

EAG Center:

Engineering AvantGarde Center - Centar Naprednog Inženjerstva

EAG, technologies portfolio:

➤ CAD/CAM, CAE

(Computer Aided Design, Manufacturing, Engineering
/ Razvoj, Proizvodnja i Inženjering potpomognuti računalom)

- Razvoj proizvoda, priprema proizvodnje
- CNC programiranje
- Konstrukcijske i tehnološke računalne simulacije



➤ PLM

(Product Lifecycle Management
/ Cjeloživotno upravljanje proizvodom)

- Upravljanje podacima i dokumentima
- Upravljanje promjenama
- Upravljanje procesima i projektima
- Upravljanje kvalitetom



➤ IoT

(Internet of Things
/ Internet stvari)

- Prikupljanje, obrada, analiza i prezentacija podataka

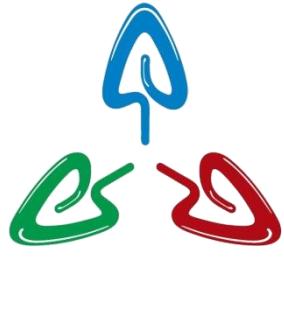


➤ VR/AR

(Virtual Reality/Augmented Reality
/ Prividna stvarnost/Nadopunjena stvarnost)

- Prostorna vizualizacija digitalnog sadržaja

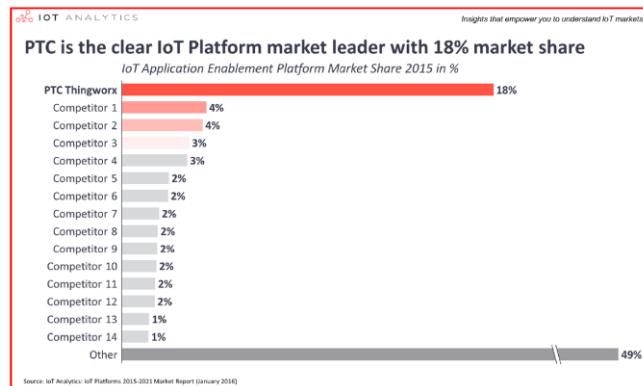
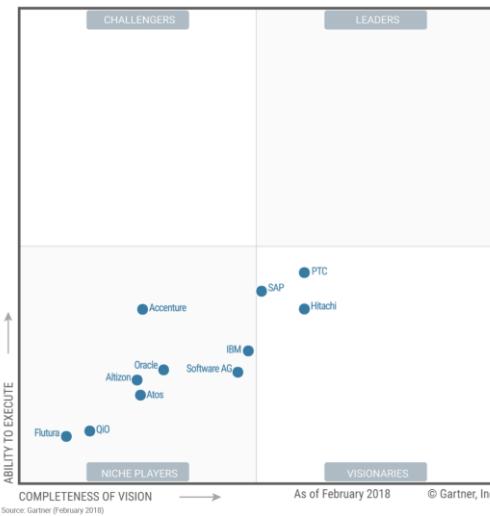




PTC: profil firme



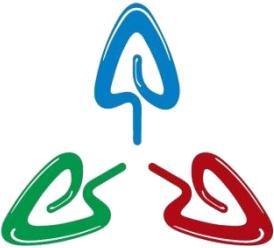
PTC: Vodeći svjetski ponuđač IoT rješenja



