

Participatory Ergonomics: A Path to Sustainable Ergonomics

By
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Overview

- ◆ What do we mean by participatory ergonomics?
- ◆ How do we grow a participatory approach?
- ◆ Examples
 - ◆ Industrial
 - ◆ Office
 - ◆ Developing Countries

Participatory Ergonomics

- ◆ Two extremes to foster ergonomics:
 - ◆ Top-Down “Push”
 - ◆ Bottom-Up “Pull”

The Top-Down Push Approach

💧 “You will do ergonomics, and here’s how you will do it!”



Image Source: <http://www.flickr.com/photos/whitehouse/3583564972/>



Image Source: <http://www.flickr.com/photos/lara604/4689353343/in/set-72157615555925749>

Bottom-Up Pull Approach

💧 “Can we get a little help down here please?”



Images Source: Peter Budnick private collection

In practice, it's push-and-pull that leads to success and sustainability



Images Source: Peter Budnick private collection

Growing Participation

- ◆ The role of the Ergonomist:
 - ◆ Leadership & participation
 - ◆ Gaining respect & approval from leadership
 - ◆ Gaining respect & approval from associates & stakeholders
 - ◆ Providing ergonomics expertise
 - ◆ Developing repeatable, sustainable processes
 - ◆ Pushing & pulling as needed

Growing Participation: Depends on Organization

- ◆ Some organizational structures are more conducive to participation than others
- ◆ Hierarchical, top-down, push style management may resist
- ◆ Flatter, distributed responsibility management may embrace
- ◆ Either way, it's all about promoting and demonstrating the value of ergonomics

The Silo Challenge



Image Source: http://en.wikipedia.org/wiki/File:Ralls_Texas_Grain_Silos_2010.jpg


Ergonomics is Cross-Functional by Nature

- ◆ Ergonomics can be applied to improve (at the least):
 - ◆ Organizational management methods (organizational ergonomics)
 - ◆ Production metrics (physical, cognitive, organizational ergonomics)
 - ◆ Safety, health and wellness (physical, organizational ergonomics)
 - ◆ Product design (physical, cognitive ergonomics)
 - ◆ Sales, marketing and customer service (cognitive, organizational, physical ergonomics)
- ◆ Ergonomists should be leaders in cross-functional teaming efforts

The (so called) Lean Journey

- ◆ Two foundational pillars for success:
 - ◆ Continuous Improvement
 - ◆ Respect for People

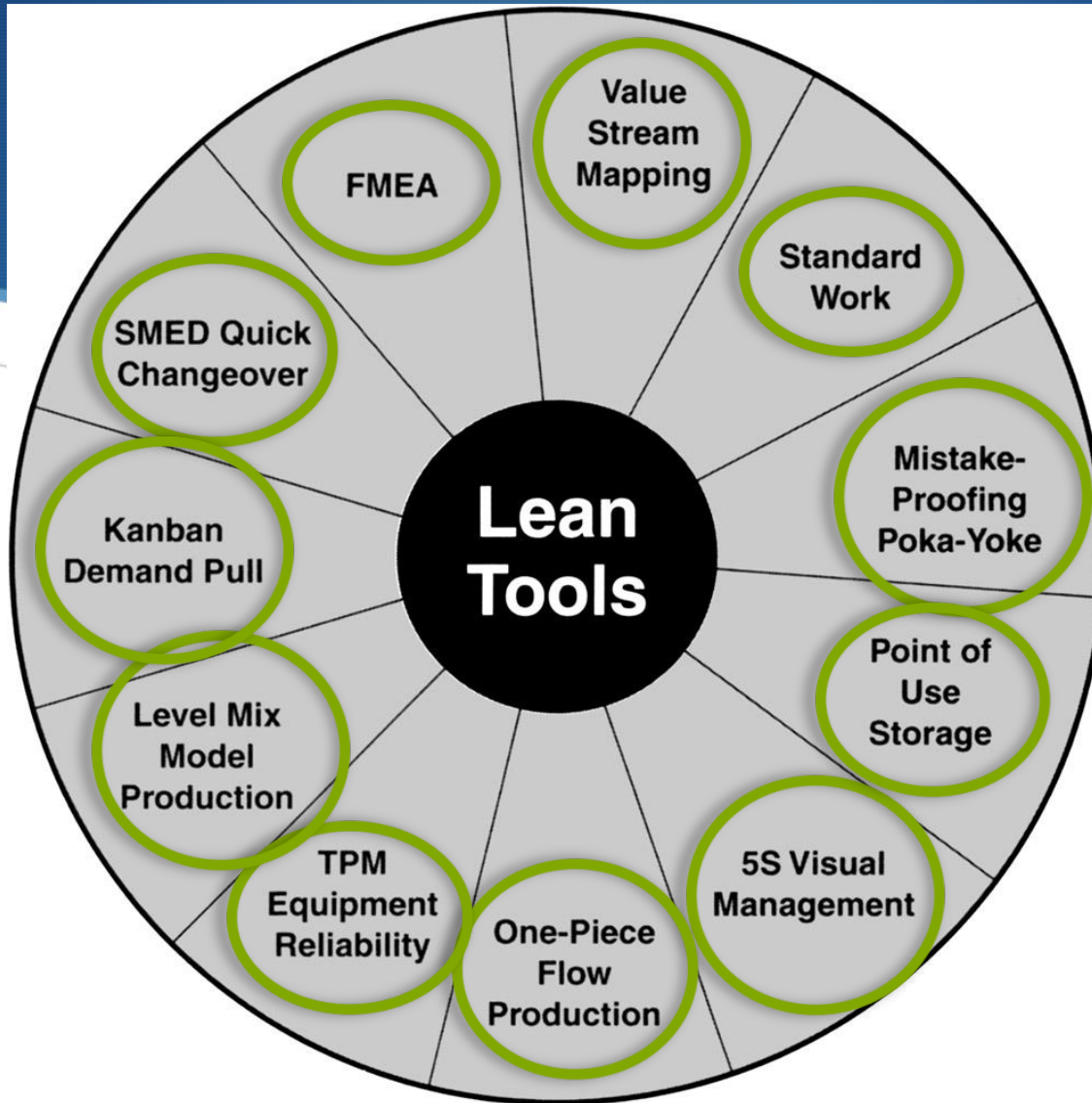
- ◆ Ergonomics *is* Respect for People, and Continuous Improvement is *what we do*



