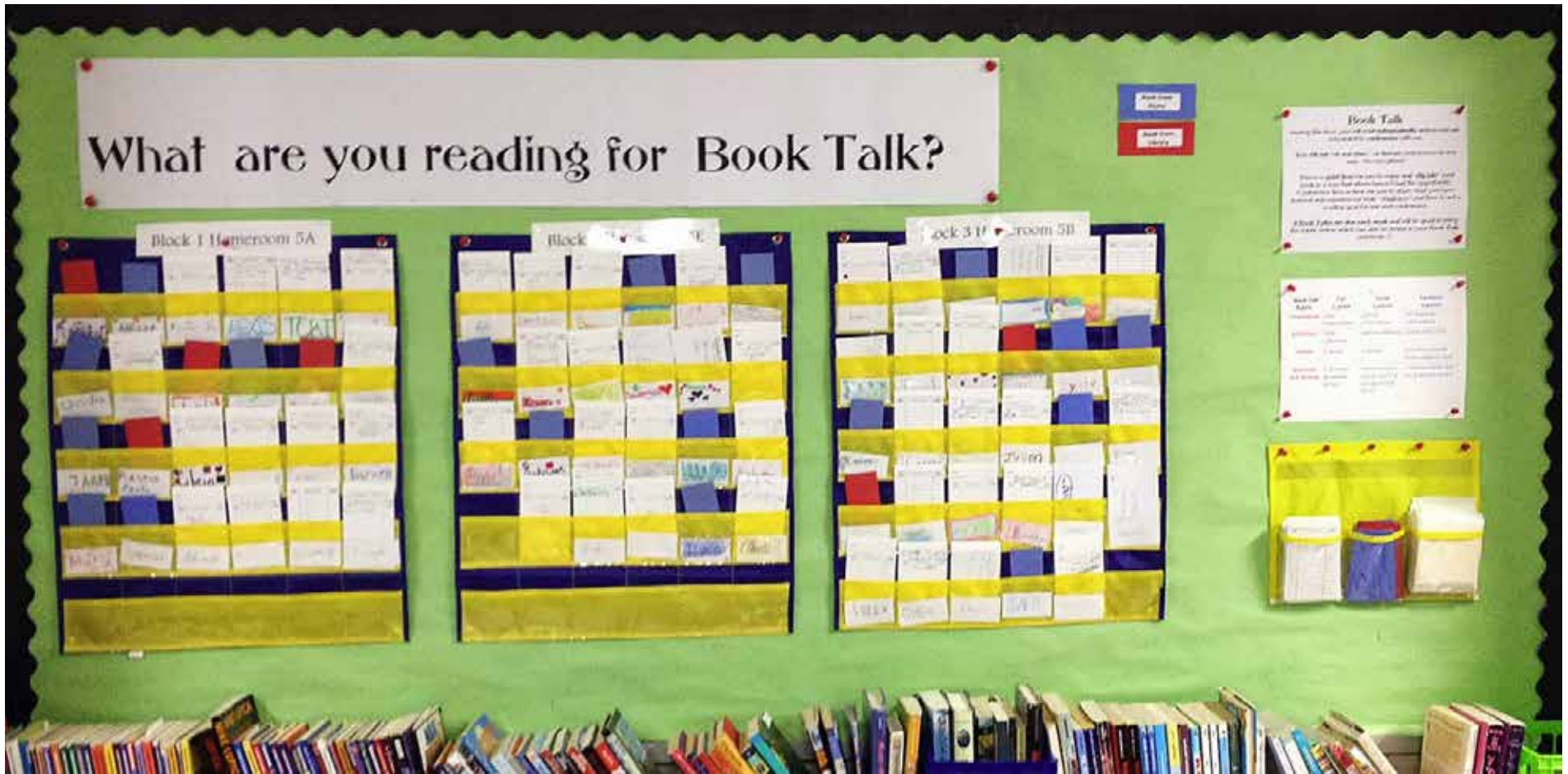
VISUAL MANAGEMENT

Display Boards Showing Goals and Key Metrics

600	139
300	359
300	344
600	501

MAR 11 2005

Teachers are Naturals at Visual Management!



