<u>Manufacturing, academic, and security stakeholders aligned to transform the construction industry</u>

DigiFab4KMU – Paving the way for smart factories in practice

Karlsruhe, Germany – archis Architekten + Ingenieure, an architecture firm successful in the development, planning, and realization of construction projects throughout Germany, ARNOLD IT Systems, a system house for CAD, CAM, PDM, Industry 4.0 & software development, manufacturing and BIM, the Institute for Information Management in Engineering (IMI) of the Karlsruhe Institute of Technology, a pioneer in virtual factory planning research, and Wibu-Systems, the cybersecurity vendor that is leveraging the protection of digital assets to monetize Industry 4.0 driven economies, have joined forces to launch the construction industry into the digital age.

Building construction has been at the forefront of technological progress throughout the millennia and stands again on the cusp of momentous changes: the digital revolution, bringing not only substantial opportunities, but also considerable challenges. Construction projects large and small are becoming ever more complex, with a constant stream of new guidelines and building codes to consider, the risks of climate change to address, and the expectations of an increasingly urban and tech-savvy clientele to meet.

Building information modeling (BIM) is an innovative process of generating, analyzing, and managing building data throughout its life cycle. Used in planning, construction and management of buildings or other structures, BIM relies on non-proprietary, end-to-end business processes that work across companies and free from media disruption. However, 3D-model design theory, like BIM, has yet to make its contributions more universally applicable in the field, as legacy

systems will continue to be used in conjunction with pioneering innovations.

DigiFab4KMU intends to leverage the potential of the digital revolution in the building industry by integrating all phases and agents involved in the construction process and their unique data and software assets in one integrated virtualization system (IVS). This IVS covers the entire process from planning to execution and operation for all trades and disciplines involved in the process, ranging from the architectural to the building technology, logistics, and IT functions. The end result is a comprehensive and fully digital value chain that brings all of the innovations already realized by other digitally transformed industries to the construction sector: business intelligence, smart and connected production processes, optimized material flows, and mass data driven process optimization. The IVS constitutes a virtual twin of the physical project in much the same way and with many of the same benefits already achieved in similar systems in the mechanical engineering and other sectors of industry.

Bastian Wieland, CEO of archis Architekten + Ingenieure states, "The introduction of IVS will allow us to configure datasets in a totally new way that will give us a high level of flexibility and expandability in planning."

Marco Arnold, CEO of ARNOLD IT Systems, adds "Our company is tasked to deal with modelling and developing connected technical systems that will form part of the foundation of DigiFab4KMU. There are many hurdles to overcome for us to offer and operate innovative digital building and factory planning in the future, but we are certain that the boundaries that still separate different departments and IT systems and different ecosystems can be bridged with our joint efforts."

KIT, the Institute for Information Management in Engineering (IMI), headed by Prof. Jivka Ovtcharova, is researching, among other topics, virtualization from CAD planning data. In the BIM domain in particular, the goal is to combine all planning data for a new building into a virtual model. For example, 3D scans of the construction progress are combined with CAD plans. In addition, the production planning in the new building is supported by the virtual model and the virtualization of the previous production as well as a value stream analysis. The virtual reality system used in this project is PolyVR.

Michael Grethler, Head of the Digital Twin Unit (IMI) of the Karlsruhe Institute of Technology, comments: "Our task is to use holistic modeling to optimally design production facilities by implementing them across departments, making economic efficiency feasible, while simulating employee paths and logistics processes. This is where so-called lean production comes into play, which is primarily intended to contribute to the success of the company by eliminating waste and accelerating business processes. The balance between academic and technical expertise will be crucial for the success of DigiFab4KMU".

Wibu-Systems is adding its expertise and capabilities to the DigiFab4KMU initiative with an innovative approach for its sub-project, ***Industry 4.0 concepts in hardware production***. The vision of Oliver Winzenried, CEO and founder of Wibu-Systems, is clear: "We plan to create a comprehensive ecosystem where the physical premises represent one link in an integral and totally coordinated chain of data and information. This includes the design of novel processes for the IVS-driven planning and construction of our new headquarters, using the integrated system to create a fully Industry-4.0-ready infrastructure and digitally optimized process flows for the manufacturing of our company's hardware products."

Wibu-Systems will also contribute to the development of a new service model that brings the capabilities of the IVS to other SMEs who are in the process of taking their production infrastructure into the digital age, with the added power of Wibu-Systems' unique protection and security solutions.

DigiFab4KMU, where the digital transformation meets the construction industry

About Wibu-Systems
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Wibu-Systems, a privately held company founded by Oliver Winzenried and Marcellus Buchheit in 1989, is an innovative security technology leader in the global software licensing market. Wibu-Systems' comprehensive and award-winning solutions offer unique and internationally patented processes for protection, licensing and security of digital assets and know-how to software publishers and intelligent device manufacturers who distribute their applications through PC-, PLC, embedded-, mobile- and cloud-based models.

Media graphic resources available at: https://www.wibu.com/photo-gallery.html.

About archis Architekten + Ingenieure
archis Architekten + Ingenieure GmbH is one of the largest architectural firms in the German region of Baden-Wuerttemberg. With approx. 100 employees, the office serves institutions, investors, and private clients nationwide. In order to offer a professional service in all areas of a project, archis Architekten + Ingenieure covers all service phases from project development, design and implementation planning to construction and quality monitoring, cost and schedule planning.

About ARNOLD IT Systems

ARNOLD IT Systems, founded in 1997 in Freiburg, Germany, is an important and experienced solution partner for manufacturing and architecture. The system house for CAD/CAM, PDM/PLM, Industrie 4.0, and cloud solutions works with both large corporations and SMEs in 20 countries. ARNOLD IT Systems covers the entire range of services such as integration, professional training, individual coaching, and system support.

About IMI KIT

The Institute for Information Management in Engineering (IMI) is embedded in the research environment of the Karlsruhe Institute of Technology (KIT), Germany. The guiding principle of our research and development work is the integration of product lifecycle management (PLM) and CAx in process and system view, supplemented by virtual reality (VR) and augmented reality (AR) for high-end visualization as a modern working environment. This enables an interactive, immersive work with virtual prototypes during generation, validation and optimization of development results and thus contributes significantly to the effective and efficient cooperation of interdisciplinary teams. This is especially true for distributed product development in cross-company and intercultural corporate partnerships.