Lean Work Cell Design: Taking the Lessons of Cellular Manufacturing into Service Organizations

Dr. Lars Maaseidvaag
MoreSteam.com
Agenda

• Welcome

• Introduction of MBB Webcast Series
  – Ellen Milnes, MoreSteam.com

• Today’s Session
  – Lars Maaseidvaag, MoreSteam.com

• Open Discussion and Questions
MoreSteam.com

- Founded in 2000
- Trained 400,000 Lean Six Sigma professionals
- Served over 2,000 corporate customers (including 50+% of the F500)
- First firm to offer the complete Black Belt curriculum online
- Courses reviewed and approved by ASQ and PMI
- Academic Partnerships with Ohio State University, Cal Poly and George Washington University
Today’s Presenter

Lars Maaseidvaag

Senior Master Black Belt, MoreSteam.com

- Leads Lean curriculum development; MBB instructor
- Previous Curriculum Director for Accenture/George Group
- PhD in Operations Research from the Illinois Institute of Technology; M.S. in Operations Research & Industrial Engineering as well as an MBA from The University of Texas in Austin
The cellular manufacturing concept is built around the idea of task specialization and repetition.

Find the family of work that shares similar resources and tasks.
# Manufacturing Routings

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Cells come in many shapes and sizes, but they are all focused on eliminating TIMWOOD

T – minimize the transportation distances
I – minimize the work in process
M – proper motions for workers
W – minimize waiting
O – eliminate over-production
O – design out over-processing
D – defects are identified quickly
In many cases, service processes and tasks experience higher variation than manufacturing processes.

Machine limitations are well known – a lathe can turn, and a grinder can grind.

But our ‘machines’ in a service process, our people, are often assumed to have how much flexibility?

What are the likely, perhaps even inevitable results of high variation? Imbalance, queuing, low utilization periods mixed with periods of panic.
The process of creating a family of work for a cell reduces the variation of work for the cell, and often for the other processes as well.

Cell Families Reduce Variation
What are some options when you don’t have enough volume to fill a dedicated cell?

In addition to all of the TIMWOOD sources of waste that cells help eliminate, perhaps the largest is the tremendous reduction or complete elimination of setups or changeovers.

And humans in service processes have ‘setups’ just like machines!
Unlike parts in manufacturing, customers to service processes are typically self-optimizing.

Grocery stores have created three ‘cells’ for the customers to choose from:

- Self-checkout: less motion, shorter queues, variation reduction?
- 10-items: less variation between customers
- Traditional lane: full service, full flexibility, more variation

Airport Check-in:

- Kiosks: low variation, low options
- Counter: full service, high variation
- Self-print: low options, no variation?
The ‘Case’ team is the classic service implementation of a manufacturing work cell.

T – reduce transportation of material  
I – reduce inventory of WIP  
M – reduce motion of people  
W – reduce waiting of worker and WIP  
O – reduce over production  
O – reduce over processing  
D – reduce defects

T – reduce transportation of information  
I – reduce inventory of customers waiting  
M – reduce motion of people and customers  
W – reduce waiting of worker and customer  
O – not typically applicable  
O – reduce losing track of customer needs  
D – reduce defects!!!

Case teams and cells are typically more scalable than large all-inclusive processes, and easier to balance and adjust to mix changes.
Move yourself, not the customer

With more flexible equipment, both manufacturing and services processes can become zero-flow, where the work or the customer stays in one place while the process comes to them.
The Center for Family Safety and Healing

A cellular approach moved all of the resources needed for a family in crisis into a single building, eliminating travel for the family, improving communication between the various specialists, removing most of the waiting, and reducing the chance for information and families to fall “between the cracks”.

The case teams consist of (see bizjournals link for full story):

- Columbus Division of Police’s sexual abuse squad.
- Franklin County Children Services' sexual abuse investigative team.
- Three Franklin County assistant prosecutors and three deputy sheriffs.
- Domestic violence advocates from the state Choices program.
- Children's Hospital's medical team, consisting of physicians, forensic social workers and nurse practitioners.
- Mental health professional and hospital therapists, providing ongoing treatment to victims and family members.

http://www.nationwidechildrens.org/about-center-for-child-family-advocacy
Akron Children’s Hospital

Zero Flow - A mobile triage cart was designed, eliminating the need for separate triage rooms, reducing the need to move patients and families, and creating an additional 4 exam rooms.

In this case, the cart became the mobile work cell.
Clinics and outpatient centers, focused on a family of healthcare tasks are the focused factories of healthcare. They all rely on the principles of cellular design and finding a family of similar tasks.

In some cases, the tasks are centered around the time for the tasks and the resources staffing the clinic, as in the CVS and Wal-Mart clinic examples. In other cases, the tasks are centered around specific specialties or treatment protocols, as seen with the Ohio State Cancer Treatment Center or center specifically for the treatment of diabetes or other ailments.

Referring to clinics at CVS Drugstores and Wal-Mart:

"They're not doing brain surgery in those clinics -- they're doing highly evidence-based protocols for about 26 procedures," she noted. "And studies have shown they're cheaper and better for the limited menu of what they do, as focused factories, than emergency rooms or primary care physicians' offices."

http://www.medpagetoday.com/MeetingCoverage/AAPM/25627
The Vanderbilt University Trauma Center underwent a complete transformation from a process characterized by functional departments, poor patient and information flow, inconsistency, and heavy rework of communication.

The new trauma center was built around cellular concepts to reduce all the sources of TIMWOOD waste, cutting cost at the same time as patient satisfaction and outcomes where improved.

*Please take some time to review this presentation from: Innovations in Healthcare Delivery, September 18-19, 2008, Cincinnati, OH*

http://www.cincinnatichildrens.org/assets/0/78/1067/2709/2807/2813/720516cb-d1ee-4d11-9f81-52ade90e600a.pdf
Questions
Master Black Belt Program

• Offered in partnership with Fisher College of Business at The Ohio State University

• Employs a Blended Learning model with world-class instruction delivered in both the classroom and online

• Covers the MBB Body of Knowledge, topics ranging from advanced DOE to Leading Change to Finance for MBBs
Thank you for joining us

Questions? Comments about today’s program?

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Watch for info about our September 26th Webcast

“Lessons Learned from Large Deployments” – Whitney Mantonya, Collaborative Lean Solutions

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