Cyber-physical systems
for processes and organisation

WEIGANG.NEO

SKILLS PORTFOLIO

WEIGANG.NEO: Our Philosophy

Leading innovator in production organisation of the future

WEIGANG.NEO stands for modern, revolutionary and innovative process organisation applications of the future.

By combining conventional document-based organisation with opportunities from IoT we are able to realise a visionary concept of future production organisation today: production organisation of the future includes decentralised shop floor management that makes people the directors of added value, as well as encompassing the coexistence of the shop floor and top floor, networking (IoT*), real-time image of production and efficient process management.

»Decentralisation and small units enable a flexible response to specific customer problems and to the market requirements of the future. Only in this way we are able to use the fastest computer available to the company for complex processes: the human brain.«

Visionary and economic theorist Reinhard K. Sprenger

It is often the case that a central ERP system fails to reflect the reality on the shop floor. That's why we think revolutionarily different:
decentral, bottom-up, from shop floor to top floor – this is our approach. People become the directors of added value and it is the human brain that is in control, being quicker and better than any computer, managing the individual production steps or deviations decentrally. We offer these directors total transparency and planning control on the shop floor using our networked boards, our technologies and the support of our assistance system. Processes thereby become tangible; people become actively involved as problem-solving, creative and competent organisers and decision makers.

A system that learns is created.

*A glossary can be found on pages 10-11.

WEIGANG.– Experience creates quality

WEIGANG stands for organisation, visualisation and communication that can be experienced. We understand the need to display information, goals, workflows and results clearly and simply. The WEIGANG Group is among the leading global providers in the sphere of visual management systems and manual planning. Our family company has been producing conventional organisation resources since 1945 and is therefore able to draw on from decades of industry experience. Our 'Made in Germany' production proves that we are committed to Germany as a production location. We have meanwhile received recognition as a German manufactory.

Our range of products has grown over the years, while our spectrum of applications and solutions has both expanded and become more individualised.

Individual customer solutions

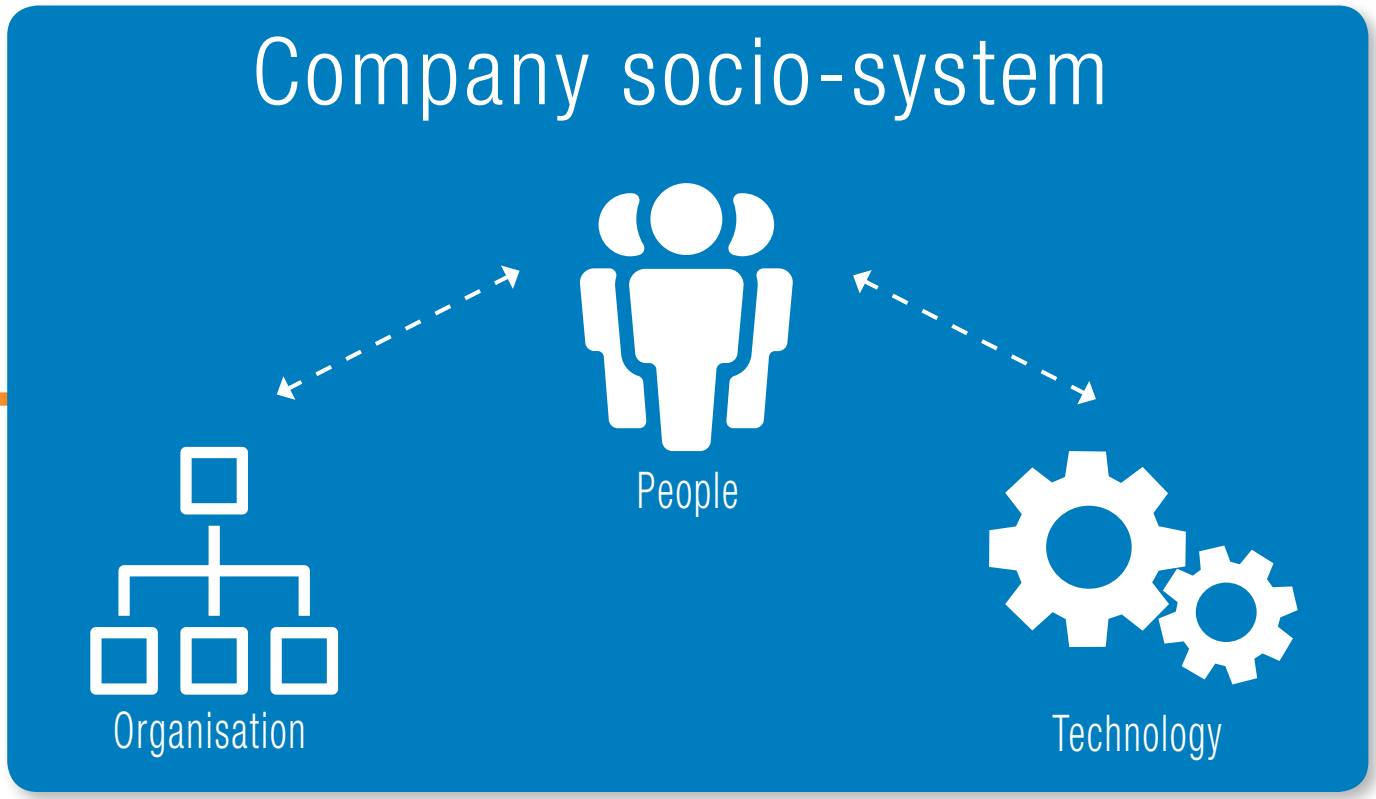
We do not consider ourselves to be suppliers of standardised organisation resources, but rather follow a holistic approach to solutions: specific and tailored to the customer. Whether you require planning boards, shop floor solutions or visualisation boards, or even networked boards and assistance systems: we support you throughout Europe with our regional expert advisors, analyse your processes and develop a tailored solution in close collaboration with you. Thanks to our great depth of production, we are able to deliver custom-made products for our customers. Our main site in Ebern accommodates metal, wood, plastic and paper processing, providing us with this depth of production.

