Standardization vs. Customization For On-Board Communication Systems

Steven Ojalvo

FOCON Electronic Systems ApS – Part of the Luminator Technology Group

Business Development Manager – Passenger Information Systems North America

DDO, Quebec, Canada

A “clever” Question

”Why is it I buy new trains *but* when I receive my *new* trains, they contain technology up to 15 years old?”

M. M., London Underground

?

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Some Common Questions from Key Industry Stakeholders

”How can we best achieve ”value for money”

ATOC

”Why do suppliers of trains and equipment want to trap us in a closed lifelong cost trap?”

India Railway Standardization and R&D organization

”Why does no one consider that we need to *grow* our trains and services in a easy and cost efficient way over time?”

Indians Railways

”Why are we not seen as the real customer – we are the ones using the train service, paying for its operation?”

The Danish Passenger Interst Organisation

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Some Common Questions from Key Industry Stakeholders

Continued...

”Why is it that you in the supply chain can not supply reliability ? We can’t stop trains and service to implement your *new* supplies and updates, your test of these nor allow integration issues to be solved comprising our service operation”

David Waboso, TfL

”We understand operations can never run 100% but why are we not guided when disruptions occur?”

London Underground Passenger

”When will I have the same entertainment possibilities travelling as I have in my home and on my smart phone?”

DSB Passenger

”How can we supply at optimised cost if everything is specially built?

Canadian and French trainbuilder

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Who hasn't heard the following?

- The rail industry is *very conservative*...
- Standardization is impossible...
- We as car builders have to offer unique solutions to compete...
- Project design costs (non-recurring) are far too high...
- We want the newest, state-of-the-art technology…
- Reliability must be improved
- We want fewer spare parts on stock without jeopardising up-time….
- Your parts are obsolete and require a re-design.
- Your delivery time for spare parts is too long…

Where is the Industry Today…

- We have fragmented operating systems running on a variety of systems
- New projects are often delayed and suffer from higher costs than anticipated
- Funding is shrinking yet demand for increasing capacity is growing (extremely)
- New standards are being adopted (i.e. TSI etc.)
- A huge portfolio of upgrades are just in front of us
- Technology is changing rapidly – you could argue day2day
- The passengers demands are still seen as secondary but the passengers "voice" is increasing in impact.

TODAY

A *New* Mix of Challenges

Suppliers

Under pressure of one-off design versus demand for low cost & short delivery times

OEM's (Train builders)

Own internal design standards and concepts

Operators & franchiser

Life time cost

Passengers

Demanding new services

30 (40 – 50) lifetime (Form, fit and function)

TODAY

OUR NEW FUTURE

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Is standardization possible and feasible?

What are pro's and con's...

Some will say N0!... Why?

...Because it breaks with the traditional way of working (it opens competition on another level – it will change the competitive environment from "close out" to cooperation.)?

... Because it forces us to limit personal "wants" and "beliefs"?

... Because we are afraid it creates new barriers of entry?

... Because we are afraid our options of choice will become limited

Why is it we can accept standard options when buying as private persons but NOT when being responsible for building / buying trains?

Steps Utilized in Our Process

1. Solicited input from our direct customers (i.e. train builders) and end-users (transit agencies)
2. Lessons learned from past project experiences
3. Design Team Turned to Ethernet / IP standards for all Equipment
4. Key success factors and conclusion

Solicited Input from Our Customers

- At FOCON – Luminator Technology Group we took the approach of "One System For it All".
- Build a solution to meet current and future technology, system and operational requirements across lines of integration for all type of rolling stock
- Design a communication system solution which would meet the most basic fundamental requirements but be able to provide high functions and features.
- Define the most common technical, functional and operational requirements based on input from industry stakeholders and build that into our core platform design "**Customer Driven Solution**"

Lessons Learned from Past Project Experiences

- Experience clearly showed dissatisfaction on all fronts with technology and passenger demands increasing the pressure on the supply chain, something needed to change
- Customized project specific solutions greatly limited future technology upgrade possibilities and capabilities
- Scalability and customization are best achieved at the software level at the heart of a Communication system as software is easier to upgrade than hardware being changed within trains..
- By using a modular approach based on a standard platform, new functionality can be added much easier as the technology and the demands evolve over time