Display Board Reveal Problems to Address

<u>DATE</u> (DD/MM)	<u>PLAN</u>	<u>ACTUAL</u>	<u>VARIANCE</u>	<u>PROBLEM</u>	<u>STATUS</u>
OCT.02-03 Days	30	38	+8		OK
OCT.02-03 A	16	16	0	<ul style="list-style-type: none"> - 2 pm. 600 (COT) (4 each) - Short roll plates remainder of shift - DCR, Top 4 Room 605-103 repaired one spot - made 2 sec. of 605-103 to finish order calculation 	C.L
OCT.03-2003 Days	30	18	-12	Meeting 45 mins. Downtime 2 1/2 hrs., wait for using machine	OK
03-10-03 A	30	30	0	Meeting 45 min. Downtime wait for using machine 1 hr.	C.L
06-10-03 N	30	24	-6	<ul style="list-style-type: none"> - Didn't start running this machine till 12 pm - waiting for roll to be installed - 1st roll installed 11:45 AM Roll 2nd roll 	MLT

Labeling Work-in-Progress



Monday
TUESDAY
Wednesday
THURSDAY
FRIDAY
SATURDAY

TODAY'S COLOR IS Wednesday
OLDEST COLOR IS MONDAY
LIME GREEN FLAGS ARE PRIORITY

Sunday	Sunday
Monday	
Tuesday	Tuesday
Wednesday	



“Sorting” Shelves are NOT Visual Management

- Don't know how bad backlog is
- Wasted steps of shelving and unshelving





LEAN TOOL: FIVE SS OF EFFICIENCY

#1 Sort

- Retain, Return, Rid
- Only what is needed, in its proper place, clean and ready to use
- When in doubt, move it out





#2 Straighten

- Find a place for every essential item, delineate it and label it
- A place for everything and everything in its place





#3 Scrub

- Clean work areas make everyone feel better, are safer, and reveal problems



#4 Systematize

Keep area

- organized
- orderly
- clean



5 Standardize

- Make this the new status quo
- “Standardized Work”

Standardized Work 4: Job Instruction Sheet

Job Instruction Sheet		Part #		Required Quantity:	Date:	Dept. /Location:		Team Leader:	Supervisor:
		Part Name				Prepared By:			
#	Step	Quality Check		Note	Time	Task Time	Cycle Time	STD WIP	<input type="checkbox"/> Quality <input type="checkbox"/> Safety <input type="checkbox"/> STD WIP
		Sampling	Tool						
Total									

Karen Ellison





WHERE LIBRARIES OFTEN GO WRONG

Bookcart Defines the Batch Size

"Large batches are the result of placing too much emphasis on labor efficiency and not enough on delivery lead times or the performance of the service chain as a whole." (Huber)

Think Differently About Bookcarts

Okay NOT to fill a bookcart

- Better ergonomically
- Limiting items on bookcart to smaller batch can reduce need to presort





Reliance on Staging Areas

Libraries use lots of different things for staging:

- Sorting carts
- Ready to shelve carts
- Sorting shelves
- Stacks
- All of the above!



"Staging areas hide inefficiencies and imbalances between workstations and staff, and they are an open admission by management that they have designed into the service flow imbalances and delays" (Huber)

Lack of Acquisitions Master Schedule

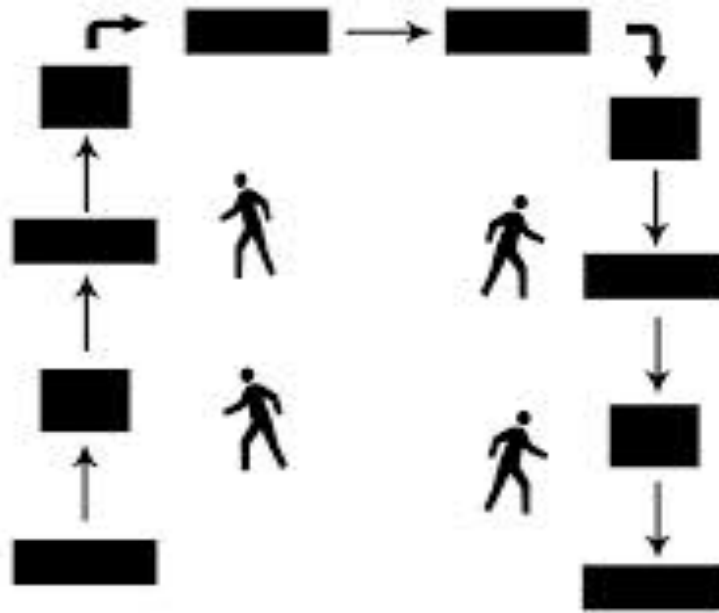


Exceptions and Expedited Workflows

- Expedited Workflows (holds, media)
- Volunteers who choose material they want to shelve instead of what needs to be shelved
- Staff unwilling to pitch in to help when needed
- Very difficult to design a workflow with lots of exceptions

