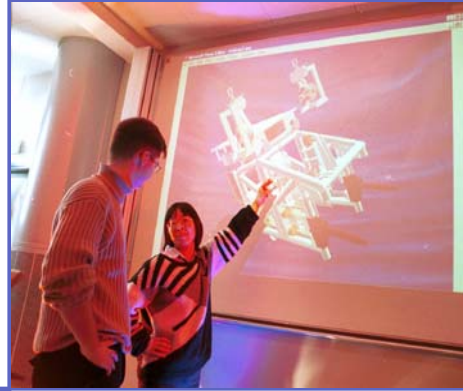


Per Skytt
Manager
Automation technologies
ABB Corporate Research

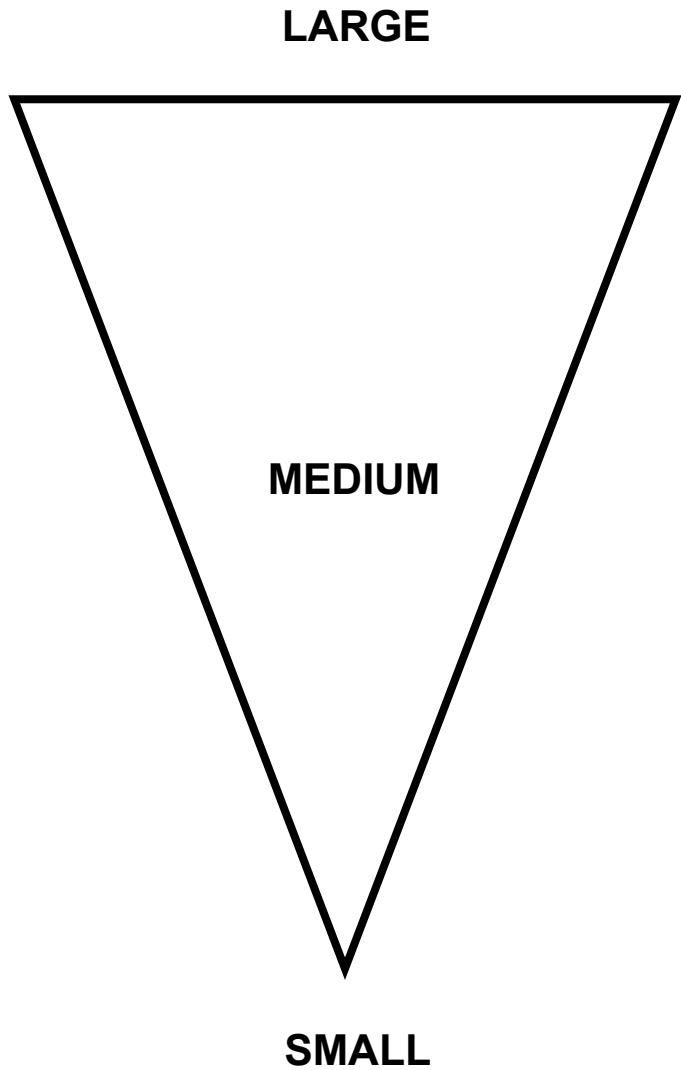


Embedded systems, of strategic importance for the Swedish society 2003-08-19



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Embedded systems



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Applying Embedded Systems



- A critical business success factor
- Large and competent organizations



- A qualifying technology
- Small and often not competent organizations



Trends and Challenges

Trends

- Continuous increase in use of Embedded Systems
- Cost reduction of hardware
- Communication between devices
- Larger Systems
- Short time to market

