Automotive Java

Java in the Automotive Industry

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JCP EC F2F, Berlin

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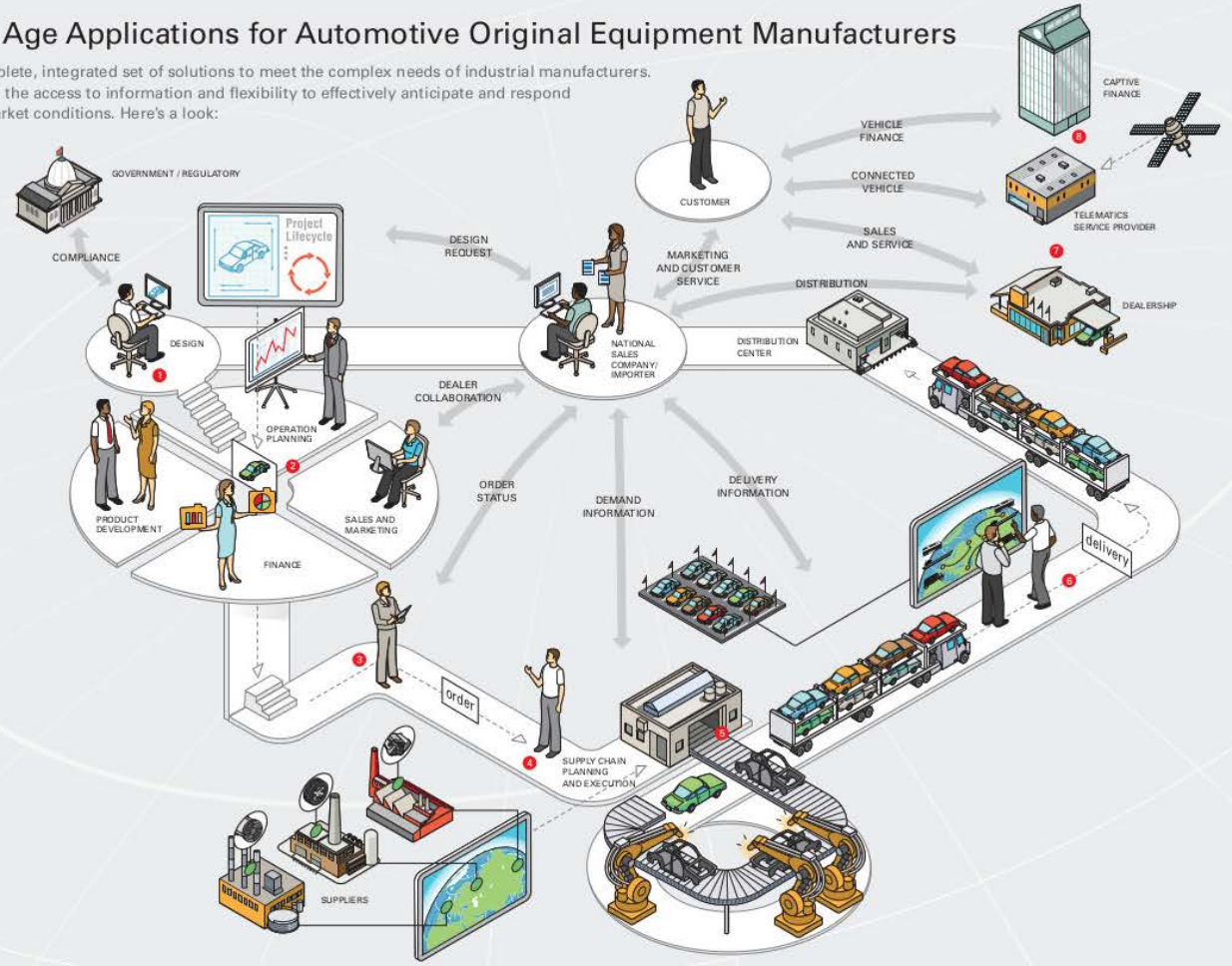
Automotive Toolchain | Oracle Solutions