Gartner, Inc

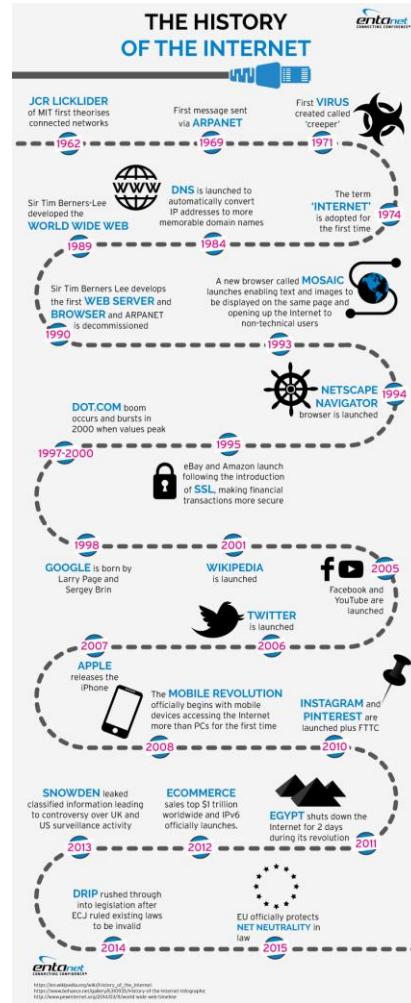
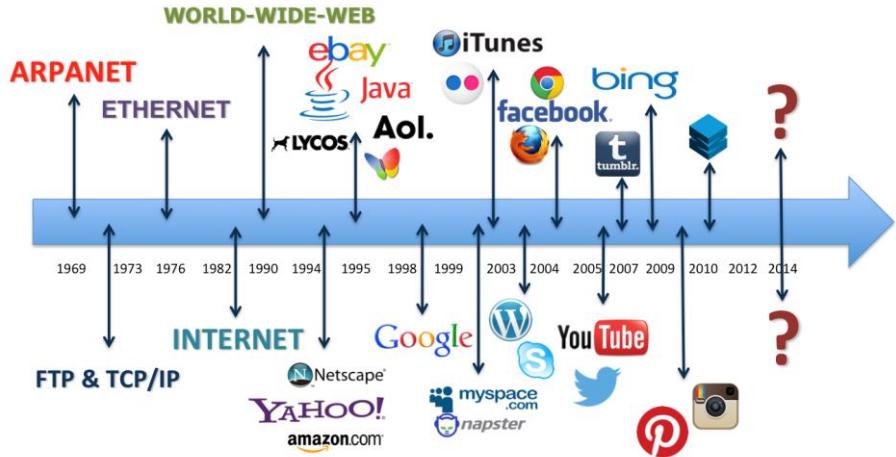
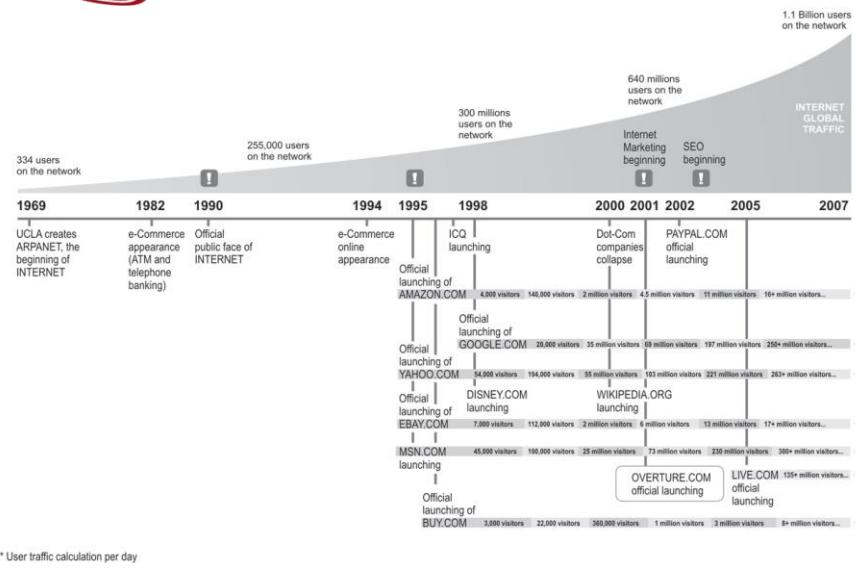
IoT Analytics

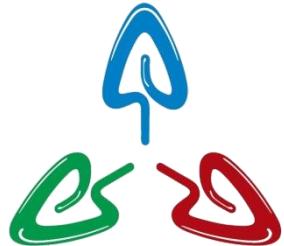
Experon Market Insight



Internet of Things (IoT)

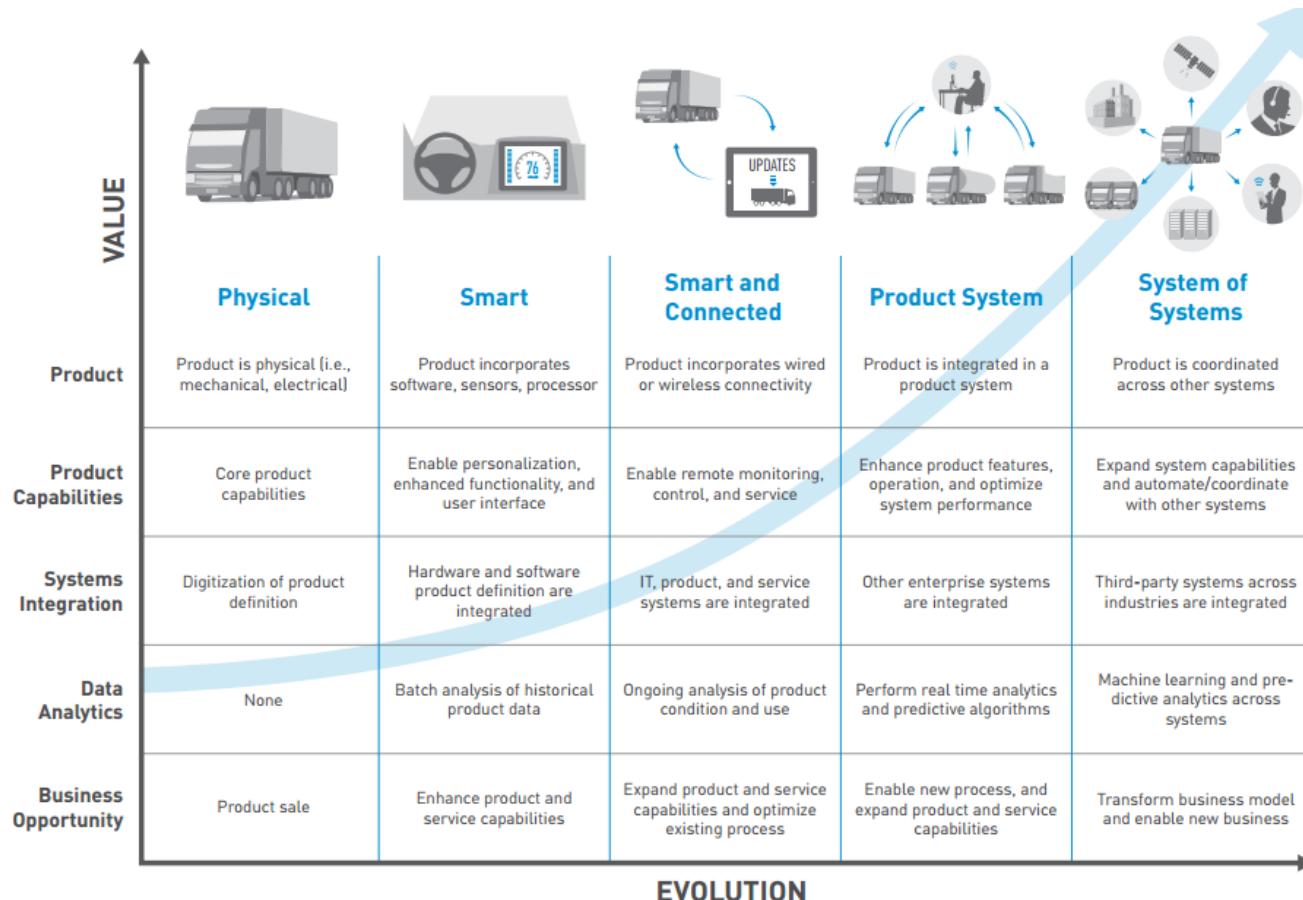
Internet: Komunikacija, evolucija obima/načina/sigurnosti