With our own research and development department and not least thanks to our expertise in IT, we continuously improve and expand our cross-industrial range of products.

Creating a system that learns

Skills like flexible and creative thinking, methodical expertise and the ability to make decisions are essential on the shop floor.
In addition, it is necessary to have complete transparency on the shop floor in order to increase confidence in decision making. WEIGANG.NEO offers you the right support in organisational and technical processes.

Complementary collaboration between people and machines produces more efficient solutions – a system that amplifies skills.
“A person continues to be the final authority for all industrial decision-making processes. And where people act, a system that learns is created, which then optimises itself,” explains Prof. Dr.-Ing. Oliver Kramer – professor of production architecture of the future at the Rosenheim University of Applied Sciences.



Our expertise is digital Transformation!

Our portfolio covers networked as well as conventional planning boards for planning, controlling and managing production, networking cyber-physical production systems as well as assistance systems for user-oriented, efficient process management.

We provide solutions tailored to your needs: from collecting information by means of barcode, QR code, NFC or UHF-RFID, optics or sensors, through interactive applications such as eKANBAN and smart process management as well as ERP interfaces to your production. Our project team works together with you to create your custom production organisation application of the future.

Think decentrally, manage directly on the shop floor, make your employees directors of their added value, control your processes efficiently and develop your production organisation with WEIGANG.NEO!

In 3 steps to PO of the future

Information

The first step to production organisation of the future concerns collecting information and creating transparency. Data are recorded on the shop floor using AutoID technologies such as NFC or UHF-RFID readers, as well as optics and sensors.
The raw data obtained are sent directly to our 'coNEO' middleware. Information is made transparent to employees on the shop floor by means of mobile assistance systems such as smartphones or tablets, or via a PC web browser, for example.

