Towards an Optimal Health Care System by 2016:
The contribution of Industrial & Systems Engineering Knowledge, Methods and Tools

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Thank YOU for being here!

*Shaping the future of health care requires an alliance between systems engineers & health care professionals!*
Research Agenda
Setting a research agenda: Goals

- Goals
  1. Conduct research to find known gaps in how human
  2. Define alternative means to enter and manage data, including patients, families & physicians
  3. Conduct research on new types of patient interactions
  4. Situational awareness and task management
  5. Training including patient and management simulator
  6. Work process re-design
  7. Document supply-chain current system and figure out where its working well and where it is not
  8. Production of services and the info needed – gap analysis
  9. Create awareness and value and skill in health systems among health professionals
  10. Improve the function of the health system
  11. Develop high reliable systems; create learning and self-improving systems
  12. Closing the knowing-doing gap
Purposes

Improve the health of society
Optimize industry performance
Create knowledge that can be used in other industries
• Goals

1. Create awareness and capacity for the benefits of health systems engineering
2. Develop high-reliability, error-free health care systems
3. Stimulate new knowledge in the base ISyE disciplines (systems analysis, modeling & optimization, human factors, materials & production)
4. Open viable, vibrant career trajectories
Scope

1. Gap analysis
2. Basic research
3. Implementation and evaluation research
4. Production of services, including people flow, materials flow and information flow
5. Optimization tools
6. Models and model systems
7. Reliability science in health care (forcing functions, prevention, novel methods not in use today)
8. May need to right size the scope of work
9. Focus on specific health care problems – this provides a constraint within which we could generate many engineering solutions – e.g. traumatic brain injury
Significant challenges to be addressed

1. Social challenges
2. Dissemination of work and career development
3. Models to test multiple users
4. Interdisciplinary field – IE’s and medical field
5. Multiple societies – how to coordinate, not burn out experts
6. Data held by proprietary agencies
7. Cross disciplinary work
8. Inventory of what is working and what is not working
9. Develop new methodology where necessary – experimental design, reliability methodology; process capability
10. “ownership” – who owns this problem?
11. Globalization – science that relates to health systems beyond the US borders
Recommended approaches

1. Create Centers of excellence (but these don’t necessarily work for individual faculty; Make sure that students & junior faculty can participate
2. Structure incentives for different kinds of faculty to participate (e.g. junior vs senior, md’s vs engr)
3. Education – basic, advanced; mid- and senior career; transform health sector, create IE’s with health knowledge
   1. Right mix of training programs- immersive, long term; intensive exposure, short courses, case studies for use in CIO, COO, CMIO training) etc
4. Pick a problem e.g. cancer, operating room, eg; five centers that will work with industry and partners
5. Create a program organized around a specific problem, launch with a meeting or workshop– the meeting serves to scope the work and assign people to work on it -then have multiple teams go forth
6. Use federal agencies to develop 10 hse centers, 150M/yr
7. Consortias - providers, payers, consumers, insurance industry
8. Implementation research – need to have providers engaged early
9. Empanel a cross-agency advisory body/clearing house
Milestones

– Short term
  • Create a study section that can evaluate the research
  • Establish coding and classification of materials and processes
  • Have people in health programs exposed to industrial engineering
  • Create testbeds and demonstration institutions
  • disseminations – journals and ‘best papers’
  • Accelerate the cycle of proposal-

– Long term
  • Demonstrated outcome improvement (safety, IT system performance, patient outcomes, etc)
  • ROI at the meta level – justify the benefits of the money used
Resources

1. Financial
   a) Engage other funders (CDC, RWJF)

2. Human

3. Technical

4. Data
   a) Develop or negotiate access to Data and data sets that researchers can use (e.g. CMS data, materials procurement, product tracing)

5. Create an implementation plan for the program

6. EFRI plan
Dissemination and sustainability

1. Journals
2. Web and non-print approaches
3. Training and retraining
4. Alliance building
   a) Consortia, virtual centers?
   b) Engage individuals early in the team building process – this will insure adoption
   c) Agency partnerships: INFORMS, IIE, SMDM, SGIM, IOM/NAE
Our work is clear!

Prepare the systems engineering road map for the future
Propose a research agenda jointly to AHRQ & NSF to develop the Industrial and Systems Engineering knowledge, methodologies and skills needed to achieve an optimal health care system 5-7 years in the future
This didn’t quite work

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<th>IT/Finance &amp; Quantitative Decision Making</th>
<th>Systems Analysis, Change &amp; Implementation</th>
<th>Materials Mgmt/Production Processes</th>
<th>Human Factors/STS</th>
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