

INDUSTRY 4.0 IN BOSCH BARI: ORGANIZZAZIONE E PROGETTI

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BOSCH BARI

Industry 4.0 @ BOSCH Bari

Bosch Group – Business Sectors

Mobility Solutions



Industrial Technology



Energy and Building Technology

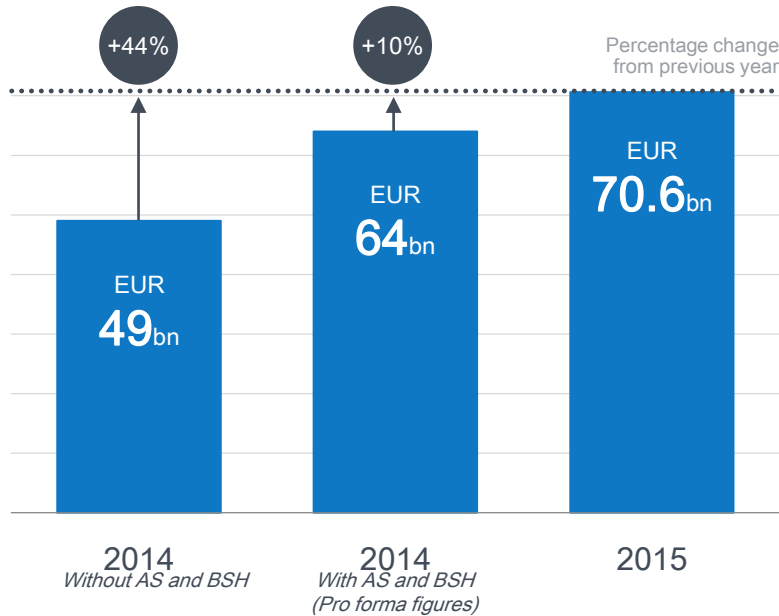


Consumer Goods



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Bosch Group - Sales Revenue



- ▶ **New record** for Bosch sales:
Up 44% percent to 70.6 billion euros
- ▶ **Consolidation effects**
EUR 16.6bn
- ▶ **Nominal sales increase** over pro forma figures for 2014: +10%
- ▶ **Exchange rate-adjusted sales increase** over pro forma figures for 2014: +3.8%

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Bosch Group – Key figures 2015

Bosch Group

- ▶ 70,6 billion euros in sales
- ▶ 374 778 associates

Mobility Solutions

- ▶ One of the world's largest suppliers of automotive technology

59% share of sales



Industrial Technology

- ▶ Leading in drive and control technology, packaging, and process technology



Energy and Building Technology

- ▶ Leading manufacturer of security technology
- ▶ Global market leader of energy-efficient heating products and hot-water solutions

41% share of sales



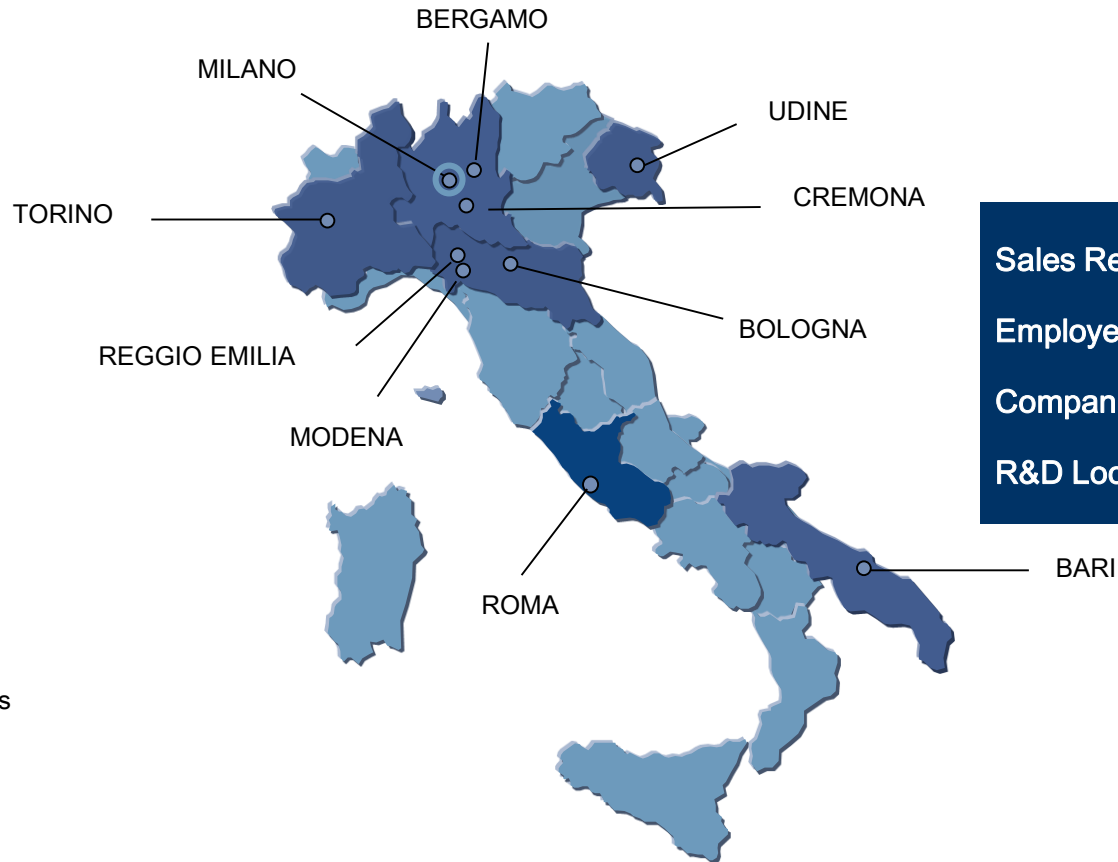
Consumer Goods

- ▶ Leading supplier of power tools and accessories
- ▶ Leading supplier of household appliances



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Bosch Italy



Sales Revenue (billion Eur): 2,2

Employees: 5.800

Companies: 19

R&D Locations: 4

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Il common rail nasce a bari



La prima auto equipaggiata con il sistema Common Rail Bosch nei primi anni '90

BarP | Plant presentation

Bosch Bari – Location Overview

Bosch Bari



Company: Tecnologie Diesel S.p.A.

