

Why people misunderstands IT OR The maintenance is the implementation

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Mechanization: an old story

- Traditional tasks requiring lot of people (and possibly animals)
 - Harvest a huge field
 - Assemble thousand of pieces
 - Execute millions of calculations
- Traditional mechanization approach
 - One machine and few specialized persons
 - The machine does the physical work
 - Persons drive it and provide cognitive processing
 - Stone in the field, broken piece, meaningless number
 - The machine has no need of recognizing and adapting to a changing environment since people intelligence takes care of it
- Once you have mechanized and automated a task 80% of the job is done. It just remains a 20% maintenance job.

Mechanization in the computer era (1)

- Computers allow mankind to solve a different kind of tasks: “problem solving”
- Mechanization of tasks where human intelligence is required, not strength or ability
- A completely different scenario in conceptual terms:
 - Mechanization of almost purely cognitive tasks (“services”)
 - Now we are replacing intellectual capabilities of human beings with machines (i.e. mechanizing intelligence)

Mechanization in the computer era (2)

- We have some success here
 - Mechanical devices control tasks (self pilots)
 - Low complexity clerical tasks (managing bank accounts)
- They accounts for most of the industrial productivity increase in the last 30 years
- But when truly substituting the human intelligence with a machine we have not had so much success
 - Complex IT systems are late and over budget in a proportion embarassingly higher than any other industrialized field

A dramatic change of paradigm (1)

- Not just a slight shift in the meaning of word “mechanization”
- Human intelligence has
 - Capability to adapt to a changing environment
 - Flexibility to cope with new/modified requirement
 - Ability to learn from errors and experience
- Computers don’t!
- But the world around an organization is constantly changing
- Hence people expects IT systems to do something they don’t know how to do

A dramatic change of paradigm (2)

- IT professional/scientific community knows maintenance absorbs the largest share of resources
- Society at large is not aware of this, since this was not true for all previous mechanization efforts in the history of mankind
- Building an IT system is only 20% of the job. The real one is adapting it to ever changing environment
 - An economic motivation for open source software?

What are we doing (1)

- Using “agile approaches”
 - Build a system a piece at a time, without detailing too much too early
 - Analyze results and adjust to errors
 - Like a person learns to do her job a bit every day
- Producing application development environments for “end-user development and maintenance”
 - Gartner: “citizen developers” by 2014 will build >25% of all business applications
 - Google’s App Inventor

What are we doing (2)

- Researching *self-adaptable software*
 - Situational computing
 - Self-managing situated computing
 - Using probabilistic models and reasoning tools to deal with changing environments
 - Using the web as a source of knowledge
- Focusing on *evolving information systems*
 - The evolution of IS is a continuous process and an inherent system property

We could and should do more...

- After 20++ years from
 - Parnas declaring SDI system could not be built
 - Brooks stressing the need for incremental development and good designers
- Society still considers IT systems just a sophisticate descendant of the plow ... instead of a radically different new species
- Hence **we** have to educate society that:



The maintenance is the implementation