

Digital Manufacturing Journey at Eli Lilly Italy

*Italian Manufacturing plant at Sesto Fiorentino -
Firenze*

The Eli Lilly logo, featuring the word "Lilly" in a white, elegant, cursive script font, positioned in the bottom right corner of the slide.

Our Purpose + Values

Lilly unites caring with discovery to create medicines that make life better for people around the world.

OUR VALUES

Integrity

Excellence

Respect for People

Global Fast Facts

A heritage more than **140 years strong**,
founded on May 10, 1876



Headquarters located in
Indianapolis, Indiana, U.S.A.



Approximately **38,000 employees** worldwide



More than **8,000 employees** engaged
in research and development



Clinical research conducted
in more than **55 countries**



Research and development
facilities located in **8 countries**



Manufacturing plants located in **8 countries**



Products marketed in **120 countries**

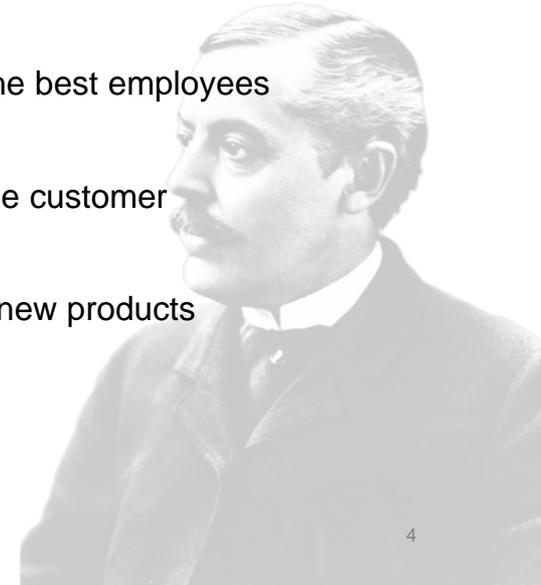
Historical Fast Facts

A HERITAGE MORE THAN 140 YEARS STRONG.

Lilly was founded on **May 10, 1876**, by Colonel Eli Lilly, U.S. Civil War veteran. Since our founding, we have pioneered medical breakthroughs such as human insulin, the polio vaccine and many other breakthrough therapies. We've also set a high standard for giving back to our communities.

COLONEL LILLY'S PRIORITIES

- ✓ Manufacture high-quality products
- ✓ Recruit the best employees
- ✓ Satisfy the customer
- ✓ Develop new products



Sesto manufacturing site overview

Lilly

Eli Lilly Italia - 58 years of history



Our Journey

TRANSFORM →

GROW →

DIVERSIFY →

1959

90s

2005

2009

2012

2015

2016

2017

2019

Eli Lilly starts production in Italy

Specialized on antibiotics production (oral and sterile)

New Mission and strategy

1st Insulin Line

2nd Insulin Line

3rd Insulin Line

1st GLP-1 Autoinjector Assembly Line

2nd GLP-1 Autoinjector Assembly Line

1st SYRINGES LINE



250 M €

320 M €

380 M €

425 M €

465 M €



380

407

565

565

640



1st Outside US Lilly Biotech site

Sesto Manufacturing - Product Portfolio

Insulins

Hlog, Hlin, U200 3 ml cartridges



Pens



Blisters



Insulin Glargine Biosimilar



49 Countries served, 94% Export

G-LP1



21 Countries served, 94% Export

Import, testing and distribution

- **Ixekizumab** (Autoinjector/Esyringe)

Testing

- **Necitumumab** vials (800mg/50ml)
- **Olaratumab** vials (50ml ; 20ml)
- **Zyphadera** vials (210-300-405mg, 4ml)

Testing & distribution (future)

- **CGRP** (Autoinjector/Esyringe 100ml; 120ml)