Intelligence

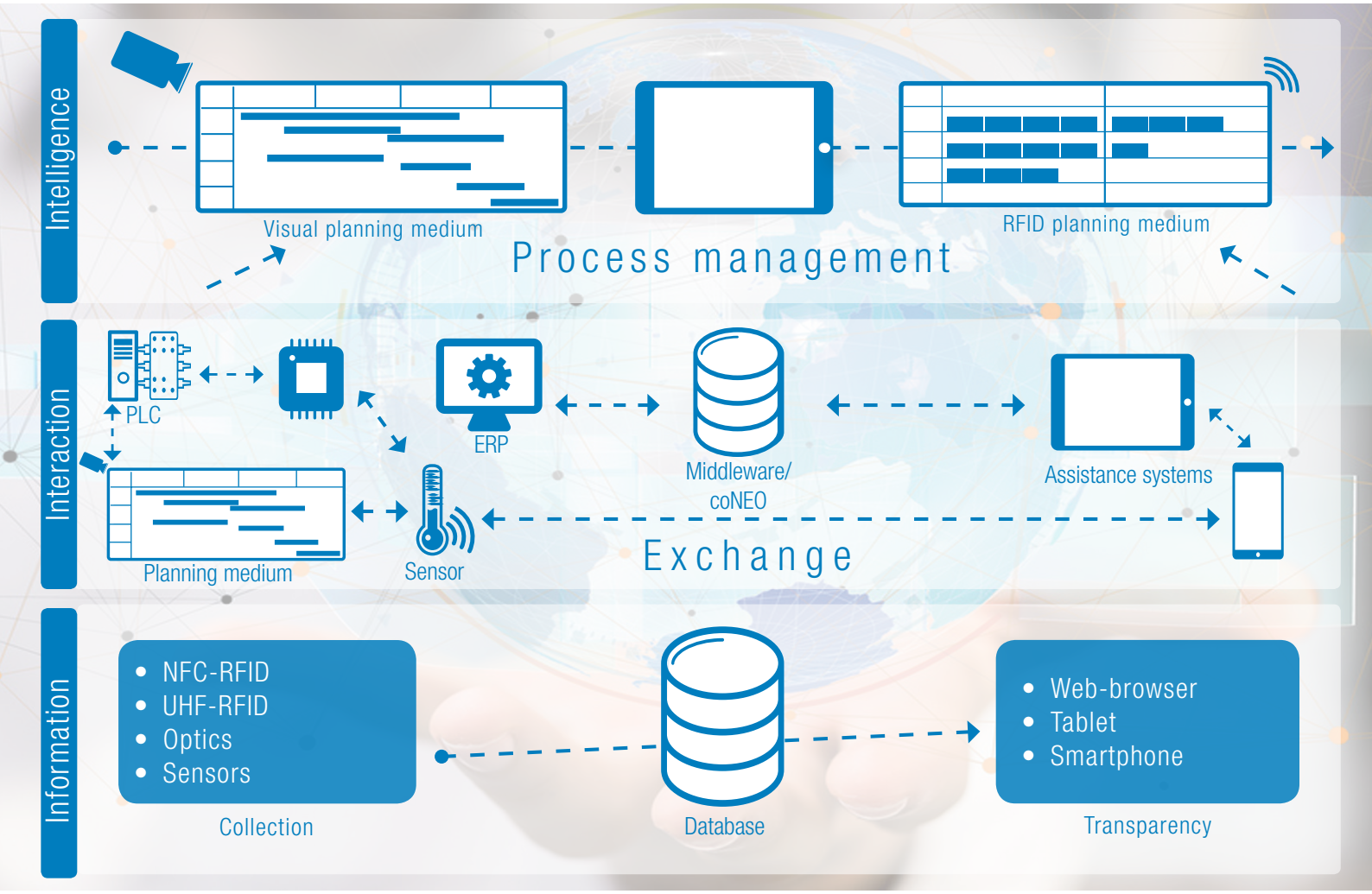
We offer an intelligent complete solution in the form of production organisation of the future: efficient process management in production organisation for your company - universally and tangibly.
Your individual solution is created according to your various requirements and our flexible capabilities. By combining relevant data and information on the shop and top floor level, we generate an overall picture that facilitates the interaction of shop floor management and central planning of an ERP system.

Interaction

Custom and direct IoT networking for all actors involved creates interaction on the shop floor. By networking with our 'coNEO' middleware and an ERP system where desired, we even enable interaction between the shop and top floor. Integrate all levels of your company and lay the foundation for the third step: intelligent process management.

Your personal route

Tailored modular solutions are created depending on the maturity of your company and according to your wishes. You obtain an initial introduction to PO of the future in the first step. We assist you towards the third step in the development of your processes.



Collection of all data on the shop floor

Advantages

- Active and passive data collection
- Futureproof data transfer
- Internal and external data processing possible
- Custom and direct IoT networking

Goals

- Real-time image of production
- Business intelligence
- Decentral production and logistics control
- Decentral control circuits, such as order processing

Benefits

The collection of all data enables the direct real-time image of production and forms the basis for effective and efficient process management.

