Under the patronage of **H.E. Dr. Abdullah Belhaif Al Nuaimi -** Minister of Infrastructure Development

CONFERENCE OMAINTEC 2019 EXHIBITION

17th Edition

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Le Meridien Dubai Hotel
& Conference Centre
United Arab Emirates

Under the Theme:
Enhancing Maintenance Through Big Data Management

Big Data Application in Maintenance Services

Eng. Ondrej Stejskal

CONTENT

BIG DATA and „TREND 4.0“

MAINTENANCE SERVICE BUSINESS MODELS

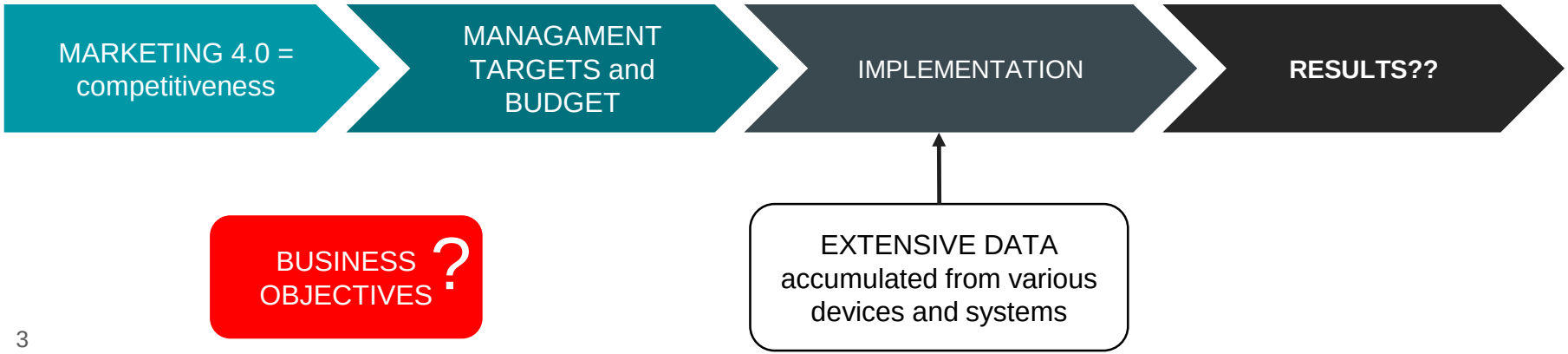
APPLICATION of TOOLS 4.0 in BUSINESS MODELS

BIG DATA and „TREND 4.0“

"We collect masses of data, but we do not use / process them effectively”

"We don't want to miss the boat and loose the competitiveness.”

"We were given political goals for innovations 4.0”



MAINTENANCE SERVICES MODELS

Case Overview

illustration picture (source: pinterest.com)

Regional producer of industrial rotary equipment

Region: Europe

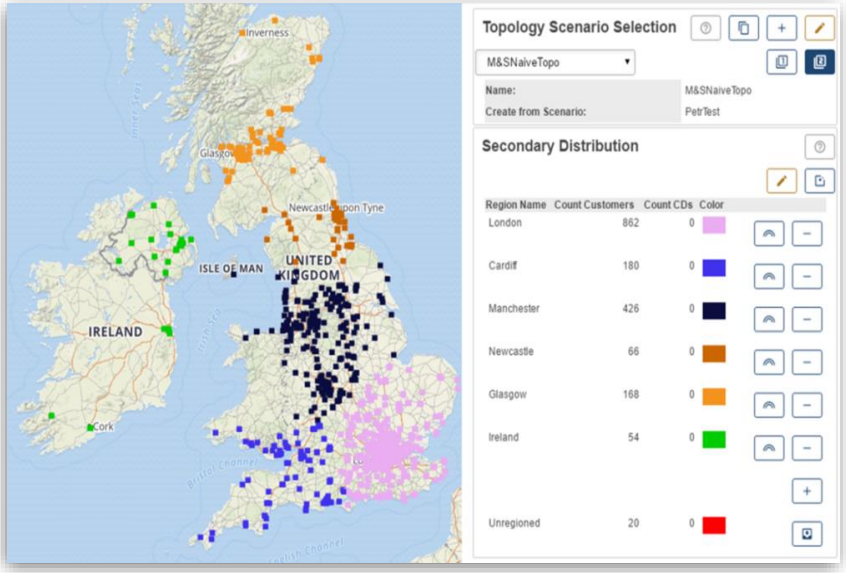
3000+ units sold in the region

No maintenance services business model (only first-set of spare parts)

