

Analytics and Optimization Project

Case Study: Prescriptive Analytics for Supply Planning

Prepared for Deutsche Post Lehrstuhl,
RWTH Aachen

Aachen, April 7th 2020



Pleased to meet you

Introduction



Felix Götzinger, Consultant

Felix is an expert in mathematical optimization, analytics, and supply chain management. He gathered experience through different industries and research projects in logistics and transportation before joining Barkawi Management Consultants in 2018. Felix holds a Master of Science in Industrial Engineering and Management from Karlsruhe Institute of Technology.

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Luis Dominguez, Senior Consultant

Luis Dominguez is an expert in analytics, algorithmic augmentation of planning decisions and supply chain planning. Luis Dominguez gathered industry experience at different major firms before joining Barkawi Management Consultants' Munich office in 2017. Luis Dominguez holds a Master of Science in mechatronics and an MBA.

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1. About Barkawi Management Consultants

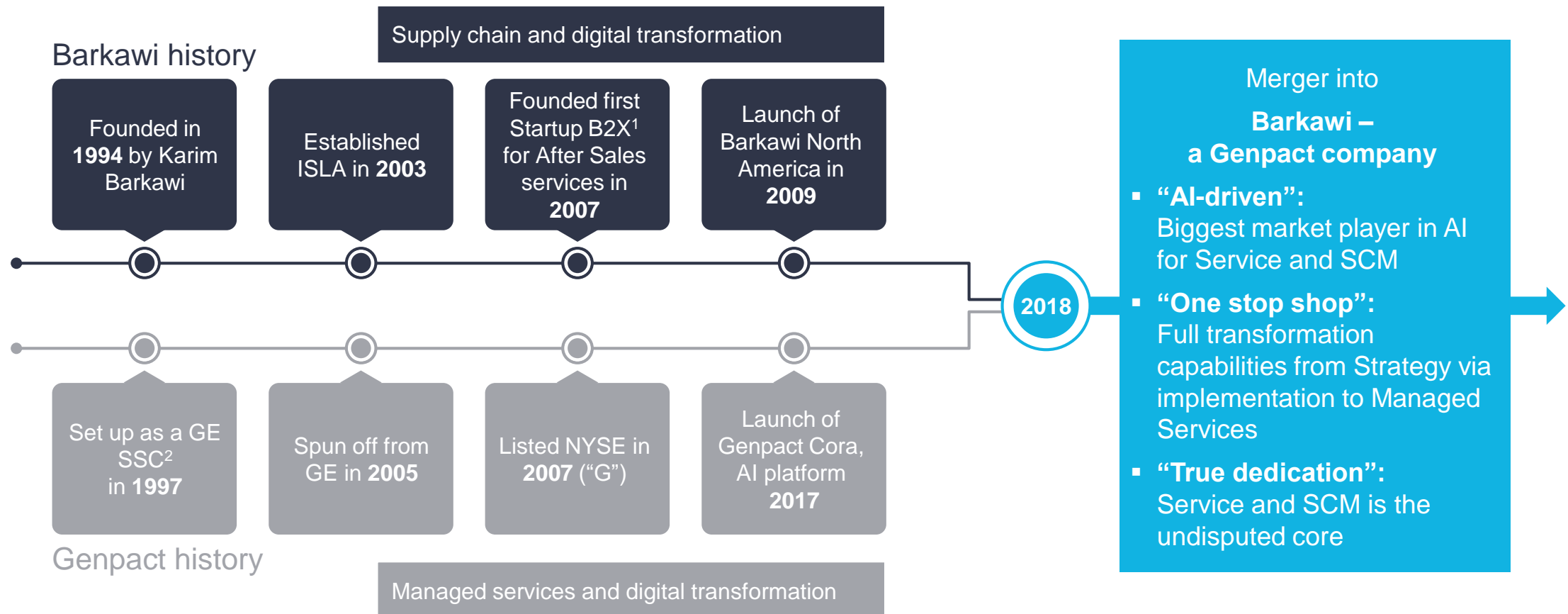
2. Case Study: Prescriptive Analytics for Supply Planning