Challenges

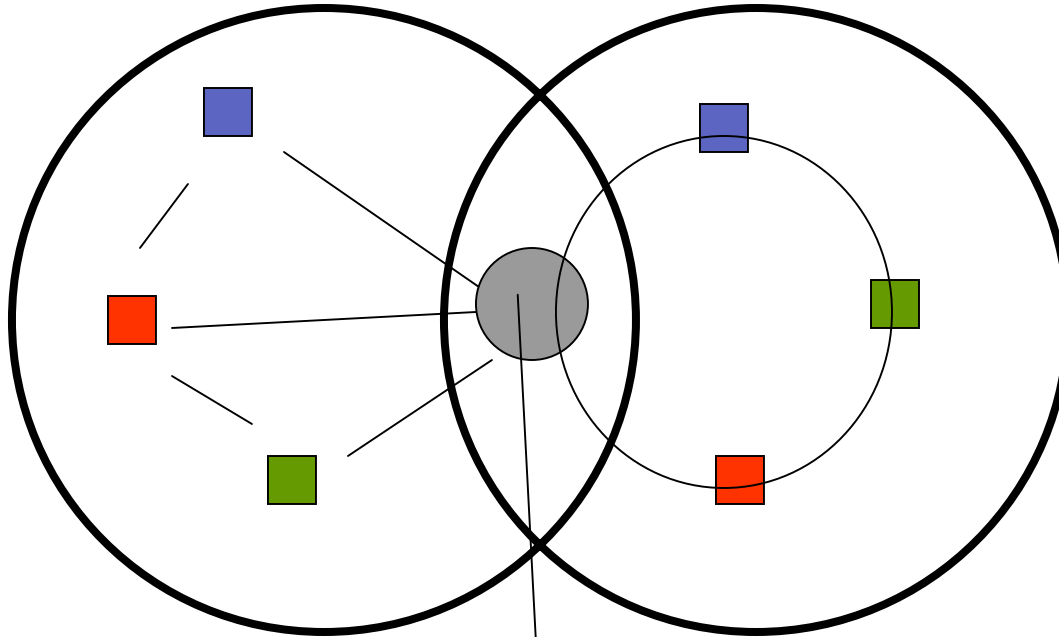
- Ease of use
- Interoperability – Standards – Security
- Flexibility and maintainability
- Development processes and tools
in combination with real time and reliability



