Nextworks

Profile, history & solutions

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❖ **Company info**

❖ History & lessons learnt

❖ Solution example

Company overview

Location: Pisa

An ideal location for the development of advanced technologies; Nextworks maintains excellent links with the local academia

Established: 2002

By a group of researchers. The core team has more than 15 years of experience in ICT, telecommunications, control & automation

Profiles: 95% graduates

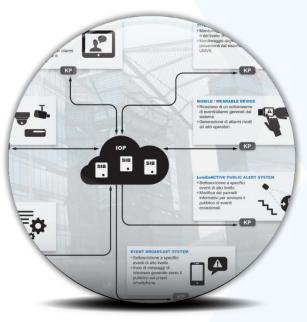The know-how and skills of its employees are the main strength and asset of Nextworks

R&D expenditure: ~25%

The time gap between technological innovation and obsolescence is narrowing, so it's mandatory, for a know-how based company, to invest in research and innovation

Main strenghts

❖ Strong focus in a well defined set of ICT technologies and architectures

❖ Specialized in integrated systems engineering and consultancy

❖ Long experience in planning and execution of co-funded R&D projects, National and EU-wide

ICT

Integrated Systems

R&D Projects

Activity areas and technology domains

Knowledge Division

research, consulting, 3rd-party development on networking architectures & technologies

Product Division

entertainment, home automation, security, control & automation systems for residential and yachting markets

Technology domains

- **Packet** networks (IP, Ethernet) and **core transport networks** (WSON, MPLS-TP, SONET/SDH, OTN)

- **Architectures** & **standards** (IETF, OIF, ITU, TMF-IPsphere, MEF, IEEE, OGF, etc.) for signalling, routing and cross-layer optimization (CSO)

- **Digital video** coding & transport (IETF, MPEG), Voice over IP (ITU-T, IETF)

- Industrial **control and automation** systems

- **Embedded systems**

Services, products, solutions

KD Services

- System/arch design
- Software development
- Software integration
- Training
- Research & development

PD Products & solutions

- BEST
- SeaLux
- Symphony
- spin-off products

[KD] Knowledge Division technology areas

❖ Developments in & long-term expertise on network control & management planes

❖ Own ASON/GMPLS and PCE network control plane

❖ Developments with Juniper's JunOS SDK

❖ Current R&D tracks

- Network + Cloud Control Plane (Cloud-to-Network interface)

- Energy efficient networks

- End-to-end and inter-carrier assured QoS network services (based on TMF-IPsphere)

- Control of sub-wavelength switching in metro networks

- Software Defined Networks (SDN) and split architectures (OpenFlow, PCE)

- Virtualization of network resources control

- Cross-layer (stratum) optimization

Customers and partners, R&D

network equipment vendors

Alcatel-Lucent, Ericsson, Cisco, Selex Communications, Nokia Siemens / Technolabs, Adva AG Optical, Juniper, Marben, Italtel, Nortel, NEC, Thomson, HP, Hitachi, Radcom

network operators

France Telecom, Wind, Telefonica I+D, Telecom Italia, Interoute, Eutelsat, British Telecom, Deutsche Telecom, Telenor, Primetel, Polish PTT, Etisalat, SAP

research partnerships

Alcatel-Lucent Bell Labs (FR), NEC Labs Europe (DE), University of Pisa (IT), CNR (IT), Consorzio Pisa Ricerche (IT), Poznan Supercomputing and Networking Centre (PL), INRIA (FR), Fundació i2CAT (ES), Universiteit van Amsterdam (NL), University of Bristol (UK), Research and Education Society in Information Technologies (GR), Technical University of Braunschweig (DE), Interdisciplinary Institute for BroadBand Technology (BE), Indian Institute of Technology (IN), Politecnico di Milano (IT), FTW (AT), Institut Telecom (FR), Universite de Versailles (FR), Technion – Israel Institute of Technology (IL), Athens University (GR), Universidad Autonoma de Madrid (ES), University College London (UK), Lancaster University (UK), Universite Catholique de Louvain (BE), Technische Universitat Berlin (DE), Universtitatea Politehnica din Bucuresti (RO), AIST (JP), KDDI (JP)