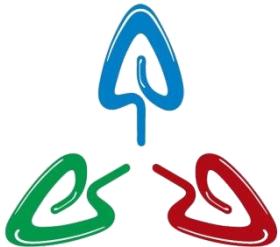


Internet of Things (IoT)

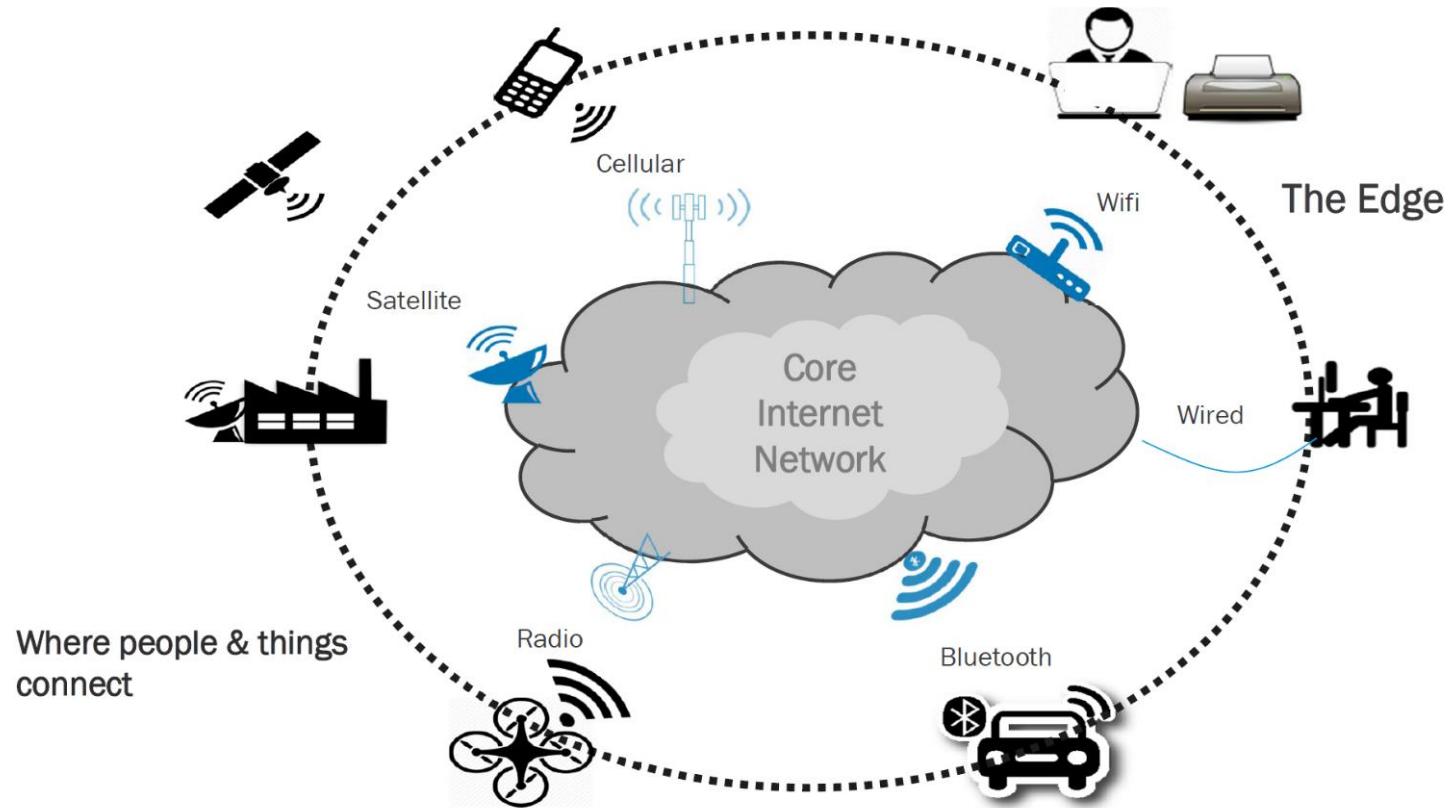
Things (Stvari): Proizvodi, evolucija kompleksnosti