3. Q&A Session



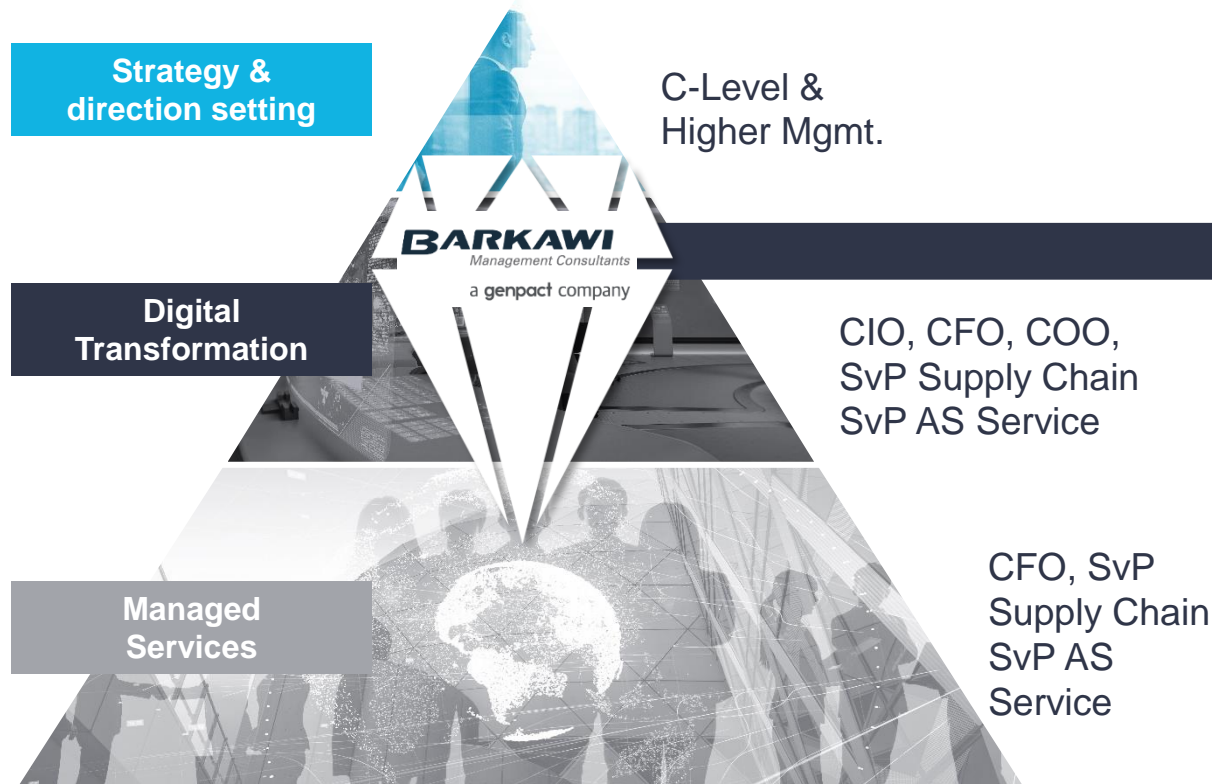
Genpact and Barkawi: 1+1 = 3

Genpact's process depth and Barkawi's consulting and technology experience bring a unique value proposition to Service and SCM



As Barkawi a genpact company we will drive the technology transformation of our clients and selectively pave the path for managed services