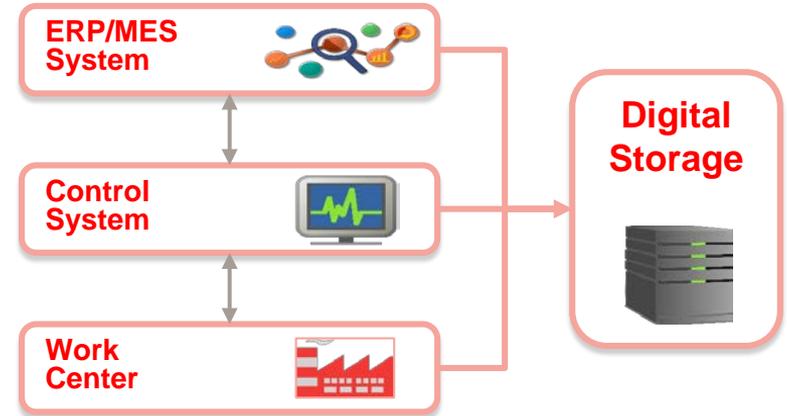
Sesto manufacturing digital Journey

Lilly

Sesto plant : Automated & digital native

Run high speed and high precision manufacturing and packaging operations replacing human being with machines/robots to execute ergonomic dangerous, work intense and repetitive operations.
All manually or automatically executed operations captured to create a 'digital' history of M&Q business processes enabling a data driven decision making and execution approach

- *State of the art technologies* on all equipments to maximise **automated high speed high precision operations execution**
- *Computer Integrated Manufacturing* to ensure **integrated execution** across all functions
- Automated Warehouse and material movements from/to warehouse to/from production lines (*conveyor & AGV*) to **minimise human interventions**

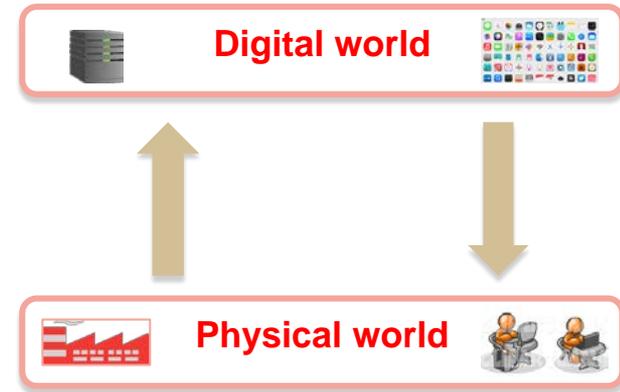


Adoption of modern technology has been a key of success for the site transformation, envisioning the value of data asset and growing across the whole organisation a technology oriented mindset

Sesto plant : The present

The availability of the 'digital image' of Manufacturing and Quality operations enables an effective and efficient analysis of past events and an accurate monitoring of on going activities.

- **GMP and not GMP integrated reporting** to improve massive data check activities (Batch Review Reports, AQMS, Warehouse operations dashboard...)
- **Key business processes performance review dashboards** (Balanced Scorecard, HSE scorecard, Quality scorecard, ..)
- **Process & Performance Monitoring** (Process book reporting, Tracksys, Control Charts, Raw data and correlation analysis,..)