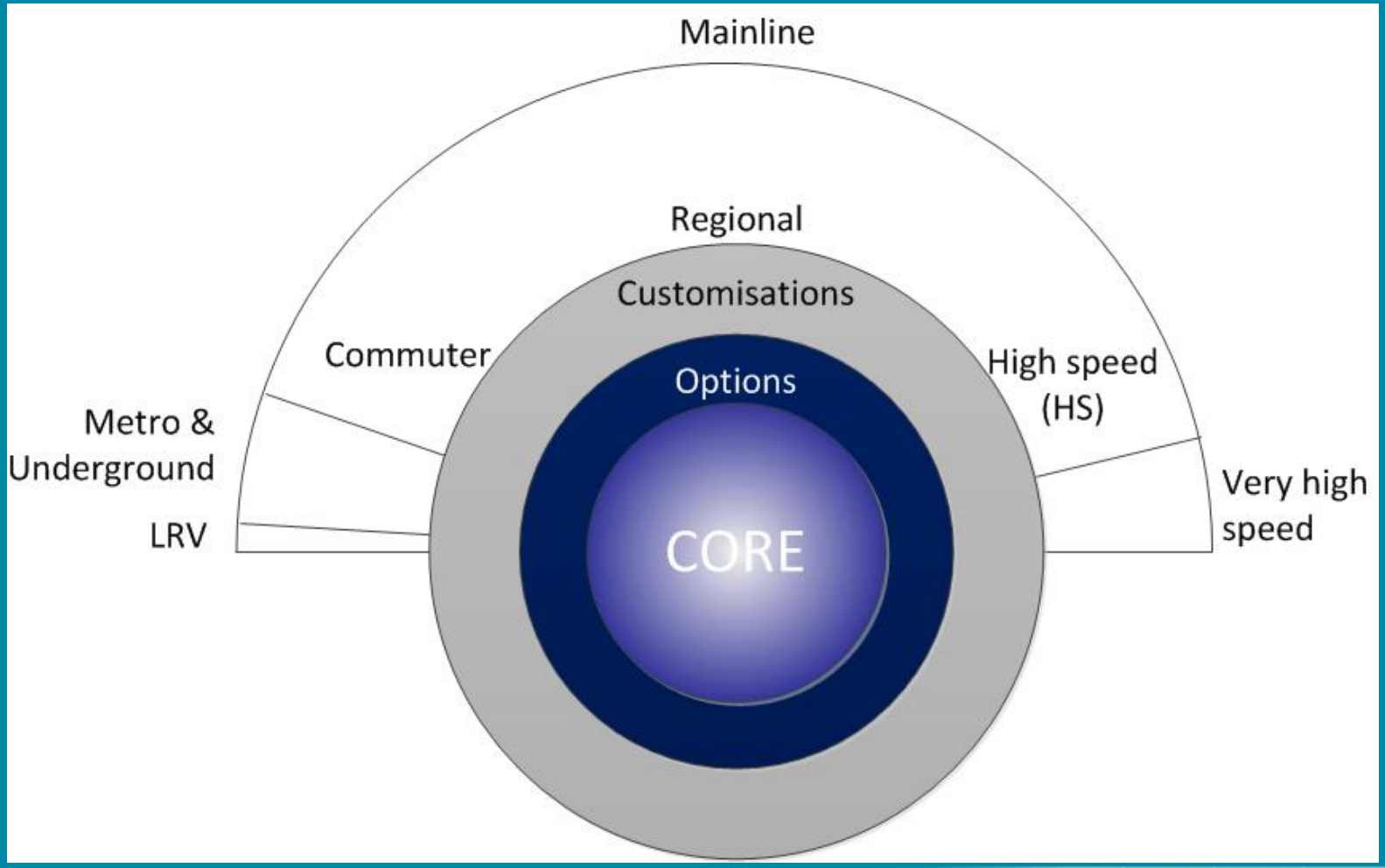
Design Team Turned to Ethernet / IP Standards for all Equipment

- By designing a Communication / Passenger Information System based on Ethernet IP standards which formed an on-board network within the train it allowed for maintenance personnel to easily monitor every component within the system for faults, upload any changes to the system remotely through the IP network, and replace any components within the system with little or no major changes or reconfiguration

- Using open industry standards like TCP/IP allowed for more seemingless integration with other systems on-board the train

- By deploying a modular platform with high flexibility, solutions could be tailored to project specific requirements without replacing any of the core hardware components

The case of IMAGINE



Key Success Factors and Conclusion

- Proper identification of cross-functional stakeholders and key end-users at the beginning of the project is essential (rolling stock, signaling, control center, security, maintenance, IT, customer service, etc.)
- Implement a product strategy approach, in addition to the traditional project-driven approach, to ensure that core system functions and components evolve properly from project to project to a rich and optimized feature set
- It is critical to also have an integrated multi-modal information strategy that clearly defines the interfaces between train, station, control center, external systems, etc.
- Manage the risk of turnover (and in some cases absence) of key end-users throughout the project lifecycle
- Acknowledge that advanced CCTV/media functionalities require enhanced train and train to wayside communication infrastructure