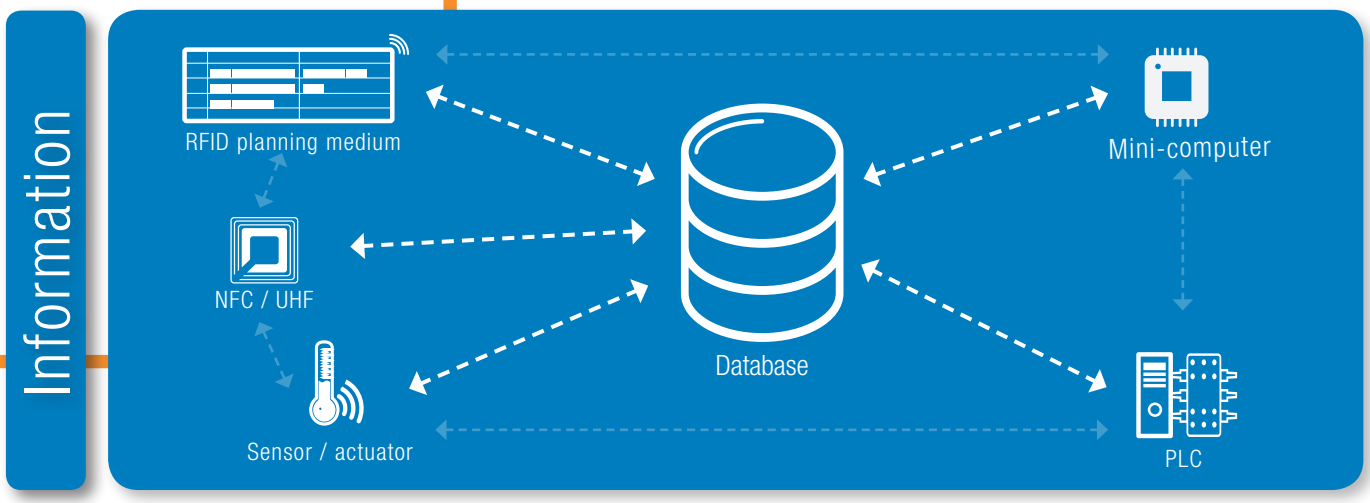
Process

Shop floor data are collected in various ways by a range of actors including sensors, readers or mini-computers and are entered into a central database. The data obtained are safely provided for further processing. All data collectors can be networked individually and directly by means of OPC-UA communication (IoT).

Expandability

The data collected can be used for synchronisation with a decentral process or in an ERP system. Information can be dispensed via web browser by non-mobile or mobile means using the assistance systems.

»Any information from your shop floor is collected, networked and processed following the principle of the IoT.«



Networked boards via UHF-RFID

Advantages

- Bulk reading of RFID tags
- Individual configuration of tags
- Precise reading of different board sections
- Internal and external data processing possible

Areas of application

- Status changes to production orders, purchase orders, material provisions and more
- Capacity control
- Decentral production supply
- Decentral order board
- eKANBAN

»RFID tags are read distinctly in different board sections.«

Benefits

Individual solutions for developing decentral control circuits can be easily integrated into your production organisation.

Process

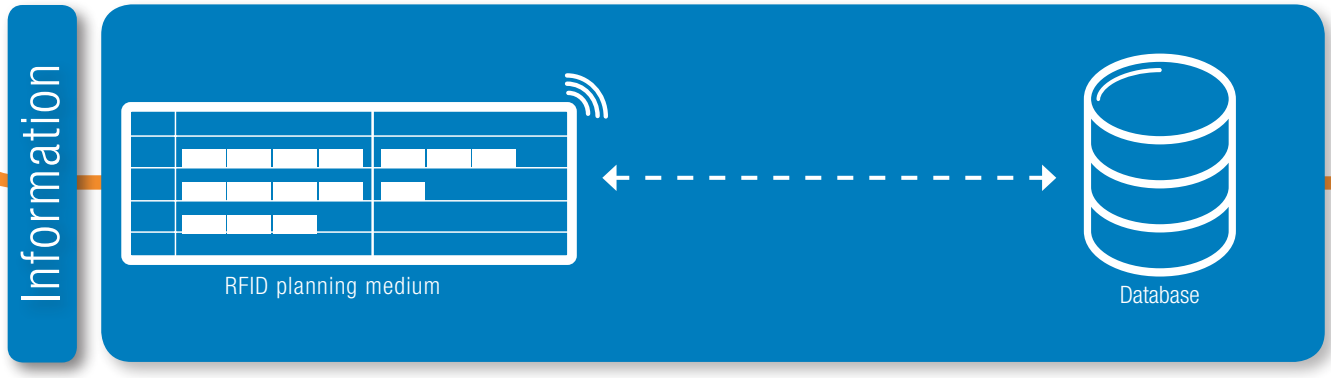
Information including data, orders, status and more are automatically read when inserting the document into the board.
Different sections of the board can be distinctly read using the SmartShelf antennas. The data collected are safely provided for further processing via a database. The insertion and removal of a document to and from a board can be used for actions.

