

# Participatory Ergonomics: A Path to Sustainable Ergonomics

By  
Peter Budnick, PhD, CPE



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The logo icon for Ergobuyer, featuring a stylized human figure in blue and green within a circular frame.

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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/>

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Image Source:

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

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# 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



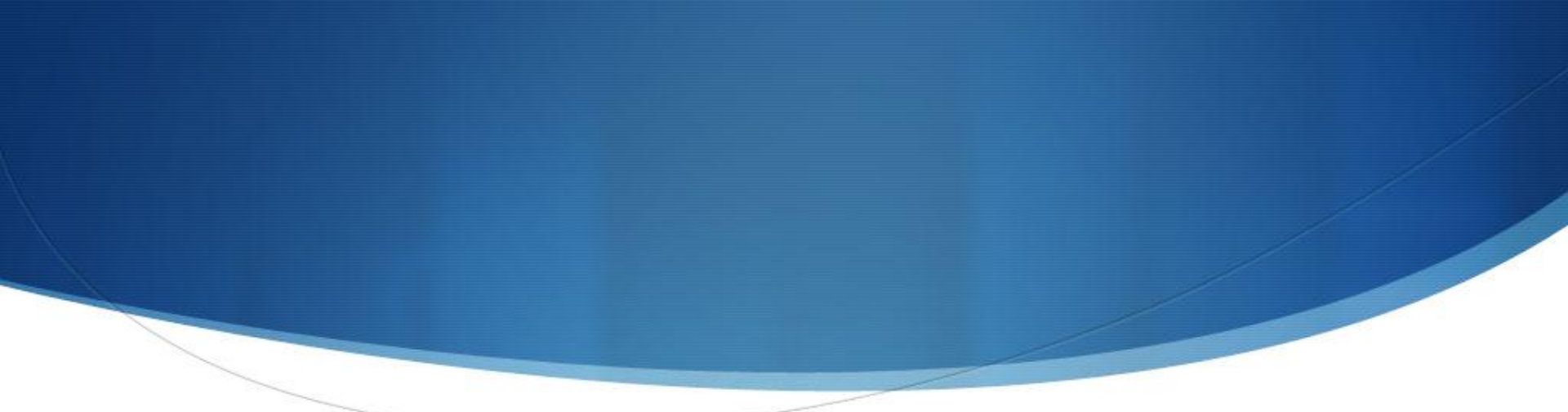
Image Source: [http://en.wikipedia.org/wiki/File:Ralls\\_Texas\\_Grain\\_Silos\\_2010.jpg](http://en.wikipedia.org/wiki/File:Ralls_Texas_Grain_Silos_2010.jpg)

