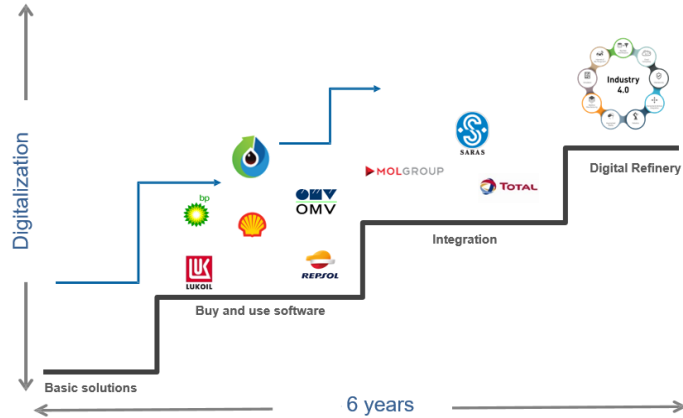# BU Production and Industrial Service

Digital Transformation

Digital transformation

Digital Refinery is an end-to-end centralized 'One view' of Refinery operations for greater operational efficiency & optimization, by effective data gathering, data management, better projections through advanced analytics and data modeling

Beside benefits and culture change, this brings also **STABILITY** to the Refinery
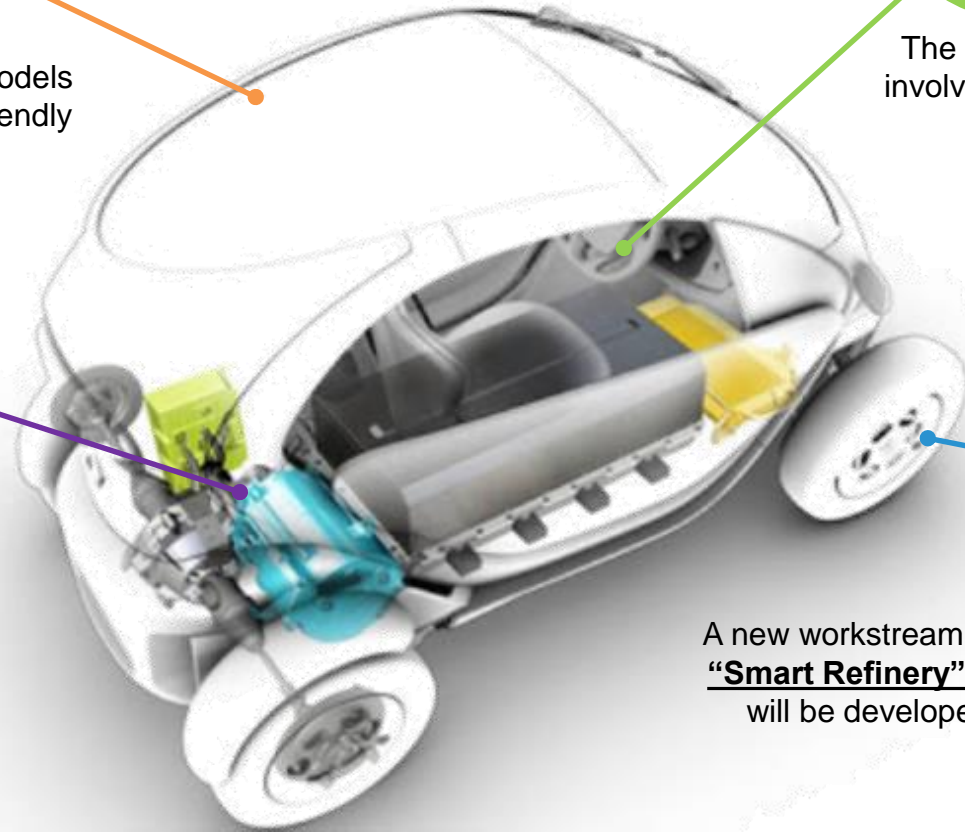