Division: DS-B2

Business:

Manufacturing of high pressure pumps and gear pumps

R&D Centre

Employees: 2.192

(Status 01.01.2016)

History



1994: Tecnologie Diesel Italia S.p.A. foundation

1996: Acquisition of Brakes Business from Allied Signal

1998: SOP CP1

2003: SOP CP1H

2010: Bosch Quality Award

2011: BPS Award “Overall”

2012: EFQM Prize “Management by processes”

2013: SOP Gear Pump

2013: BPS Award “Deliver”

2014: EFQM Award and Triple Prize winner

2015: EOP Brakes

Products

CP1H:
Lead Plant



Gear Pump:
Lead Plant



eGP:
Development phase in Bari ISEC



BarP | Plant presentation

Bosch Bari - Customers

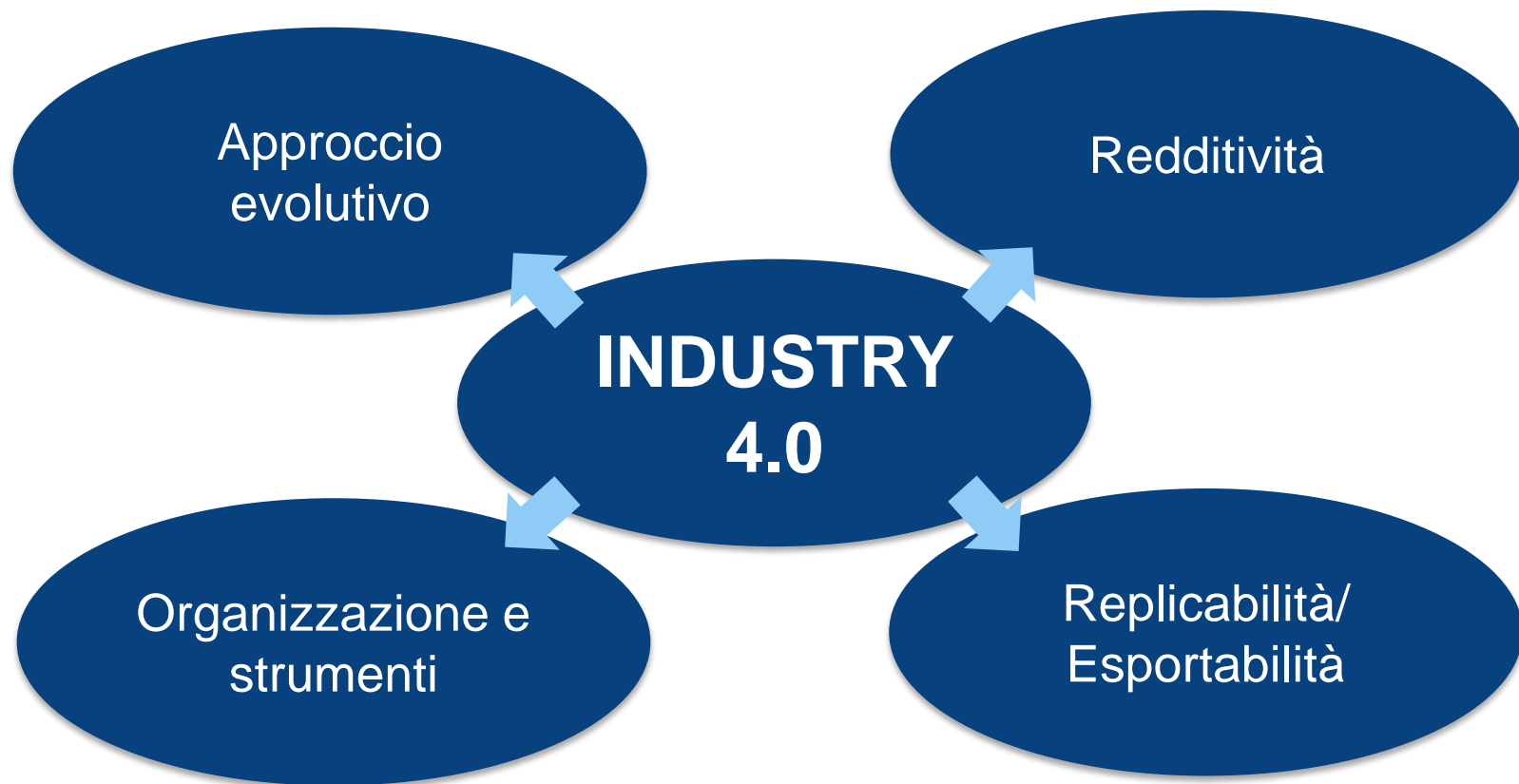


BarP
