

Improving automotive electronic engineering efficiency with process & method tool support

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Agenda

- ▶ Managing the change – Volvo Car Experience
- ▶ The Vision
- ▶ Guiding principles
- ▶ Project set-up and management involvement
- ▶ Where to start, and how to get started?
- ▶ Experiences so far



Managing the Change – Volvo Car Experience

Background:

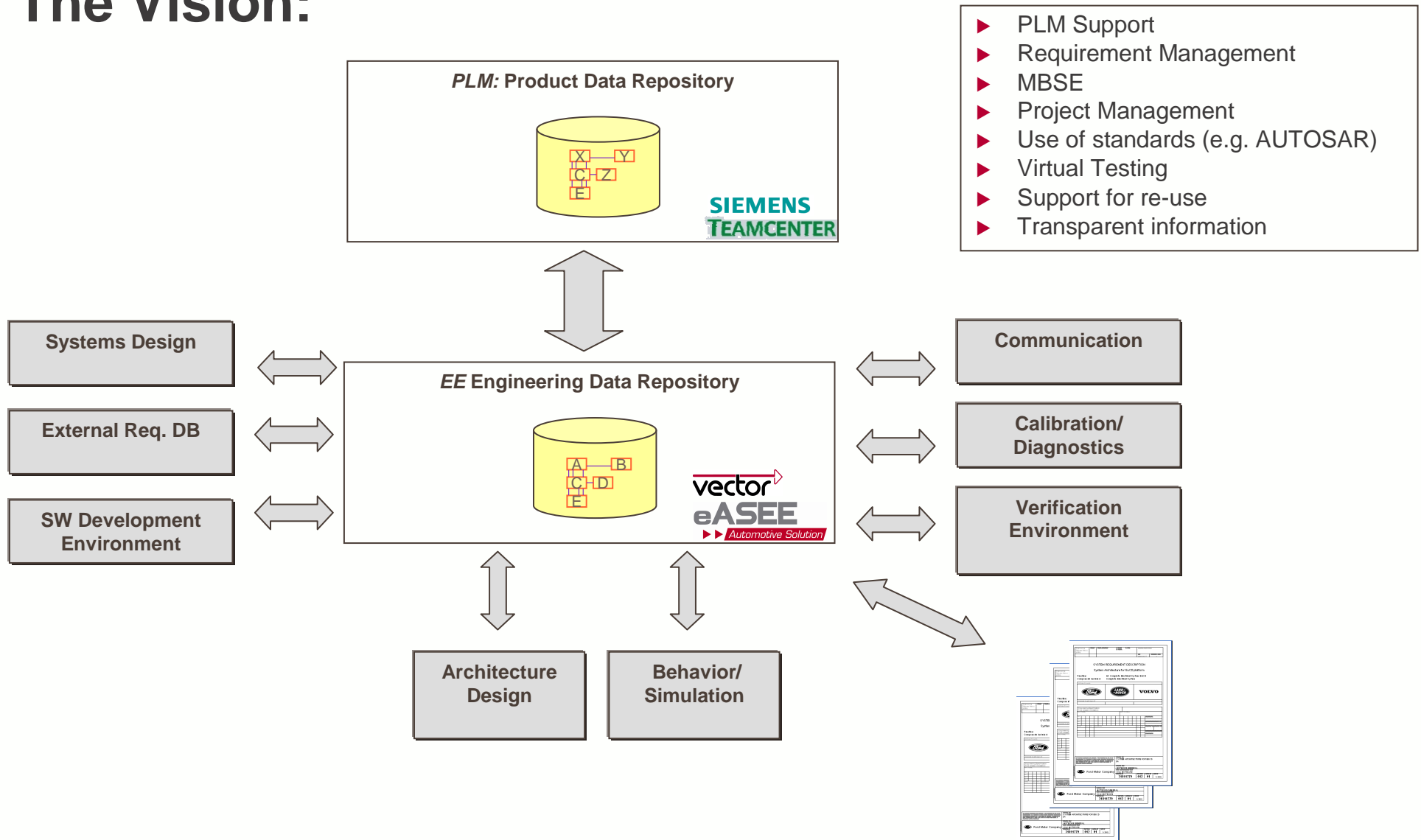
- ▶ Volvo Car wanted to be more **efficient, reduce quality risks and long lead time** for the Volvo Cars EE engineering community.
- ▶ The problems were the internal work within the community, not towards production or aftermarket.

