

Innovation and systems engineering

After the economic crisis

in the 21st century

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Every crisis is an opportunity

From Bakunin to Schumpeter:

“Creative Destruction”

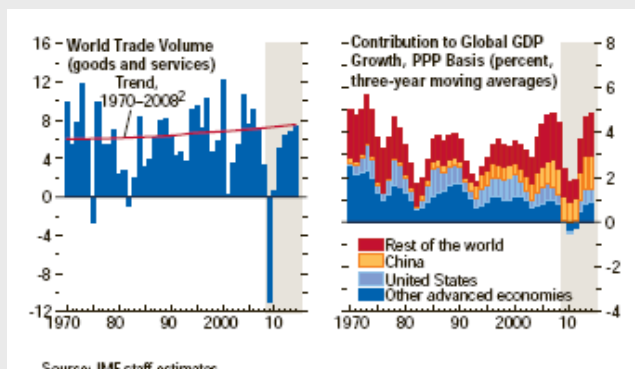


Who's Altreonic?

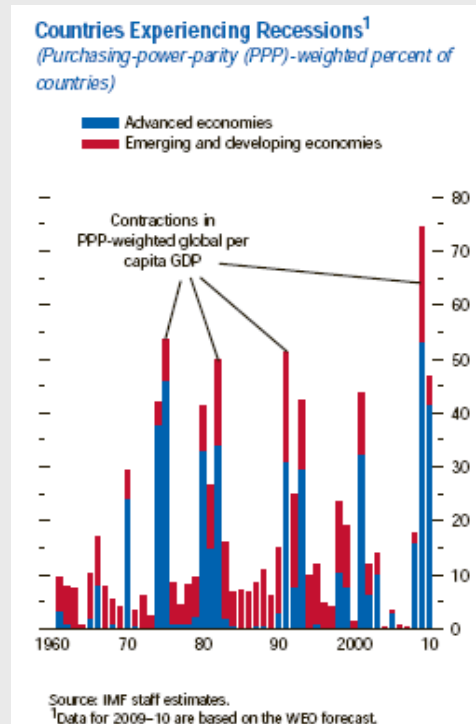
- Eonic (Eric Verhulst) : 1989 – 2001
 - Parallel RTOS Virtuoso (=> Wind River Systems)
 - Formally rooted in CSP (Hoare): “pragmatic superset of CSP”
 - Open License Society: 2004 – now:
 - R&D on Systems and Software Engineering
 - Unified Semantics & Interacting Entities
 - Formally developed network-centric OpenComRTOS
 - Supporting methodology from requirements capturing, over modelling and formal software to processing modules
 - Altreonic: 2008 – now
 - Commercialises and develops OLS results
 - HQ close to Brussels, Development group in Ukraine
- => **Systems thinking**



Historical data IMF



- Economic crisis will last 2 to 3 years
- Current crisis is deeper:
 - structural reasons
 - credit expansion rather than value creation
 - over consumption and over production of less valued goods



What not to do?

- Crisis is rooted in USA post 2001 policy
 - Extreme low base rate of FED
 - Housing bubble
 - + criminal schemes of money creation
 - Pyramid schemes
 - World has become global
- The remedy is not to create another money bubble
 - Value = capital
 - Capital and money are not the same



What to do?

- Create value that has a future
 - New technologies
 - Energy and resource efficient
 - Develop and produce, not just assembly
- Needed:
 - Entrepreneurship: culture + personality
 - Innovation: culture + personality
 - Capital: still available but risk avoiding
 - Labour: a lot of unused capacity



Should governments help?

- Cars = steel and coal anno 2009 ?
- No sense to keep world-wide overproduction going
- Recover know-how and labour skills
- Invest in the future
- Two domains:
 - Mobility platform: not based on fossil oil but scalable solution
 - Energy: not based on fossil fuel



Example 1: Mobility (1)

- Mobility need is universal
- Is not: more trains, more cars, more buses, ...
- But:
 - Door to door, decentralised
 - Seamless connection of different transport modi
 - Factor of efficiency, not of waste
- How:
 - (Semi)-electrical vehicles (already exist!)
 - Automated cargo transport (incl. tunnels, not roads)
 - Semi-automatic persons transport
 - Develop standardised scalable moving platform
 - Adapt infrastructure
 - Competitive advantage in the economic sense



Example 1: Mobility (2)

- Possible platform:
 - 4 electric motors in wheel, high torque
 - Solves many issues
 - Drive by wire becomes fault tolerant
 - No transmission losses
 - Put electronics in chassis
 - Reduced cable harness
 - Use high speed busses
- Power:
 - Battery packs
 - For exchange or charged at home
 - Small Wankel or Stirling motor for “off-road” use and emergency
- From 3-wheelers to trucks
- Automatic “train-forming” using adaptive sensors on highways for high speed (200 km/hr).



A few examples



See other examples:

http://www.ted.com/index.php/talks/shai_agassi_on_electric_cars.html

<http://www.hybridcars.com/>

<http://www.zapworld.com/>

<http://www.teslamotors.com/>



Example 2: Energy

- Fossil fuel $C_xH_yO_z$ is over its peak
- Bio-fuels not a solution, on the contrary
- CO₂ is just an excuse
- Geopolitical dependence
- Health risks
- “Ecological” can also be “efficient”
- Nuclear + soft energies + preventive measures (insulation) can cover all needs of a country: no CO₂ needed!
- Needs decentralised network:
 - Solar power, wind mills, hydro-generators
- Competitive in economic sense



Conclusion

- Economic crisis can be opportunity
- Needs will never change, what will change is the way human provide solutions
- Solutions = value
- Opportunity to develop, produce and to export these to the whole world
- Small countries can be the winner:
 - Finland: from rubber to mobile phones (and No.1)
 - Mobility and energy are the next challenges