always one step ahead

BOSCH
Tecnologia per la vita

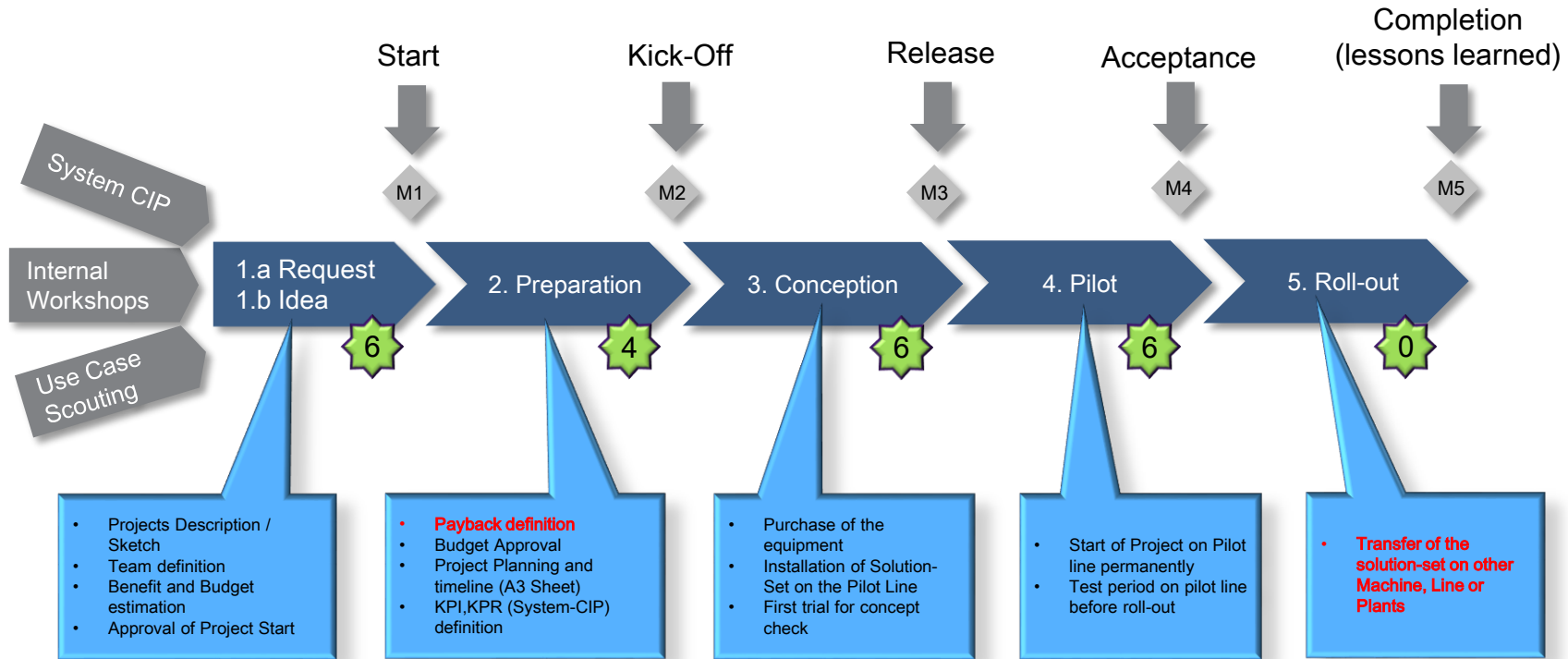
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Aspetti fondamentali

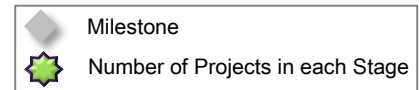


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Project Life Cycle

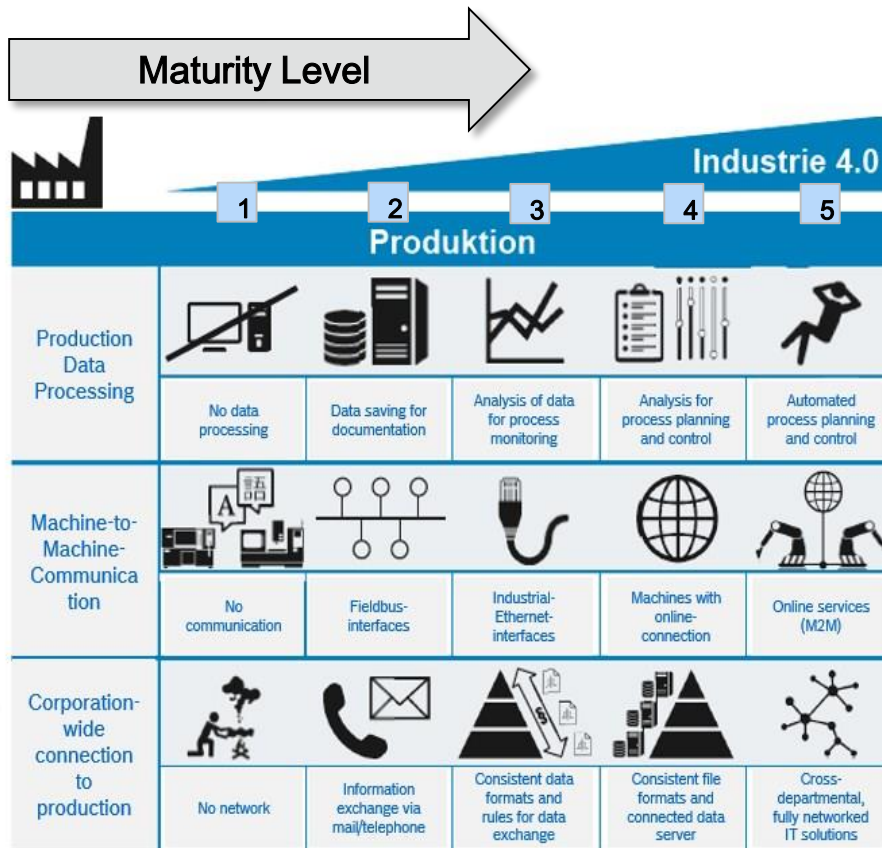


Total number of projects: 22



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Maturity Level (1/2)



Production Data Processing



Data processing is a core issue in industrial 4.0 applications. It can be used both for simple documentation as well as the pursue of goals, ranging from process monitoring to autonomous process planning and control.