Your process can be specifically organised by means of individual descriptions for the RFID tags. Large volumes of tagged documents can be read using UHF solutions in an automatic and cost-efficient manner.

Expandability

The collected data can be used in a decentral process or for synchronisation with an ERP system. Information is dispensed via web browser by non-mobile or mobile means using assistance systems.

Your organisational solution can be designed as desired by linking multiple boards and using individual configurations.



Networked boards via visual reading

Advantages

- Automatic visual reading
- Internal and external data processing possible
- Maximum reading reliability
- Individual QR codes for clear identification of documents

Areas of application

- Lead time scheduling
- Attendance and absence planning
- Capacity planning
- Shift planning

»Scheduled detailed planning is precisely read by visual reading!«

Benefits

A large volume of documents can be visually read in an automatic and cost-efficient manner using this solution. Various planning scenarios can be depicted on the boards such as for instance lead time scheduling or team-based capacity planning.

Process

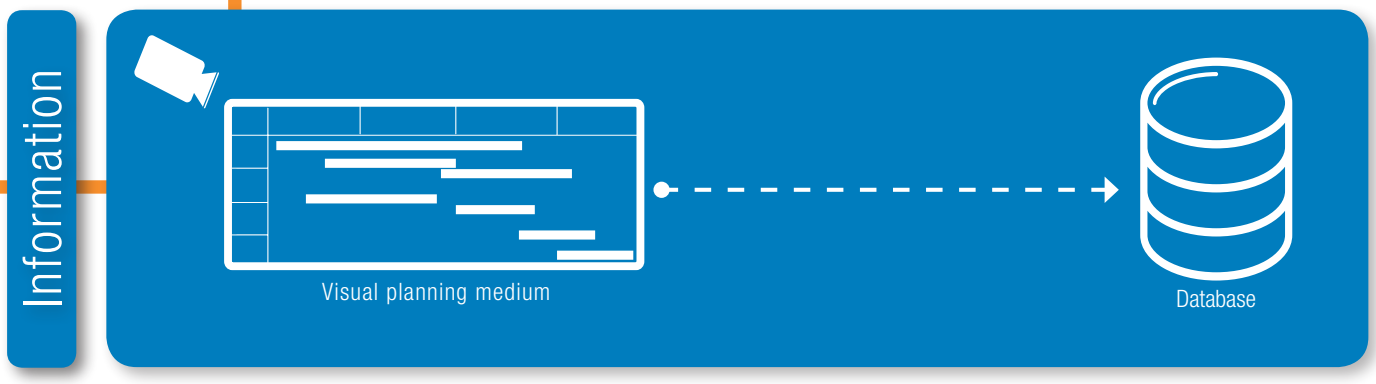
The document inserted in the board is automatically visually read. The document information can be clearly identified using the QR code. The scheduling of the production order is detected on the timeline. This enables a comparison with target deadlines.

The raw information obtained is safely provided for further processing via a database.

Expandability

The data collected can be used in a decentral process or for synchronisation with an ERP system. Information can be dispensed via web browser by non-mobile or mobile means using the assistance systems.

Your organisational solution can be designed as desired by linking multiple boards and using individual configurations.



Transparency through mobile assistance systems

Advantages

- Stationary and mobile use
- IoT networking
- Constant availability of information

Goals

- Visualisation of the real-time image of production
- Transparency on the shop floor
- Status and condition monitoring
- Deviation management
- Intelligent process management

»Shop floor and top floor information become clear and transparent through the use of assistance systems!«

Benefits

Mobile assistance systems enable us to view, check and validate data, information, statuses or deviations. It provides us transparency on the shop floor. In addition, it offers us the basis for interactions and intelligent applications.