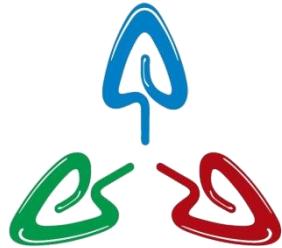


Internet of Things (IoT)



IoT okolina

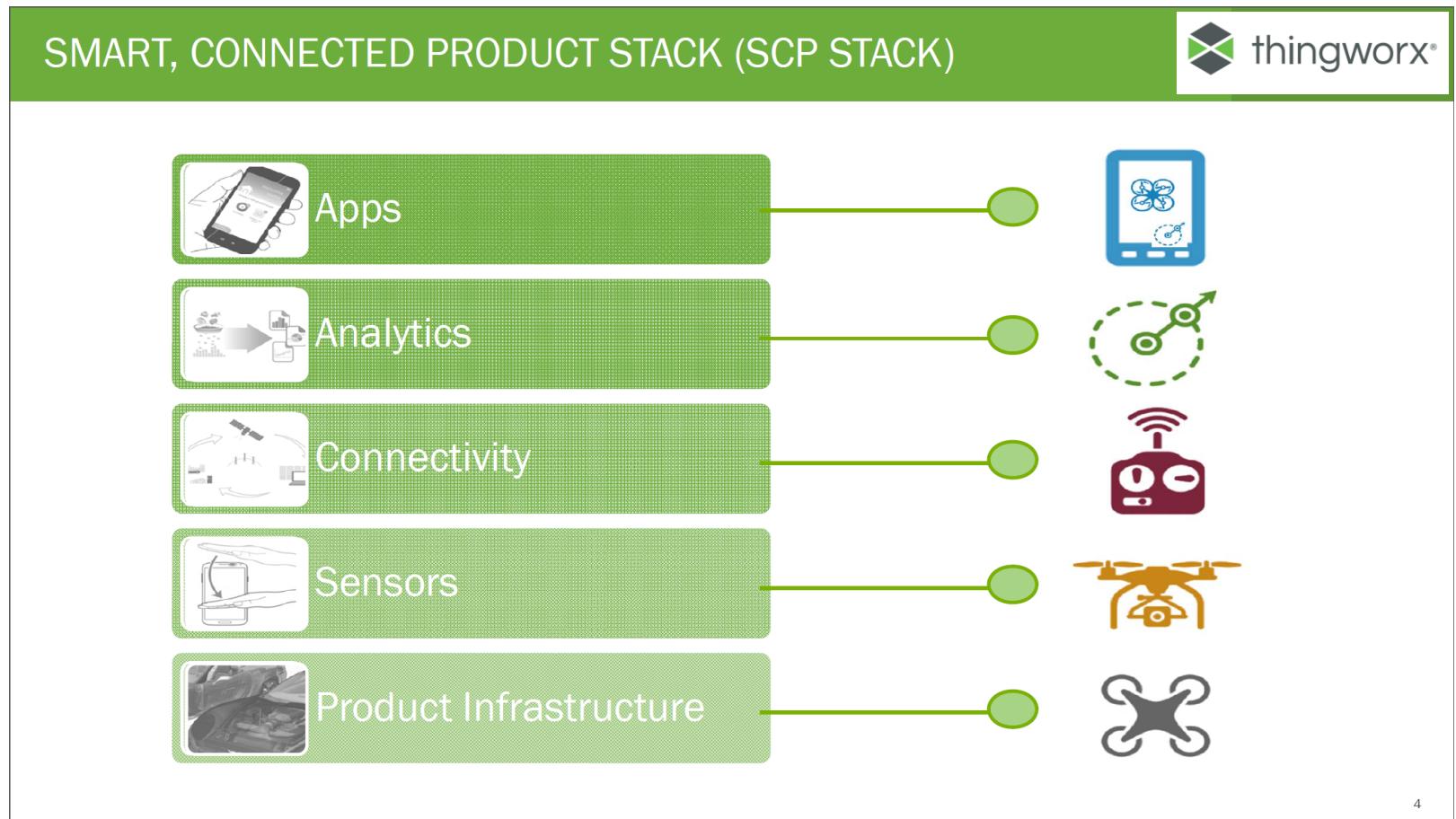


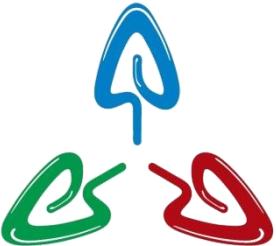


Internet of Things (IoT)