Machine-to-Machine Communication



Interfaces for automated data exchange between machines offer a basis for industry 4.0. In the Industry both Fieldbus, Industrial Ethernet and Internet interfaces are used. Internet interfaces offer the advantage of a possible separation of information and location.

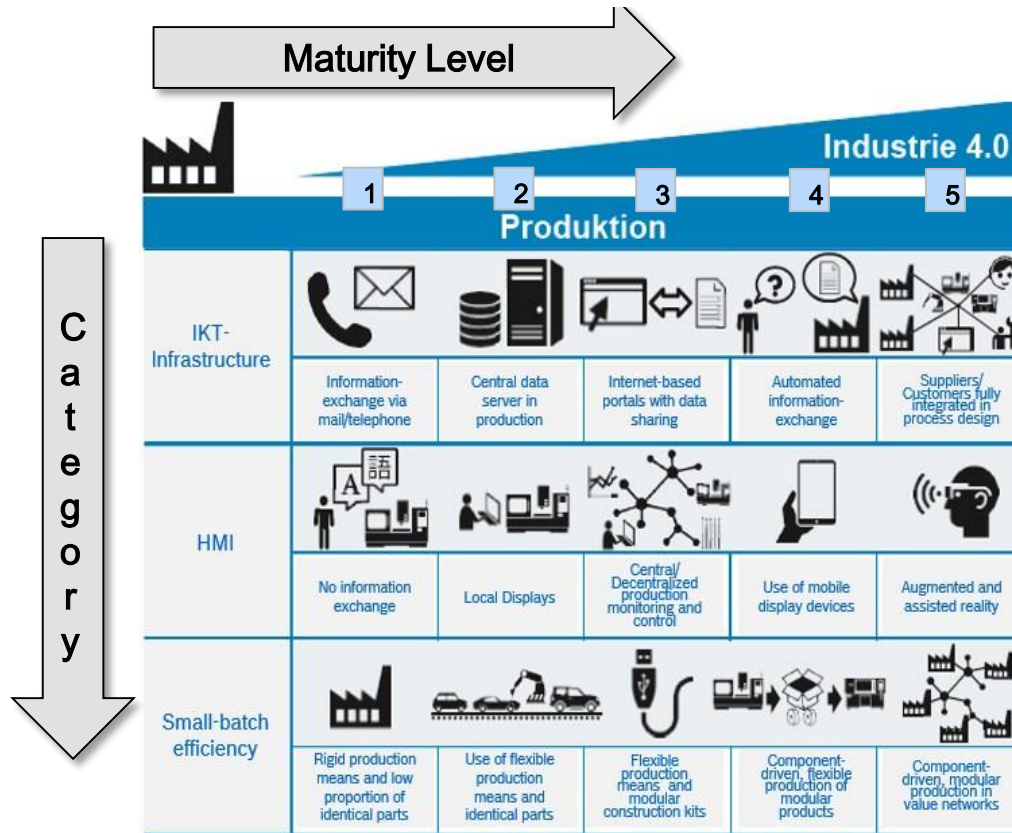
Corporation-wide connection to production



Through an improvement in the network between different the company levels and the production, synergies can be realized and duplication of effort can be avoided. The networking with other productions enables standardized IT solutions, workflows and file formats, of which the entire company benefits.

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Maturity Level (2/2)



IKT-Infrastructure



The infrastructure of information and telecommunication technologies determines the potential improvements. In addition to the use of central data server Internet-based communication portals and automated processes for external data exchange can be used.

Human-Machine-Interface



With increasing complexity of production, focus is more and more set on human-machine interfaces. Innovative operating concepts such as mobile tablets that provide the right information in an appropriate manner at each right place, promise potential for relief of employees and increases production efficiency.