Process

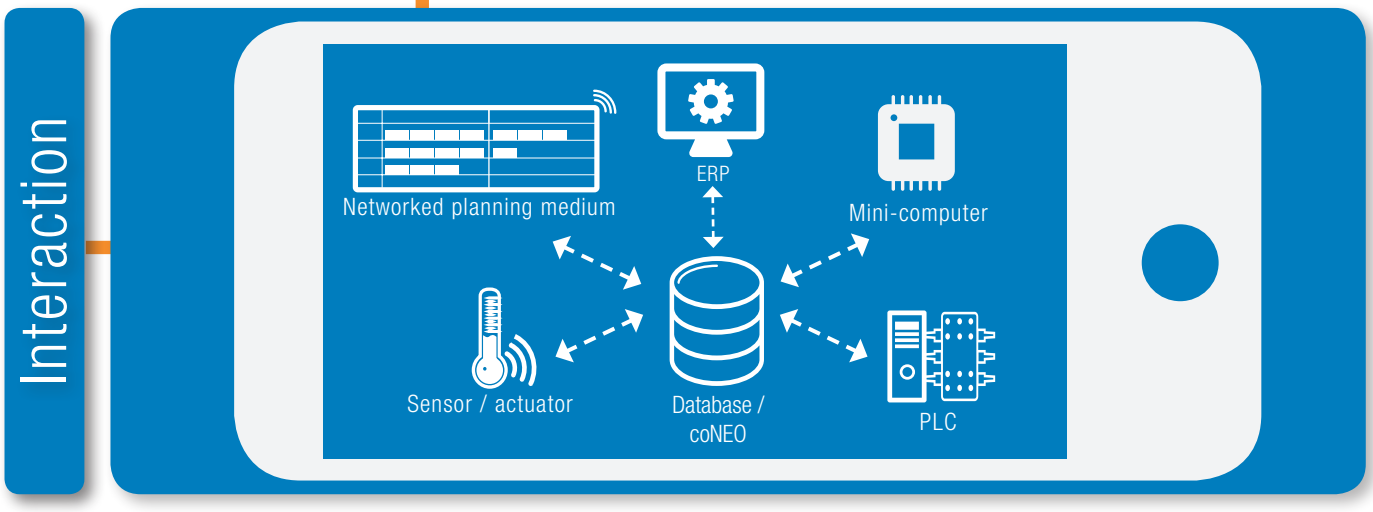
The data collected in various ways are provided on mobile assistance systems according to specific users and processes, and help to support employees in process management.

Support is given to the direct and decentral interaction and communication between all actors, and the employee is able to utilise individual assistance.

Expandability

Due to the diverse technical functions such as locating, camera, sensors or speech recognition, mobile devices can be used for many of the tasks involved in decentral, transparent process management.

Individual applications turn them into assistance systems that can interact with ERP systems, enabling interaction and intelligent assistance for efficient process management in addition to information supply.



