



DOK-ING

Innovative Solutions



MyHMI

Overview

MyHMI - HMI Synergy

In the era of the necessity for Human Machine Interface (HMI) enhancements, DOK-ING recognized the opportunity for imparting a fully modular and innovative HMI framework. **MyHMI** uses the power of software to achieve the synergy between man and machine. Modularity of the framework includes possibilities for a customizable advancement of the HMI in the domains of communication, data acquisition and processing, and visualization. The framework's innovative component is contained in its orientation towards distributed processing and embedded systems.

MyHMI provides an easy interface implementation, regardless of the architecture and graphics mechanisms, even the communication system it relays on, through an easy to use graphical development tool.

Ergonomics of MyHMI interface

MyHMI is an industrial application development platform, adjustable to the specific requirements. It's fully flexible towards an underlying hardware platform and communication systems, and thus has opportunistic usage in many industries:

// **Automation and manufacturing**

// **Energy and infrastructure**

// **Medical and pharmaceutical**

// **Travel and transportation**

MyHMI concerns any industry branch which shows the need for control and visualization mechanisms through HMI.

Intended use of **MyHMI** can be seen through:

Managing concept - referring to the design, industrial system integration and management, and customer or end users aspects of a HMI.

Engineering concept - referring to the development, implementation, building, maintenance and customization aspects of a HMI.

The two concepts interleave in the unique purpose of developing, and delivering or managing of visual, processing and communication components of the industrial interfaces.

MyHMI - partner in graphical interface development

MyHMI framework represents an innovative approach in design, development, and integration or building of the graphical interfaces.

Based on its modularity, **MyHMI** enables building of graphical interface platforms, that are easily customizable to fit the special requirements.

Besides the customizability, the main gain of using **MyHMI** as interface development partner, is a rapid deployment. Fast and adjustable construction of the graphical elements enables quick and robust deployment of the interface.

The customizability and rapid deployment, not only evolve procedures of enhancing the interface itself, but evolve the whole product development process.

Development with MyHMI reduces:

Risks - The modular, pre-tested graphics software core, mountable on various hardware and OS platforms, simplifies custom application development, lowering the risks of cross platform portability. **MyHMI** enables significant HMI extensibility, keeping the consistency in the development process at the same time.

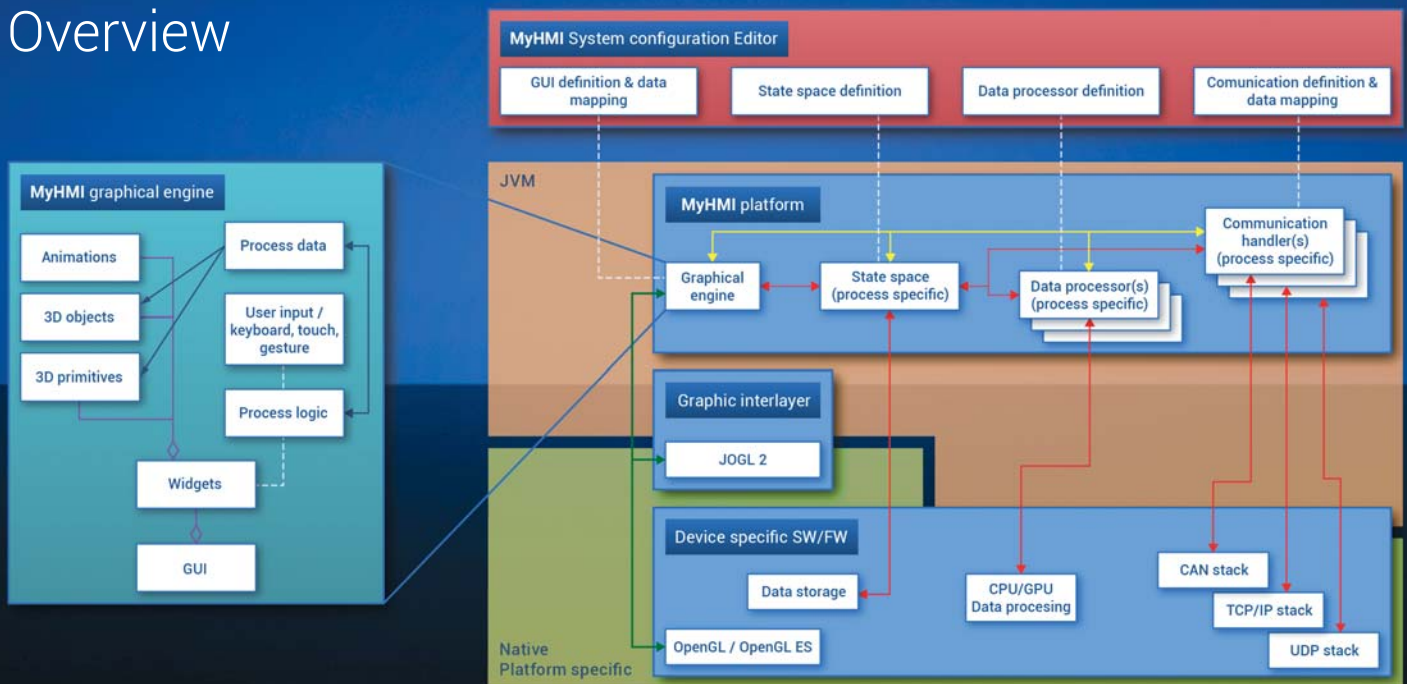
It also increases development process agility and responsiveness to the customer demands changes, reducing risks of negative outcomes for the clients.