Information Age Applications for Automotive Original Equipment Manufacturers

Oracle provides a complete, integrated set of solutions to meet the complex needs of industrial manufacturers. In addition, we provide the access to information and flexibility to effectively anticipate and respond to rapidly changing market conditions. Here's a look:

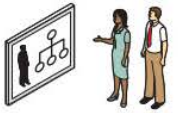


INTEGRATION AND ANALYSIS

A standards-based integration framework along with the most complete master data management solutions allow the easy orchestration of cross-application business process. In addition, best-in-class performance management and business intelligence applications provide business insight and link operational decisions to strategic objectives.

HUMAN RESOURCES

Manage, optimize, and leverage the workforce throughout the employee lifecycle across your enterprise through automated, industry-leading practices for human capital management.



FINANCE

Provide best-in-class global financial management, consolidation, and reporting processes while providing complete governance, risk management, and controls.

1 PRODUCT LIFECYCLE MANAGEMENT
Accelerate innovation; reduce costs; enable design collaboration with customers, partners, and suppliers; and control all product information from concept to end of life.

2 SALES, MARKETING, AND OPERATIONS PLANNING
Provide brand consistency, track opportunities, and optimize channel strategies through an integrated and unified view of the customer.

3 ORDER MANAGEMENT
Ensure complete and accurate capture and execution of orders across all channels for increasingly complex products and services.

4 SUPPLY CHAIN PLANNING AND EXECUTION
Provide real-time sales and operations planning capabilities to drive accurate forecasts while optimizing material and resources constraints across a global supply chain.

5 MANUFACTURING AND ASSEMBLY
Maximize efficiencies, product quality, and responsiveness to demand fluctuations through lean, flexible manufacturing processes.

6 LOGISTICS AND TRANSPORTATION MANAGEMENT
Reduce inventory and transportation costs while meeting customer delivery expectations.

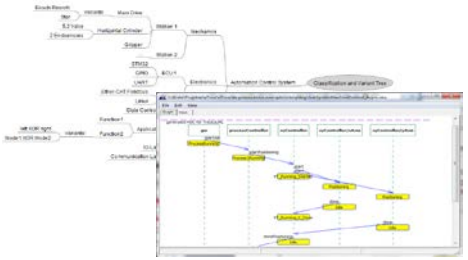
7 AFTERMARKET SALES AND SERVICE
Optimize product performance and expand service revenue through comprehensive, efficient service offerings.

8 CAPTIVE FINANCE
Help captive finance companies be more customer focused by obtaining a comprehensive understanding of customer needs, profitability, and risk exposure.

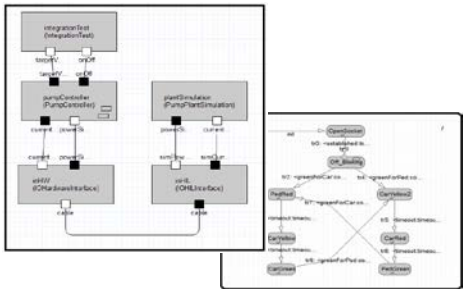
Automotive Toolchain | eTrice

- Eclipse eTrice provides an implementation of the ROOM (Real-Time Object-Oriented Modeling) language together with editors, code generators for Java, C or C++ code and exemplary target middleware.
- The model is defined in textual form (Xtext) with graphic editors (Graphiti) for the structural and behavioral parts (i.e. state machine)