SCP Stack

 ptc  thingworx®





Internet of Things (IoT)

Digital Twins



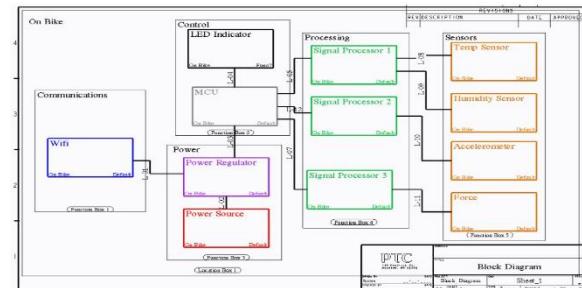
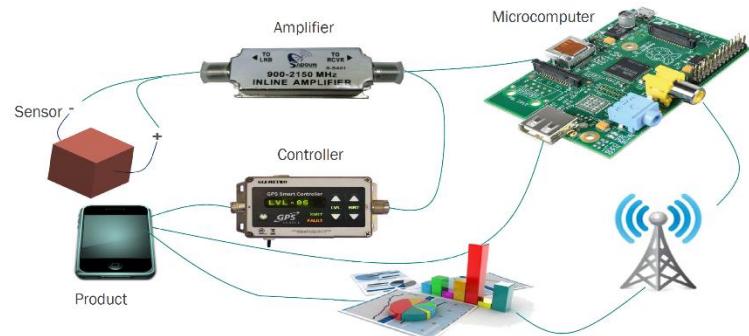
PRODUCT INFRASTRUCTURE

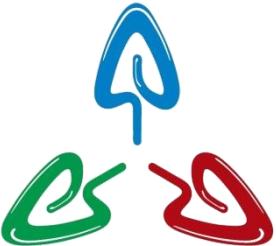


Hardware components



Software components





Internet of Things (IoT)

Connectivity, Options



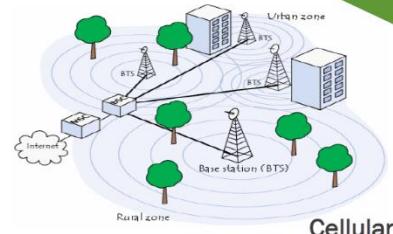
CONNECTIVITY OPTIONS



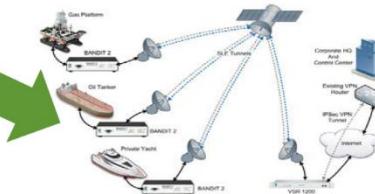
Increasing cost & distance



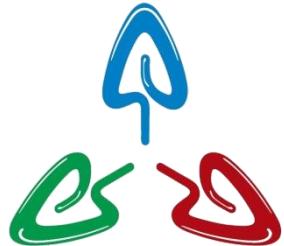
Wifi



Cellular



Satellite



Internet of Things (IoT)

Artificial Intelligence (AI)
Machine Learning (ML) ...



ANALYTICS



Four solution types to identify when planning your analytics value-add:

1

DESCRIPTIVE

What can we observe about
this product now?

2

DIAGNOSTIC

Why is this happening?

3

PREDICTIVE

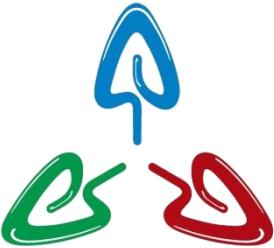
What is going to happen?

4

PRESCRIPTIVE

How can we prevent failure or
optimize product performance?

