

Relianeering AB is a technological consultancy company, built on years of experience with innovative development and problem solving.

## Our Values

**N** - Networking. We consider the Networking as indicator of the company's ability to build a true relationships between our customers, partners and employees. For us the Networking is the source of trust and brings information about true needs. The information from the Network is the main driver for developing our new solutions.

**E** - Efficiency. The key of success is to be efficient, get the maximum from efforts given to solve a problem. Be electric motor not a gasoline combustion engine.

**W** - Work. Work in a smart way and get fun, instead working hard only for financial figures.



# Best Practices in Predictive Maintenance training

## WHO WE ARE

Relianeering AB is the Innovative Knowledge Company.

- We are the next generation of engineering company simplifying the complexity.
- Our target is to deliver smart solutions and bring value to our customers.
- With years of experience from a complex world of **RELI**ability and engi**NEERING**, Relianeering is a technological consultancy company combining the gained experience and knowledge with the new mindset of next generation engineering.
- We offer you inspection services, engineering solutions, monitoring services and maintenance products based on the latest technology and mobile solutions.
- With our totally new monitoring device SES Logger connected to Hash Mobile Inspector we increase the mobility of data collection further and maintenance engineering becomes on-the-go.
- Our promise is to provide our customers with the best possible solution. Simple, Easy and Smart.