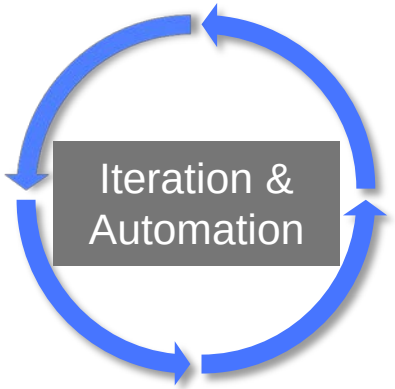
eTrice | Protos Development Process

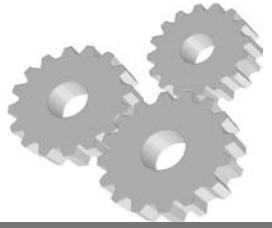


Requirements & Specification

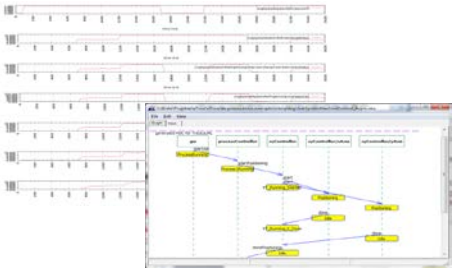


System & Software Architecture





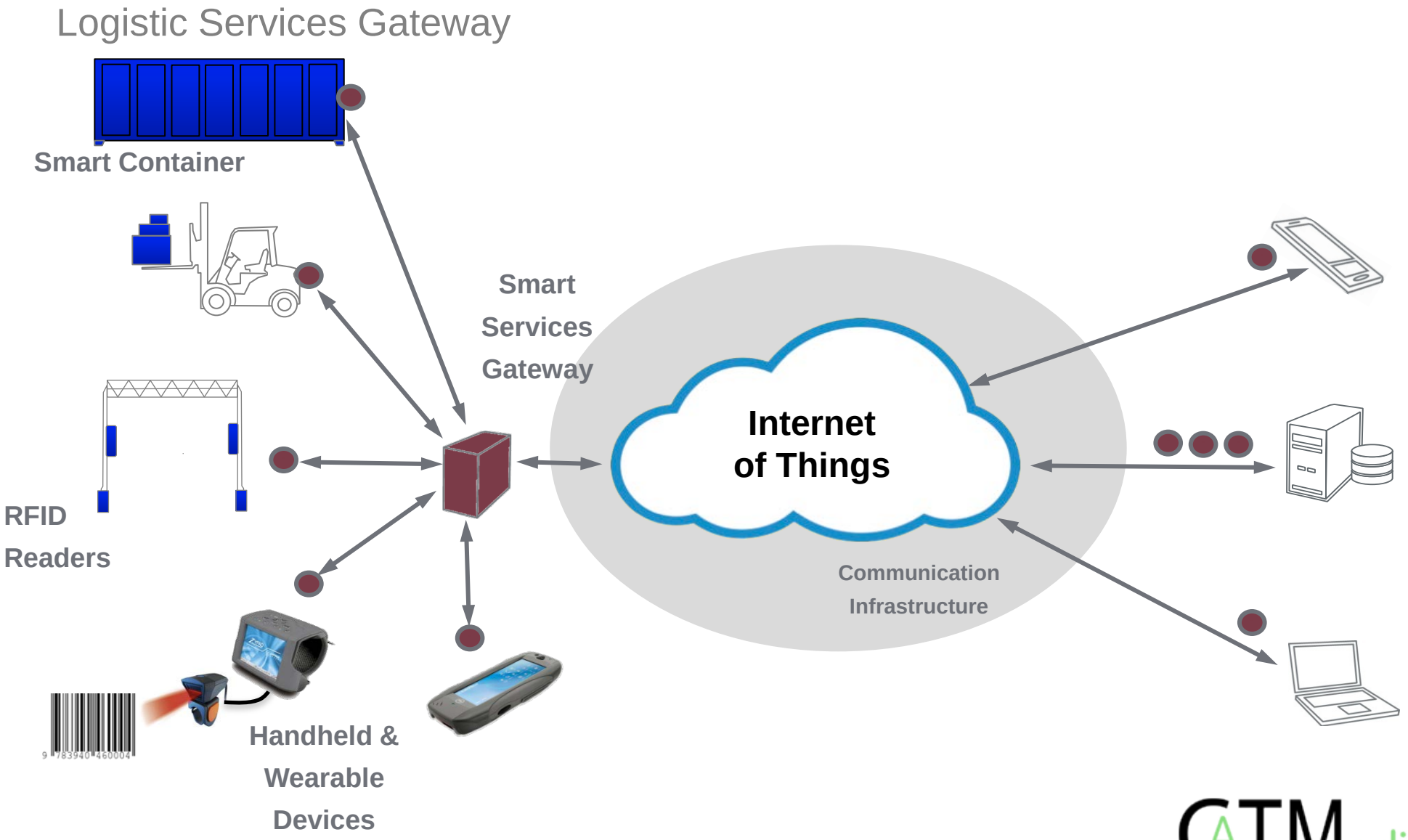
Implementation by Code Generators



Verification & Validation

Continuous Integration & Delivery

IoT | Transport & Logistics



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IoT | Smart Container

RFID e-Seal Example

- Barrier-type bolt seal