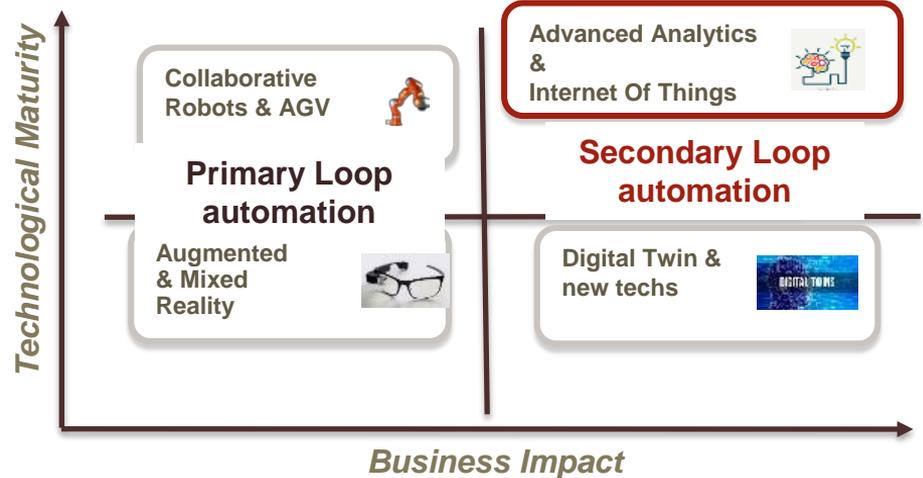


So far the focus has been on improving existing processes and build the foundation for a digital evolution; looking into the future the growth of digital density will enable new business processes more digital native

Sesto plant : digital journey

New technologies can drive efficiency in the way we operate today but more importantly can inspire a transformation of business processes more oriented to leverage growing digital density , evolved robotic and augmented reality

- **New Generation robots and modern AGV** can operate side by side with human being perceiving and reacting to the environment around them
- **Machine Learning** combined with an expanded **IOT** can evolve the role of technology in the decision making process
- **Augmented and Mixed reality** enriches the perception of the physical environment through the addition of relevant digital information
- **Digital Twins** and **new technology** could allow a step change in root cause analysis, Return to production and more broadly Shop Floor operations execution



Each technological stream provide specific opportunites, but even more importantly their combination can enable a significant evolution of existing processes

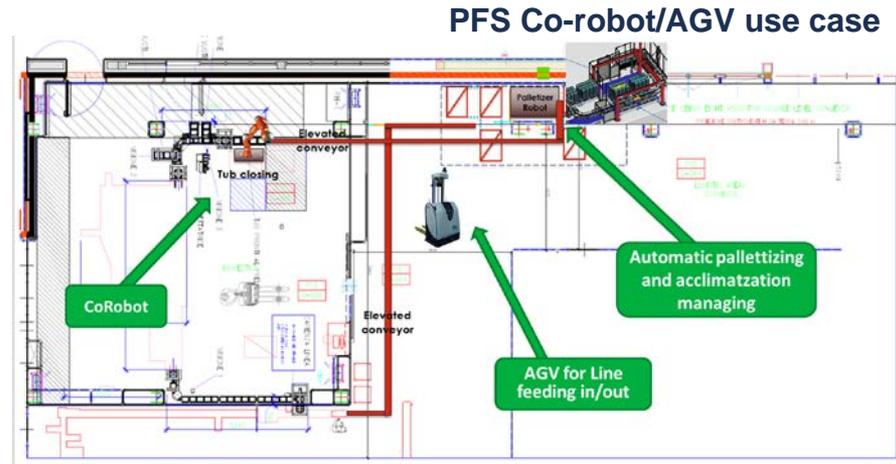
Sesto plant : future digital opportunities

New Generation robots and modern AGV can operate side by side with human being perceivng and reacting to the environment around them

Collaborative
Robots & AGV



Program	Status	Next	When
PFS Co Robot/AGV to automate repetitive, low value adding and ergonomics operations execution	Sanctioned by Digital working team	Agree with Global Robots team on execution	September 2018
Expand AGV footprint to manage material and product trasportation across the whole site	Business case under development	Submit business case for approval	November 2018



We can re-think the way operations are organized taking in account manufacturing operations offer many opportunities to introduce at the shop floor level collaborative robots to execute repetitive and ergonomical dangerous activities

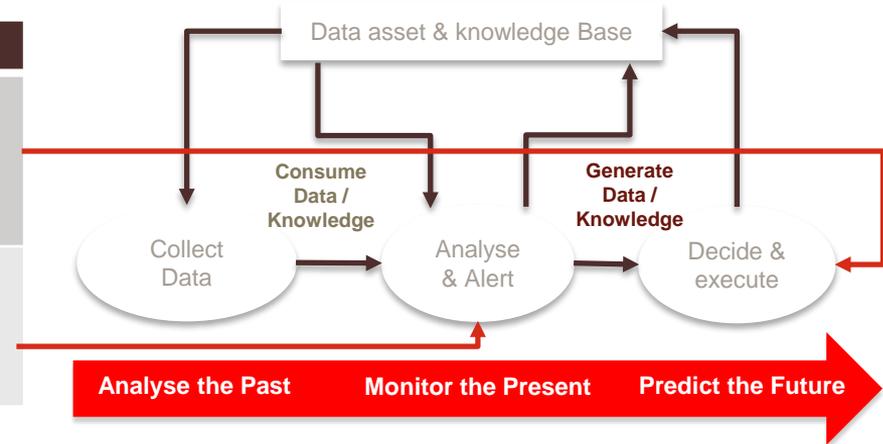
Sesto plant : future digital opportunities