## Setting excellence standards



### Global delivery standards

Defined excellent  
Services



Gathered & standardized  
knowledge



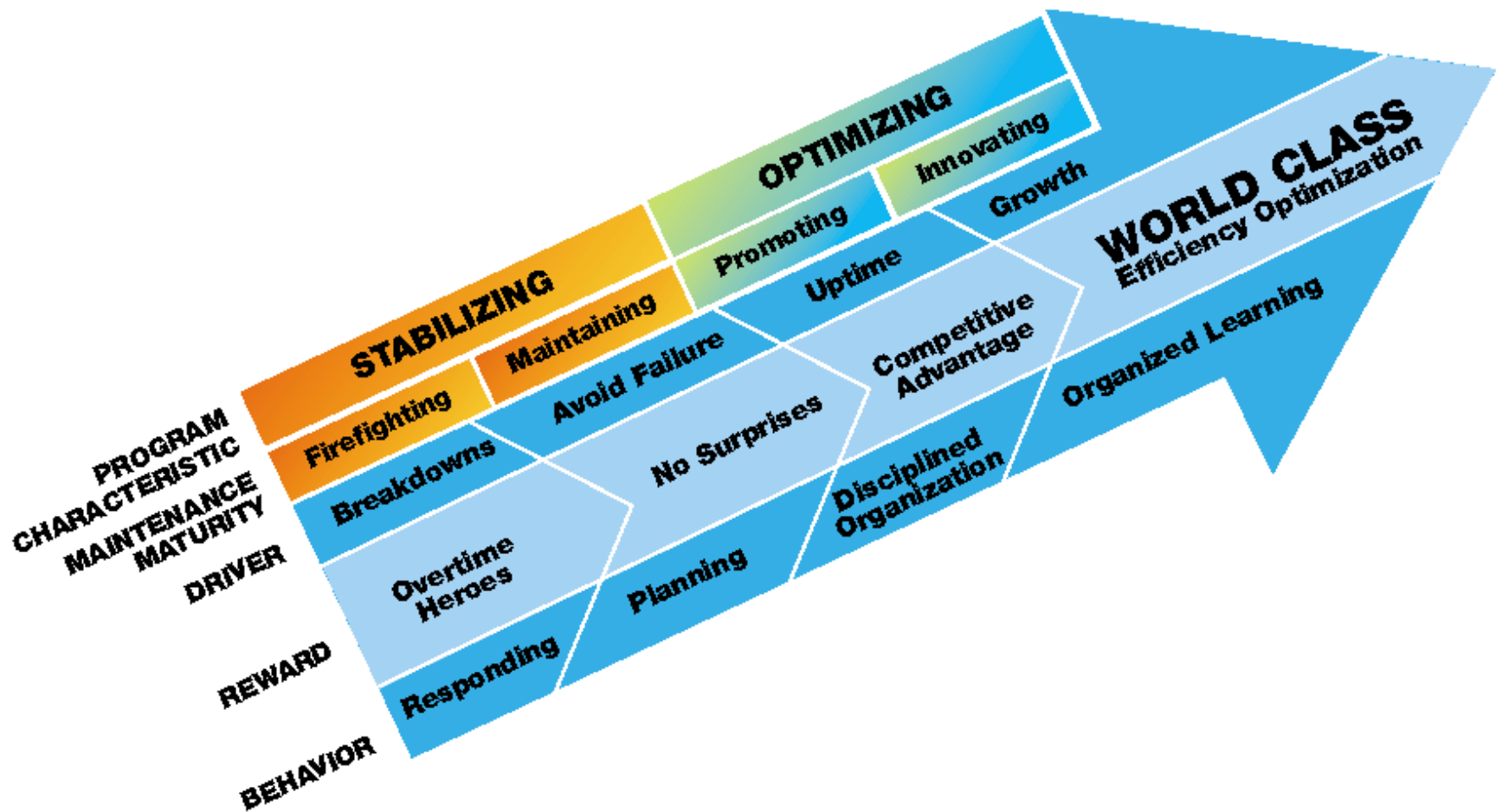
Documented  
& shared



Replicated



## Maintenance maturity



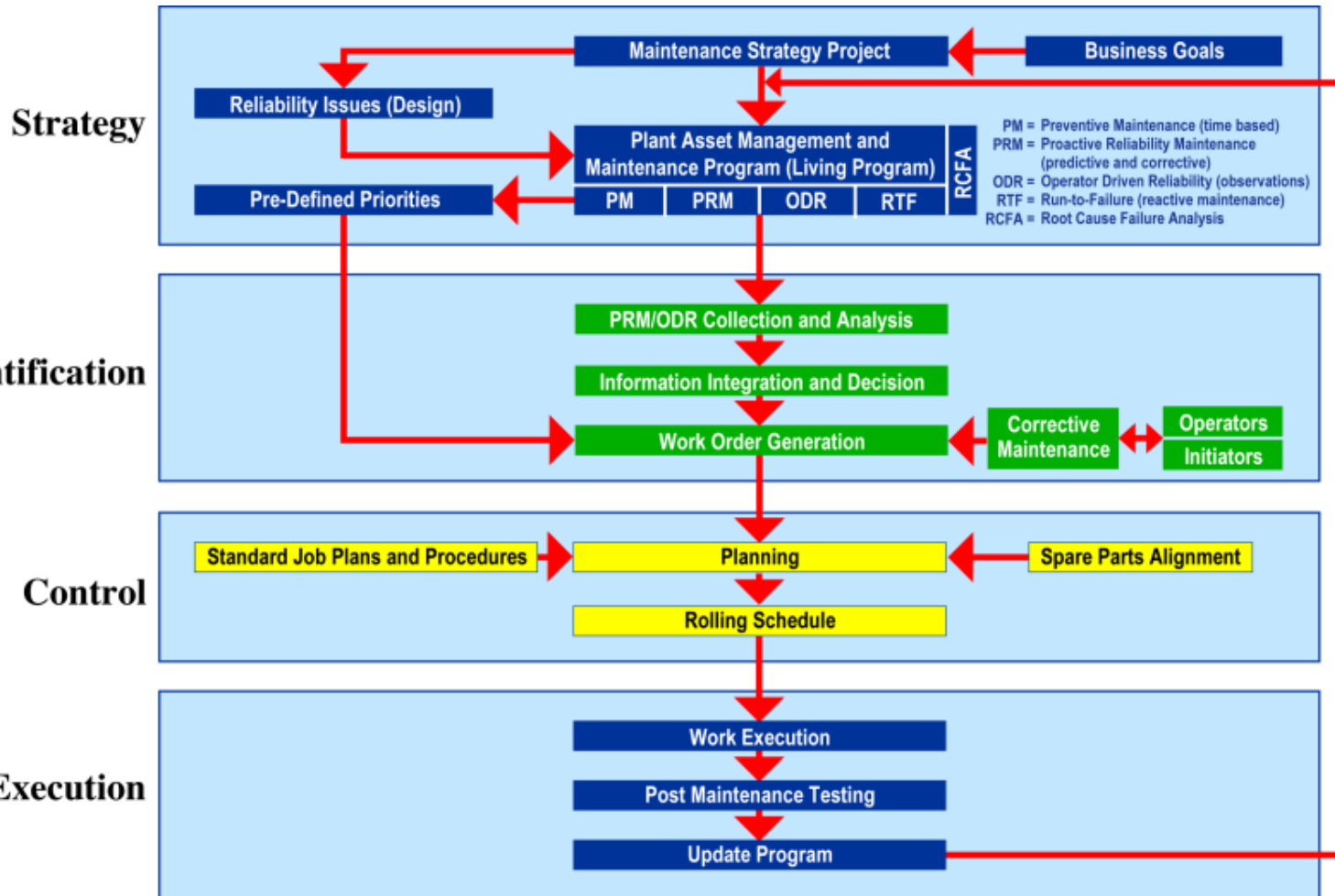




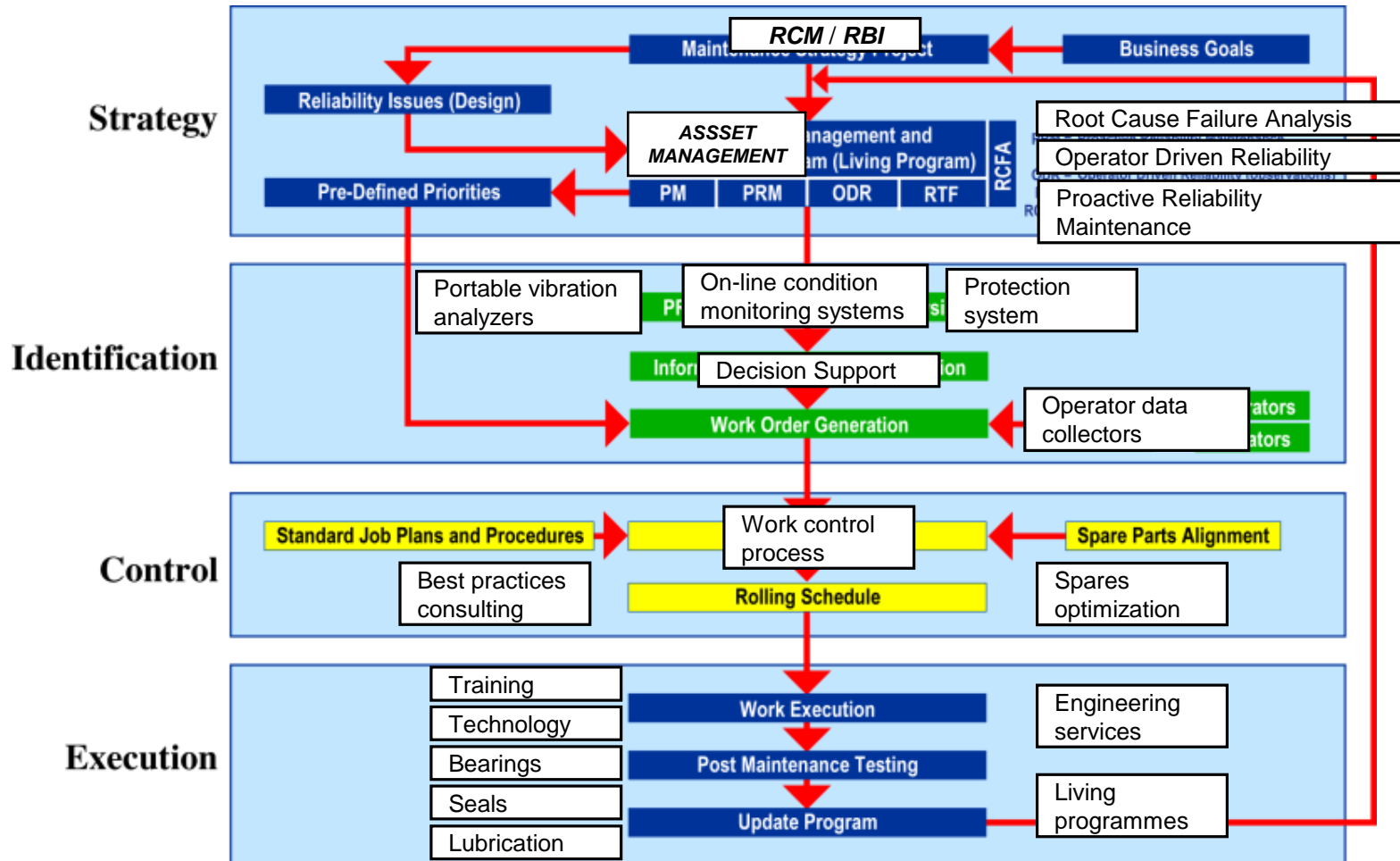
## Knowledge Management



## Asset Efficiency Optimization



## Asset Efficiency Optimization





# Best Practices in Predictive Maintenance training

## Classroom training courses listed by AEO Facet

Strategize	Identify	Control	Execute	Optimize
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- > MS212 Proactive Reliability Maintenance
- > MS230 Maintenance strategy review
- > MS300 Asset reliability improvement
- > MS331 Streamlined Reliability Centred Maintenance
- > MS332 Reliability Centred Maintenance

Strategize	Identify	Control	Execute	Optimize