Goal: to establish maintenance service business model to maximize turnover on spare parts, dealing with expected lack of qualified personnel

MAINTENANCE SERVICES MODELS

1. Basic service network



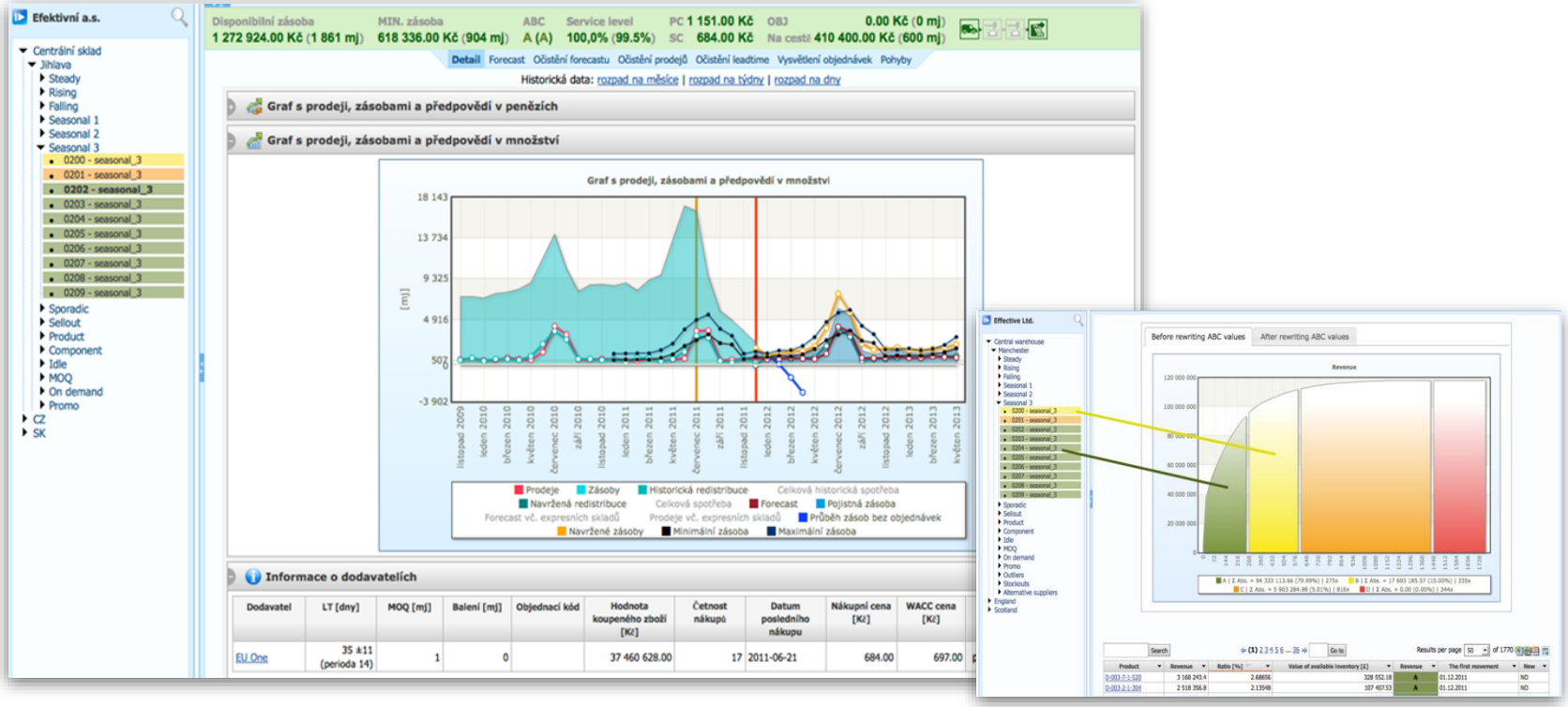
How many warehouses should I have? Which locations?