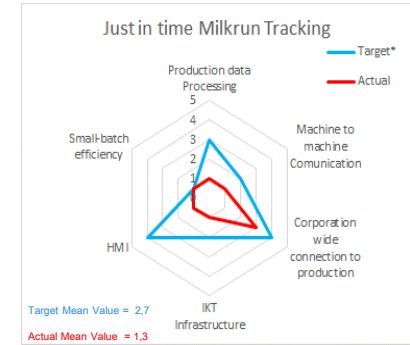
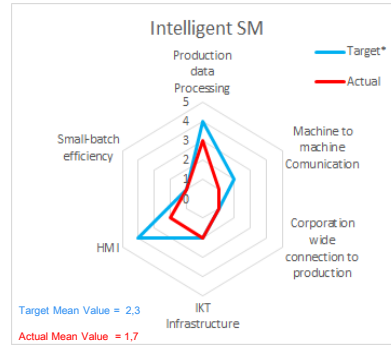
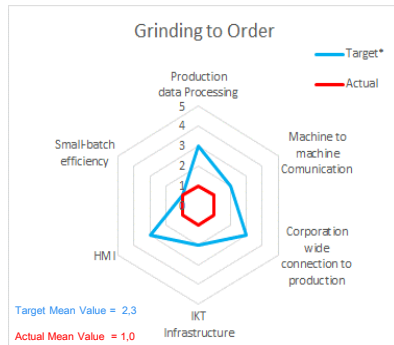
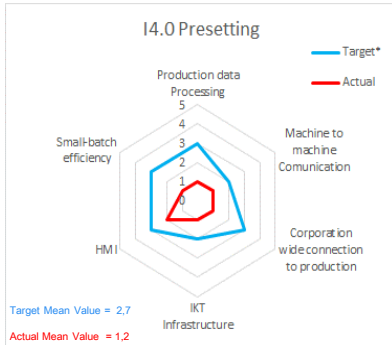
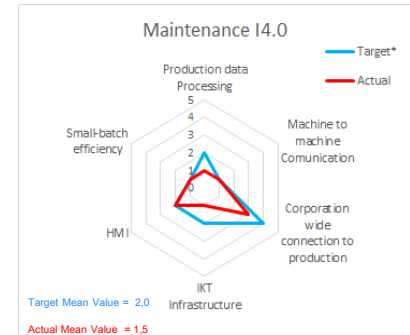
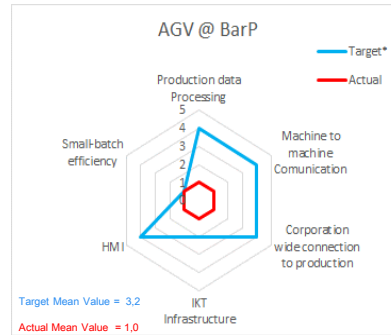
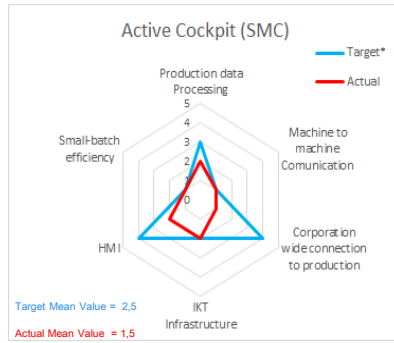
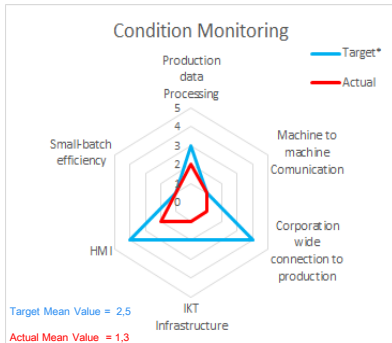
Small-Batch efficiency



The trend towards individually manufactured goods and thus smaller lot sizes leads to an increasing complexity of workflows. Achieving high efficiency in small batch sizes is thus a decisive competitive factor. Here, the use of flexible means of production with appropriate fitting in each value stream opens up potentials.

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Maturity Level: Self Assessment Results



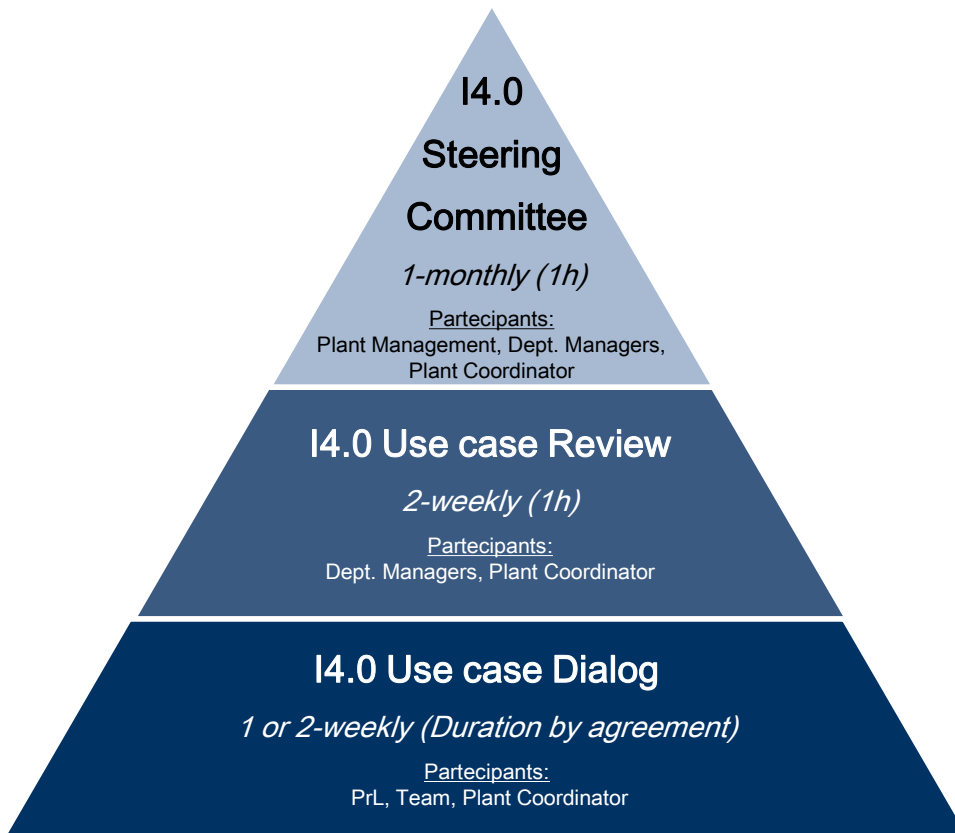
Current average total value = 1,3



Target average total value = 2,5

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Organizzazione



Compiti principali:

I4.0 Steering Committee:

- Strategia I4.0@Bosch Bari
- Discussione di temi ad elevata priorità
- Approvazione del budget
- Review sintetico degli use cases