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- > WI201 Fundamentals of Machine Condition
- > WI205 Vibration troubleshooting for reliability
- > WI210 ISO Category I - Vibration Analysis Entry Level
- > WI211 ISO Category II -Vibration analysis 1
- > WI212 ISO Category III - Vibration Analysis II
- > WI213 ISO Category IV (Part 1) – Vibration Analysis III
- > WI241 Machine Lubrication Technician—Level 1
- > WI251 Machine Lubricant Analyst—Level 1
- > WI304 ISO Category IV (Part 2) — Advanced Vibration Analysis
- > WI305 Applied Modal and Operating Deflection Shape Analysis

Strategize	Identify	Control	Execute	Optimize
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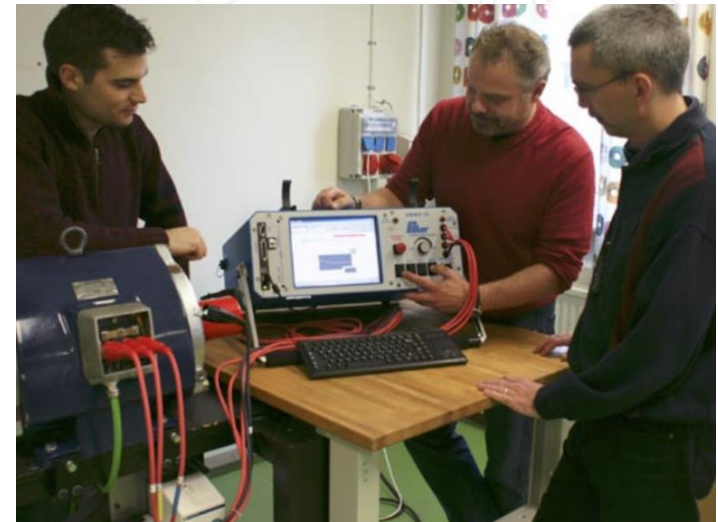
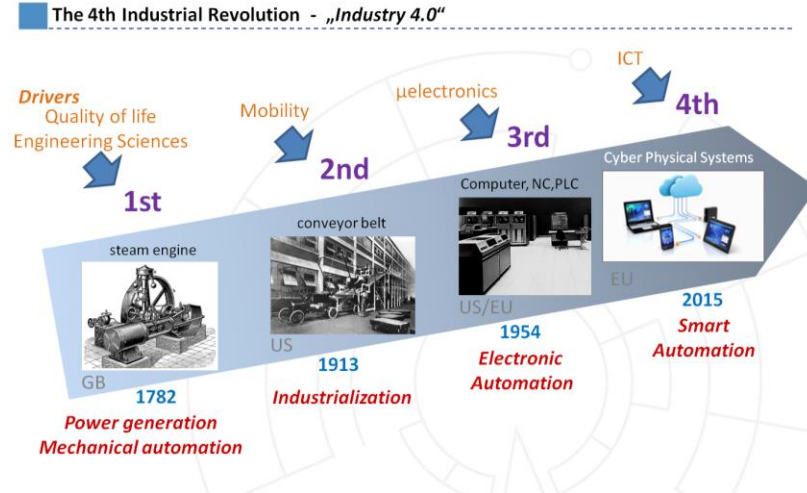
- > WC200 Maintenance planning and scheduling
- > WC230 Spare parts management and inventory control