Our future positioning

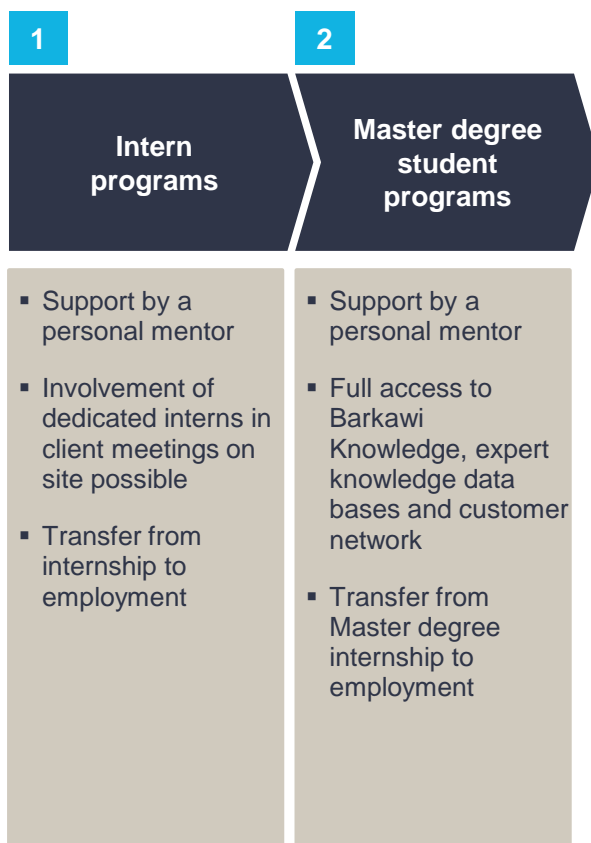


- Barkawi – a genpact company, competes in:
 - setting direction with the management
 - driving optimization of value chain
 - driving the digital transformation with the functional areas
- Competition at the top against “classical” top consultants, but with a **boutique focus on after sales and supply chain**
- In the growing area of **digital transformation against the leading implementation firms**
- Putting client’s value first, driving also **managed services business capabilities** of genpact

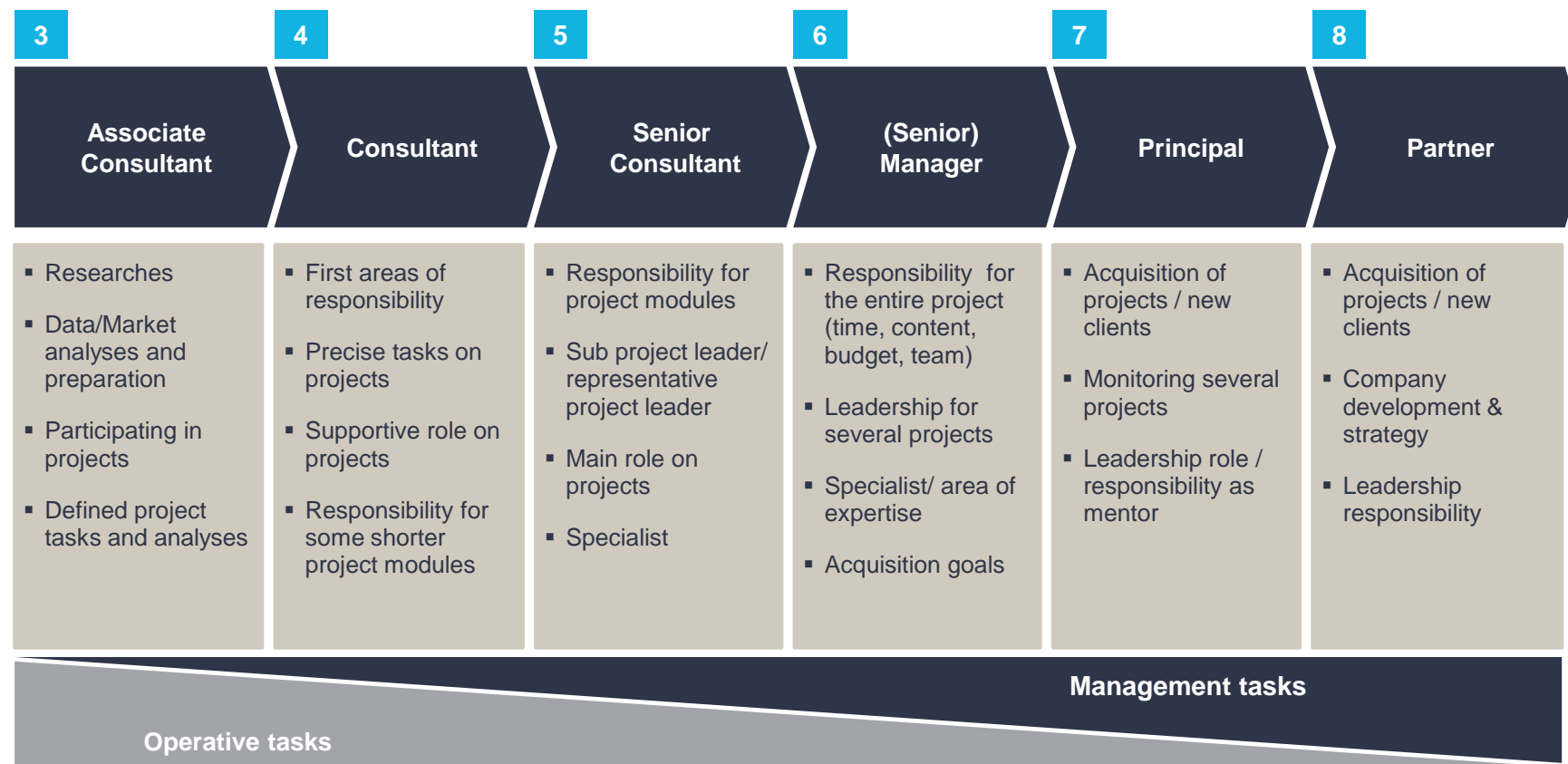
Becoming part of our success

Classic career path

Undergraduate



After graduation



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Meet Munich-Metal-Mechanica (MMM)