Causes of this were:

- ▶ Non connected tool chain
- ▶ Document driven subsystem & component development
- ▶ Manually managed interfaces
- ▶ Redundancies and inconsistencies
- ▶ Poor version control and change management process
- ▶ Improper workflow in many cases

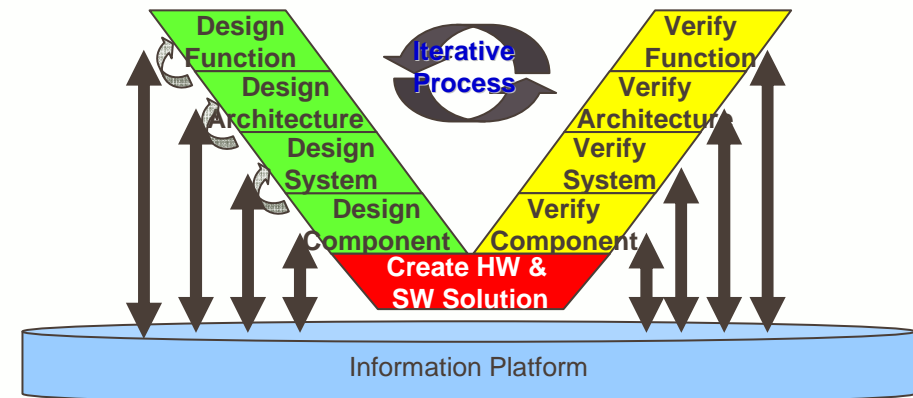


The Vision:



Guiding Principles:

- ▶ Seamless information management of Engineering Data from Function to ECU S/W&H/W.
- ▶ One source of information.
- ▶ Minimize handovers.
- ▶ Same information but with different views.
- ▶ Simple hand shaking mechanism for changes.
- ▶ Reusability of information.
- ▶ Utilize AUTOSAR concepts and naming.
- ▶ Use commercially available tools.
- ▶ Changes made in smaller context instead of huge documents.



Project set-up and management involvement:

A four year program (2008-2011) was set up with a significant budget.

Savings identified of up to 13% efficiency increase in the E/E development finally.

Program was decided and is followed up each month by Volvo Cars top management.

Vehicle Software & Electronics Management (VSEM)

Partnership with Vector was set up to develop data backbone and engineering environment.

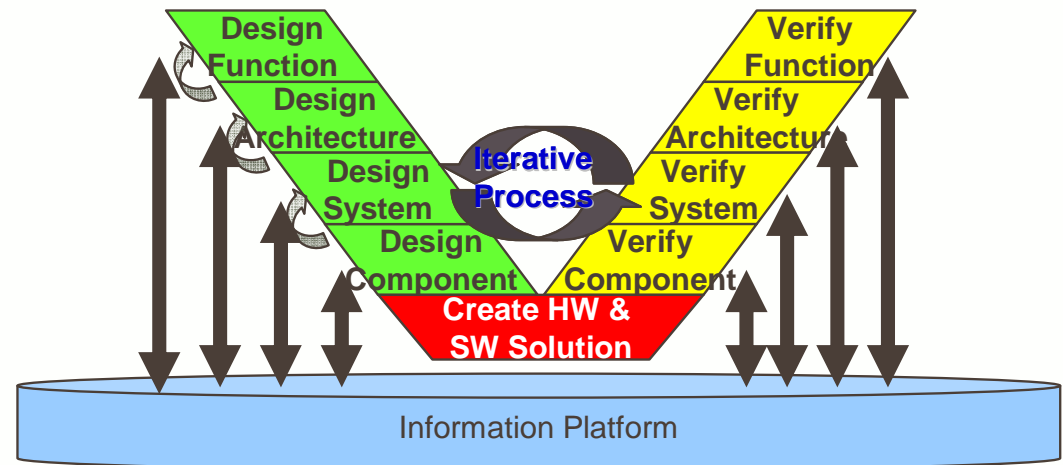
Program has highest priority and is currently the largest of its kind (IT and OD) within Volvo Cars.

An extended team including pilot users has been active during the product development.

A co-located team from E/E dept and Volvo Cars IT was set up.