Strategize	Identify	Control	Execute	Optimize
------------	----------	---------	---------	----------

- > WE201 Bearing maintenance and technology
- > WE202 Bearings in rotating machinery applications
- > WE203 Lubrication of rolling element bearings
- > WE204 Root cause bearing damage analysis
- > WE211 Bearing reliability in centrifugal pumps
- > WE212 Bearing reliability in aggregate and cement

Strategize	Identify	Control	Execute	Optimize
------------	----------	---------	---------	----------

- > LP200 Root cause failure analysis
- > OEM301 Bearing System Design



## Integrated Operations - Look at the total picture

### People

Attitude and behaviour towards IO  
Communication – onshore/offshore/disciplines  
Knowledge management

### Business

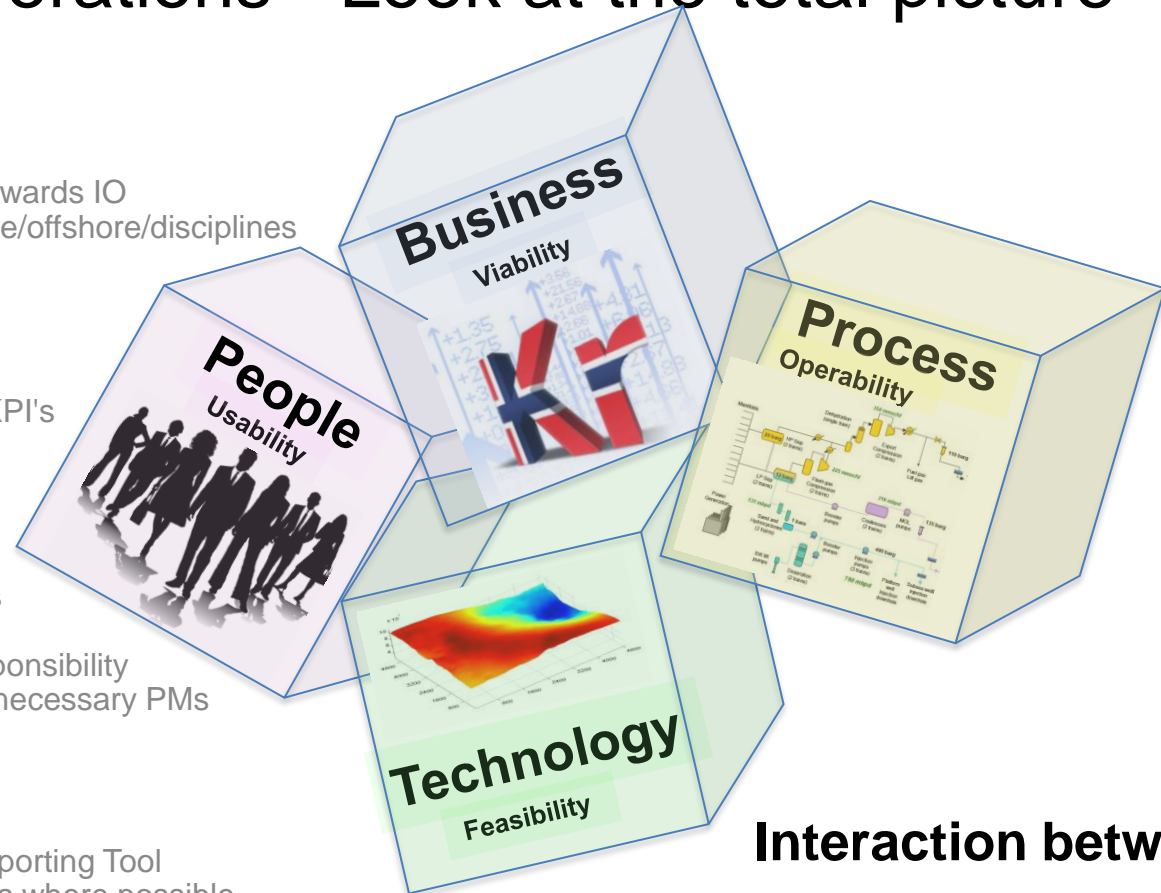
Clear defined Business KPI's  
ROI

### Process

Optimised Production  
Integrate work processes  
Clear defined CBM KPI's  
Enhance Roles and Responsibility  
PM review - get rid of unnecessary PMs

### Technology

Common Historian  
Common Web Based Reporting Tool  
Online and Wireless Tools where possible  
Integrate Software  
Integrated Logistics



**Interaction between**

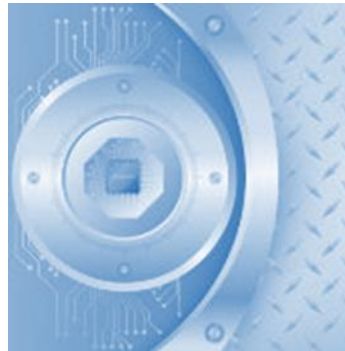
**“The right people, doing the right thing at the right time, every time”**