Machine Learning combined with an expanded IOT can evolve the role of technology in the decision making process

Machine Learning
&
Internet Of Things



Program	Status	Next	When
Shop Floor operation scheduler to optimize resources sharing in execution	Sanctioned by Digital working team and PPN ladership POC on going	POC completion	November 2018
Advanced Cognitive maintenance and predictive applied to part washers and component processors	Sanctioned by Digital working team and PPN ladership POC on going	POC completion	November 2018



Many of the new technologies are thought to expand our ability to collect data and gather knowledge and eventually provide a competent electronic partner in decisions making.

Sesto plant : future digital opportunities

Digital Twins and new technology could allow a step change in root cause analysis, Return to production and more broadley Shop Floor operations execution

Digital Twin & new techs



Program	Status	Next	When
Deploy smart devices to enable seamless identification, tailored notification and smart notification	Approved by Site Lead team Tech solution under development	Solution built completed and rady for deployment	November 2018

Reduce any planned and unplanned downtime improving the capabiltiy to perform reliable off line testing and improve connections between human and machines at the Shop Floor

✓ Seamless Authentication



✓ Tailored Notification machine-to-human profile-based



✓ Smart Communication human-to-human



Sesto plant : future digital opportunities

Augmented and Mixed reality enriches the perception of the physical environment through the addition of relevant digital information

Augmented
& Mixed
Reality



Program	Status	Next	When
Mixed Reality can improve the ability to drive operations execution	Screening potential uses cases to be submitted for approval	Identify use cases and proceed with request of approval	Year end

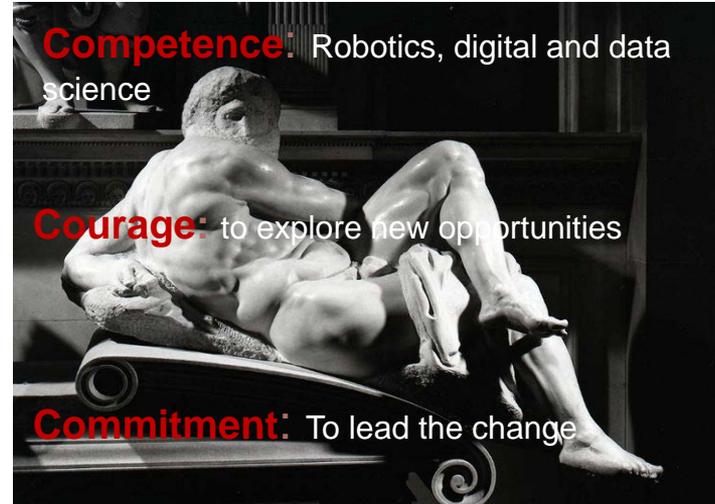


Reduce any planned and unplanned downtime improving the capability to perform reliable off line testing and improve connections between human and machines at the Shop Floor

Sesto plant : future digital opportunities

New technologies can drive efficiency in the way we operate today but more importantly can inspire a transformation of business processes more oriented to leverage growing digital density , evolved robotic and augmented reality

- New technology maturity status and their business impact positioning is an on going process
- New opportunities will come with the first successes and failures
- We need to adopt a different approach in managing those projects to consider the speed of innovation in this space



***A long term transformation map approach could hardly fit with this potentially revolutionary conditions:
The digital transformation is what happens to us while we are very busy in making our plans***