I4.0 Use case Review:

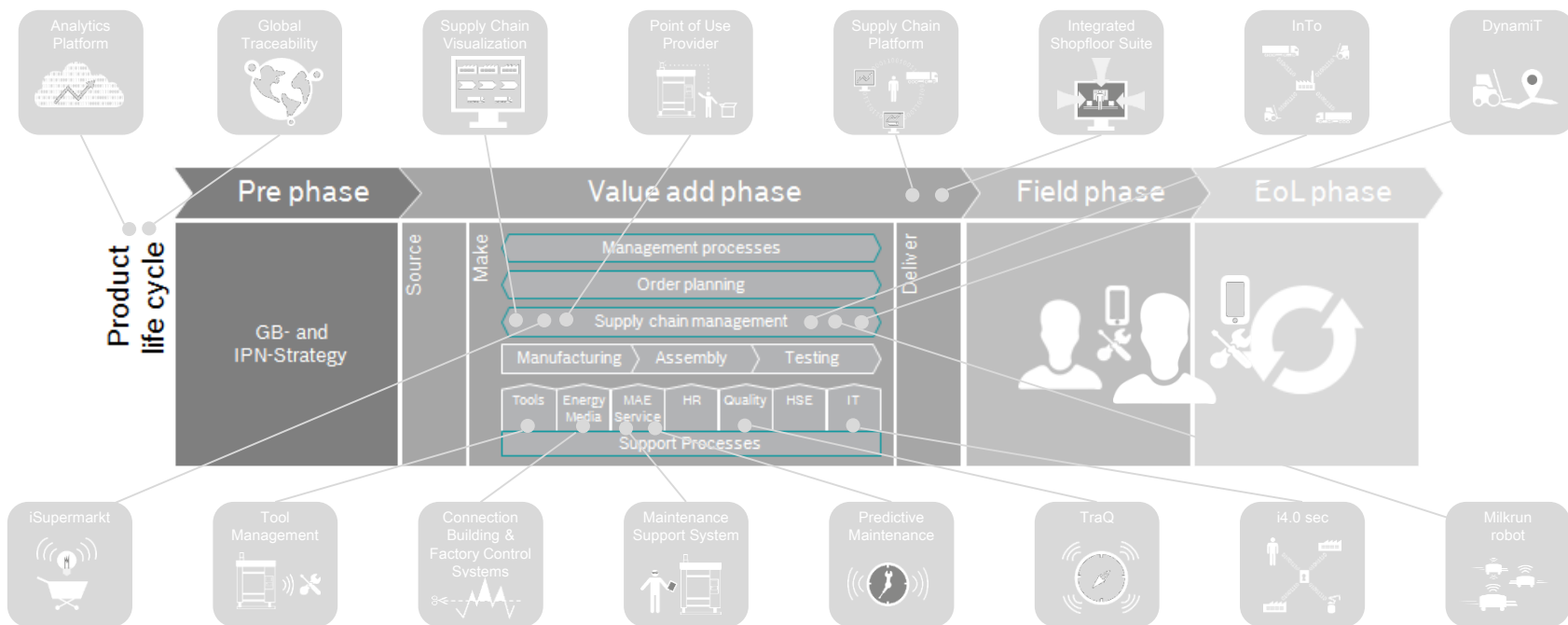
- Review di tutti gli use cases
- Coordinamento delle attività cross-funzionali

I4.0 Use case Dialog:

- Definizione di target, chance e rischi
- Project progress tracking (A3)
- Approfondimenti tecnici
- Gestione della documentazione

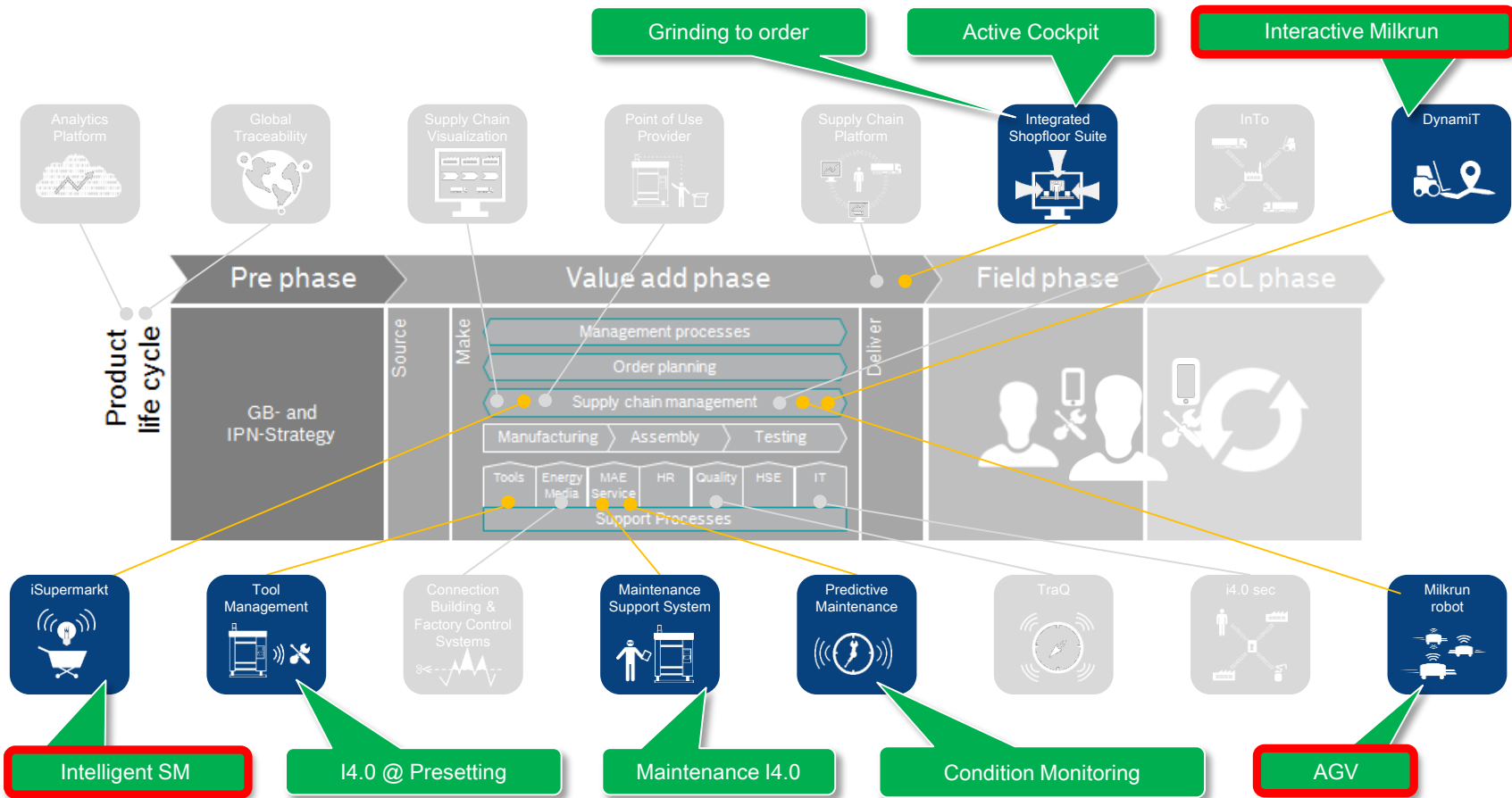
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Applicazioni nella Value Chain