## Industrial 4.0

### Mobile apps and instruments



### Embedded sensorization



### Wireless communication



### Cloud Computing



### Integration and interfacing



### Advanced analytics



## Mobile app solutions

### Industry and cross-functional/ -application knowledge



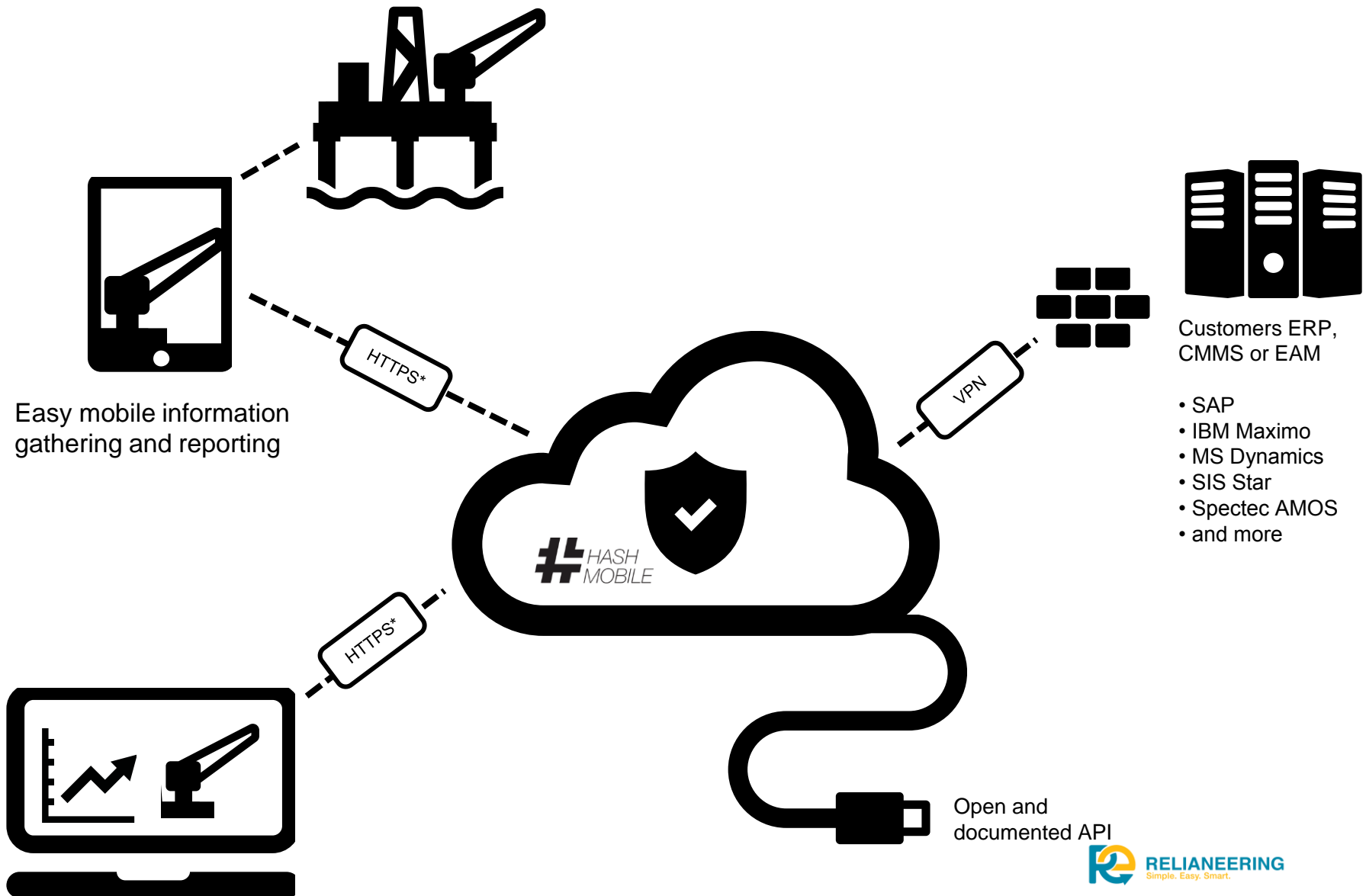
### Advanced analytical knowledge



- Data Collection
- Process Visualization
- Sales and marketing
- Documented Solutions
- ...

- Technology (e.g. Condition monitoring, Alignment, ...)
- Engineering & simulation apps
- System integration
- ...

# Best Practices in Predictive Maintenance training

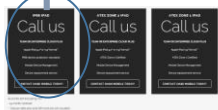




# Best Practices in Predictive Maintenance training

## INTEGRATED OPERATION

### APPs



### Expert Knowledge



#### Your Industry

Energy & Power

Maritimes

**Oil & Gas and Chemicals**

Manufacturing & Engineering

Pulp & Paper

Metal Working

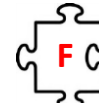
Mining & Minerals

Food & Beverage

### Know2U



Inspection AUT



Fire Alarm Inspection



Inspection RBI



Sparepart Optimization



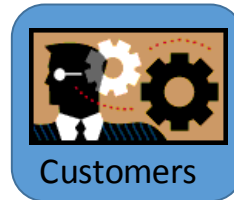
Lubrication management



Inspection RCM



CBM (Condition Based Maintenance)



Customers



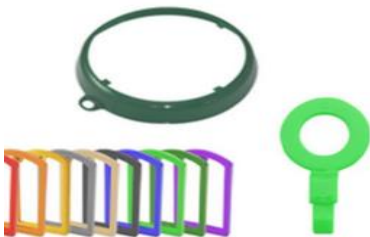
# Best Practices in Predictive Maintenance training



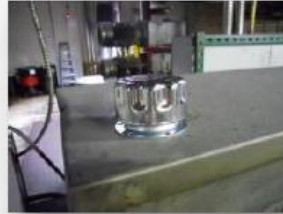
OIL EQUIPMENT



GREASE EQUIPMENT



IDENTIFICATION



AIR SENTRY



OIL ANALYSIS



MONITORING & INSPECTION



**Do it right the first time!**



## Effective plant performance is about driving efficiency in...

### Staff & Skills

- Operate the line
- Maintain the line
- Turnover
- Shifts

### Operations

- Utilization & capacity
- Product changes
- Production stops
- Product filling (overfill)
- Breakdowns (MTBF)
- Time to restart after stop (MTTR)
- Services & maintenance time
- Cleaning time