Focused Reserach to stay Competitive

University Network

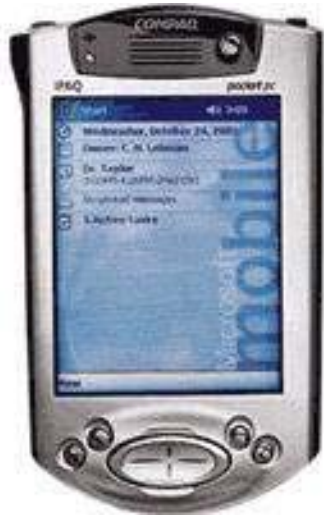
Industry Network



Focused R&D programs
Several comitted industries
Research on real problems



Consumer versus Industrial



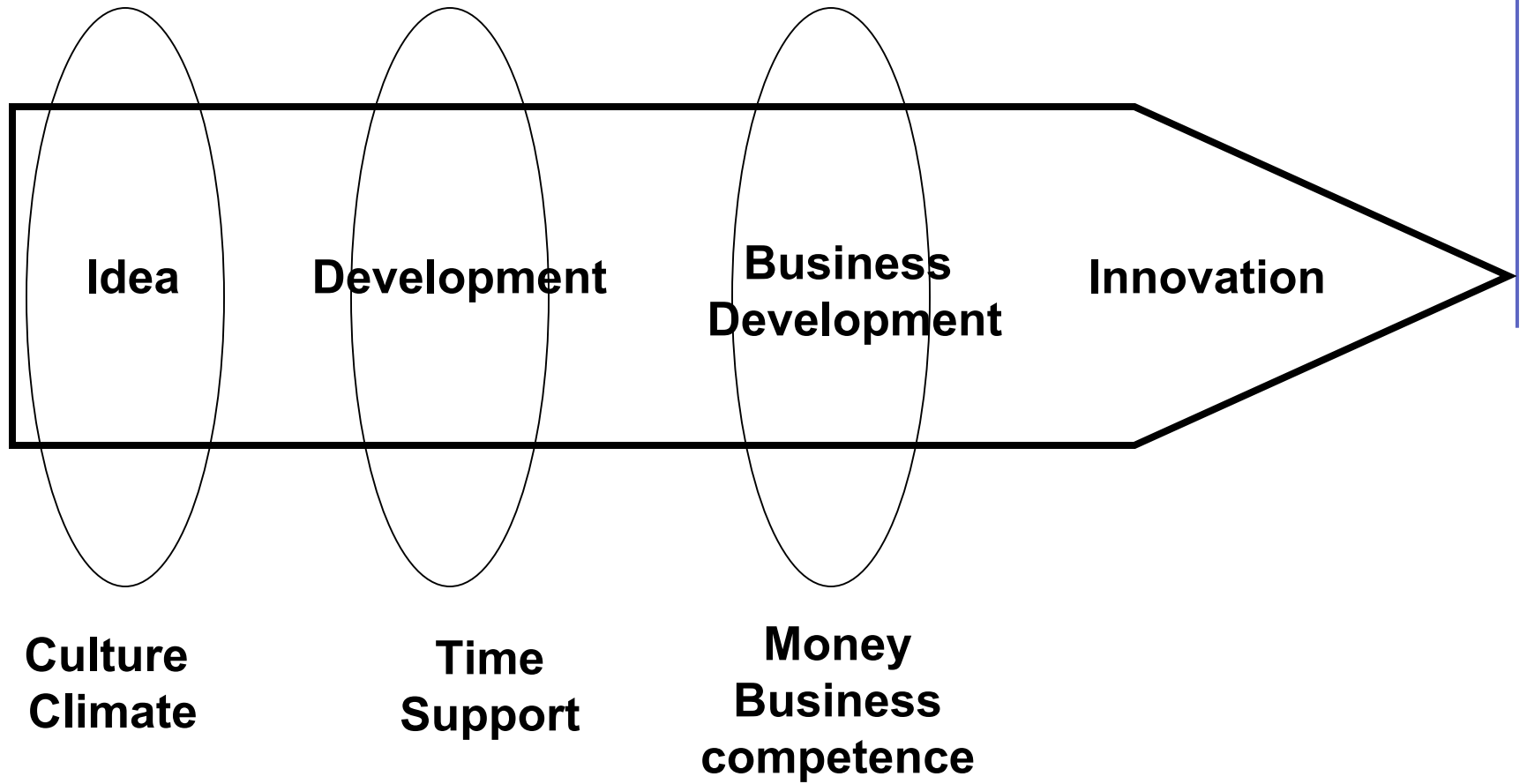
- Volume Driver
- Technology Driver



- Real time
- Reliability
- Safety
- Low volumes



Drive Innovation at University



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YES!

Embedded systems is Critically important for Swedish Industry!



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- Are embedded systems of importance for Sweden?
Many would agree to answer this by Yes, but terminology and different interests open up for some debate.
- Yes, it is of importance, around 97% of all computer systems are embedded.



- Which are the core areas for embedded systems for Sweden - do we have specific areas of excellence/strength?
- Real time and safety critical systems, These areas are needed for main industry like, Volvo, Saab, ABB, and Ericsson. Sweden should not focus on ubiquitous computing with computers everywhere. This is more market for sony or toshiba. automotive with newer ones, e.g. toys and PDAs toys such as PDA can be turned into industrial applicaitons, mobile maintenance/operator.
- future embedded system applications will have more communication capabilities. Information is easily shared between the devices.



- Which are the main challenges (research, industrial development,...) and trends?
- Communication, security, reliability, and more see AIC STP.
- Organisational difficulties in small organisations or organisations traditionally hardwareoriented to handle sw development



- Where should the efforts be directed (i.e. where are the needs) to move Sweden to a leading position and how should they be implemented
- To have leading universities cooperating with industry



- Applied vs basic research? - Applications vs. systems?
Focused vs. broad efforts?
- Applied research for main industry, focused.

ABB

- Coordinated research (industry,/adademia)? (what are the needs for coordination? - Compare with funding efforts are today not coordinated at all) coordinate
- Transfer of research results and education?
- Clearly, there is a need for efficient interaction between industry, academia and funding bodies. Given the recent reduction of funding, and the vast opportunities provided by embedded systems together with the strong position of Sweden in the area -



- Developing a good climate for research and innovation is essential. How can this be achieved?
- Better education of students in embedded realtime systems.



Vad skall Sverige fokusera på inom IT området i framtiden?

1. IT blir värdemässigt en allt större del av (nästan alla) produkter och system. Ex. är , enligt Daimler-Chrysler, att elektroniken internt i en bil står för 30% av värdet och snabbt närmar sig 100 olika datorsystem. Sverige har inte råd att inte satsa på export av IT intensiva produkter/system!
2. Sveriges framtida IT fokus måste till stor del baseras på idag befintlig industri! (Telekom, automation, fordon, försvar, etc)
3. Endast till mindre del (värde-, sysselsättnings-, export-mässigt) kommer nya segment att bidra de närmaste 10 åren.
4. Sveriges nisch måste vara programvaru intensiva produkter/system av investeringkaraktär med en världsmarknadsvolym på 1.000 - 1.000.000 enheter/år . (För större serier, t.ex personbilar, vitvaror kan Sverige ev vara en framgångsrik 'technology provider'. Kortare serier blir ofta lokala lösningar och genererar mindre pengar. Obs tumregel med undantag!!)
5. Oftast IT i form av inbyggda realtidssystem baserat på standard elektronikkomponenter. (Sverige bör glömma hårdvaran!!)
6. Sedan skall givetvis Sverige vara skicklig och snabb i att utnyttja vad andra utvecklar/säljer för att öka produktiviteten internt och funktionaliteten i våra egenutvecklade produkter/system - men det gäller ju för all teknik!!!



- Focus on reserach areas of interest and collaboration with traditional companies

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