Make a Single Workflow

- You should be able to stand in the middle of a process and see where everything is and how everything is doing (U-shape)



Rigid Staff Roles

- Surges are a way of life (delivery, holidays, new acquisitions)
- Implement flexible job descriptions
- Cross train staff so they can be more flexible about handling surges
- Seeing the bottlenecks and clogs in the flow isn't useful if you can't put resources to the task of unclogging

“If the current organizational structure cannot change, then the processes behind this organizational structure cannot change either” (Huber)

San Jose Lessons Learned

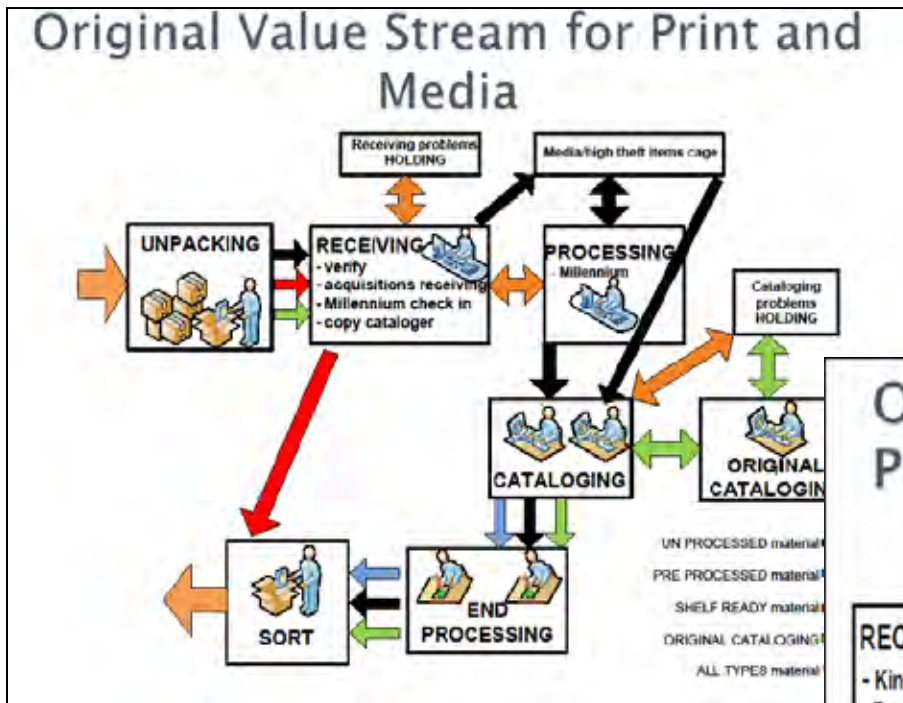
- Don't need staging areas for sorting
- Sort only to top shelves of book carts
- Two return slots are better than four



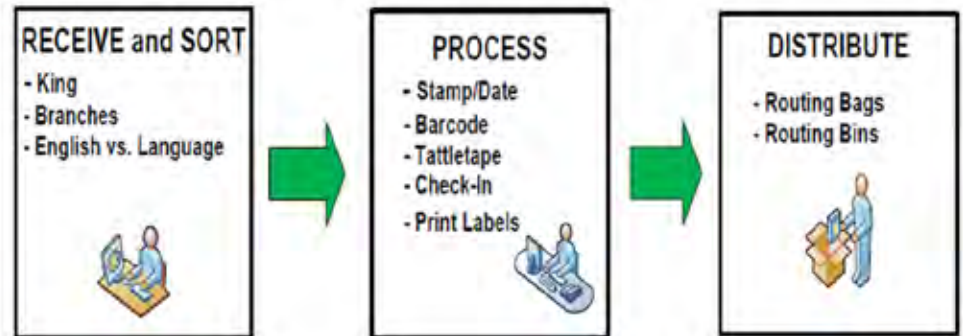
San Jose's Lean Project

- Time for returned materials back to shelf went from 23 hours to 15 hours
- 20% reduction in labor costs
- Improved employee productivity and morale
- Improved space utilization
- Staff re-assigned to relational work