### Products

- No SKU
- Marketing
- Branding
- Sales



### Waste

- Product
- Paper
- Utilities
- Time

### Logistics

- Plant layout
- Line set-up
- Spare parts handling
- Utilities handling

### Processes

- Production planning
- Spare part ordering
- CIP requirements
- Maintenance

### Consequences of non-performance:

- Lower production
- Product quality issues
- Losses/waste
- \$\$\$





## To maximize profitability, Tetra Pak focuses on two industrial standard measures

### Operational cost



Maintenance cost  
Running cost  
Waste cost  
Direct capital cost

### Overall Equipment Effectiveness (OEE)



**Availability**  
• Produce *when I want*

**Performance**  
• Produce *according to plan*

**Quality**  
• Produce with good output  
(*not wasted*)



## Reliability centered maintenance



## Spare parts



## Skilled service staff



## Maintenance Services

Proactively securing operational performance

### Service contracts



**On-site consulting**  
**Asset Care**  
**Performance Guarantee**  
**Operational Cost Guarantee**

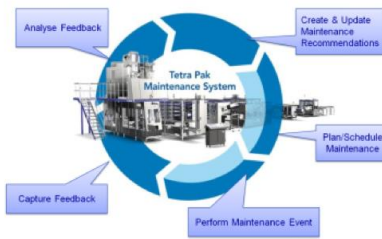




## Maintenance Services

Proactively securing equipment performance

### Reliability centered maintenance



#### Reliability-centered maintenance

- Basis for unique maintenance plans with the right combination of predetermined, condition-based and corrective maintenance

#### Maintenance history

- The only OEM in industry having a centrally controlled, globally integrated Enterprise Asset Mgmt

#### Continuous improvement

- ~30 000 assets in >170 countries provide input to recommendations updated every 2 weeks

### Skilled service staff



#### Skilled and experienced staff

- Certified engineers trained in TPMS and advanced troubleshooting
- Apply best industry practice tools, technology & methods

#### Global reach

- 1600 service engineers and 150 system specialists globally
- Local presence in ~40 market companies
- ~40,000 maintenance events performed annually by Tetra Pak at customer sites

### Service contracts



#### Drive operational efficiency

- We jointly identify improvement areas
- Focus on factors that will reduce operational cost and increase OEE
- Foundation is in increased quality of maintenance and quality of operations

#### Different levels of commitment

- Cost predictability and fixed price
- Guarantee on line performance (PTU)
- Guarantee on operational cost





# Best Practices in Predictive Maintenance training





## HOW DOES IT WORK?

### S.E.S.-LOGGER

-SIMPLE. EASY. SMART.