Allocation of resources according to distribution of equipment and related maintenance needs

Keeping the desired level of availability (service level) of maintenance material when needed

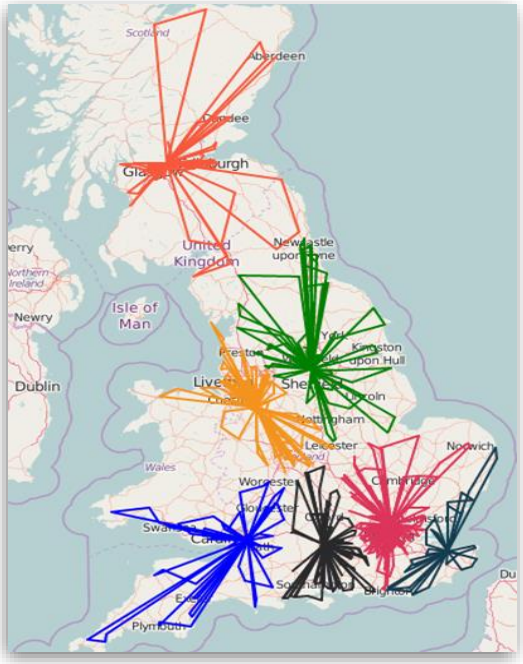
MAINTENANCE SERVICES MODELS

Spare parts stock level management



MAINTENANCE SERVICES MODELS

2. Maintenance contract



SCALING:

- **Preventive maintenance planning and execution**
- **Corrective maintenance execution**
- **Remote condition based maintenance**
- **Predictive maintenance**
- **Selling of uptime of equipment**

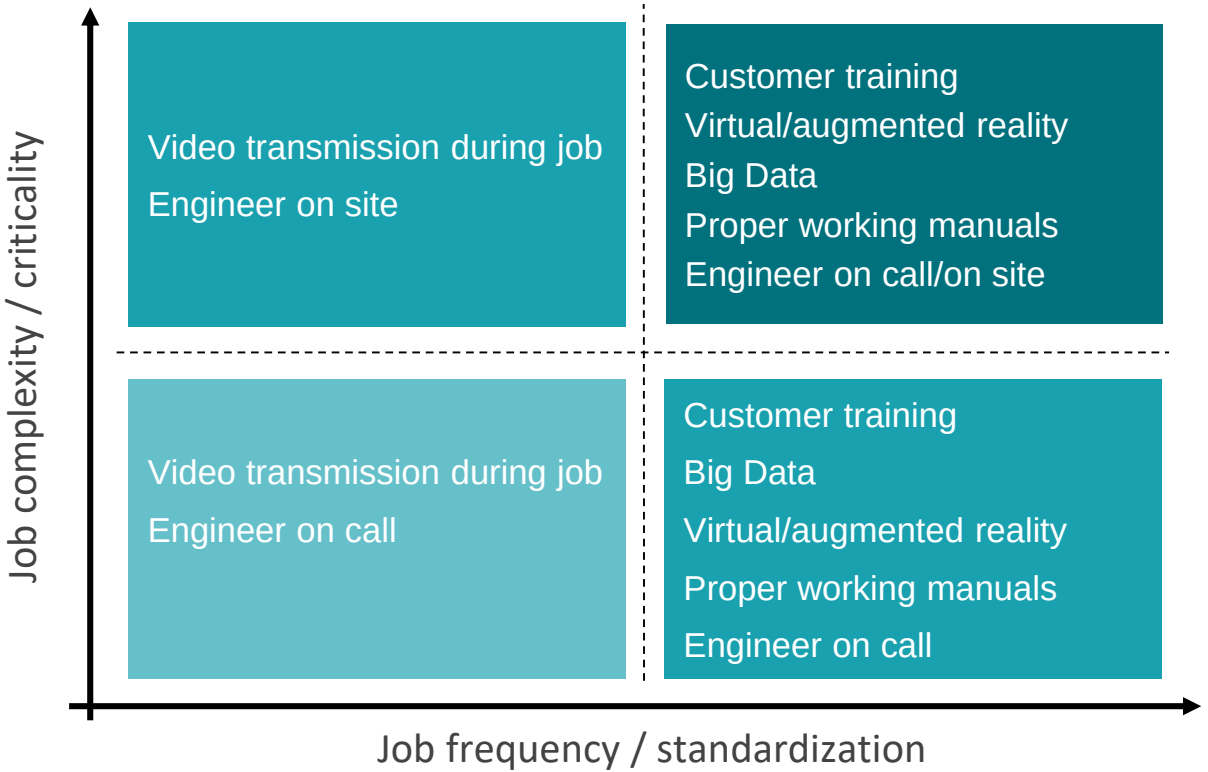
Maintenance made by customer or by producer = allocation of maintenance technicians across network