Case introduction



CLIENT

'Munich-Metal-Mechanica'
(anonymized)

INDUSTRY

Machinery

TURNOVER

> 6.5 bn EUR worldwide

EMPLOYEES

~ 20,000 worldwide

OPERATING COUNTRIES

> 130 Countries

You are the team of
management
consultants hired by
Munich-Metal-
Mechanica to improve
their supply planning



MMM's business relies heavily on difficulty to plan spare parts sales

Client information

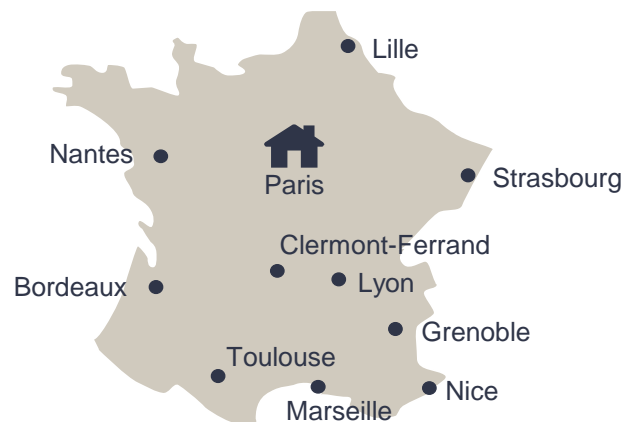
Products

- Motor engines
- Pumps
- Custom industrial mechanical parts (typically used for manufacturing)



Market

- Spare parts with highly seasonal demand
- Independently working outlets owned by MMM
- Proof-of-concept: French market with central warehouse in Paris and ten outlets