Time-to-market - **MyHMI** eases the process of building a HMI from the bottom, as well as enhancements of the interfaces built with **MyHMI**. Customizability of **MyHMI** enables adding and changing of the special use intended interface elements, in a remarkably reduced time period.

Costs - **MyHMI** provides easily and quickly adjustable graphical elements due to its modularity thus reducing overall costs through all phases of the development process.

Changes and adjustments in the visual and functional dimensions of the interface do not slow down nor downgrade the deployment, reducing the costs of customization or enhancements.

Overview



DESIGN AND DEVELOPMENT

Primarily, MyHMI framework was developed for automotive and vehicle infotainment and control applications. In architecture design phase, the developers have foreseen extensions of those applications. They used nVidia Tegra embedded systems as the framework development platforms. Tegra based systems rapidly overwhelmed the consumers and mobile industry, with a clear tendency to expand to other industries and markets. Through the phases of MyHMI development cycle, the same tendency became obvious for the framework itself.

The base of MyHMI system is a configurable kernel for real-time data acquisition, processing, display and interactive visualization, control messaging and managing. The kernel is encapsulated by the powerful and adjustable graphical software engine. Engine's architecture is two and a half layered, consisting of the low level graphical layer based on

the OpenGL and OpenGL ES standards, JOGamp's JOGL2 interface interlayer, and Java based upper layer. Lowest layer is device specific and handles OpenGL/OpenGL ES drivers and OS calls. Upon lowest layer, there is JOGL2 interlayer, that bridges Java API OpenGL/OpenGL ES calls, and provides multiplatform compatibility through device profiles and wrappers to the native OpenGL driver implementations. Therefore the interlayer enables a portability of the graphical engine to ARM or x86 based architectures, using Windows, Linux, or Android operating systems. The highest layer is Java implemented, and encapsulates a full 3D graphical engine, process specific state space and data processor, and communication, handlers. The graphical engine enables the usage of graphical primitives, as well of more complex, compound graphical structures (widgets), in a fully 3D interactive environment, with the purpose of building a configurable graphical visualization interface.