Support by modelling of life cycle of equipment (age, failures and its probability on population of equipment)

Managing optimal level of availability of spare parts

MAINTENANCE JOB EXECUTION 4.0

Maintenance job execution



MAINTENANCE JOB EXECUTION 4.0

Frequent / regular maintenance jobs

Reactive / rare maintenance jobs

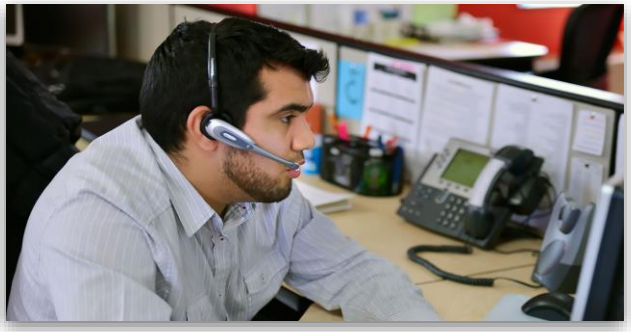
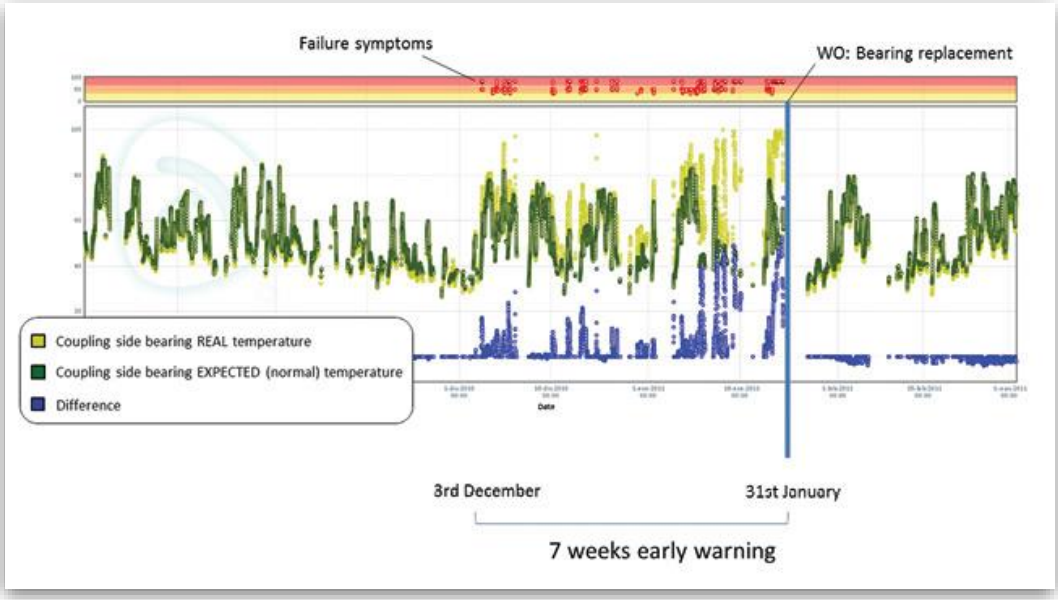


Illustration pictures
(source: librestream.com
oulu.fi
nvcc.edu)

