

UNO STRUMENTO DI VALUTAZIONE «INDUSTRIE 4.0»

A CURA DI FRANCESCO BUFFOLI (GRUPPO BUFFOLI INDUSTRIES)



4.0 PRODUCT EVALUATION



0 25% 50% 75% 100%

	0	25%	50%	75%	100%
Integration of sensors / actuators	No use of sensors/actuators	Sensors/actuators are integrated	Sensors reading are processed by the product	Data is evaluated for analyses by the product	The product independently responds based on the gained data
Communication / Connectivity	The product has no interfaces	The product sends or receives I/O signals	The product has field bus interfaces	The product has industrial Ethernet interfaces	The product has access to the internet
Functionalities for data storage and information exchange	No functionalities	Possibility of individual identification	Product has a passive data store	Product with data storage for autonomous information exchange	Data and information exchange as integral part
Monitoring	No monitoring by the product	Detection of failures	Recording of operating condition for diagnostic purposes	Prognosis of its own functional condition	Independently adopted control measures
Product-related IT services	No services	Services via online portals	Service execution directly via the product	Independently performed services	Complete integration into an infrastructure of IT services
Business models around the product	Gaining profits from selling standardized products	Sales and consulting regarding the product	Sales, consulting and adaption of the product to meet customer specifications	Additional sale of product-related services	Sales of product functions

The product independently responds based on the gained data

The product has access to the internet

Data and information exchange as integral part

Independently adopted control measures

Complete integration into an infrastructure of IT services

Sale of product functions

4.0 PRODUCTION PROCESS EVALUATION



0 25% 50% 75% 100%

	0	25%	50%	75%	100%
Data processing in the production	No processing of data	Storage of data for documentation	Analyzing data for process monitoring	Evaluation for process planning / control	Automatic process planning / control
Machine-to-machine Communication (M2M)	No communication	Field bus interfaces	Industrial ethernet interfaces	Machines have access to internet	Web services (M2M software)
Company-wide networking with the production	No networking of production with other business units	Information exchange via mail / telecommunication	Uniform data formats and rules for data exchange	Uniform data formats and inter-divisionally linked data servers	Inter-divisional, fully networked IT solutions
ICT infrastructure in production	Information exchange via mail / telecommunication	Central data servers in production	Internet-based portals with data sharing	Automated information exchange (e.g. order tracking)	Suppliers / customers are fully integrated into the process design
Man-machine interfaces	No information exchange between user and machine	Use of local user interfaces	Centralized/ decentralized production monitoring/control	Use of mobile user interfaces	Augmented and assisted reality
Efficiency with small batches	Rigid production system and a small proportion of identical parts	Use of flexible production systems and identical parts	Flexible production systems and modular designs for the production	Component-driven, Flexible production of modular products within the company	Component-driven, modular production in value-adding networks

Automatic process planning/control

Web services (M2M software)

Inter-divisional, fully networked IT solutions

Suppliers/customers are fully integrated into the process design

Augmented and assisted reality

Component-driven modular production in value-adding networks

IL CASO

BUFFOLI

OBIETTIVO:

**VALIDARE LE SOLUZIONI 4.0
VERSO IL MERCATO**

Il bene strumentale deve avere **5 Caratteristiche Obbligatorie...**



Controllo
per mezzo
di CNC e/o PLC



**Interconnessione
ai sistemi
informatici di
fabbrica**
con caricamento da
remoto di istruzioni
e/o part program



**Integrazione
automatizzata**
con il sistema logistico
della fabbrica o con
la rete di fornitura e/o
con altre macchine
del ciclo produttivo



**Interfaccia
uomo-macchina**
semplice e intuitiva



Rispondenza
ai più recenti
parametri di
**Sicurezza,
Salute,
Igiene del lavoro**

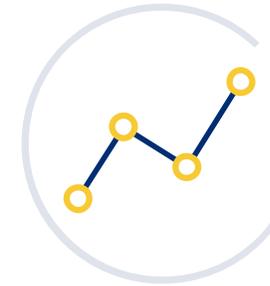
... e almeno 2 tra le seguenti **Caratteristiche Qualificanti**