14

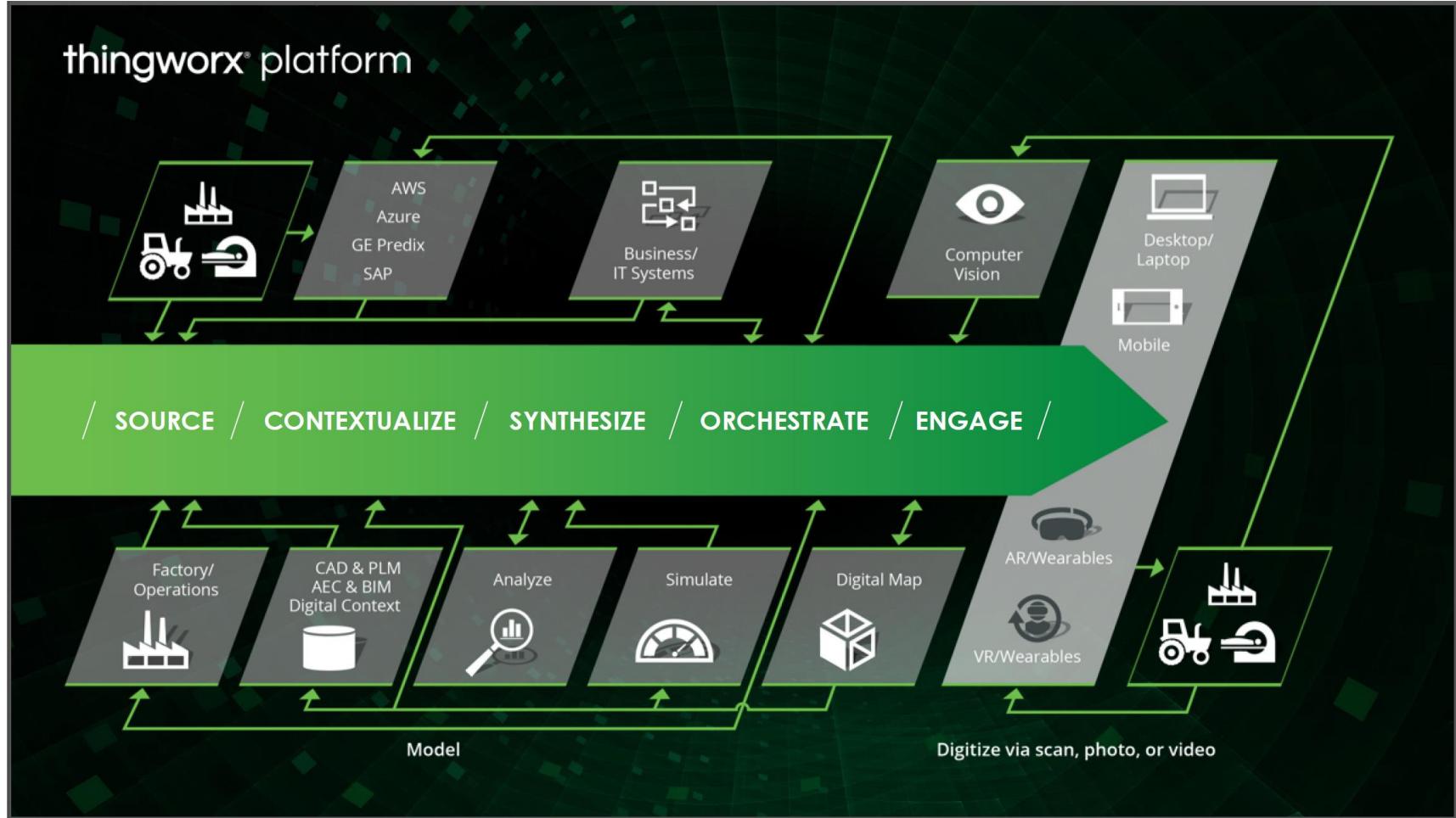


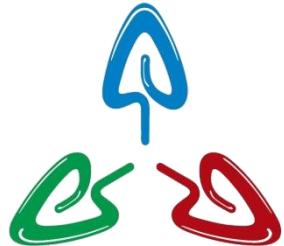
Internet of Things (IoT)

thingworks platforma

ptc thingworx®

/ PRIKUPLJANJE / KONTEKSTUALIZACIJA / SINTEZA / ORKESTRACIJA / PRIKAZ /





Internet of Things (IoT)

