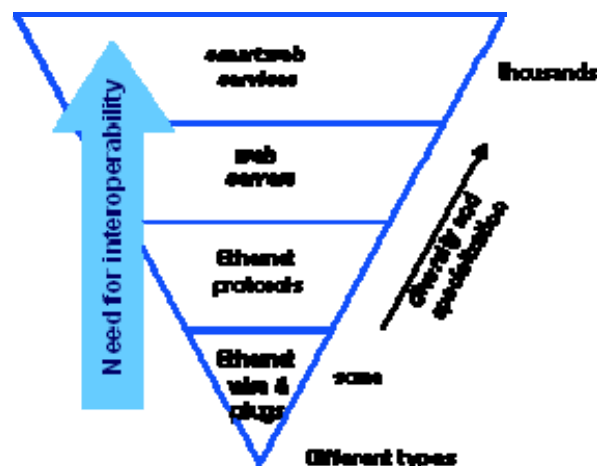


Towards Intelligent Distributed Systems

We are facing enormous pressure to stock more and more intelligence into small and smaller devices. This trend is common to all industrial sectors, such as home electronics, building installations and industrial automation.

In industrial automation, both for process and manufacturing, this trend manifests itself through a strong movement towards industrial Ethernet connections. Multiple protocols like Modbus, Ethernet IP, Profinet are used on top of this. Additionally, growing web services are offered, leading to thousands of different ongoing developments.

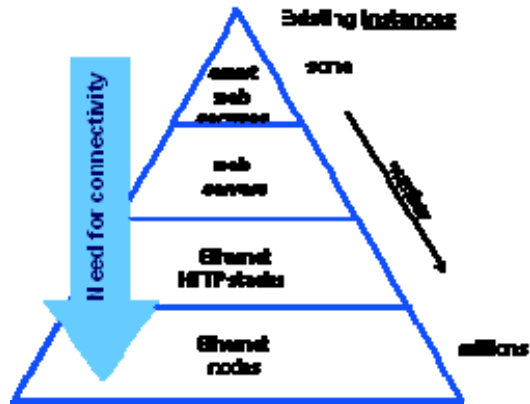
The higher these levels of communication are, the stronger the need for **interoperability** growth. Embedding more and more services into devices requires (from this perspective) a huge need for cooperation of heterogeneous systems. The key challenge is to have these smart devices working together to perform a specific role in one or more distributed applications.



On the other hand, looking at the number of solution on the market (instances) rather than the different types of development, leads to another picture.

Millions of Ethernet nodes, most of them using HTTP stacks, provide the base for industrial communication. A subset of these devices is providing web servers, but few instances have been implemented to offer smart services.

So, the deeper these layers of communication are and the greater the number of instances, the stronger the need for **connectivity** . The key challenge here is to have these smart devices using common communication protocols, communication interfaces and data access.



In the keynote, these needs will be illustrated and an explanation on the latest progress on both areas will be given – mainly provided by the results of two international projects: the ITEA SIRENA project and the I*PROMS network of excellence project, which are both linked to the IEEE IEC Technical Committee on industrial agents.