[PD] Current products & solutions

BEST
BENETTI'S EXCLUSIVE SEA TECHNOLOGY

the technology behind Benetti's Exclusive Sea Technology

The platform that integrates all the on-board electrical systems: video distribution, communications, video surveillance, yacht automation, monitoring, telematics

SEALUX
POWERED BY BEST

a suite of advanced, highly reliable products for the full comfort of onboard life

Entertainment, Videosurveillance and Monitoring, Communications, Living and Yacht Automation, Networking, Fleet Control System

symphony

an integrated system for home automation

multimedia entertainment, communication/videoconferencing, video surveillance, domotics, management

[PD] The technologies behind the Product Division

❖ Home and building control/automation

- Domotics (KNX and proprietary solutions)
- Home and building automation systems integration
- Middleware for IoT architectures

❖ Overarching solutions for the integration of various subsystems

- Building automation, A/V, Communications, Videosurveillance, …

❖ Energy monitoring (Cisco EnergyWise, IETF EMAN)

❖ Industrial information systems

- Sensor data gathering and processing architectures
- Real-time monitoring
- Remote display and management systems
- Alarm management and integration with multiplatform communication systems

Partnerships

❖ Member of

- **Polo PENTA** since 2011

- **Polo ICT/Robotica** (Media Cluster) since 2011
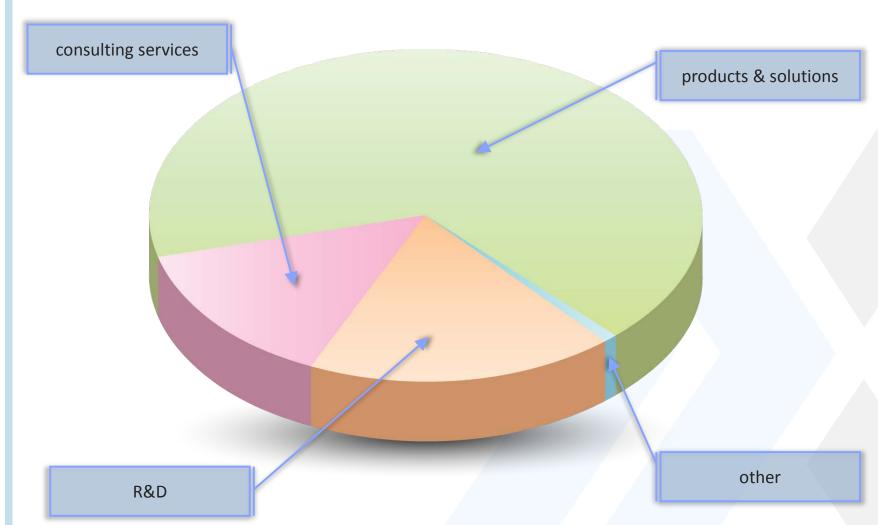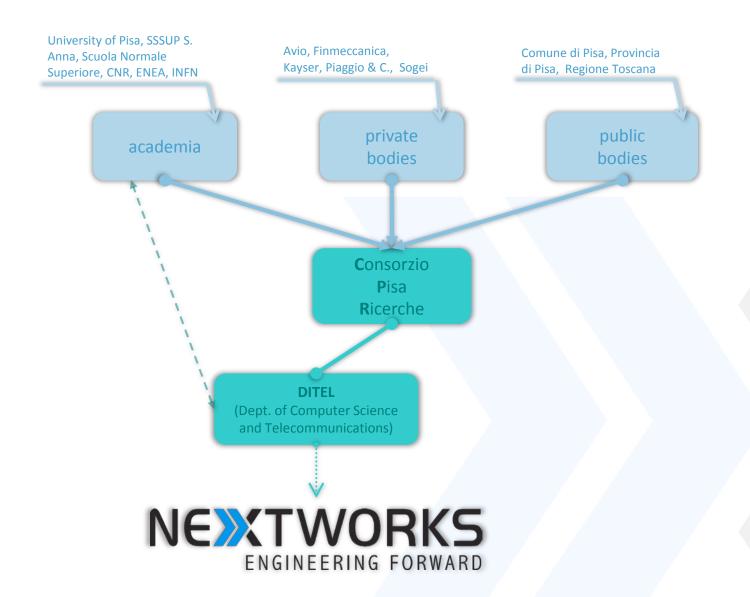
- **NET-Y** since 2012

