A PROPOSED ROAD MAP FOR RESEARCH IN SYSTEMS ENGINEERING

A SUMMARY REPORT OF A BRAINSTORMING MEETING CONDUCTED AT GORDON CENTER FOR SYSTEMS ENGINEERING-TECHNION-HAIFA-ISRAEL-29.01.09

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Goals of the Meeting

- Assessment of industry needs for research in systems engineering
- Diagnosis of the special features of research in systems engineering (Is systems engineering a research discipline?)
- Determining routes for promoting cooperation between industry and academia for research in systems engineering and implementation of the research findings

Participants

More than 50 senior systems engineering experts and practitioners from industry and academia.

Industry Needs

- Developing methods and tools as response to industry challenges-Innovation, technology and market uncertainties, complexity, short TTM, globalization, intensive communication, networks
- Tailoring methods, tools and processes for different scenarios
- Assessing the efficiency and benefits of the current methods
- Efficient and effective training of systems engineers
- Mutual lessons learnt

Developing Systems Engineering as a Research Discipline (Following Presentation of Prof. Yoram Reich-Tel Aviv University)

- Acting like engineers bottom up
- Treating the research in systems engineering as a system
- The research should meet our needs
- Developing the architecture of the research
- The research should meet the research requirements (output, schedule, resources, risks)
- Creating partnership between academia and industry for long term research
- Recruiting Ph D students to perform research
Developing the Partnership between Academia & Industry

- Following the format and practice of SEARI and EPSRC
- Using the industry as a research field labs for the academy
- Promoting systems engineers from industry to study for Ph D
- Promoting lecturers from industry to teach and research in the academia

A LIST OF RESEARCH TOPICS IN SE - BASED ON THE BRAINSTORMING

Integrating Behavior Sciences and Arts Aspects

- How integrating arts, common sense and engineering in developing complex systems
- Integrating human and behavioral aspects into systems engineering
- Creating integrating working environment
- How to select and design the systems engineering team
- How to integrate customers and users in the systems development process
- How to promote creativity and innovation into system thinking

Systems Engineering Methods Tailored and Effective

- Systems theory development
- Development of SE methods which fit other industries besides defense and aerospace, like: Biotechnology, traditional, healthcare, transportation, small businesses, information systems
- Systems engineering for systems evolving with time
- SE for families of systems
- Lean SE
- SE tailored for fast TTM
- Developing SE methods tailored for the local culture
- Lessons learned from successes and failures on the ingredients of successful SE
- SE of System of Systems ( SoS ) - Complex systems, systems in layers, integrating people in the loop, networks, evolving systems
- Effective integration of project management and SE
- Integrating SE with other disciplines (including ILLITIES)
- Designing the physical architecture with link to the logic model
- Non textual requirements management
- Integration processes of kits and COTS
- Integrating models and simulations in SE
- How to test systems effectively – how much enough is enough
- Integrating systems safety into the development of systems and SoS
Tools & Methods for implementing SE

- Assessment of benefits of SE
- How to persuade managers
- How to persuade traditional industries and small companies

Systems Thinking

- Defining, partitioning, developing, implementing systems thinking
- What can we learn from the general practitioner physician to systems engineering
- What can we learn from the architect to systems engineering

Training Systems Engineers

- How to identify the people with potential as systems engineers
- Types of systems engineers
- Effective training of systems engineers by simulators, trainers, case studies and by scenarios analysis
- Expert system for systems engineers
- Systems decisions making in uncertainty environment
ענודת מועסקים בировки בנוווע מסת-
מרך גורודן לחינוך}

הומנה להפעילה שומרת את המาศ
INCOSE-IL מועדון לעובדים של מחקר
מהכימים להופעתו של מחקר הבניה

пустוי המועסק

הדברות:
��ך התחבורי לתחבורי מועסק
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נובו

הוזמע הידית בים' 29.1.09, בשעות:
8:30-13:00, בכניסה, שורט השכני
(מרופר ממח זו למחזו).

הוזמע
- 8:30-9:00
tכונת קול
- 9:00-9:15
cbecoh, מעוזר, שדר-ותו
- 9:15-10:15
קרוב, אברר, בור, רועי בורוד
- 10:15-10:30
תכנה המיתוג שברועה במצנין בורוד
- 10:30-11:15
תכנה המקשה
- 11:15-12:00
תכנה המקשה
- 12:00-12:45
תכנה המקשה
- 12:45-13:00
תכנה המקשה קהל
- 13:00-13:30
תכנה המקשה קהל


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יאיר זבוב