“... the best way to make money for the stockholders is to take very good care of all of the stakeholders.”

Bill Waddell, Lean Consultant and Blogger

Source: <http://www.evolvingexcellence.com/blog/2013/01/shareholders-versus-stakeholders.html>



Adapted from <http://www.bexcellence.org/Lean-manufacturing.html>

Successful Lean *Requires* Ergonomics

- ◆ Make ergonomics an integral part of cross-functional improvement teams and efforts:
 - ◆ Create value for ergonomics beyond MSDs alone
 - ◆ Promote and demonstrate respect for people as a core team value
 - ◆ Be a leader in Lean efforts to ensure ergonomics is recognized, valued and applied

Participatory Examples: Industrial

- ◆ Many great examples in the Applied Ergonomics Conference Ergo Cup competitions

Boeing Ergo Cup Example

- ◆ Problem:

Injuries and product damage while installing 136 lb. aircraft doors.

- ◆ Solution:

Employees designed, built and implemented an assistive tool.

- ◆ Outcome:

Eliminated injury potential; **eliminated parts damage potential; reduced manpower requirement; reduced install time; achieved 67% overall reduction in installation cost.**

Source: Ergoweb's ROI Training, example gathered from Applied Ergonomics Conference Ergo Cup competitions

<http://www.iienet2.org/ergo/Conference/>

Ford Motor Company Ergo Cup Example

◆ Problem:

Worker installing a 26 lb. radiator 80 in. overhead, then apply 72 lb. downward force to seat part.

◆ Solution:

Modify a hoist to assist the lift, placement and seating of radiator.

◆ Outcome:

Previous process resulted in 351 restricted work days, 1 lost work day (\$17K cost); new process resulted in 0 restricted or lost days, **0 quality concerns**.

Source: Ergoweb's ROI Training, example gathered from Applied Ergonomics Conference Ergo Cup competitions

<http://www.iienet2.org/ergo/Conference/>

Honda of America Ergo Cup Example

◆ Problem:

Worker had to apply 71 lb. force to turn steering wheel to find true center when automated processes failed.

◆ Solution:

Designed, developed and implemented portable device to assist workers.

◆ Outcome:

Reduced force requirement to 4 lb. (94% reduction); reduced time requirement by 62%; reduced rejects to near 0; cost savings and avoidance of \$80K with \$1K investment; 1910% ROI; patent application for new device

Source: Ergoweb's ROI Training, example gathered from Applied Ergonomics Conference Ergo Cup competitions

<http://www.iienet2.org/ergo/Conference/>

Participatory Examples: Office



Image Source: <http://www.ergoadvocate.com/>

Verizon Example

- ◆ Problem:

MSDs and absenteeism

- ◆ Solution:

Institute an ergonomics program

- ◆ Outcome:

33% decrease in MSDs in first 12 months, 60% decrease in MSDs in 24 months, saved \$1,700,000 in direct medical costs in 2 years, gained \$503,685 in productivity improvements in 2 years, tied ergonomics to corporate absenteeism objective; saved upwards of \$6 million on that alone.