- The **NAVIGO network** since 2013

Sales & breakdown

❖ Sales in 2012: ~2,7 M€

consulting services

products & solutions

R&D

other

❖ Company info

❖ **History & lessons learnt**

❖ Solution example

Genesis of Nextworks

University of Pisa, SSSUP S. Anna, Scuola Normale Superiore, CNR, ENEA, INFN

Avio, Finmeccanica, Kayser, Piaggio & C., Sogei

Comune di Pisa, Provincia di Pisa, Regione Toscana

academia

private bodies

public bodies

Consorzio **P**isa **R**icerche

DITEL
(Dept. of Computer Science and Telecommunications)

NEXXTWORKS
ENGINEERING FORWARD
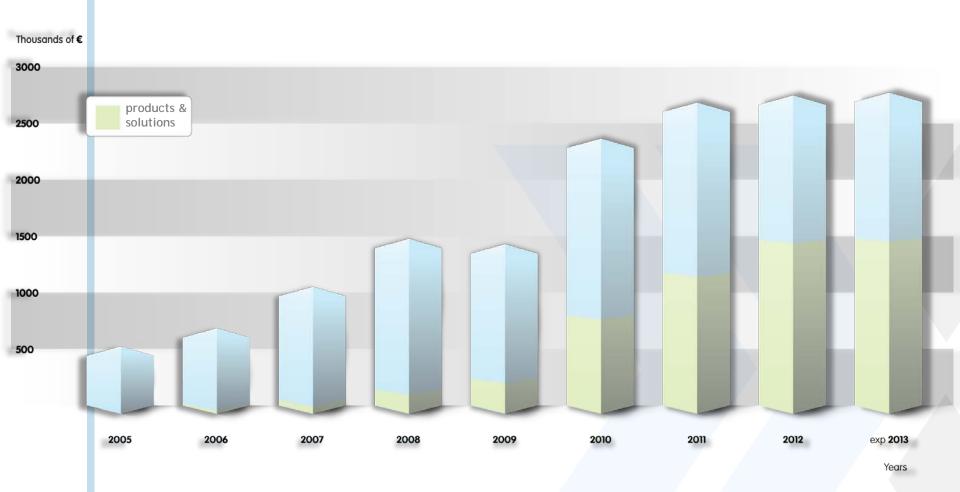
Funding history

❖ Small initial capital by the shareholders

- all of them employed by and working in Nextworks

❖ Started up with consulting activities

❖ Ignited R&D co-funding since 2005

- European, National, Regional

❖ No external capitals so far

Annual sales

[KD] Track of major consulting activities

(with type of activity, technical topics and customer)

❖ Design and development of an ASON/GMPLS control plane stack for SDH and WSON devices (Linux / VxWorks / pSOS boards) [Marconi Communications]

❖ Support to the GMPLS integration and validation activities on SDH equipment [Siemens/Technolabs]

❖ Design and development of Transport Ethernet E-LINE/E-LAN control components of a hybrid TDM-GbE switching equipment (Linux PPC boards) [Alcatel-Lucent]

❖ Design and development of a T-MPLS/MPLS-TP data plane software agents for a hybrid TDM-GbE switching equipment (Linux PPC boards) [Alcatel-Lucent]

❖ Design and development of extension to a commercial GMPLS PCE server [Ericsson]

❖ Development and I&V for GMPLS on SDH and WSON equipment [Ericsson]

❖ Design and development of system software on radio BSes [Selex Communications]

❖ Support for network architecture design and service operations [Interoute]

[PD] Track of major products & solutions delivered

❖ **BEST**

- **40 full systems delivered since 2007**: 15 Benetti Custom (50-90 mt), 25 Benetti Class (30-40 mt)