Intelligent process management - coexistence between shop floor and top floor

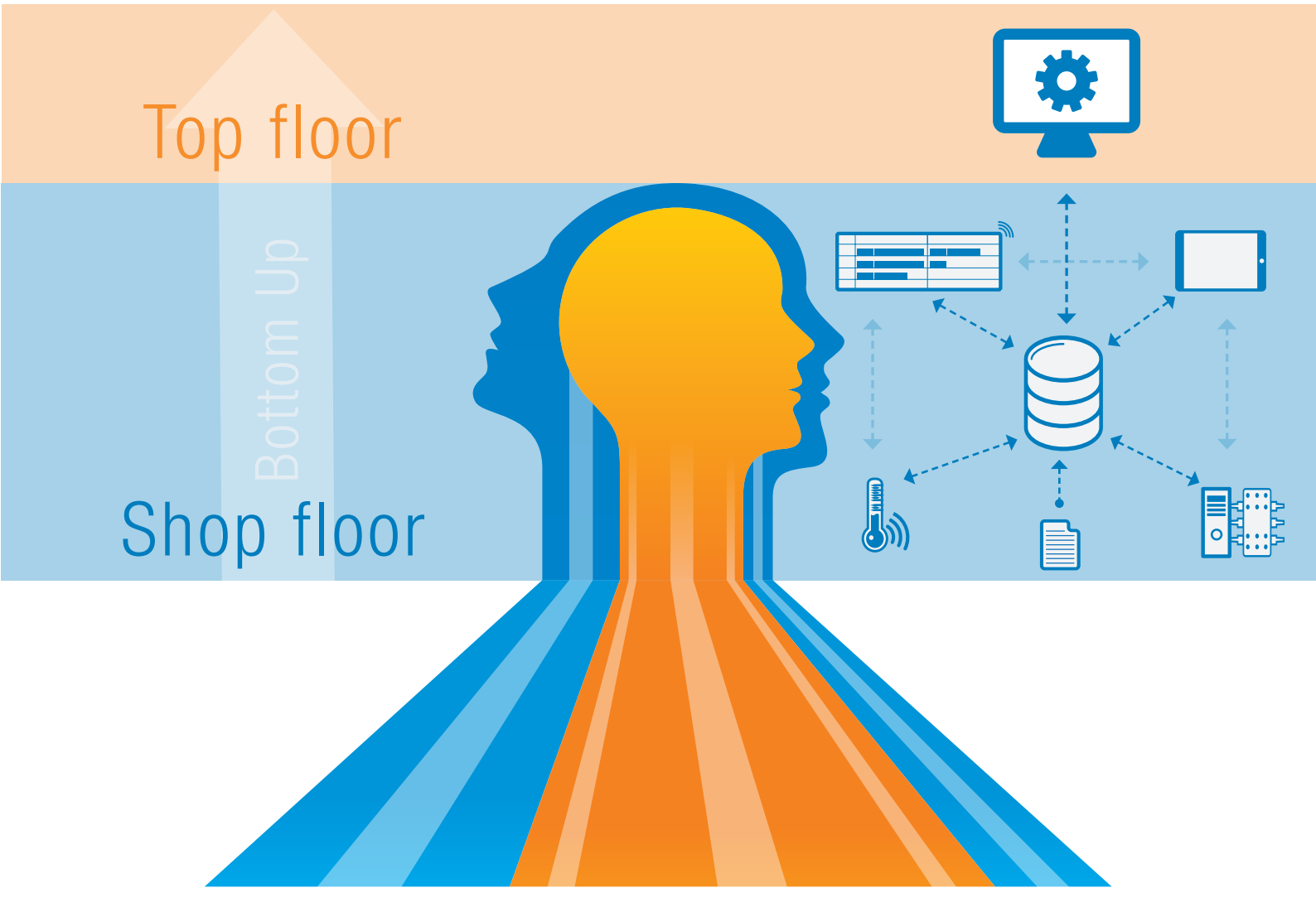
By combining conventional document-based organisation with the opportunities of IoT we create a new and innovative complete solution: production organisation of the future.

We network and collaborate starting from the shop floor – by taking a bottom-up approach.

People thereby become decentral decision makers and directors of added value where the action takes place. This results in "brain-compatible" organisation for employees, through the overall picture of document-based organisation, IoT, mobile assistance systems and an interface to the ERP system. The mobile assistance systems support the employees in detailed planning and interaction on the shop floor, as they provide the necessary transparency in conjunction with planning media 2.0. The people on the shop floor organise, decide and act in a direct, conscious and concrete manner.
We also make use of networking with centralized rough planning systems (ERP). An ERP connection is made possible via an interface, allowing rough planning information from the top floor level to be included.

This results in intelligent and efficient process management, which enables interaction between shop floor and central planning of an ERP system.

Our philosophy is shop floor management that coexists with top floor!



Glossary

Actuator

Actuators convert electrical signals such as commands from PLCs into mechanical motion or other physical variables and thereby actively engage in the process.

Bulk Reading

Bulk reading enables the simultaneous identification of multiple RFID-tagged objects. A particular protocol enables the

individual addressing of tags.

eKANBAN

KANBAN helps to reduce stocks of intermediate products by ensuring that only the quantities that are actually needed go into production. Once a container, box or bin has been used up, the KANBAN card is sent as a signal to the source for production or refilling.

In the case of eKANBAN, all card movements and thus the goods in stock are automatically read by barcode or RFID scan. KANBAN signals are thereby sent and processed automatically and in real time.

ERP – Enterprise Resource Planning

ERP systems are software solutions for planning and controlling enterprise resources such as machines, materials, personnel and capital.

Frequencies

RFID systems operate in various frequency ranges depending on the type of application:

Low frequency (LF)
30-500 kHz low range

High frequency (HF)
10-15 MHz medium range

Ultra-high frequency (UHF)
850-950 MHz long range

IoT – Internet of Things

IoT refers to the networking and communication between small devices as well as ‘smart objects’. M2M (machine-to-machine) communication aims to help supporting people in their work. IoT also stands for decentralisation as commands are not sent via a central server. They are exchanged directly between actors.

Middleware

A middleware is an additional layer within a given software architecture. Its purpose is to simplify access mechanisms to sublevel layers.

For instance, ‘coNEO’ handles the provision of information from sublevel layers for assistance systems in your processes or triggers notifications in case of a discrepancy deviation ‘coNEO’ also manages the connection to ERP systems.

