Welcome, to the first newsletter of the vf-OS project - virtual factory Operating System

What is vf-OS? virtual factory Operating System – is a project funded by the H2020 Framework Programme of the European Commission under grant agreement 723710, conducted between the period of October 2016 until September 2019. It engages 14 partners from 7 countries with a total budget of 7.5M€. The goal of the project is to develop an Open Operating System for Virtual Factories for the Factory of the Future. It is a Virtual Factory Platform that enables multi-sided market interactions between:

- Software Developers either independent or within individual manufacturers who will develop Manufacturing Apps (vApps) either through innovation or due to manufacturing user demand
- Manufacturing and Logistic Users who will explore the marketplace for existing vApps ready to run on their environment or request new ones to be developed
- Manufacturing and Logistics Solutions Providers who will provide ICT interfaces and manufacturing connections
- Service Providers who will make services available such as hosting, storage, connected cloud services, etc. including those based on developed solutions

### Software Operating System Environment vs vf-OS Equivalents

<table>
<thead>
<tr>
<th>Software Operating System Environment</th>
<th>vf-OS Equivalents</th>
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<tbody>
<tr>
<td>Kernel Processor, Memory, Internal Bus</td>
<td>Virtual Factory System Kernel</td>
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<tr>
<td>I/O Interfaces, Device Drivers, Peripherals</td>
<td>Virtual Factory I/O</td>
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<td>File and Data Handling Interfaces</td>
<td>Virtual Factory Middleware</td>
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<td>SDK Application Development, System Monitor</td>
<td>Open Applications Development Kit</td>
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<tr>
<td>Applications ERPS, CRMS, MES, WMs</td>
<td>vApps</td>
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Analogy between regular Operating Systems and vf-OS

vf-OS will provide a range of services to connected factories of the future to integrate more efficiently manufacturing and logistics processes. The vf-OS Manufacturing Applications Store will be open to software developers, using the freely provided Open Applications Development Kit. They will be able to quickly develop and deploy smart applications, to enable and optimise communication and collaboration among supply networks of several sectors in all the manufacturing stages and logistic processes.

### vf-OS Multi-sided platform

vf-OS business is largely foreseen to happen through a platform / marketplace approach where demand and supply for certain goods or services meet in order to:

- Offer products and services in a structured manner
- Select and find required products and services
- Negotiate the price and conditions
- Set up a contract
- Pay and deliver the offered products and services

vf-OS aspires to become sustainable after the project ends. Therefore, it is envisioned to create a consortium from partners to set up the “vf-OS Limited” to jointly commercialise the work developed.

vf-OS Pilot Industries

- A Spanish SME located in Aretxabaleta, Gipuzkoa specialised in designing, developing and installing systems and equipment to automate assembly processes. More info @ www.mondragon-assembly.com
- A Lithuanian company located in Vilnius that merge and utilize PhotoVoltaic glass processing & lamination as well as insulated glass manufacturing industries to supply entirely customized safety glass components. More info @ www.viasolis.eu
- A Portuguese company located in Oeiras that provides project management and construction work supervision on behalf of its clients ensuring work implementation is according to the contract agreement. More info @ www.consulgal.pt
- A French SME located in Saint Symphorien d’Ozon specializing in the manufacturing and transformation of plastic for several application domains. More info @ www.apr.eu
- A French SME located in La Grand-Croix which has significant expertise in engineering and transforming metal parts, using several technologies, for major industrial sectors such as aeronautics, energy and railways. More info @ www.tardy.fr

The team @ vf-OS Kick off Meeting in Calp, Spain
vf-OS Research Partners

- **A multidisciplinary, independent, and non-profit research institute employing around 180 people, located in Almada, Portugal.**
  - More info @ [www.uninova.pt](http://www.uninova.pt)

- **A public university with 13 High Technical Schools of Engineers, employing more than 5300 people, located in Valencia, Spain.**
  - More info @ [www.upv.es](http://www.upv.es)

- **A university that develops undergraduate, master and PhD courses in several fields and 38 research labs, located in Lyon, France.**
  - More info @ [www.univ-lyon2.fr](http://www.univ-lyon2.fr)

- **A private non-profit, technology center R&D located in Mondragon, Spain.**
  - More info @ [www.ikerlan.es](http://www.ikerlan.es)

vf-OS SMEs

- **A specialist in Software, Data, and Services including commercial R&D, development, located in Cheshire, United Kingdom and Calp, Spain.**
  - More info @ [www.technologycatalyst.com](http://www.technologycatalyst.com)

- **A spin-off company focused on three different business areas: Research & Development, support on the creation of Startups, and Technology Consultancy, located in Almada, Portugal.**
  - More info @ [www.knowledgebiz.pt](http://www.knowledgebiz.pt)

- **An independent software vendor focused on software apps, cloud-based systems development and Big Data management located in Ganderkesee, Germany.**
  - More info @ [www.ascora.net](http://www.ascora.net)

- **A research and development company that conducts activities in several ICT domains, ranging from healthcare to manufacturing systems; located in Rotterdam, Netherlands.**
  - More info @ [www.almende.com](http://www.almende.com)

- **A software company that conducts several types of businesses from software development, Linux appliances, e-learning, open-source consulting and research & development, located in Lisbon, Portugal.**
  - More info @ [www.caixamagica.pt](http://www.caixamagica.pt)

vf-OS Architecture

vf-OS is based on a federated architecture, which consists of several components split into the following architectural building blocks:

- **Design time: Application-Development:** This block comprises of the different vf-OS components that will be used for the development of vApps. These components or features are useful for developers or for business people to carry out relevant activities when developing a vApp.

- **Runtime: Application Services & Middleware:** This block includes the vf-OS components that will be used by the vApps when they are executing or when they are trying to execute some of the vf-OS resources. It is possible to distinguish four different modules depending on their functionality: Middleware, Data Management, I/O Toolkit, and Control modules.

- **Use: Application-Deployment:** This block is composed of vf-OS Assets, including vApps, as well as the Marketplace where assets can be acquired from, which are then deployed in manufacturing organisations.

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vf-OS Workshop

vf-OS has hosted two successful workshops at the 23rd International Conference on Engineering, Technology and Innovation held in Madeira, Portugal. The main goal of these workshops was to establish synergies with other factory-of-the-future projects reaching an impact position among the stakeholders of the European Factories of the Future Research Association (EFFRA). Also, the workshops helped vf-OS analyse which results have potential to be proposed as a standardisation activity or initiative.

**27 June 2017 – Conceptual Workshop**

Chaired by Eduardo Saiz – IK4-IKERLAN and Ricardo Gonçalves – UNINNOVA (vf-OS) with the following three sessions:

- CPS Legacy Systems
- Interoperability of Platforms & State of the Art Platforms
- FiWARE-FITMAN and the new FiWARE further organisation

**28 June 2017 - Platforms Analysis Implementation and Business Workshop**

Chaired by Raúl Polier – UPV (CZNET) and Gash Bhullar – TANet (CREMA) with the following five sessions:

- Core ICT Technologies and Reference Architectures
- European Projects Business Models and Ecosystems
- Multi-side Platforms Business Models
- Collaboration Plan
- EFFRA Mapping Framework


Thank you very much for your interest in vf-OS project!

- [www.vf-os.eu](http://www.vf-os.eu)
- [www.facebook.com/vfoseuropeanproject](http://www.facebook.com/vfoseuropeanproject)
- [www.linkedin.com/in/vf-os-project](http://www.linkedin.com/in/vf-os-project)