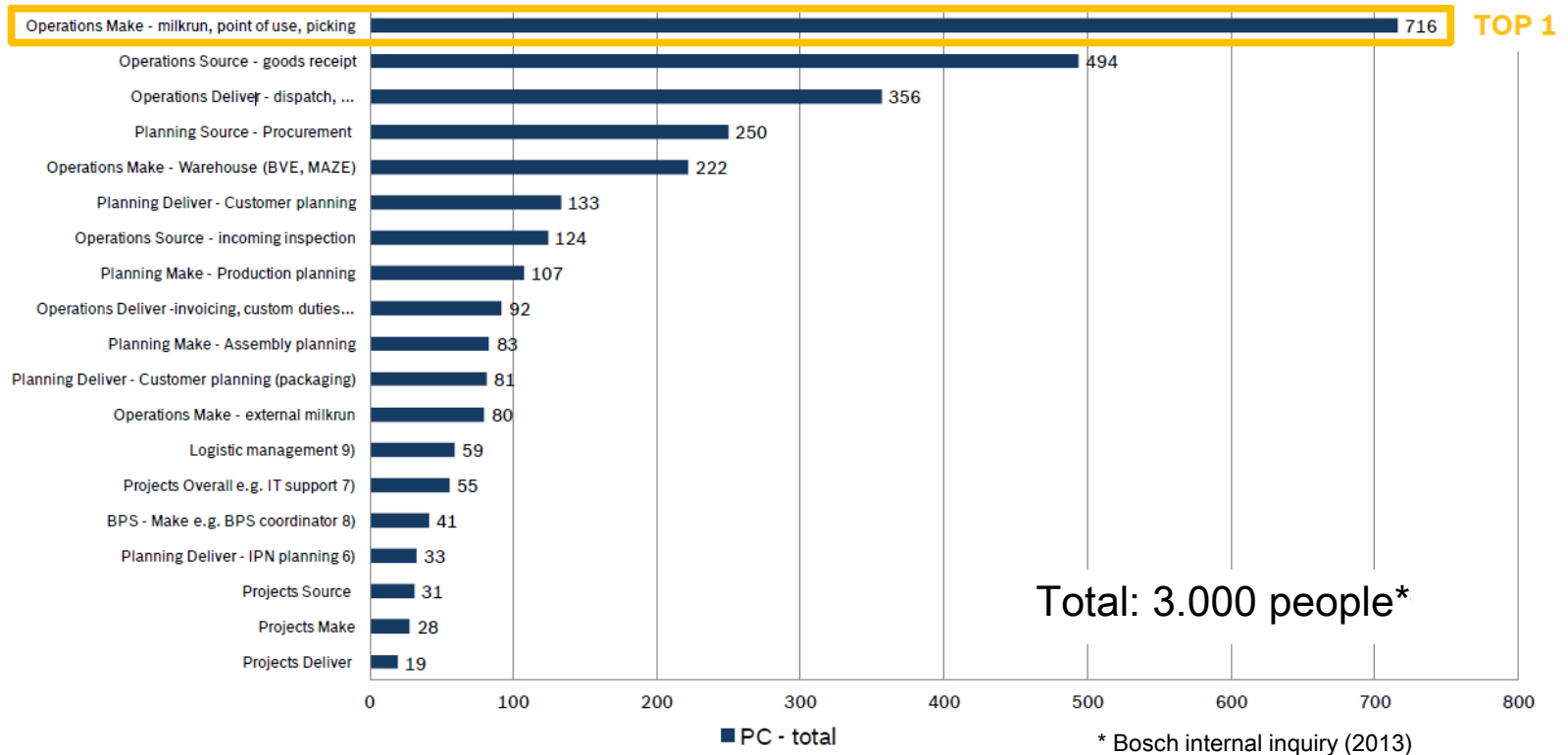
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Applicazioni nella Value Chain