Poslovni utjecaji

REMOTE OPERATION



BIG DATA



EVERGREEN DESIGN



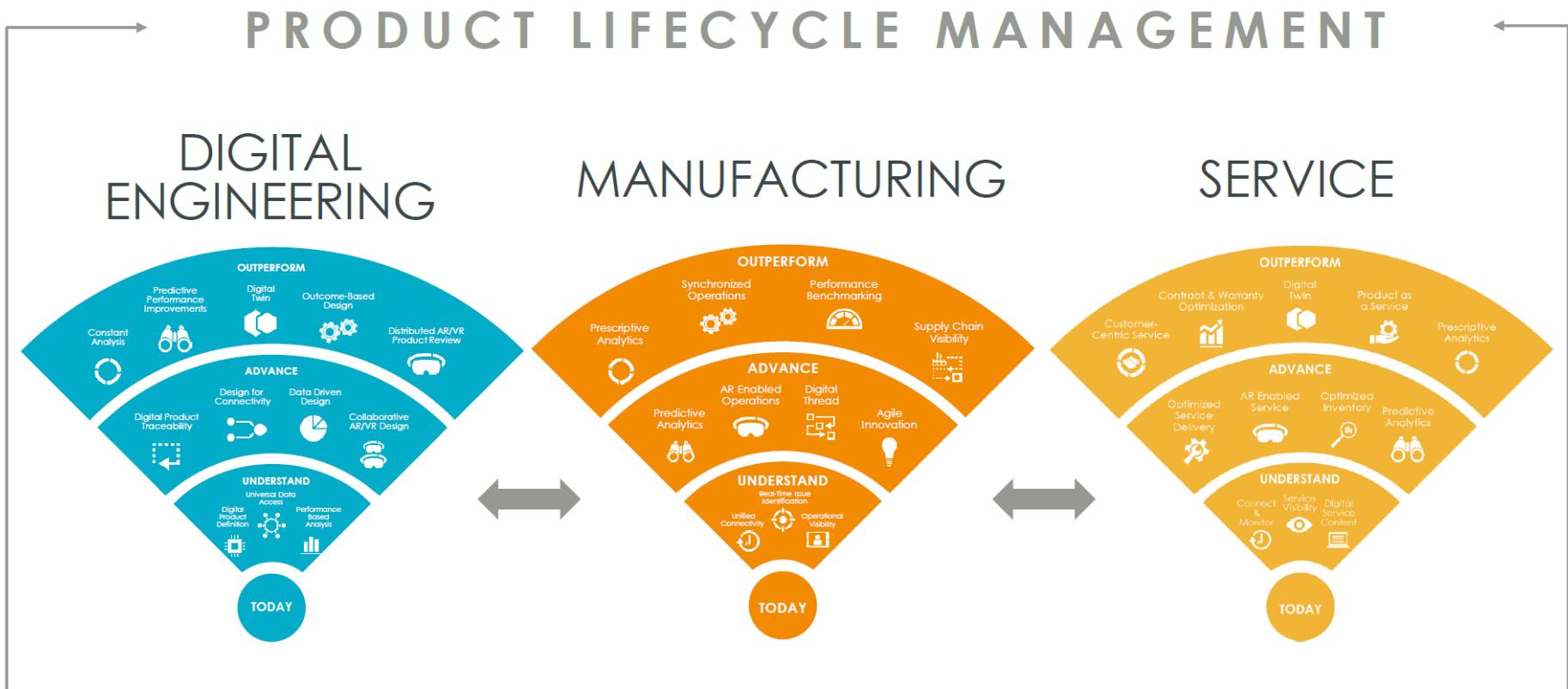
PRODUCTS-AS-A-SERVICE





Internet of Things (IoT)

Područja primjene





Internet of Things (IoT)

Područja primjene: Korištenje proizvoda

- praćenje stanja
- optimiranje iskoristivosti
- preventivno održavanja

The screenshot displays the Thingworx Asset Advisor application. It shows a central monitoring dashboard for 'Pump1'. The top section provides basic information about the pump, including its model number (CP3X), serial number (C007CH004), and location (Needham, MA). It also shows current status (Running), alerts (0 active), anomalies (0 total), and calibration information. Below this, a graph plots 'Inter_X' and 'Discharge' over time, with a red line highlighting an anomaly. A callout box points to this graph with the text 'Sensor data detects irregular operating conditions'. To the right, a detailed view of sensor information is shown for Pump1, listing various metrics and their values. Further down, a list of assets (Pump1, Pump2, Pump3) is displayed, each with its own card showing operating status and alert counts. A callout box points to this list with the text 'Asset list with operating status and alerts'. The bottom right corner of the interface shows a summary of overall system health.

Detailed view of sensor information

Sensor data detects irregular operating conditions

Asset list with operating status and alerts

Administrator

Last Calibrated: 10/17/2017 01:25:30 PM

Pump1

Model Number: CP3X
Serial Number: C007CH004
Description: Dime pump with anomaly alerts enabled, with data bindings from PTCSCASCO.DemoKeyServer
Location: Needham, MA
Customer: Group:

Monitored Properties

5 Anomalous Sensors

Inter_X

Current Value: 0.73
Anomaly Time: 10%
Longest Anomaly: 1 min

Discharge

Current Value: 13.96
Anomaly Time: 0%
Longest Anomaly: 0 mins

Anomaly Status

Normal (0)

Customer: Group:

Pump2

Model Number: CP3X
Serial Number: C007CH002
Description: Dime pump with anomaly alerts enabled, with data bindings from PTCSCASCO.DemoKeyServer
Location: Needham, MA
Customer: Group:

Pump3

Model Number: CP3X
Serial Number: C007CH003
Description: Dime pump with anomaly alerts enabled, with data bindings from PTCSCASCO.DemoKeyServer
Location: Needham, MA
Customer: Group:

Warning: 1 active
Alerts: 1 active
Weekly total: 2
Anomaly: Normal (0 mins)
Weekly total: 0 hrs 44 mins
Calibration: 1 day 23 hrs

Warning: 1 active
Alerts: 1 active
Weekly total: 2
Anomaly: Normal (0 mins)
Weekly total: 1 hr 45 mins
Calibration: 1 day 23 hrs

Warning: 1 active
Alerts: 1 active
Weekly total: 2
Anomaly: Anomalous (16 mins)
Weekly total: 3 hrs 33 mins
Calibration: 1 day 23 hrs



Internet of Things (IoT)

Područja primjene: Proizvodnja (Industrie 4.0)

- praćenje stanja strojeva i opreme
- prikupljanje i obrada informacija
- preventivno održavanje
- optimiranje procesa
- fleksibilni proizvodni pogoni