2
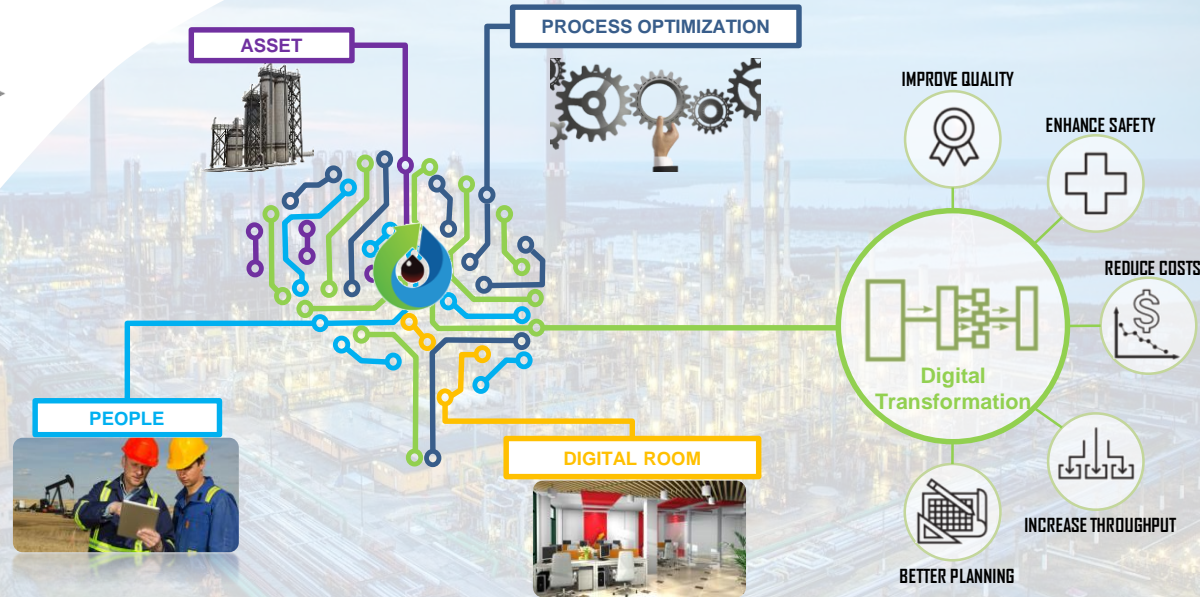
Approach strategy

IT Department

Design the shape of the models making them more user friendly

Production

The end-user which will be also involved in developing the models

Excellence center

Build the models,
Coordinate the digital projects

A new workstream within Delfin 3 Project, called **"Smart Refinery",** in which the digital initiatives will be developed from idea till deployment

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Refinery APC program
Project benefits and timeline

Project *Description*:
- ✓ Advanced Process Control (APC) is a comprehensive predictive control software that improves process profitability by increasing capacity, improving product quality and reducing energy consumption.

- ✓ All the operational knowledge is used to build a custom APC model. This model is based on both a thermodynamic and a statistical model, along with a linear programming technique and an economic performance feature, allowing the APC to identify the optimal operating point based on maximum capacity, minimum power consumption, or a balance between these and other performance goals.

Main *Benefits* :
- ✓ It gives a tighter control of the key process parameters and is based on a dynamic model;
- ✓ Drives the process as close as possible to technological boundaries.

Project *Stages* :

2017	2018	2019	2019	2020

In 2017, APC was implement to CDU.	Stage 1	Stage 2	Stage 3	Stage 4
	DCU-NHT-SGP	FCC-HPP	Ref-KHT-DHT	MHC-DHT
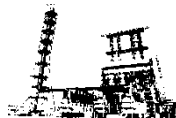
Cumulative estimate benefits at the end of program

**~4 mil$/y**

Predictive Maintenance project
Project, benefits and timeline

Project *Description*:

- ✓ .Project for implementation of Mtell and Fidelis Application

- ✓ Mtell is a prescriptive maintenance application, used to monitor real time equipment sensors, predict known failures and alert anomalies, while tracking asset depreciation.

- ✓ Fidelis is an asset reliability application, which runs different type of scenarios, to quantifiy the true value of any improvement projects in design, maintenance, operations, or supply chain

Project *Benefits*:

- ✓ Less downtimes on the monitored equipment

- ✓ Improved visibility and awareness on the production/maintenance parameters, dependencies and environment.

