## Enablers and Barriers of Digitalization

And Industry 4.0 in the Chemical Fertilizer Manufacturing Industry

by Gabriele Genyte





#### **Industrial Revolution**





### **Digitalization is hard...**

- Less than 1% of urea plants are running as Cyber-Physical Systems
- BUT ~90% have DCS in place





### LIGHTS-OUT FACTORIES Look Like

Unlike traditional factories true lights-out manufacturing refers to factories that operate completely autonomously.





Though it sounds like a dream, lights-out factories are the Industry 4.0 future that's already in action.



# Digitalization doesn't have to be hard...

With the rollout of 5G and improved digital capabilities, Industry 4.0 is becoming a reality for more industries.

\$337.1**B** 

Projected Industry 4.0 market size by 2028, up from \$116.1B in 2021.

Source: Fortune Business Insights





#### **Grounded Theory**

- Emergence of relevance .... instead of looking for validation...
- Cognitive barriers





#### **Risk aversion**

Kahneman & Tversky's (1979) **prospect theory**. how people assess decisions under uncertainty:

A VALUE FUNCTION THAT IS: concave for gains convex for losses and steeper for losses than for gains

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#### **Enablers**









#### INCREASED PRODUCTION & PLANT OPTIMIZATION

#### REDUCTION OF FAILURES, PRESCRIPTIVE & PREDICTIVE MAINTENANCE

#### LOWER CONSUMPTION OF RAW MATERIALS

#### EFFICIENCY & ACCELERATION



#### Why Would YOU Digitalize?



INCREASED PRODUCTION & PLANT OPTIMIZATION REDUCTION OF FAILURES & PREDICTIVE MAINTENANCE LOWER CONSUMPTION OF RAW MATERIALS EFFICIENCY & ACCELERATION



#### **Barriers**





**Barriers** 

#### Lack of Suppliers and Reference Cases

#### Expensive

#### IT and OT Together

Lack of Digital Skills



#### Why Would YOU NOT Digitalize?:

#### Lack of Suppliers and Reference Cases

#### Expensive

#### IT and OT Together

Lack of Digital Skills



### **Defeat risk aversion**

- Small steps
  - e.g. Pilot Project
- Training
- Collaboration





# Reap digitalization benefits

This is the world where we are all going to **Win** together...





## Thank you

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