360 view into machine operations

Normalized manufacturing KPIs

Line issues investigation

Detailed Availability

360° view into operations, including historical trending

Name	Type	Status	Alert	OEE (%)	Availability (%)	Quality (%)	Performance (%)	Description
1-1-Line	Line	✓	⚠️	44	100	75	55	
1-2-Line	Line	✓	⚠️	89	100	75	113	
1-3-Line	Line	✗	⚠️	48	100	75	86	
2-1-Line	Line	✓	⚠️	47	100	80	59	
2-2-Line	Line	✓	⚠️	83	100	75	105	

Overall Equipment Effectiveness

47% ↑ OEE

Availability: 100% → 80% ↑

Quality: 80% ↑

Performance: 59% ↑

Status History (Day)

Status Summary (Day)

Performance History

Legend: OEE, Availability, Quality, Performance

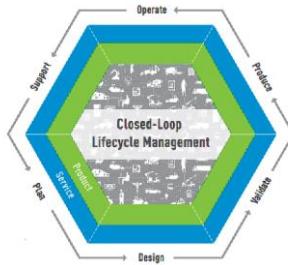
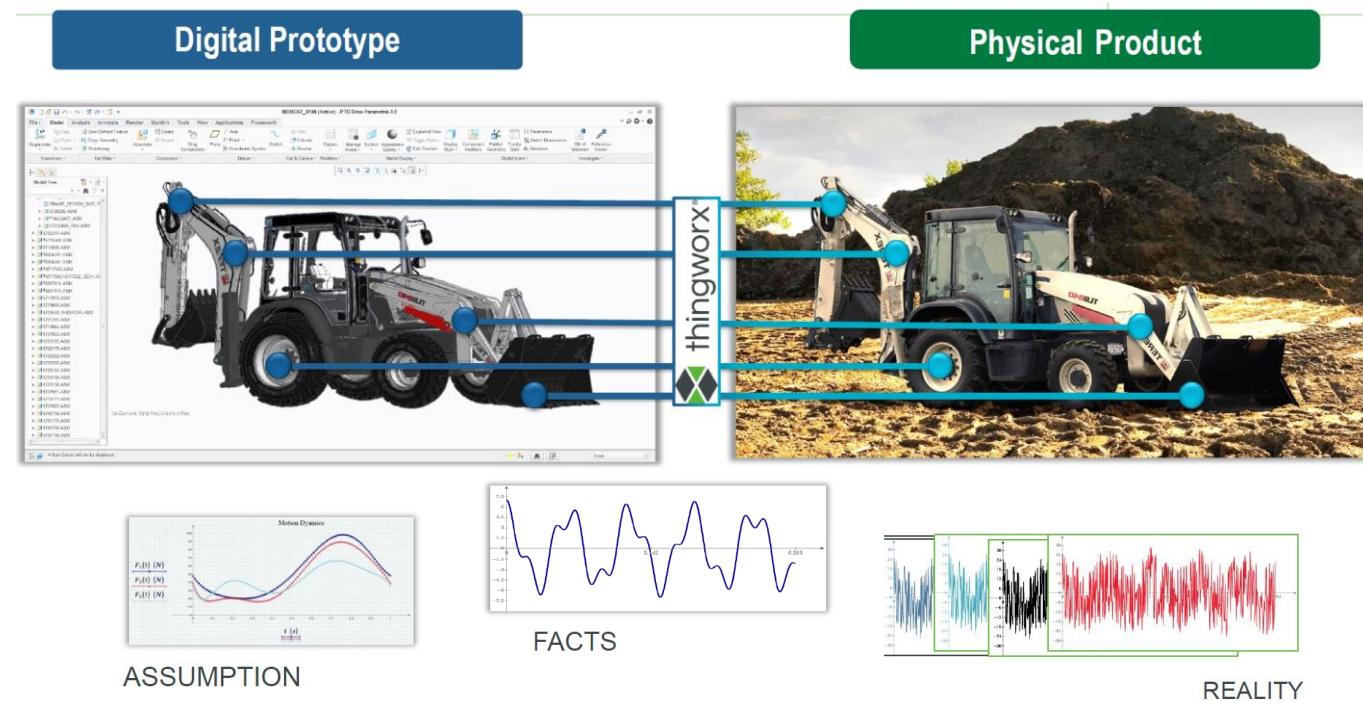
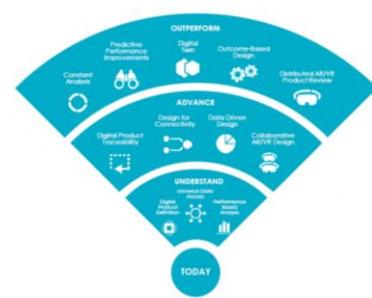


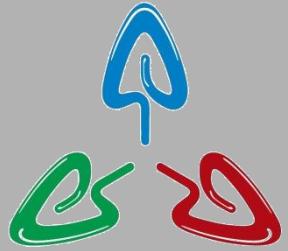


Internet of Things (IoT)

Područja primjene: Digitalno Inženjerstvo

- uvid u stvarne uvjete korištenja
- mapiranje stvarnih opterećenja
- „Digital Tween / Digitalni blizanac“





EAG Center:
Engineering AvantGarde Center - Centar Naprednog Inžinjerstva

PLM Technology Implementation and Solution Providing company

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