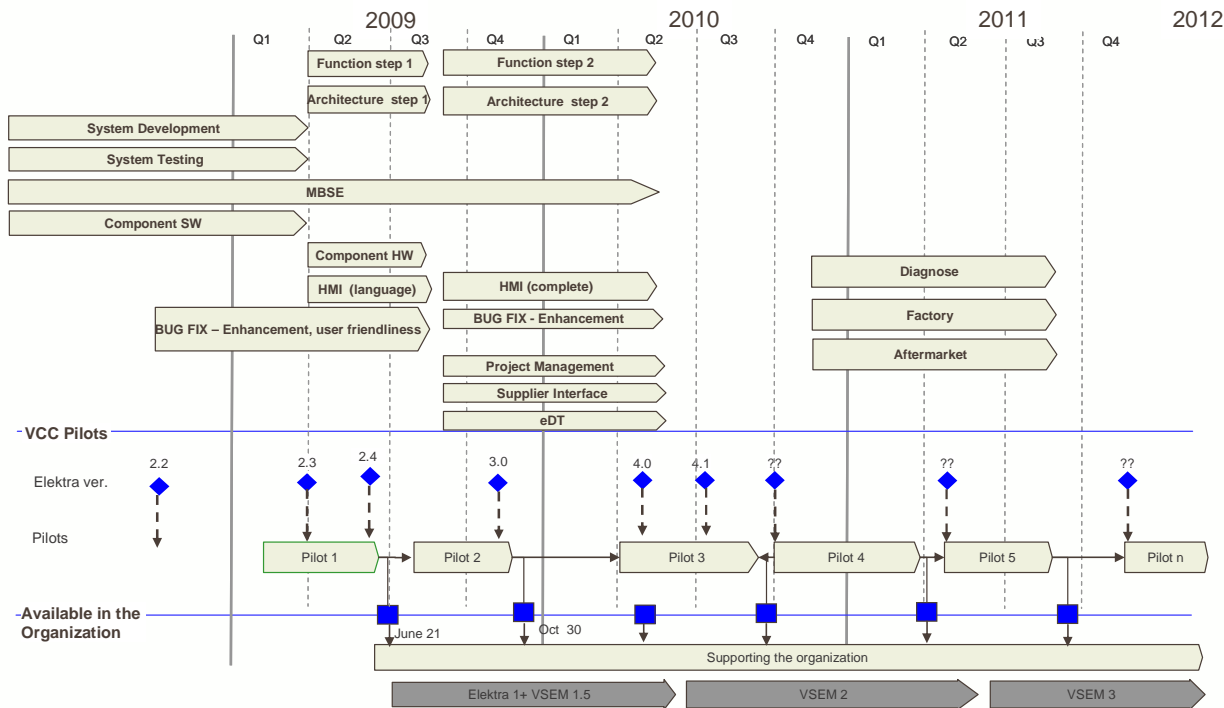
Where to start, and how to get started?

- ▶ At Volvo Cars, we decided for an iterative approach.
- ▶ The initial implementation (now in place), supports subsystem engineering (incl. signal handling) and component engineering-SW and testing relating to it.
- ▶ That means that we immediately address the most number of users.
- ▶ Rationale was that we wanted to ensure an acceptance from the "heart" of the E/E community to allow us to continue to more up streams or specialists tasks.



Where to start, and how to get started? (cont.)

A roadmap was developed for the four years, enabling users to have confidence that the system will develop further, therefore accepting to enter now.



Where to start, and how to get started? (cont.)

Extensive training is required.

"Jump-start" also helps with the initial data entry but, more important, ensures alignment in using the system. Problem detected is feed back.

"Jump-Start projects" were set up with dedicated experienced engineers (with Volvo Cars engineering background but extensively ELEKTRA trained) supporting and coaching the normal engineers during a transition period (typical 2 months/subsystem).

A key aspect is to allow senior engineers with a high influence in the organization to participate in the work, not only to improve the product but also to "sell the idea" to their colleagues.

Communication with management teams is absolutely important.



Current status at VCC

- ▶ 300 licenses of eASEE Automotive Solution, 70 active users.
- ▶ Approximately 300 employees trained so far.
- ▶ VCC China operations ramping up.
- ▶ PREEvision evaluation ongoing.
- ▶ AUTOSAR 4.x decided for the new Scalable Platform Architecture platform.



Experience so far:

- ▶ Besides all the technical matters, VSEM is essentially an organizational change program – with all collaboration and personality aspects of human beings.
- ▶ We are more convinced now that we are doing the right thing. The hesitation at the start is now much lower. Potential improvements to the process (initially not identified) may increase final wins.
- ▶ It takes time and costs a lot of energy:
 - ▶ To build processes that are real and efficient.
 - ▶ To build real confidence between functions and professions.
 - ▶ To fine tune the processes and tools to be accepted by the engineers as a valuable improvement.
 - ▶ To implement a new developed tool environment in a running platform project.
- ▶ “Jump-Start” is a must.
- ▶ The transition process is painful, when the E/E system is only partly in the system.



Experience so far: (cont.)

As a summary:

- ▶ With continued good support from management and the most senior engineers,
- ▶ and having the patience to do the right thing,
- ▶ we are confident to deliver significant improvements to the Volvo Cars EE engineering community.