ACCELEROMETER  
100 MV/G

Vertical

Axial

STUD +  
RFID TAG

JUST  
PRESS THE  
BUTTON

KNOW2U  
APPS

DATA2U  
CLOUD  
APPS



**RELIANEERING**  
Simple. Easy. Smart.

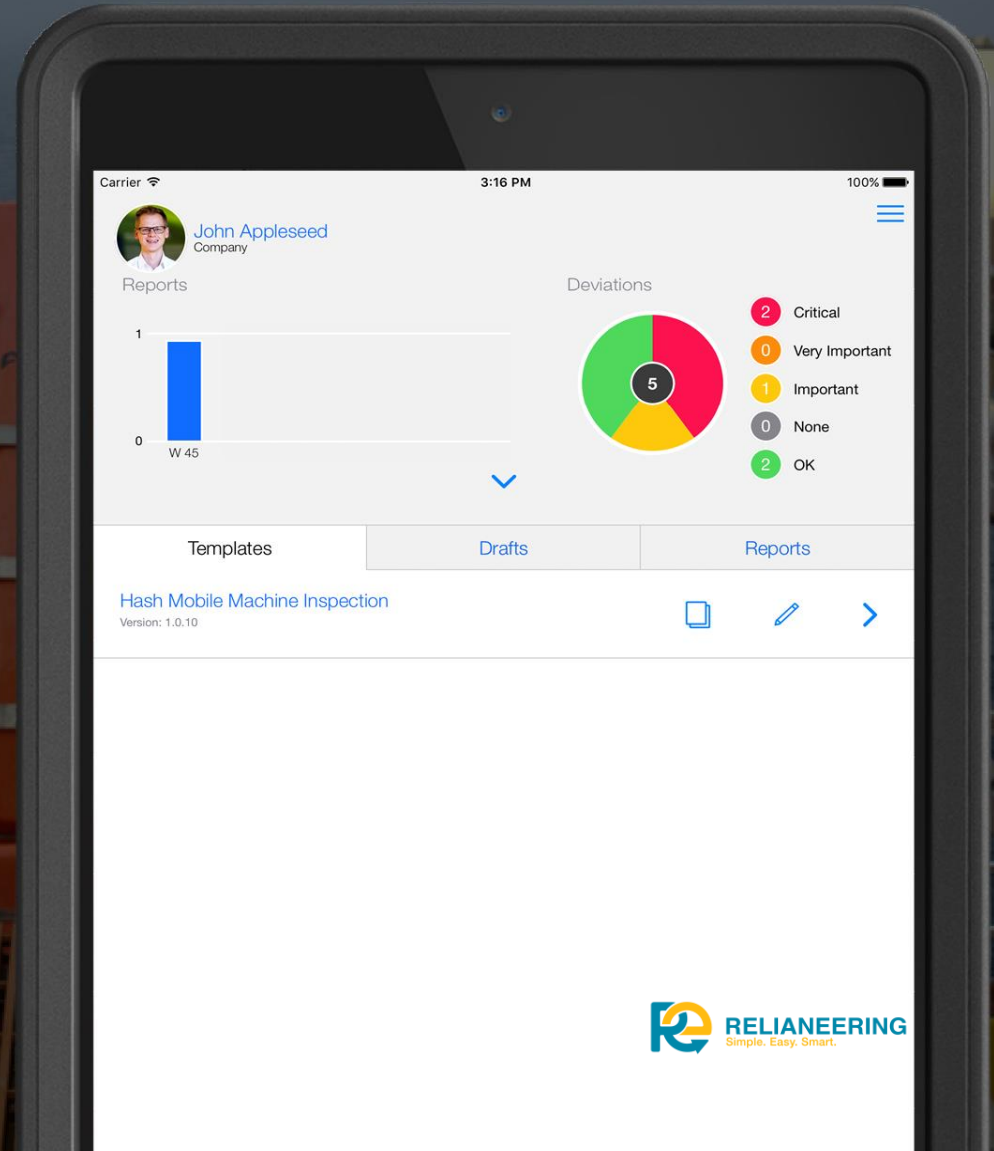
## PROFESSIONAL

Collect, report and share information instantly.

With Hash Inspector your report will be ready at the same time your inspection is done!

Never spend time again compiling information by cut and paste text and images into Word.

Visit [hashmobile.com](http://hashmobile.com)





## EASY TO USE

Create structures, templates and conduct inspections right in the app.

With Hash Inspector it's easier than ever to identify deviations and see to that they are managed properly.

Hash Mobile make sure you can use your current systems and do more with less.

The image shows a tablet displaying the Hash Mobile Machine Inspection app. The interface is clean and organized, with a top bar showing "Carrier", "3:18 PM", and "100%". Below the bar, there are buttons for "Discard" and "Save draft", and the title "Hash Mobile Machine Inspection".

The main content area is divided into sections. The first section is titled "1 These tabs are called sections". Below this, there are subsections:

- 1.1. Use subsections to make your template easy to use
  - 1.1.1 Sliders are good for numerical values. This section includes a slider with a value of 38, ranging from 0 to 100. A "Mandatory" label is visible on the right.
  - 1.1.2 Single choice input fields are good for pre-selection choices. This section includes five buttons: "Choice 1", "Choice 2", "Choice 3", "Choice 4", and "Choice 5".
  - 1.1.3 Using the is an easy way to manage checklist. This section includes a table with three rows and three columns.
- 1.2. Use subsections to make your template easy to
- 1.2.1 Use any combination of fields to build you

A legend at the bottom right indicates the importance of the items:

- Critical (Red square)
- Very Important (Orange square)
- Important (Yellow square)





## DOCUMENT EVERYTHING

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## SECURE

Manage users, geolocate reports and securely synchronise data.

Your data and reports are automatically synchronized and securely stored in the Hash Cloud.

Powerful user management ensures that only your employees access your information.

Visit [hashmobile.com](http://hashmobile.com)