- RFID: ID-number + integrity
- Bar code
- Battery 1 year transmitting
- 50 cycles
- Range up to 50 meters
- 915 MHz + 2.4 GHz
- Data transmission rate 500 kbps
- Storage 64 bytes

IoT | Gemalto M2M – Wireless Modules

MC75i, TC65i/TC65i-X, TC63i

- Powerful Processor Large Memory
- SIM Access Profile
- Quad-Band
- Tunneling Mode
- EDGE / GPRS Class 12
- Industrial Interface
- FOTA
- USB
- Java™
- RIL Driver
- TCP/IP
- RLS Monitor (Jamming Detection)

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IoT | Sierra Wireless at CPH Airport

To ensure maximum safety for all passengers, Copenhagen Airport continuously monitors local weather conditions. In addition, airport operations regularly measures weather-related runway conditions, such as temperature and moisture, in order to store and analyze data and relay status and safety information to incoming flights.

SIERRA WIRELESS™ | AirLink™

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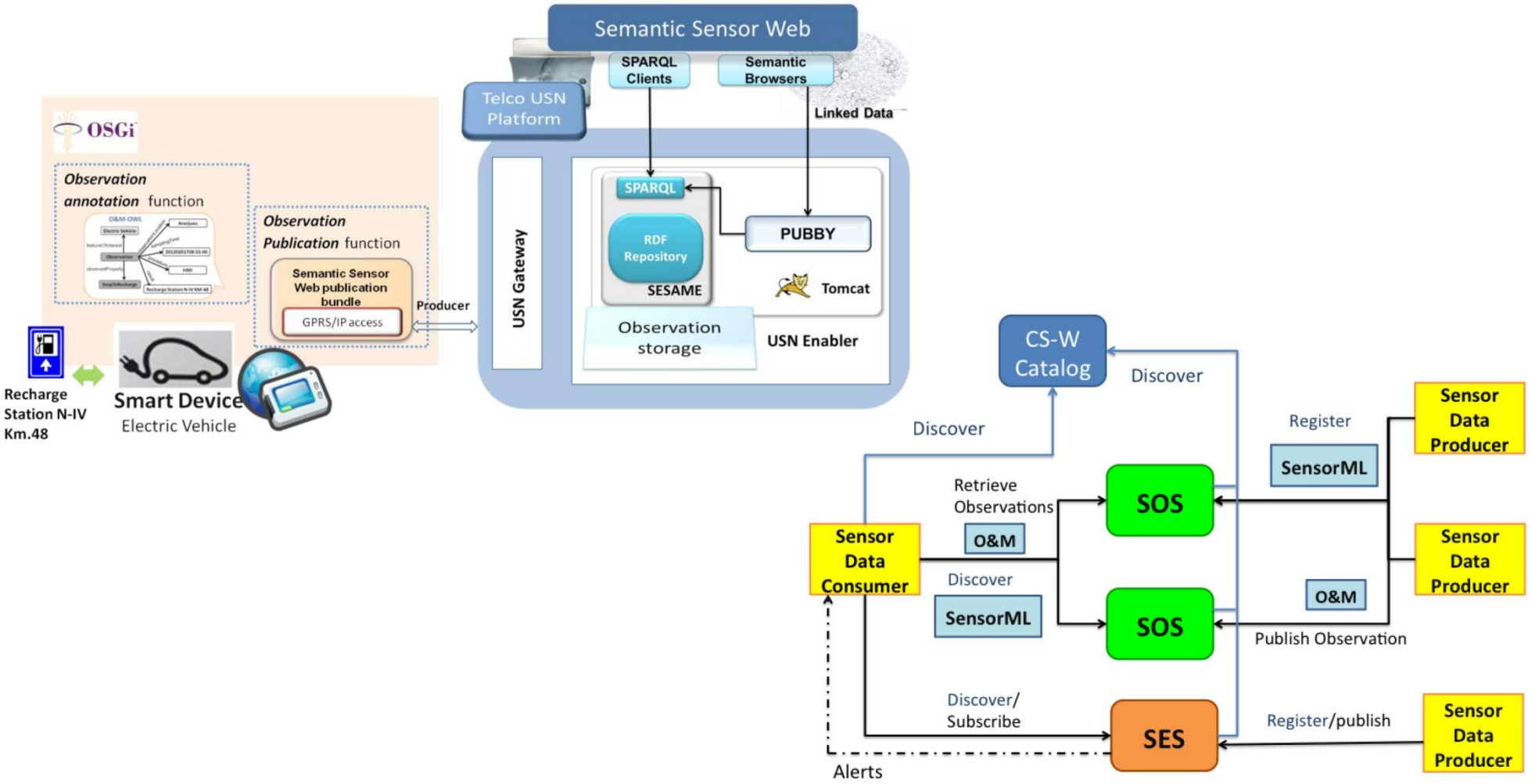
Smart Grid | Sensor Web