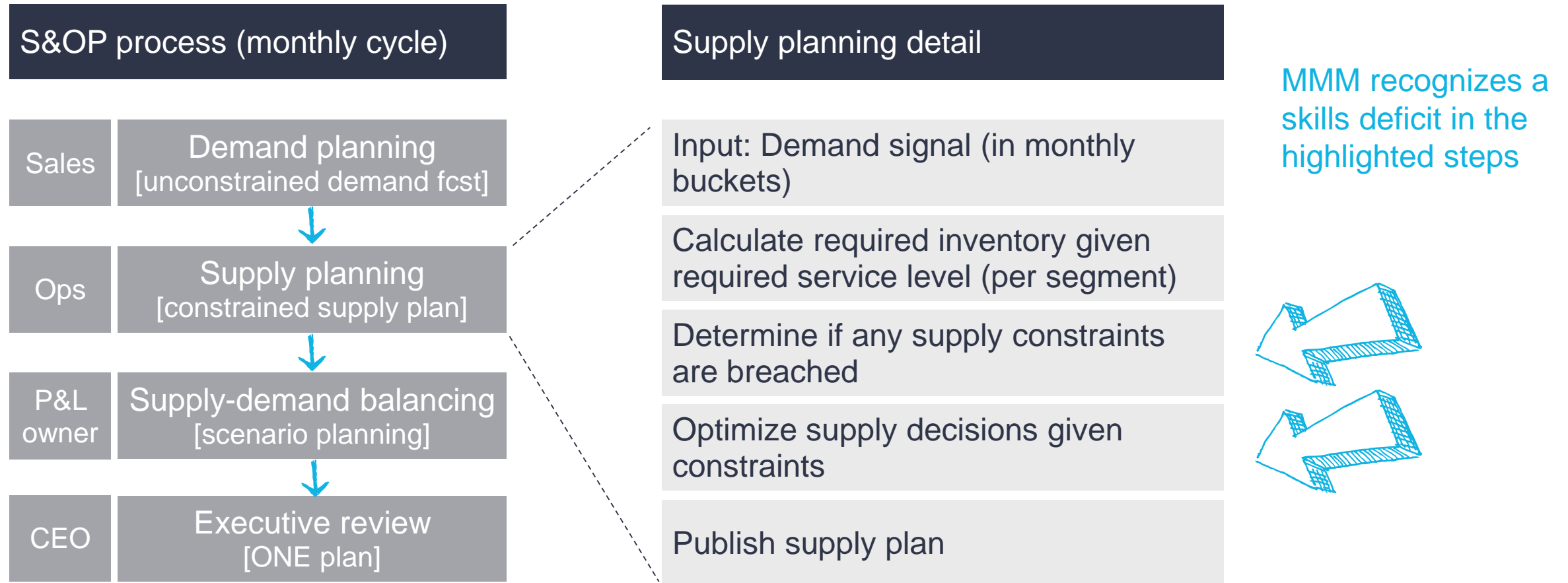
Strategy

- Sale of equipment at low margin
- Sale of spare parts and services at high margin
- Guarantee high service level in maintenance and parts availability



MMM uses the Sales & Operations Planning process to steer its operations

Planning process



MMM wants to test the upside economic potential of supplementing their skills deficit in optimization with an algorithmic approach

Planning problem



Sub-optimal supply decisions are causing missed revenue, increased costs, reputation loss towards customers and market share loss to generic spare parts suppliers



To prevent these losses, MMM wants the engagement team to propose a **new optimization methodology** to support planning decisions



MMM Management expects the new optimization methodology to **outperform current heuristic** significantly in terms of operating costs

At present, supply planners make decisions with the following heuristic:

No rebalancing, only direct buy from MMM central WH



1. Low fill rate to end customer and too many lost sales
2. High Inventory holding costs

MMM not only expects superior performance, but also that the solution is robust

Goals and expectations

The proposed supply planning methodology has to:

Prescribe supply decisions to planners



The planner can decide once a week what to order from central WH and what to rebalance between locations

Allow reoptimizing if uncertain demand arises



Once a week the planner is able to order or rebalance to pool the risk of lost net sales

Perform significantly better than current heuristics in terms of operating costs



Inventory holding costs, lost sales, transportation costs

The team has proposed to address the problem in stages: first by testing and validating a deterministic model and in a second step including uncertainty with respect to customer demand for a single part (8YE32821942352L)

Summary

Available resources



Data

- Locations of ten outlets and central warehouse
- Customer orders with 3 years of history
- Sku information including current inventory at outlets, unit costs, minimum order quantities at central warehouse (MOQ)
- Leadtime:
 - Rebalancing leadtime = 0 weeks
 - Leadtime central WH = 1 week
- Transportation costs only dependent on distance
- Margin for spare parts = 30%
- No fixed order costs



Time availability

- First case review call 17th April 2020
- Proposed: Every second Friday an alignment and Q&A call
- Available for questions via mail if needed an additional question meetings can be set up at any time

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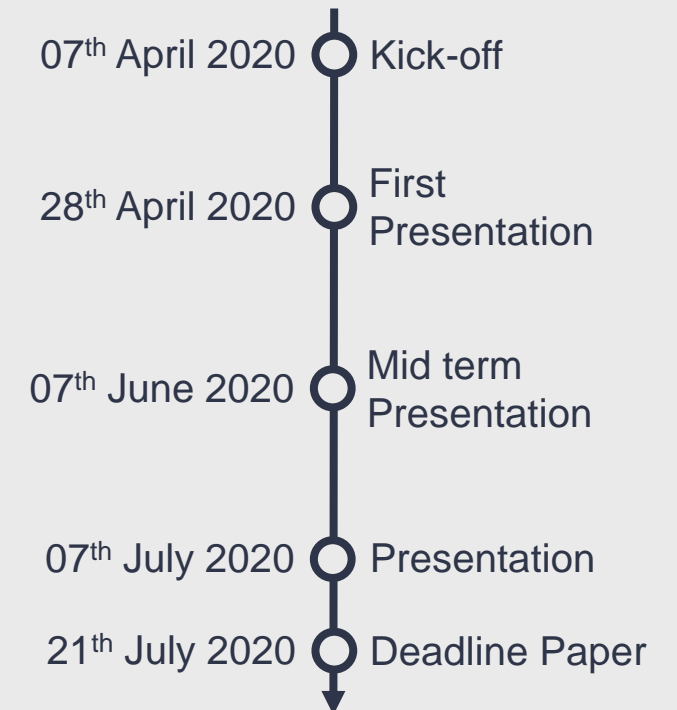
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Milestones



Good luck!

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