Work Systems Division

Town Hall Meeting

Industrial and Systems Engineering Research Conference

05/20/2013
Meeting Agenda: (75 min) - Tues. May 21th, 8:00 – 9:15 AM

1. Welcome, Agenda, & Introductions – (Sign-in/Contact info)
3. 2013 Abs/Tutorials/Best Paper
4. IIE Best Practice Conf Preview; Oct 7th, 2013 in Chicago, IL. – George
5. 2012 Town Hall Meeting Follow-Up  3 Areas of Concern from 2012: SubTeam Exercise
   b. Academic Relations – A Plan to promote Academic Engagement – Dr Gonzalez
   c. Business Relations – A Plan to promote Business Relations - George
6. Productivity & GNP: US vs. China (Key Note Speaker) – Dr Macedo
7. Closing Comments - Richard
Work Systems Division - Past
Historical Timeline

**Beginnings** - Society for Work Science (inactive)
1. 2011 May - June - contact with IIE
2. A Team of Stakeholders were organized June - Sept to begin preparing for the 2012 ISERC & Solutions Conference
3. YE 2011 Division Name, Board of Directors, Policies, Pro's, Bi-Laws
4. Call for Abstracts & Selection Process Nov - Feb
5. Hosted WS Division at the 2012 Conference Orlando
6. July 2012 - Monthly Board of Directors Meetings began
7. Aug 2012 - Annual Conf preparations began (Call for Papers, etc)
8. Annual Officer Elections Nov 2012 - Mar 2013
9. 2013 Conf preparations Nov - May
10. 2013 ISERC & Annual Conf May 2013
VISION: (What we want to become)

Work Systems Division is to be the leading source for promoting advancements in the science, mathematics, and engineering principles that define Work Systems.

The Work Systems Division inspires those with an interest in designing, implementing, analyzing, and improving Work Systems in all environments (terrestrial, subterranean, underwater, atmospheric, outer space, cyberspace, etc.).

http://www.youtube.com/watch?v=EYg-cHe79hI
**MISSION:** *(What we are doing today)*

The Work Systems Division Primary focus is on defining/establishing a Work Systems Framework and Scientific Approach to design, standardization, measurement, analysis, and optimization.

We provide professional forums for IIE members, present advanced concepts in Work Systems theory and application, and define the Work Systems Body of Knowledge.

Division Members actively promote research, discovery, and open dialogue on the science, mathematics, and engineering discipline needed to design, build, operate, and sustain Work Systems.

Our efforts stimulate innovation, foster competitiveness, and promote advancements in Work Systems theory and practice.
# Work Systems Division - Current State

**Vision/Mission/Membership/2013 President Elect**

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**Grand Total:**

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Work Systems Division - Current State
Vision/Mission/Membership/2013 President Elect

Work Systems Division Officers
Past President  Richard Elliott  Boeing
President  Dr. Miguel Gonzales  University of Texas PA
President Elect  Ed Pound  Factory Physics

Work Systems Division Board of Directors & TVP's
George Bishop  West Monroe Partners
Dr. Jose Macedo  Cal Poly
Dr. Steven Alter  University of San Francisco
Dr. DJ Kong  Boeing
David Prestin  Boeing  Communications
Larry Aft  IIE Associate
Gwen Campbell  IIE Technical VP
IIE Solutions – 5 Presentations 3 Withdrawn

1. Combined Productivity Management & Ergonomics Based on MTM Process Description
2. Implementing Ergonomics Solutions through Lean workshops
3. Successful Applications of Work Sampling in Knowledge Work Environments
4. Work Measurement Approach w/Multifaceted Practical Usage in Process Improvement
5. Quality Improvement in Pharmacy Inventory Control
ISERC – 6 Presentations / 6 Withdrawn / 2 Posters

1. Productivity Evaluation for Visually Impaired Employees - A Sewing Industry Application
2. Time Study and Work Measurement: Impacts on Six Sigma Projects
3. Using a Systems Dynamics Model to Assess Skill Level Impact
4. Modeling an Aging Workforce: Impact on Eng Project Selection, Execution & Completion
5. Work Measurement in the 21st Century
6. IE-Renaissance based on the Fundament of Time Data Management
Work Systems Division - Current State
2013 Conference

ISERC – 4 Tutorials by Work Systems Board of Directors

1. Dr. Gonzales - Predetermine Motion-Time Sys Work Measurement Past, Present, Future
2. Dr Kong - Human Error, Safety, and Usability in Workplace: Theory and Application
4. Richard Elliott - Designing a Work System for Competitive Advantage

Will be posted on the IIE Website
Slated to become Webinars 2013 - 14
Best Paper Award

Abstract #624

*Using a Systems Dynamics Model to Assess Skill Level Impact*

R.J. Urbanic

Faculty of Engineering,
Department of Industrial and Manufacturing Systems Engineering
University of Windsor – Windsor, ON, Canada

Will be posted on the IIE Website
Best Practices Conference
Oct 7, 2013
Chicago, Ill
Division Board Members Recruiting Volunteers for:

2013 - 14

- Conference Coordinating Committee (Session Chairs; Montreal June 1 - 3)
- Communications Committee (Mthly Meetings, Webpage, 4 Webinars)
- Awards Committee
  - Best Application in WS Design &/or Improve (Industry - Solutions Conf)
  - Best Research Paper (Academic - ISERC)

2013 - 16

- Academic Sponsorship Committee (Fund Raising/Sponsorship)
  - Fund Raising/Sponsorship for Academic Research
  - Work Systems College Course Development - Pilot App's - Then Core Curriculum
- Work Systems Chapter in the Handbook of Industrial Engineering
SubTeam Exercises 10 min ea

Three Areas of Concern from 2012:

1. **Technical Content** – *7 Best Practices for Work Systems (What are they?)* - Rick
2. **Academic Relations** – *Promote Academic Engagement (How?)* – Miguel
3. **Business Relations** – *Promote Industry Relations (How?)* - George

A best practice is a method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark.

A "best" practice can evolve to become better as improvements are discovered.
State of US Manufacturing in the Global Arena

Jose Macedo
Cal Poly State University – San Luis Obispo
May 21, 2013
The Challenge for US Manufacturing

- Misperception by the general public that manufacturing in the US is in decline.
- Not enough high school students interested in technical careers in manufacturing.
- Industry’s cannot find enough skilled engineers and technicians.
Manufacturing in the U.S.
Manufacturing in the U.S.

Figure 1. Value Added in Manufacturing
Billions of U.S. Dollars, 2010


Note: * Data for France are for 2009.
Manufacturing in the U.S. vs China

World Bank Report 2012  http://data.worldbank.org/indicator/NV.IND.MANF.CD. Manufacturing refers to industries belonging to ISIC divisions 15-37. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3. Data are in current U.S. dollars.
Global Manufacturing

Figure 3. Share of Manufacturing in National Economies
(Manufacturing value added as percent of gross domestic product, 2010)

Sources: World Bank, computed from data available at http://data.worldbank.org/
indicator/NY.GDP.MKTP.CD and http://data.worldbank.org/indicator/
NY.IND.MANF.CN.

Note: Figures are rounded to nearest percentage point.

Figure 4. Change in Value Added in Manufacturing, 2000-2010
(Adjusted for inflation in each respective country)

Sources: Derived from U.S. Bureau of Labor Statistics, "International Comparisons of
Manufacturing Productivity and Unit Labor Cost Trends: Underlying Data Tables.
October 13, 2011, Figures for China, Mexico, and Taiwan derived from World Bank,
http://data.worldbank.org/indicator/NY.IND.MANF.CN.

Figure 7. Investment in Manufacturing Fixed Capital as Share of GDP, 2009

Sources: OECD, National Account Statistics, "Detailed National Accounts: Capital
formation by activity" and "Gross Domestic Product.

Figure 8. Service-Sector Inputs into Manufacturing
(Service-sector value added in manufactured goods as percentage of
total value added of manufactured goods, 2005)

Source: Organisation for Economic Co-operation and Development (OECD), STAN
Global Manufacturing

Figure 9. Services-Related Occupations in Manufacturing Industries
(Percentage of all employees in manufacturing, 2008)

Notes: Swedish data are for 2007. Services-related occupations include (1) legislators, senior officials, and managers; (2) professionals; (3) technicians and associate professionals; (4) clerks; and (5) service workers and shop and market sales workers as defined in the International Standard Classification of Occupations, 1988.

Figure 10. Manufacturing Employment
Percentage change, 2001-2011


Figure 11. Manufacturing Employment
Percentage change, 1990-2011


Figure 12. Real Output per Labor Hour in Manufacturing
Percentage change, 2001-2011

Table 1. Hourly Compensation Costs in Manufacturing
(U.S. dollar basis)

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<td>United Kingdom</td>
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<td>$23.70</td>
<td>$35.53</td>
<td>3.1%</td>
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Table 2. Hourly Compensation Costs in Selected Manufacturing Industries
(U.S. dollar basis, 2011)

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Global Manufacturing

**Figure 13. Importance of High-Tech Industries**
(Share of country’s manufacturing value added)


**Figure 14. R&D in Manufacturing, 2008**
(Billions of U.S. dollars at purchasing power parity)


**Figure 15. Growth in Manufacturing R&D**
(Change in real local currency, 2000-2008)

Conclusions

- The US remained the largest manufacturer in 2010.
- Employment in manufacturing has declined in most major manufacturing countries in the past 20 years.
Successful Manufacturing in CA

- HAAS
- Solar Turbines
- Robinson Helicopter
- Alcon
- Next Intent
- Schilling Robotics
- Edwards Lifesciences
- Intuitive Surgical
HAAS Automation
Oxnard, CA

Solar Turbines
San Diego, CA
Robinson Helicopter
Torrance, CA

Alcon
Irvine, CA
Schilling Robotics
Davis, CA

The Boeing Co
before

after
Next Intent
San Luis Obispo, CA

Mars Exploration Rover

Intuitive Surgical
Sunnyvale, CA
References


(3) Organization for Economic Cooperation and Development (OECD), International Direct Investment Statistics.

Work Systems Division

Town Hall Meeting
Industrial and Systems Engineering Research Conference
05/20/2013

Question and Answers
Closing Comments