MyHMI



FEATURES

- Full 3D visualization with support for OpenGL/OpenGL ES with different device profiles and import of 3D models in OBJ format
- Java based application that can run on different device profiles with ARM or x86 based architecture, easily deployed on Windows, Linux or Android devices
- Modular architecture that allows you to develop and plug-in your own data processing and data acquisition modules
- Built-in modules specific for electric vehicles which include CAN bus or IP communication/state mapping and power consumption analysis
- 3D editor for application widgets/scenes built on Eclipse IDE, with possibility for extending basic widget functionality with your own code-behind
- System and visualization modules are wired through respective XML configuration files



BENEFITS

- Portability across different platforms/device profiles
- Freedom in using your own 3D models for visualization
- Ability to easily integrate your own data processing logic
- Confidence in using a fault tolerant system built with best practice industry standards
- Familiarity of proven development tools used by a wide developer base

UNIMOG

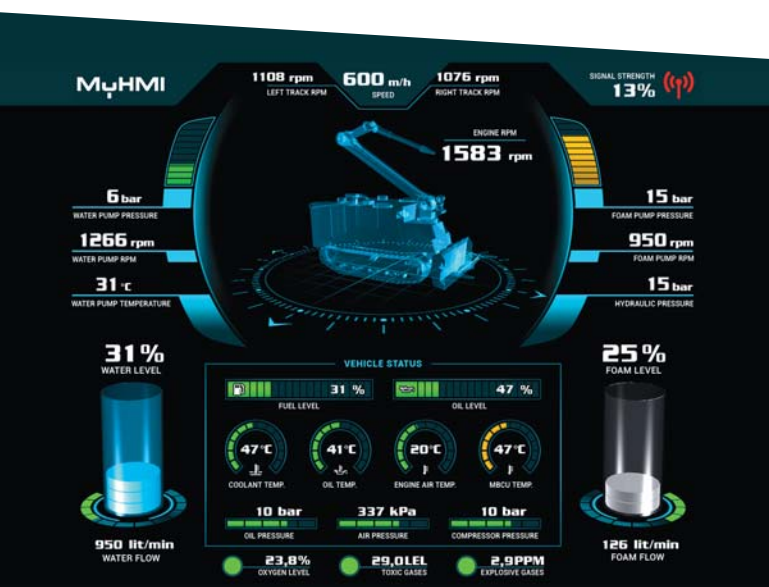


Power of MyHMI expressive graphical abilities, with application to the industrial interfaces, was demonstrated by development of the interface for a mobile control center - UNIMOG.

UNIMOG is supporting vehicle for DOK-ING's multifunctional robotic system MVF-5, representing the mobile control center with the additional tank for water.

Utilization in UNIMOG's graphical interface includes display and management of control relevant information, enabling remote monitoring of the MVF-5 system, reducing risks and influences of hazardous environments for an operator. MyHMI brings the fresh new 3D graphics into UNIMOG's interface, presenting telematics data transferred from the MVF-5 machine using duplex RF connection channels, in effective and jet fully visually attractive way. Interface integrates numerous graphically expressive indicators, bars, and outputs, as well as MVF-5 system 3D model, emphasizing one of its most prominent features.

UNIMOG's interface implementation highlights two significant features of MyHMI: 3D graphics and parallel communication and data processing mechanisms, fully adjusted to the specific needs. This interface is manifestation of the benefits, not only operational ones, like easing MVF-5 control and operator's safety, but also those in a whole process of integrating a new usability oriented looks and functionality into existing system.





CROSS-PLATFORM CONNECTIVITY PRESENTED AT CES 2013

Application of MyHMI framework in automotive industry, was presented in a form of table-top demo system, on CES 2013 and GTC 2013, as a part of the NVIDIA Automotive Division.

Industry software platform for the future

MyHMI reveals itself as the comprehensive framework for the industry interfaces deployment and integration. MyHMI is software platform adjustable to low-level device engines and communication protocols, and provides the ease of development and customizability. It leverages 3D graphical visualization, empowering the use-oriented application developers in the process of a complex and modular graphical user interfaces deployment.

As the software platform solution, MyHMI overrides the highly specialized solutions, prevailing on today's industry framework market. Superseding them because of their inertness and tightness, MyHMI provides itself the inevitable power of growth.

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Your solution for the
embedded tomorrow.



MyHMI

MyHMI is developed by DOKING Research & Innovation team.