APPLICATION OF BIG DATA

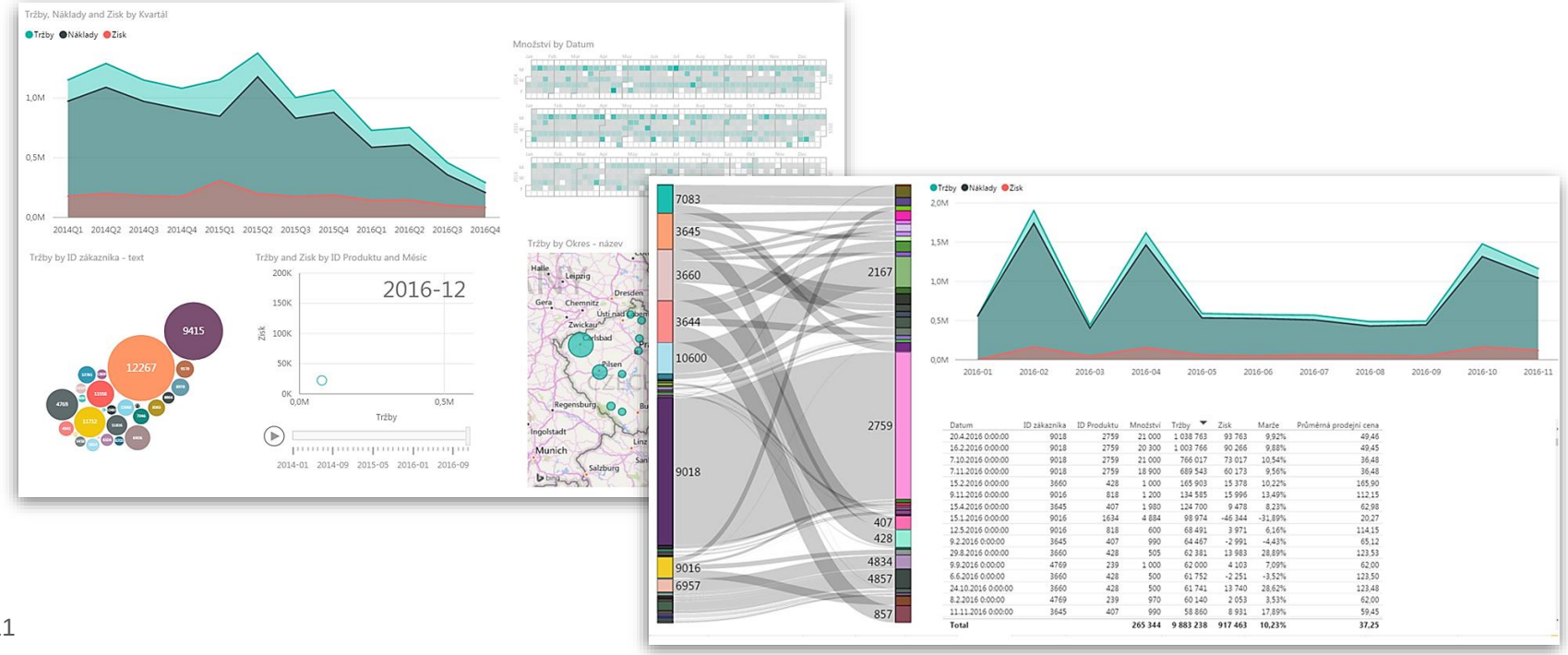
Predictive maintenance - Remote sensing and diagnostics