- ✓ Early warning for similar failures like the ones met in the past

- ✓ Automatic diagnostic of predicted failure based on history

- ✓ Advice from application for what and how to do the repair, based on artificial intelligence and machine learning

- ✓ Assets life-cycle management

- ✓ Visibility and control on reliability versus other financial or production objectives

Project *Stages* :
Project *Stages* :
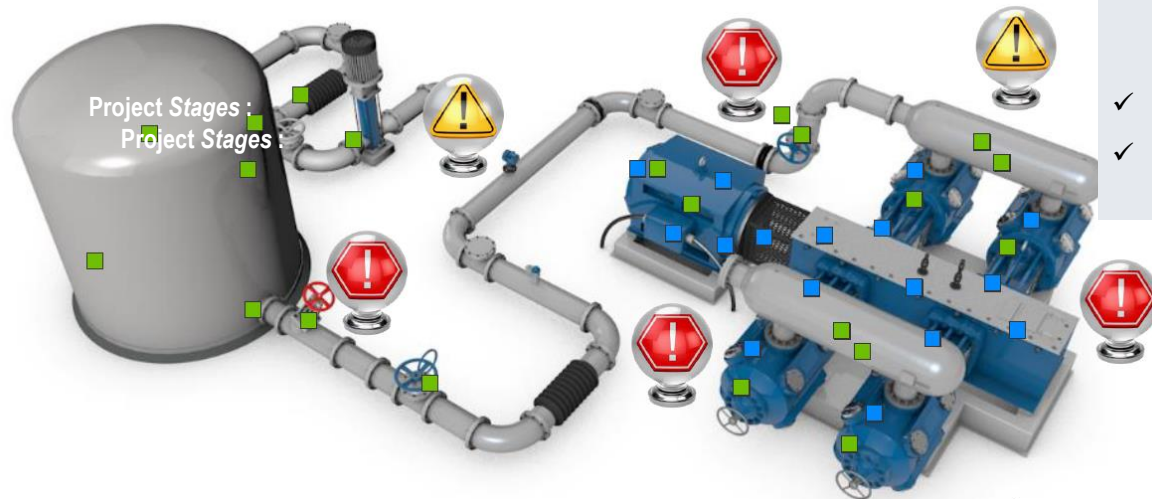
Cumulative estimate maintenance reduction cost starting with 2020
0.5mil$/Y

Automation of evidence for pressure vessels, boilers, pressure pipes and lifting equipment

Project Description:
Project is required in order to implement ISCIR requirements related with evidence of pressure vessels, boilers, pressure pipes and lifting equipment in refinery asset management system.

Scope of work:
- ✓ Registered in a system with trasability more then 12.000 special refining assets
- ✓ Scan documentation for a limited lot of ISCIR books ;
- ✓ Documentation of ISCIR books with items from maintenance system;

Main *Benefits* :
- ✓ Create a database with necessary info align with business requirements and improve all ISCIR activities
- ✓ Archive all ISCIR documentations in electronic format;
- ✓ Have an database smart interrogation software that enable the management to take proper decisions on operations and ISCIR operations
- ✓ Better control of ISCIR periodically revision

SAP HANA Big Data Platform
Project, benefits

Project *Description*:

✓ Big Data Platform is a database management system that process large amounts of data using in-memory technology.

✓ Big Data Platform includes a number of analytical engines for various kinds of data processing

✓ Big Data platform processes analytics at the same time on any data type with multi-model data processing engines

Project *Benefits*:

✓ Accelerate data processing for real-time insight and action

✓ Efficiently manage large volumes of structured and unstructured data

✓ Integration with existing applications to process larger volumes of data in real time

✓ Capable of predictive analysis, spatial data processing, text analytics, text search, streaming analytics, graph data processing and includes ETL (Extract-Transform-Load) capabilities

Digital Transformation

Activity	2018			2019				2020				2021				2022			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

In progress
- APC program
- Predictive Maintenance
- ISCIR equipment application

Next steps
- Artificial intelligence (Big Data)
- Electronic Permits to work (ePTW)
- Asset operation
- Generic Dynamic Optimization Technology (GDOT)
- Predict-RT Corrosion

Digital Platform
- Employee training/hiring
- Software acquisition

Instrument Package
- Development of app
- Implementation of software
- Research of the projects

Smart Refinery 4.0
- Integration
- User training

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