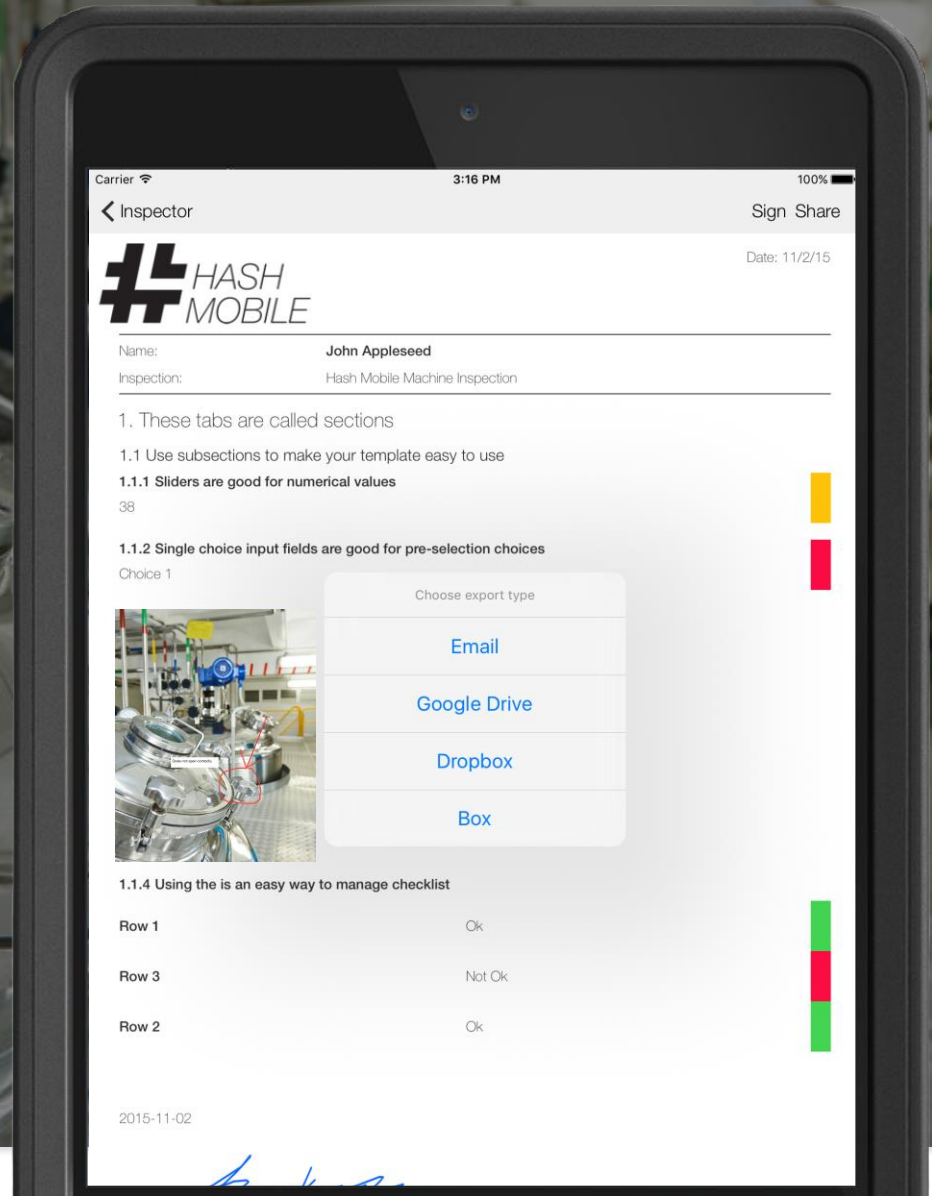


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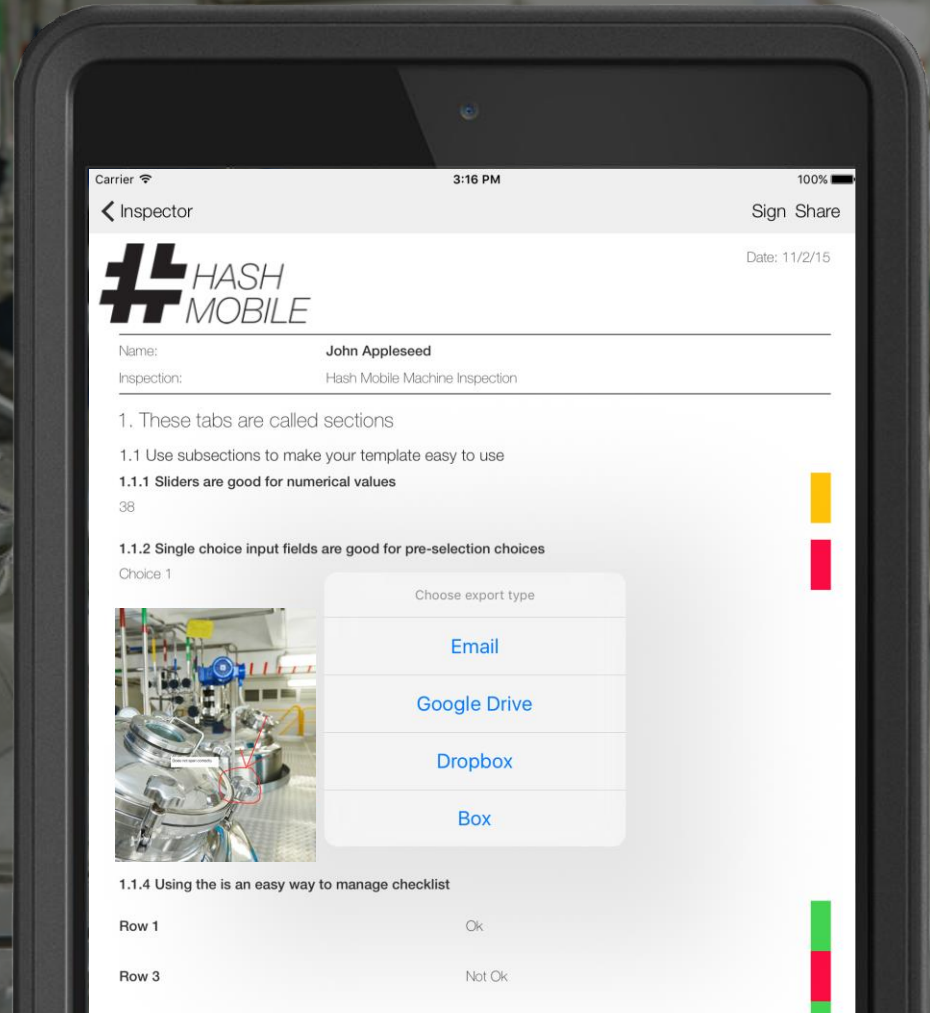


## SECURE

Manage users, geolocate reports and securely synchronise your data.

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Powerful user management ensures that the right people have access to the right information at the right time.



## MANAGE & UNDERSTAND

Hash Cloud ensure that your staff is always working with the latest information help you keep track of your reports.

Hash Cloud provides a powerful Dashboard to trend information, find geographic positions and your reports – right at your fingertips.





# Best Practices in Predictive Maintenance training

iPhone in Business - Profiles - SKF - Windows Internet Explorer

http://www.apple.com/iphone/business/profiles/skf/

Media Finder skf-hotels.com Hotell Sto... Medvind Arbetstid (2) Customer Log In Box Weekly reports RSS Europ... Mitt SKF SKF Timetable Login checkmytrip for AMEX - I... Empowering people SKF (2) KDS Corporate Logga in till IBM Cognos... SKF @ptitude Exchange -

Year-end report 2014 | SKF Apple - iPhone in Busin...

Store Mac iPhone Watch iPad iPod iTunes Support

iPhone in Business

iOS Apps IT Profiles Buy Now

SKF sets the world in motion with iOS.

Watch the video

"We are going through an industrial renaissance, an industrial change, faster than we've done before. iPhones

Internet | Protected Mode: On

annual report 2014 Find it! SV

## PDCA

(Deming cycle)

Plan



Do



Check



Act



Let's **together** replace complexity with  
**Simplicity**

Thank you for listening  
*The way we **move***