Source: <http://www.ergoweb.com/news/detail.cfm?id=645>



“Traditional ergonomic measures do NOT
keep corporate executives up at night.”

Jack D'Angelo, VP, Verizon

Source: <http://www.ergoweb.com/news/detail.cfm?id=645>

American Express Example

- Problem:
MSDs and Workers Comp costs

- Solution:
1997: Ergonomics Program in Minneapolis operations became GAO case study; 2003 roll-out to entire company with strong focus on self-help, participatory web based features backed by experts as needed

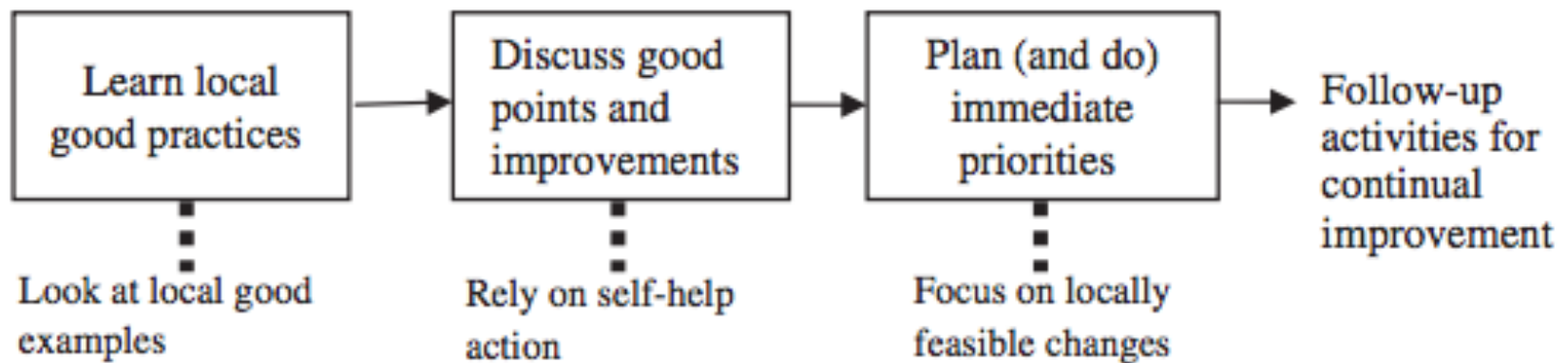
- Outcome:
79% reduction in WC claims; 50% reduction in claims; \$7.2 company-wide savings in WC costs alone over 4 yrs

This is the program and process that the ErgoAdvocate® Office Ergonomics system is based on.

Source: <http://www.ErgoAdvocate.com>

Participatory Examples: Industrially Developing Countries

◆ Asian Work Improvement Network



Source: Peter Budnick, Kazutaka Kogi, David O'Neill, (2012). Examples of Practical Ergonomics in Industrially Developing Countries. *Ergonomics In Design*, October 2012, 20:5, pp 5-11, doi: 10.1177/1064804612460041.

Materials handling



Mobile rack for semi-finished products (China)

Workstation design



Elbow-level kitchen work (Vietnam)

Workstation design



Labels for controls (Vietnam)

Welfare facilities



Resting corner (Malaysia)

Work organization



Lighting for teamwork (Japan)

Work organization



Group training by a farmer trainer (Vietnam)

Source: Peter Budnick, Kazutaka Kogi, David O'Neill, (2012). Examples of Practical Ergonomics in Industrially Developing Countries. *Ergonomics In Design*, October 2012, 20:5, pp 5-11, doi: 10.1177/1064804612460041.



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Tractor “Graveyard”



Source: Peter Budnick, Kazutaka Kogi, David O’Neill, (2012). Examples of Practical Ergonomics in Industrially Developing Countries. *Ergonomics In Design*, October 2012, 20:5, pp 5-11, doi: 10.1177/1064804612460041.

Take-Away Points

- ◆ Participatory ergonomics is a natural fit with operational excellence initiatives
- ◆ Ergonomists are in a unique position to contribute to or lead cross-functional improvement teams
- ◆ Ergonomics produces a great deal of value, well-beyond safety, health and wellness
- ◆ Participatory ergonomics fosters self-help, responsibility and accountability among all stakeholders
- ◆ Participatory ergonomics is sustainable

Thank You

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