❖ **SeaLux**

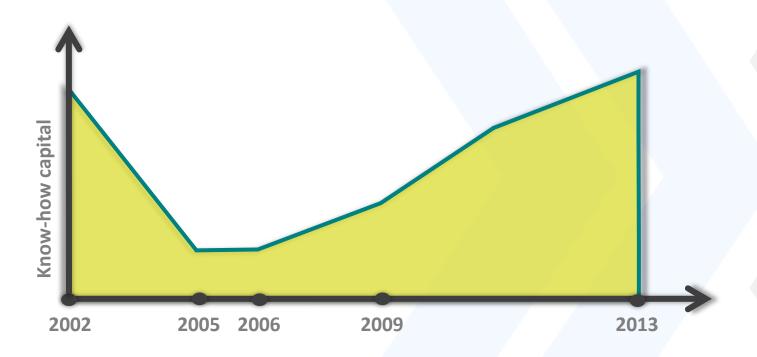- **6 delivered in the last 12 months**: 3 Shipyard Overmarine, Shipyard Viudes, Shipyard Leopard

❖ **Symphony**

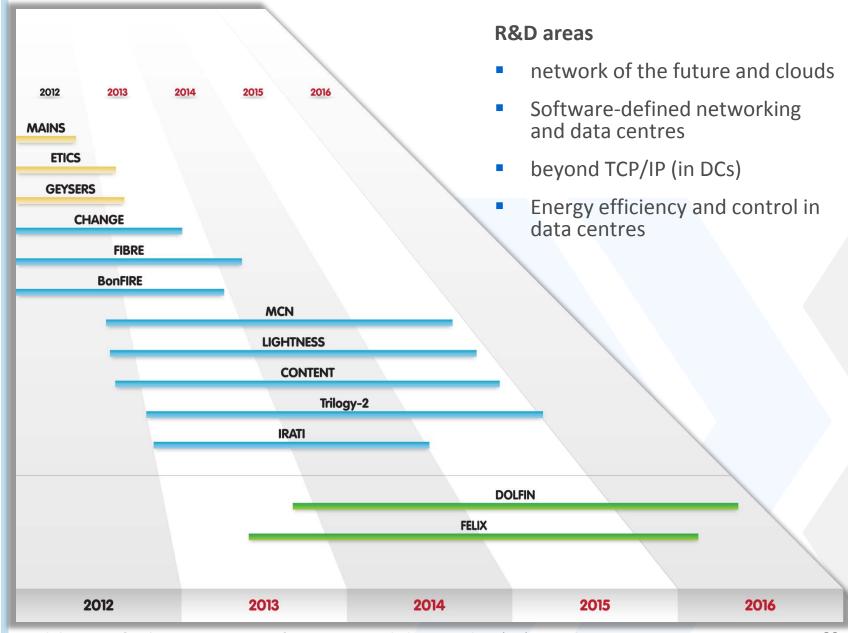- **4 full systems delivered**: 1 hotel, 1 office, 3 villas
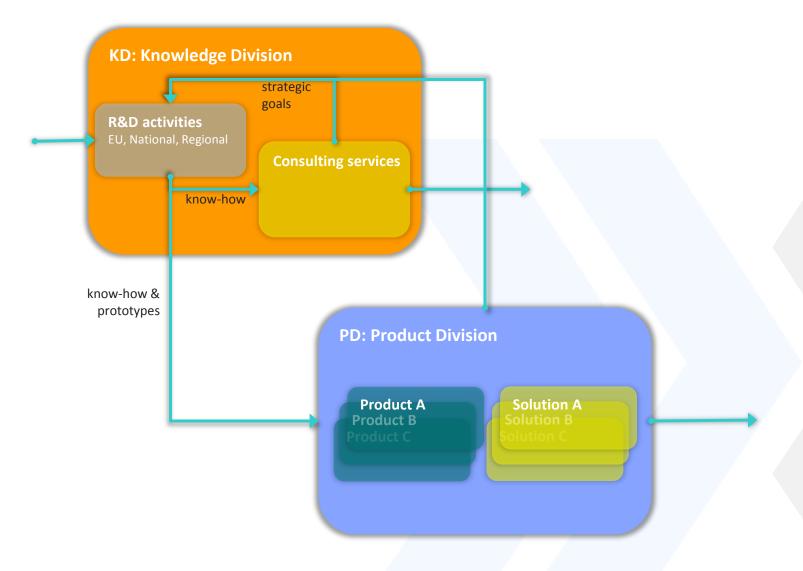
The need for continuous R&D/innovation