Sistemi di
Telemanutenzione e/o
Telediagnosi e/o
Controllo in remoto

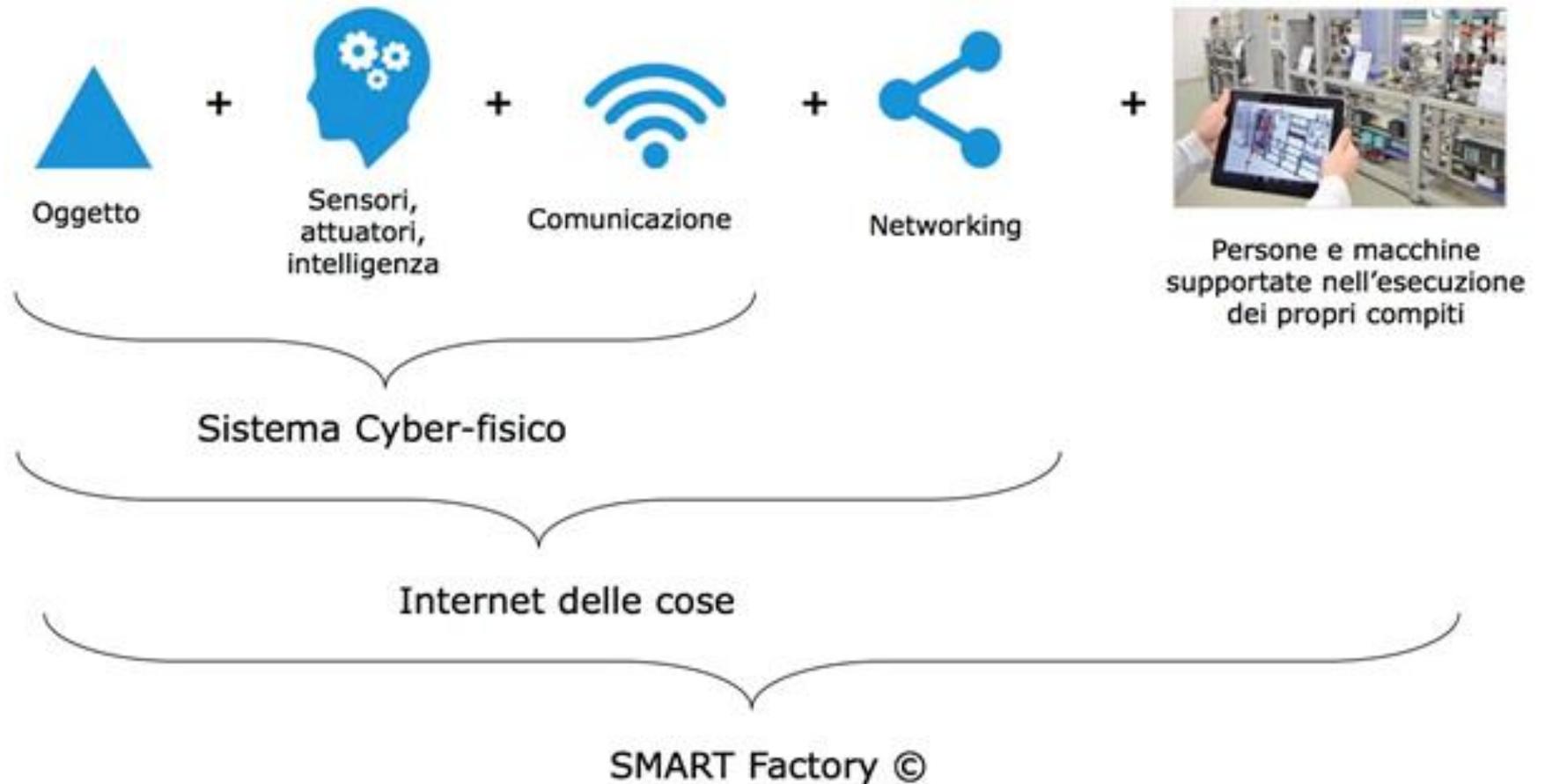


Monitoraggio in continuo
delle condizioni di lavoro
e dei parametri di processo
mediante opportuni
set di sensori e adattività
alle derive di processo



Caratteristiche di integrazione
tra macchina fisica e/o impianto
con la **Modellizzazione** e/o
la **Simulazione** del proprio
comportamento nello
svolgimento del processo

Le determinanti dell'industria 4.0



La multinazionale tedesca **FESTO**, leader internazionale della pneumatica ed una delle aziende di riferimento per l'Industria 4.0 nel mondo, è fra i maggiori clienti dell'azienda bresciana **BUFFOLI TRANSFER S.p.A.**

Insieme alla loro società di consulenza

FESTO
Consulting

abbiamo verificato quanto le **macchine** Buffoli e i **processi** produttivi che si realizzano con gli impianti Buffoli siano rispondenti al paradigma tedesco **INDUSTRIE 4.0**, sulla base del criterio **VDMA**.

BUNOLI

CNC PRECISION
TRANSFER MACHINES
AUTOMATION
& SOFTWARE



BUFFOLI

PRECISION CNC
TRANSFER MACHINES
AUTOMATION
& SOFTWARE

40

BUFFOLI INDUSTRIES

ALCUNI CLIENTI DI BUFFOLI NEL MONDO



Mercedes-Benz



SCHELL FOR



CATERPILLAR

+GF+ ISEO

Villeroy & Boch
1748



TRW Automotive



GRUNDFOS



Volkswagen

Honeywell



MAHLE

Danfoss



HONDA

KÄRCHER

ABB



GEBERIT

tyco

SCANIA

FESTO

SIEMENS



KOHLER



Continental

EATON

Parker

WATTS INDUSTRIES

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Buffoli

PRECISION CNC
TRANSFER MACHINES
AUTOMATION
& SOFTWARE



GRAZIE PER L'ATTENZIONE

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