Images: Facultad de Informática, Madrid Spain

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JavaOne 2009 | LincVolt

Images: eWEEK

JavaOne 2009 | Audi

Images: Sun Microsystems

JavaOne Japan 2013 | NXP

In Vehicle Java : Sensors and Gateway

センサーネットワークのプラットフォームとしてのJava

Java ME

Java ME Embedded

Java Card

Sensors

- スピード
- ブレーキ
- GPS
- 室内外温度
- ライト
- サスペンション
- エンジン/オイル
- ハンドル
- ドライバーの状態
- ドライバーの確認
- ワイパー
- ティルト
- ドア

等々.....

WiFi
Bluetooth
Wired
etc.

Cloud

3G/LTE
WiFi
Wired
etc.

Gateway

Apps
* Write Once, Run Any Where

Java VM	Java VM	Java VM
OS A	OS B	OS C
R-Car	i.MX	Atom

Oracle Event Processing

Java Embedded Suite

Java SE

Berkeley Database

 | |

Images: Sun Microsystems

JavaOne ORACLE

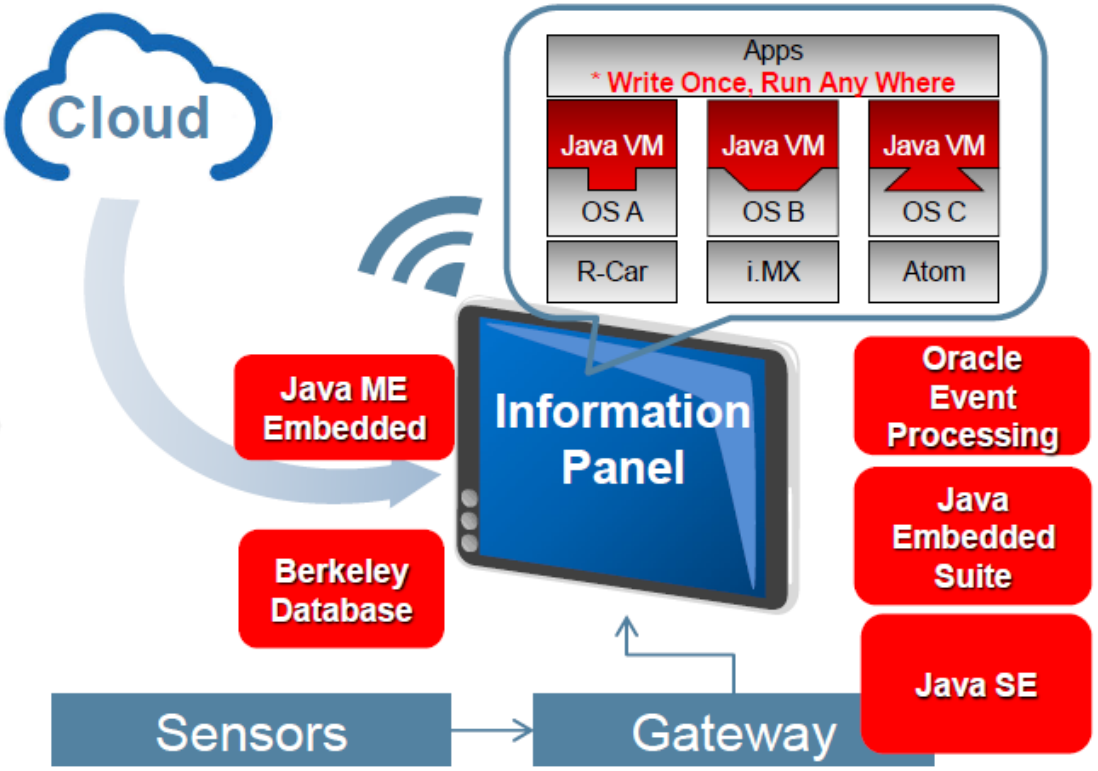
In Vehicle Java : Infotainment

自動車内でのネットワーク・サービスプラットフォーム

Network Service

- GPSによるロードサービス
  - 渋滞情報
  - ガソリンスタンド（価格情報）
  - レストラン/娯楽情報/店舗情報/スポット
  - 最新マップ/工事情報
  - 場所情報のシェアリング
- 局地的な気象情報（GPS + Wiper）
- アプリケーションの追加
- ネットワーク　エンタメ情報
  - インターネット・ラジオ
  - マルチメディア・プレイリストの ストリーミング
- センサーデバイス経由によるカーメンテナンス情報C

etc.....



CES 2015 | Audi Cars Powered by Java

https://youtu.be/lDEpAVgS-js

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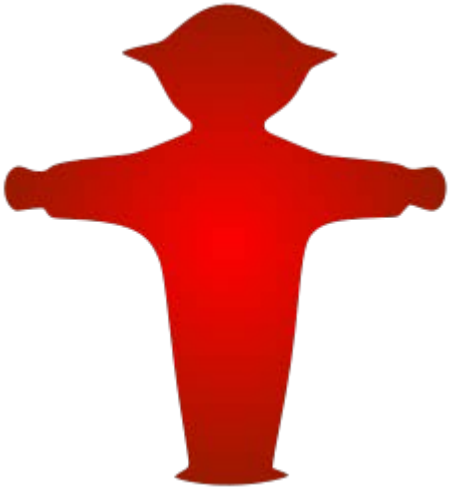
Where is Java used in Automotive?

- Tools and Factory Automation
- Sensors (often specialized solutions), Telemetry and Data Transfer to the Cloud
- IVI (In Vehicle Infotainment)
- No Real-Time or Safety-Critical usage other than a few concept cars or demonstrators, nothing in production

Why Java lost its ”Drive”?



- JavaRTS and Safety Critical JSRs either stuck in J2ME or inactive.
- Mobile and Embedded JVMs not stable and reliable enough compared to e.g. C/C++. Automotive experts who worked with them or evaluated say it’s at least another “few years”, assuming vendors/community pursue rather than just sue