# 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

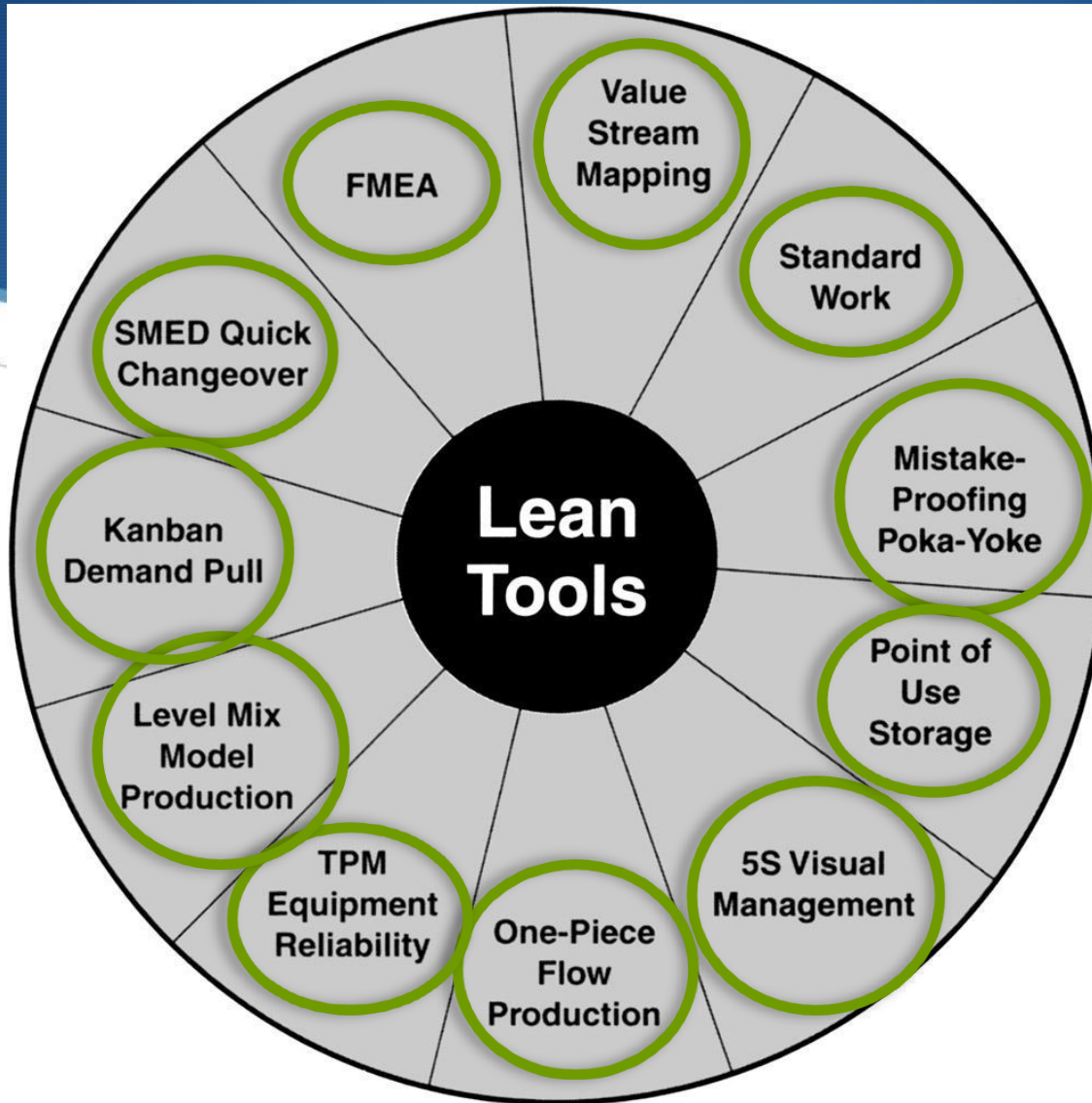
- ◆ Two foundational pillars for success:
  - ◆ Continuous Improvement
  - ◆ Respect for People
  
- ◆ Ergonomics *is* Respect for People, and Continuous Improvement is *what we do*



“... 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

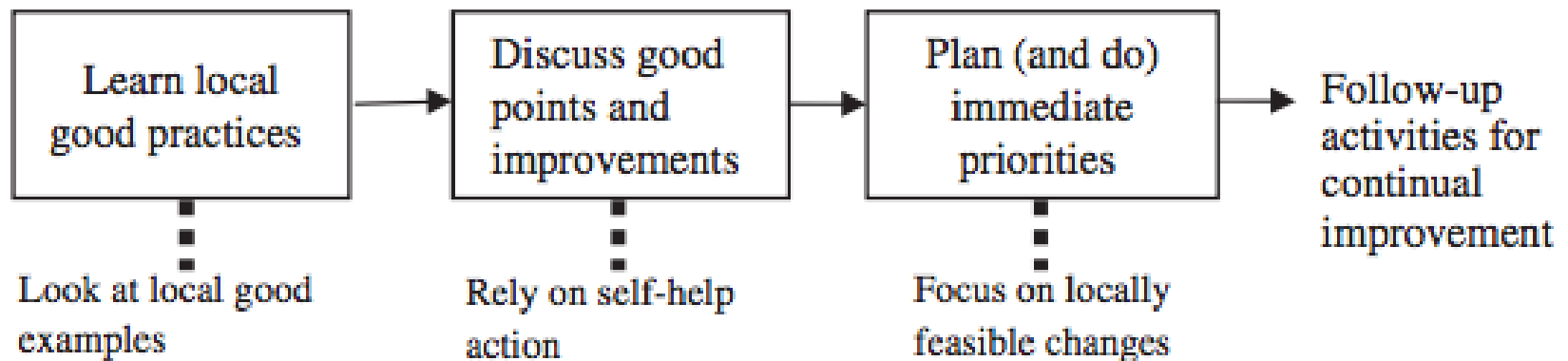
- ◆ Outcome:

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

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

# 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)

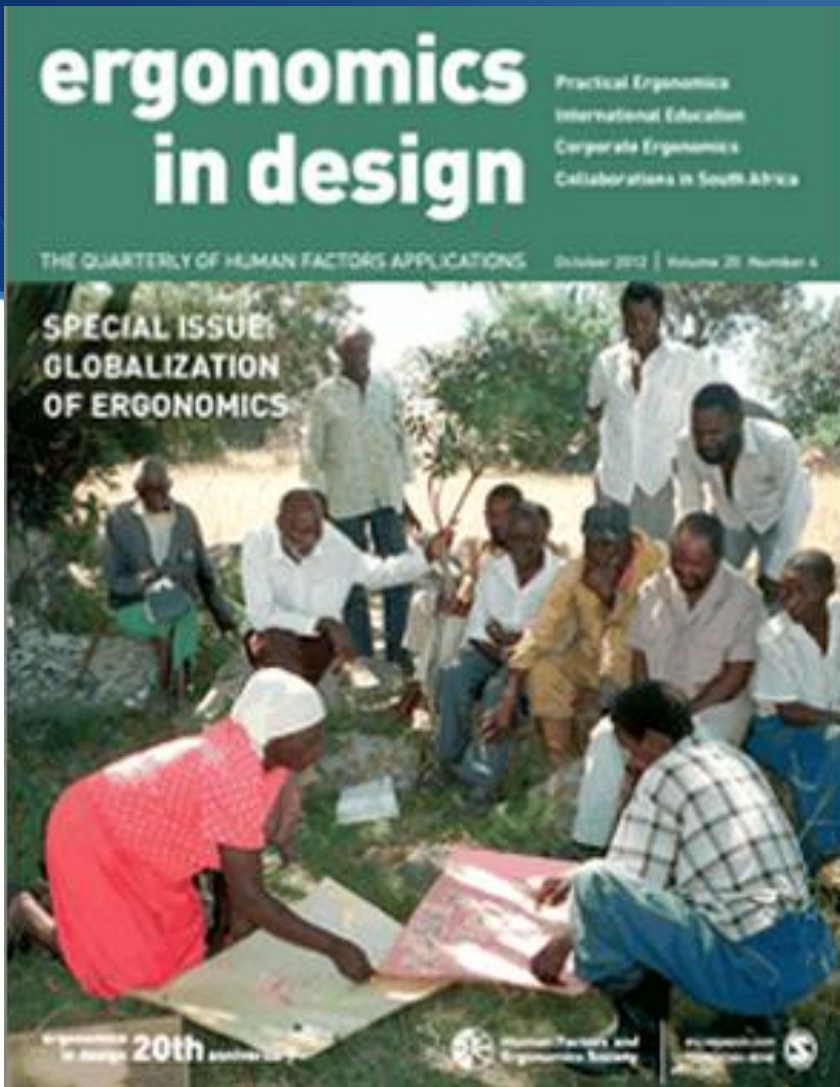
### Work organization



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

Peter Budnick, PhD, CPE

Ergoweb® Inc., ErgoAdvocate® LLC, Ergobuyer® LLC

435-214-4266

[budnick@ergoweb.com](mailto:budnick@ergoweb.com)