❖ Started from a know-how capital in 2002

❖ Deployed in early innovation activities

❖ Depleted the know-how fuel by approx 2005

❖ Started over with R&D activities in 2006
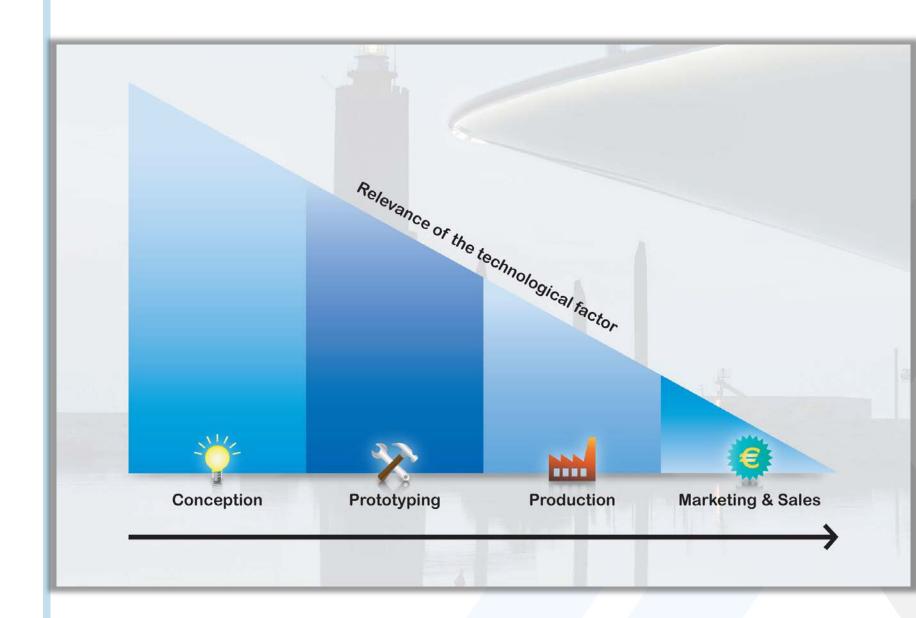
❖ Sticking to that since then

Ongoing R&D projects

R&D areas

- network of the future and clouds
- Software-defined networking and data centres
- beyond TCP/IP (in DCs)
- Energy efficiency and control in data centres

The innovation cycle

KD: Knowledge Division

R&D activities
EU, National, Regional

strategic goals

Consulting services

know-how

know-how & prototypes

PD: Product Division

Product A
Product B
Product C

Solution A
Solution B
Solution C

Product innovation [1]

Product innovation [2]

❖ Market specific requirements

❖ Low-tech yet demanding customer

　　⇒ Design for the user, engineer for flexibility

❖ Not just product, but service

- Design
- Realization
- Commissioning
- Delivery to the end user
- After-sales assistance

　　⇒ Seamless subcontracting chain

Managing innovation at large

❖ When know-how is the main result of R&D…

  ▪ …the personnel involved is crucial

❖ $\Rightarrow$ Need for a

  ▪ Core, stable team involved in R&D and consulting services [KD]

  ▪ Regular rotation of the key technical staff involved in products & solutions [PD]

❖ We mostly require **vertical skills for R&D activities**; bottom-up:

  ▪ Execution of the R&D activities as planned (e.g. sw development)

  ▪ Concept, architecture & design

  ▪ Research strategy & project planning

Besides innovation…

❖ Enlarging the activities from consulting services to products/solutions implies a number of changes

❖ **Progressive differentiation of functions**, i.e. from personnel with **vertical skills**, to more **specialized staff**

- Customer accounts & product strategy
- Software developers
- Installation and assistance
- Warehouse & logistics

❖ Vertical skills are still needed when selected persons are involved in R&D activities

Where do we go from here?

❖ Consulting services

- Progressive migration to a product-based approach in telecommunication software

  - Not a whole product of our own; just a small piece in the bigger value-chain

  - Enabled by new chances in the business ecosystem of telecommunication networks

    – E.g. SDKs by big vendors (Juniper, Cisco) and Software-Defined Networking at large

❖ Products & solutions

- The yachting market is saturated

- Gradually approach the high-end residential and office markets

- …and the energy monitoring business at large

❖ Company info

❖ History & lessons learnt

❖ **Solution example**

Lighting
HVAC
Curtains
Surveillance

Available on the App Store

Thank you! For any further info…

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