This thereby reduces the strain on application programs.

Mini-Computer

A mini-computer is a cost-efficient and high-performance computer system in which all the electronic components that are needed for its operation are stored on a single printed circuit board.

NFC Reader – Near Field Communication

NFC readers are high frequency RFID scanners. Data is transmitted over very short distances. The employee thereby actively and directly triggers the reading of the transponder.

OPC-UA – Open Platform Communication - Unified Architecture

OPC-UA is a communication standard and an industrial M2M (machine-to-machine) protocol. It is able to not only transmit machine data, such as process or measurement values, but also semantically describe them so that they are legible to machines. OPC-UA is neutral with respect to the platform or operating system, and enables communication between all of the actors involved in production. It also provides safe and reliable data collection and transmission.

PLC – Programmable Logic Controller

PLCs control industrial processes and ensure automation solutions. Sensor inputs are processed into control commands (outputs) in PLC programs that are then carried out by actuators.

RFID – Radio Frequency Identification

RFID systems are sender-recipient systems that localise and identify objects by means of radio waves in an automatic and contactless manner. The system comprises a transponder (tag), which is furnished with an identification code, and a reader. If the transponder is scanned by the reader, this triggers two-way communication. This serves to transmit and store data in a contactless manner.

Sensor

Sensors register various inputs and convert these into electrical signals. These are then processed into control commands (output) by PLCs program.

Shop floor

Shop floor management is a method of production organisation on the level of operations. The effective approach aims to ensure continuous process improvements by means

of cooperation between employees and executives.

SmartShelf-Antennas

SmartShelf antennas are thin and light RFID antennas that are installed directly into shelving systems or POS (point of sale) applications. The intelligent bypass function allows up to 32 SmartShelf antennas to be interlinked per reader. In our eKANBAN applications they ensure the selective reading of different board sections.

Tags

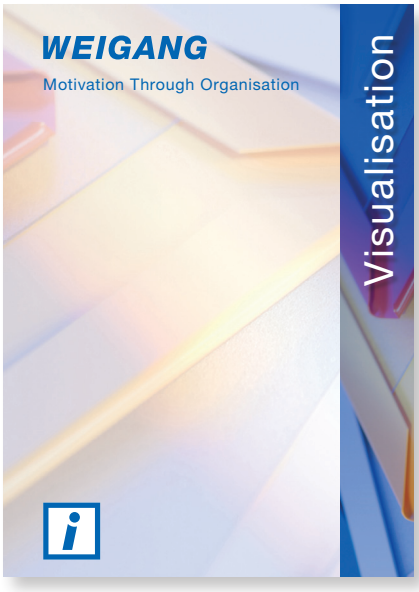
Tags are small transponders that contain stored data and which transmit these to the RFID reader via radio waves. They are affixed to the object and hold writable memory. They contain a processor, memory and the send-and-receive device which matches to the RFID frequency depending on the type of application. The memory capacity can range from 8 bytes to 8 KB. Visual contact with the reader is not necessary.

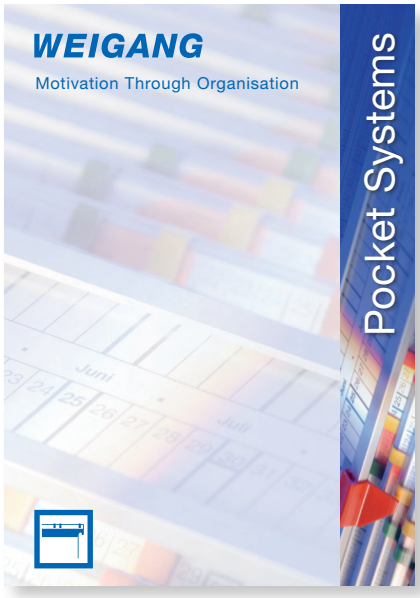
UHF – Ultra-High-Frequency

UHF readers are ultra-high frequency scanners which ensure a long scan range. They are predominantly used in automated goods distribution. In contrast to NFC readers, they are able to read a larger volume of tags (bulk reading) simultaneously and not just one-by-one.

Would you like to learn more about the WEIGANG product portfolio?

We recommend you take a look at our catalogues ‘Planning’, ‘Visualisation’ and ‘Pocket Systems’ as well as our ‘New Products’!





We are happy to support you finding the best possible solution for you. Give us a call!

WEIGANG.

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