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Logistics Operations & Personnel Capacity



TOP 1: Operations Make, milkrun, point of use, picking: 24% della PC totale

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Interactive Milkrun (1/2)



Auto-valutazione delle performance



Situazione iniziale: istruzioni di lavoro e dati di performance gestiti manualmente, con conseguenti limiti nell'analisi di processo e nella ricerca di aree di miglioramento

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Interactive Milkrun (2/2)

- ▶ SOP: E06.2016
- ▶ Disponibilità di **dati affidabili** sulla performance
- ▶ Possibilità di scegliere una **rotta alternativa** in tempo reale in caso di vincoli ambientali (ad es.: lavori in corso lungo il percorso standard)
- ▶ Target: **Tempo Ciclo**: 57->42 min (-27%);
Saturazione: 74%->85%; **Produttività**: 2,21->2,35 pallet/h (+6%)



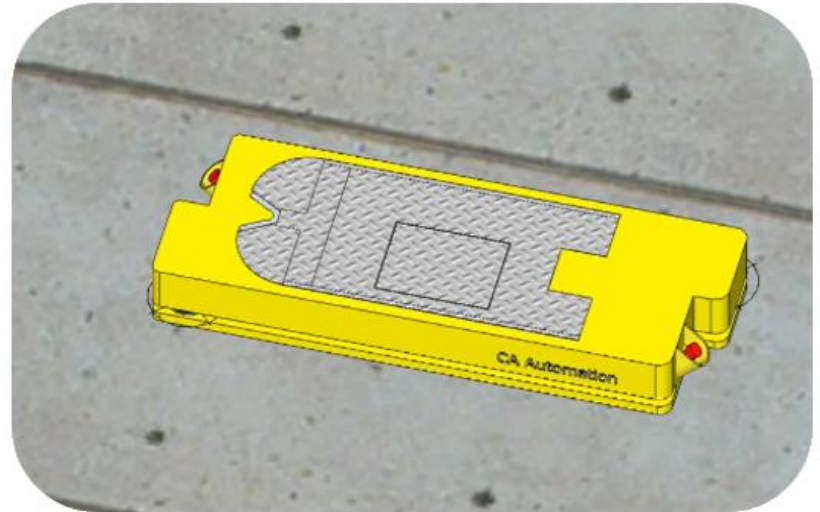
Saving ➔ - 120 k €/year; PBP: 1,4 years

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Autonomous Guided Vehicles (AGV)

Caratteristiche principali

- ▶ **Nessuna modifica necessaria** alle infrastrutture esistenti
- ▶ Capacità di carico di **circa 350 kg**
- ▶ Possibilità di **movimento multidirezionale**
- ▶ Sistema di **gestione flotte**

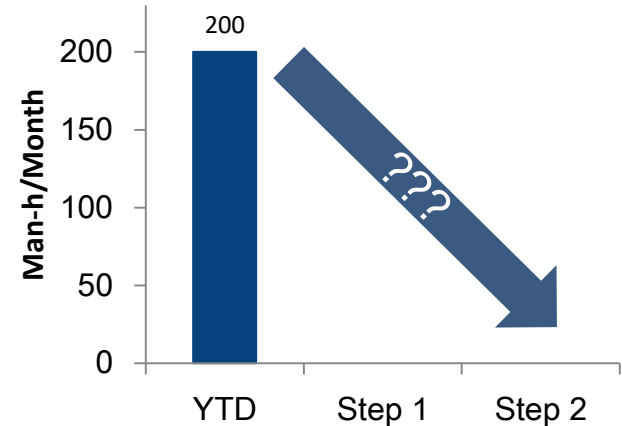


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Intelligent Supermarket (1/2)

Situazione iniziale

- ▶ Aggiornamento manuale dei dati nelle corsie FIFO delle linee di lavorazione
- ▶ Gestione manuale per la scansione RFID delle carte Kanban



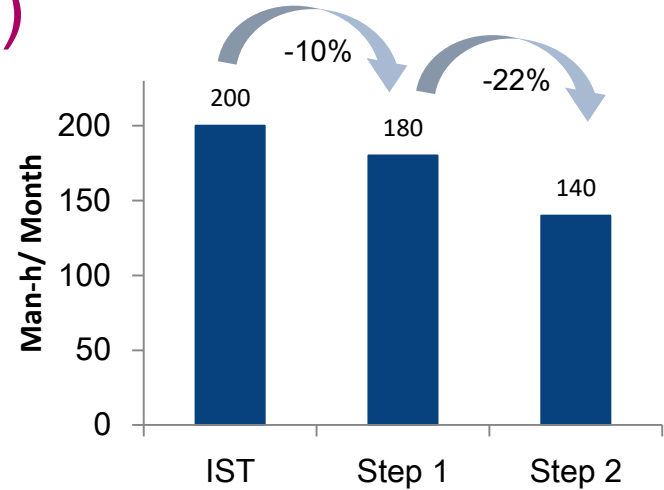
200 h/uomo mese per attività di gestione manuale dei dati di produzione

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Intelligent Supermarket (2/2)

Situazione finale

- **Etichette elettroniche** per ogni corsia FIFO, con aggiornamento automatico con il sistema (valore di Stock, Part Number, ...)
- Creazione di un **gate con lettura automatica** del materiale in transito (in/out)



Saving → - 20 k €/year; PBP: 3,0 years

**GRAZIE PER
L'ATTENZIONE**