source:
windpowerengineering.com
abb.com

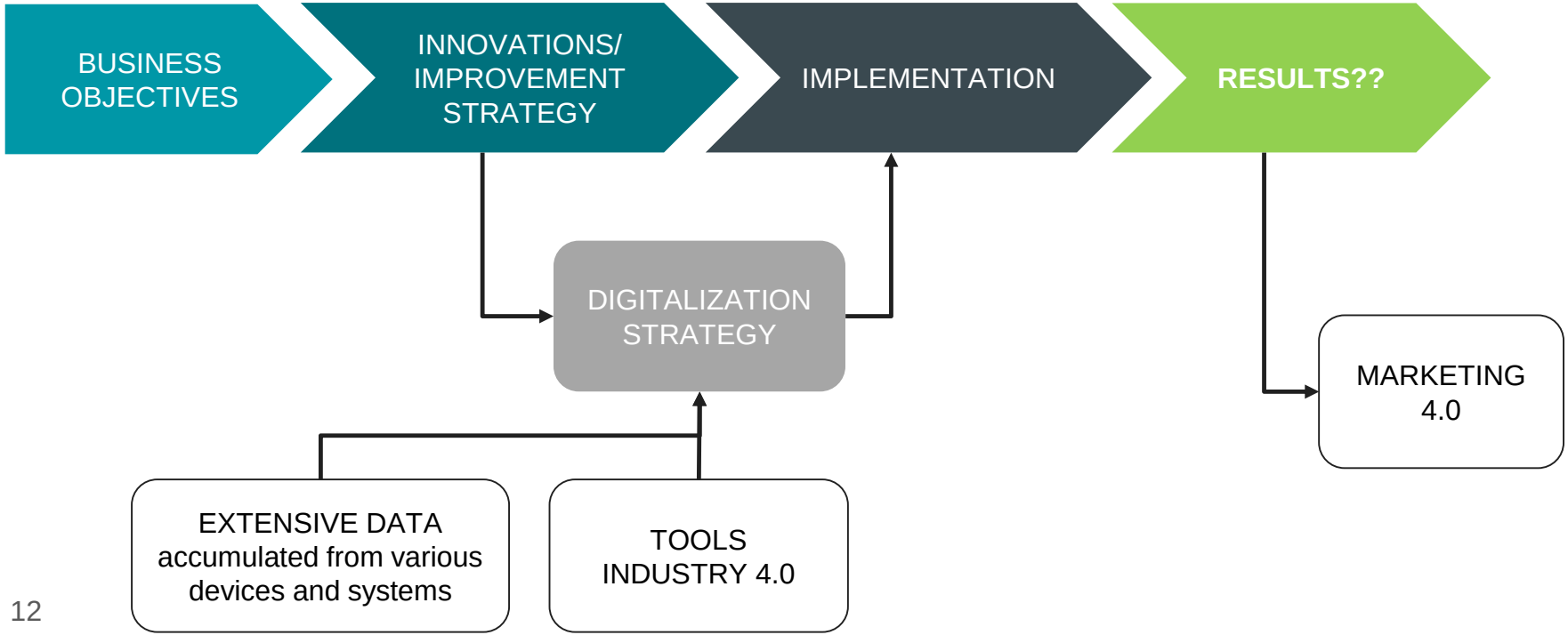
APPLICATION OF BIG DATA

Data mining of multidimensional data – visualization



Datum	ID zákaznika	ID Produktu	Množství	Tržby	Zisk	Marže	Průměrná prodejní cena
20.4.2016 0:00:00	9018	2759	21 000	1 038 763	93 763	9,92%	49,46
16.2.2016 0:00:00	9018	2759	20 300	1 003 766	90 266	9,88%	49,45
7.10.2016 0:00:00	9018	2759	21 000	766 017	73 017	10,54%	36,48
7.11.2016 0:00:00	9018	2759	18 900	689 543	60 173	9,56%	36,48
15.2.2016 0:00:00	3660	428	1 000	165 903	15 378	10,22%	165,90
9.11.2016 0:00:00	9016	818	1 200	134 585	15 996	13,49%	112,15
15.4.2016 0:00:00	3645	407	1 980	124 700	9 478	8,23%	62,98
15.1.2016 0:00:00	9016	1634	4 884	98 974	-46 344	-31,89%	20,27
12.5.2016 0:00:00	9016	818	600	68 491	3 971	6,16%	114,15
9.2.2016 0:00:00	3645	407	990	64 467	-2 991	-4,43%	65,12
29.8.2016 0:00:00	3660	428	505	62 381	13 983	28,89%	123,53
9.9.2016 0:00:00	4769	239	1 000	62 000	4 103	7,09%	62,00
6.6.2016 0:00:00	3660	428	500	61 752	-2 251	-3,52%	123,50
24.10.2016 0:00:00	3660	428	500	61 741	13 740	28,62%	123,48
8.2.2016 0:00:00	4769	239	970	60 140	2 053	3,53%	62,00
11.11.2016 0:00:00	3645	407	990	58 860	8 931	17,89%	59,45
Total			**265 344**	**9 883 238**	**917 463**	**10,23%**	**37,25**

CONCLUSION


BUSINESS OBJECTIVES
INNOVATIONS/ IMPROVEMENT STRATEGY
IMPLEMENTATION
RESULTS??
DIGITALIZATION STRATEGY
MARKETING 4.0
EXTENSIVE DATA accumulated from various devices and systems
TOOLS INDUSTRY 4.0

THANK YOU