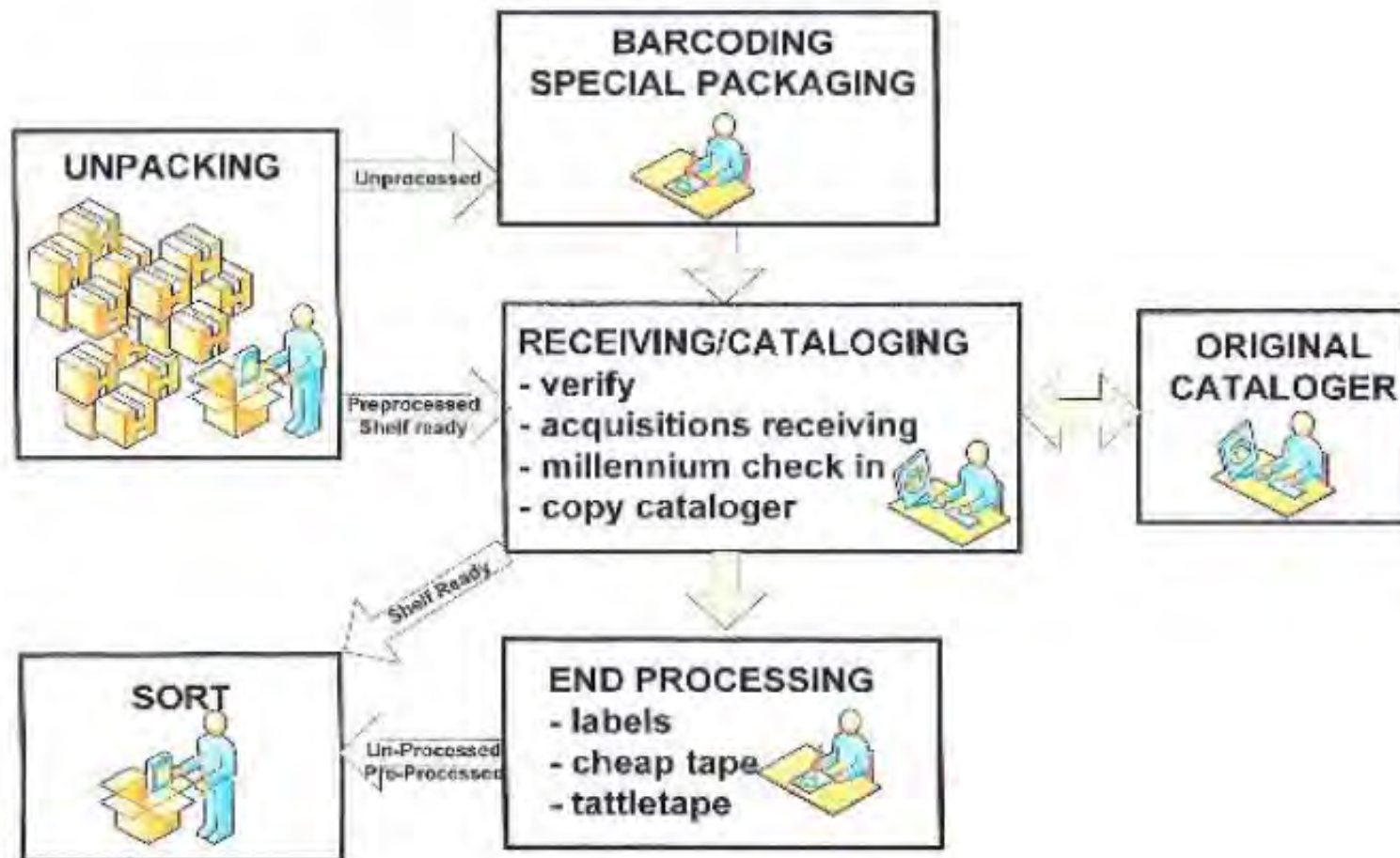
San Jose's 2nd Lean Project



Original Value Stream for Periodicals – Separate Work Flow



New Value Stream for Print, Media and Periodicals



Getting Started with Lean

- Huber, John J. (2011) Lean Library Management: Eleven Strategies for Reducing Costs and Improving Customer Services, Neal-Schuman Publishers, New York.
- Review SJPL Presentation (CLA 2012)
- Free webinars from Lean office consultant Karen Martin: <http://www.ksmartin.com/webinars/>

Questions?

Thank you.

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