Production Wheel
EyeOn proposition

September 2020

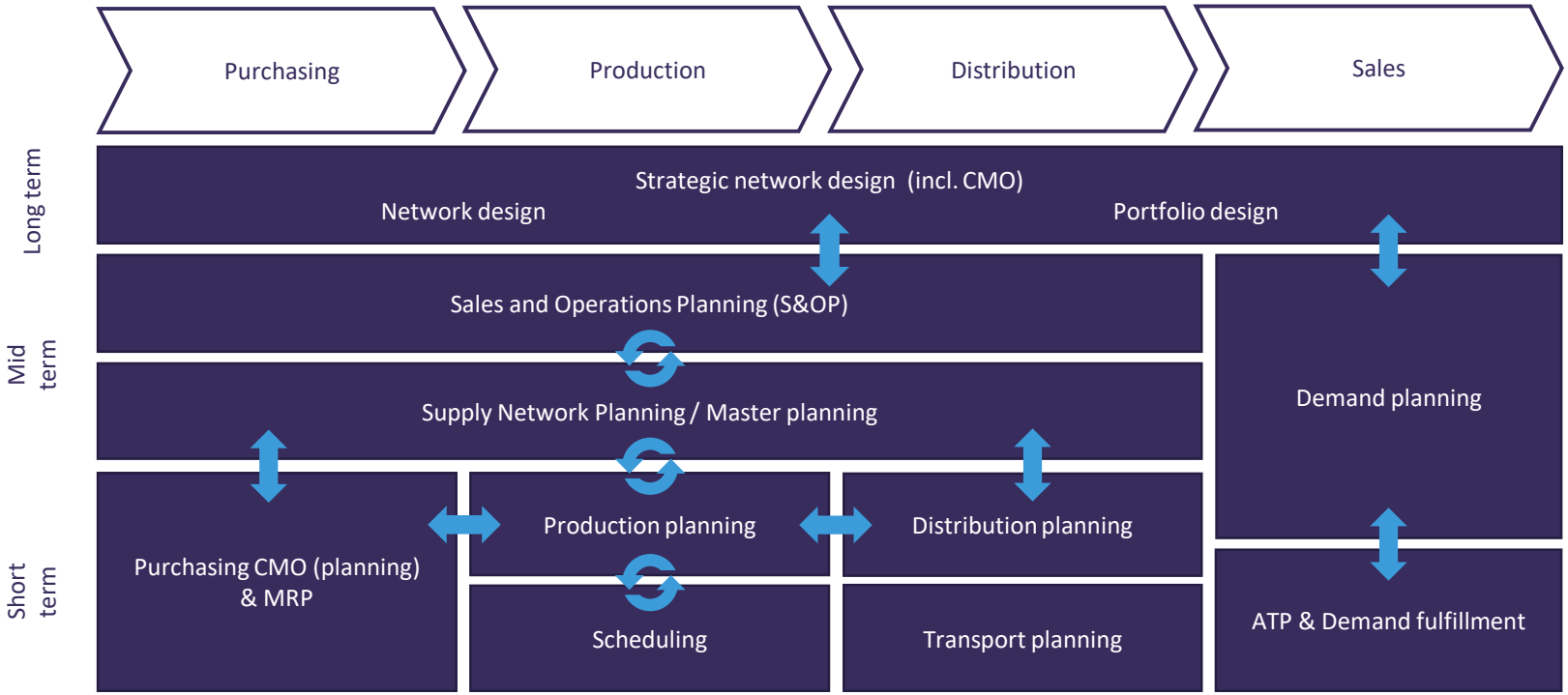
Introduction

What is a production wheel?

- Terminology: “Production Wheel”, “Product Wheel” or ”Rhythm Wheel” are often very similar
- The Production Wheel methodology is a comprehensive framework for production planning & scheduling. Some differentiating aspects are:
  - It incorporates lean principles combined with analytical optimization
  - It uses cyclical patterns
  - It uses production strategies with variable production quantities and cycle times
- Addresses major challenges of operations managers, amongst others:
  - Follow demand or optimize production
  - How long to make a production cycle
  - Production scheduling

Planning Framework

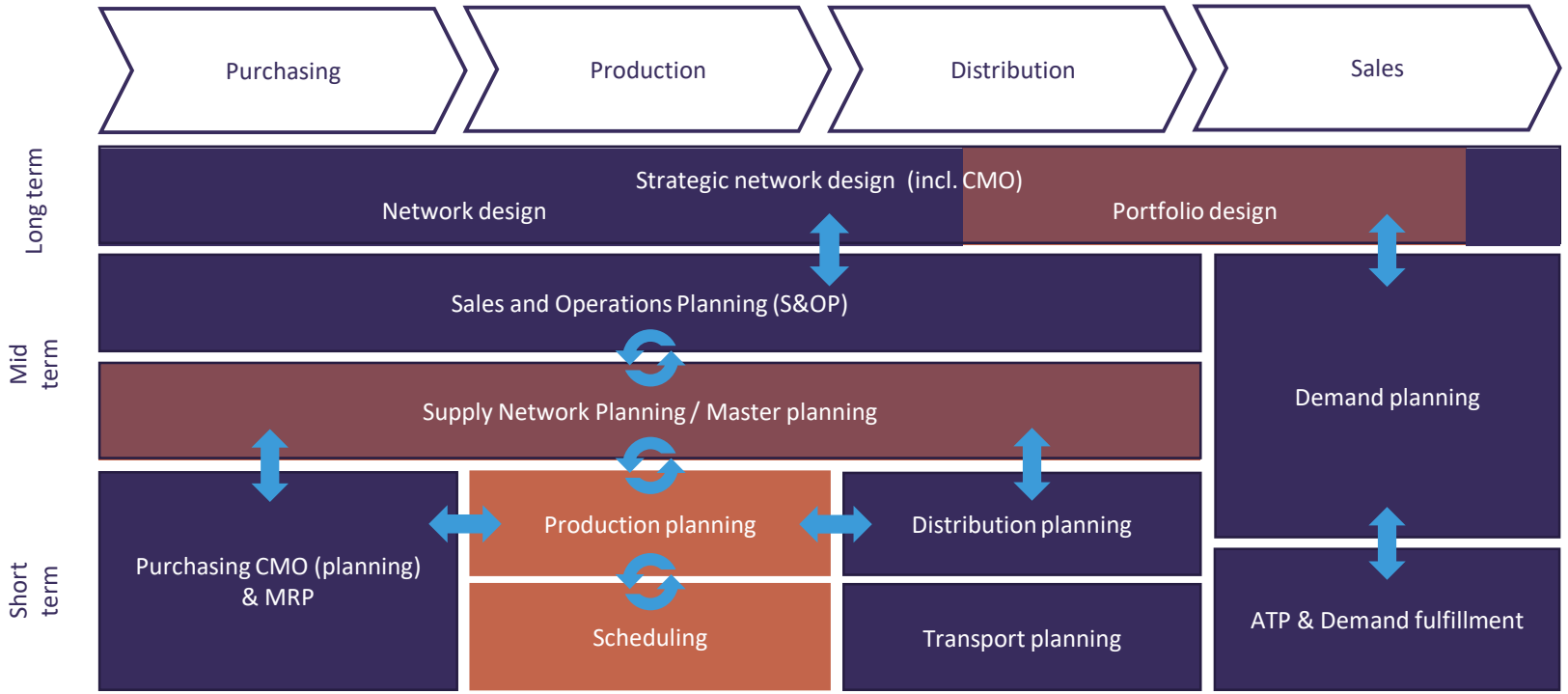
H. Stadtler (2002)



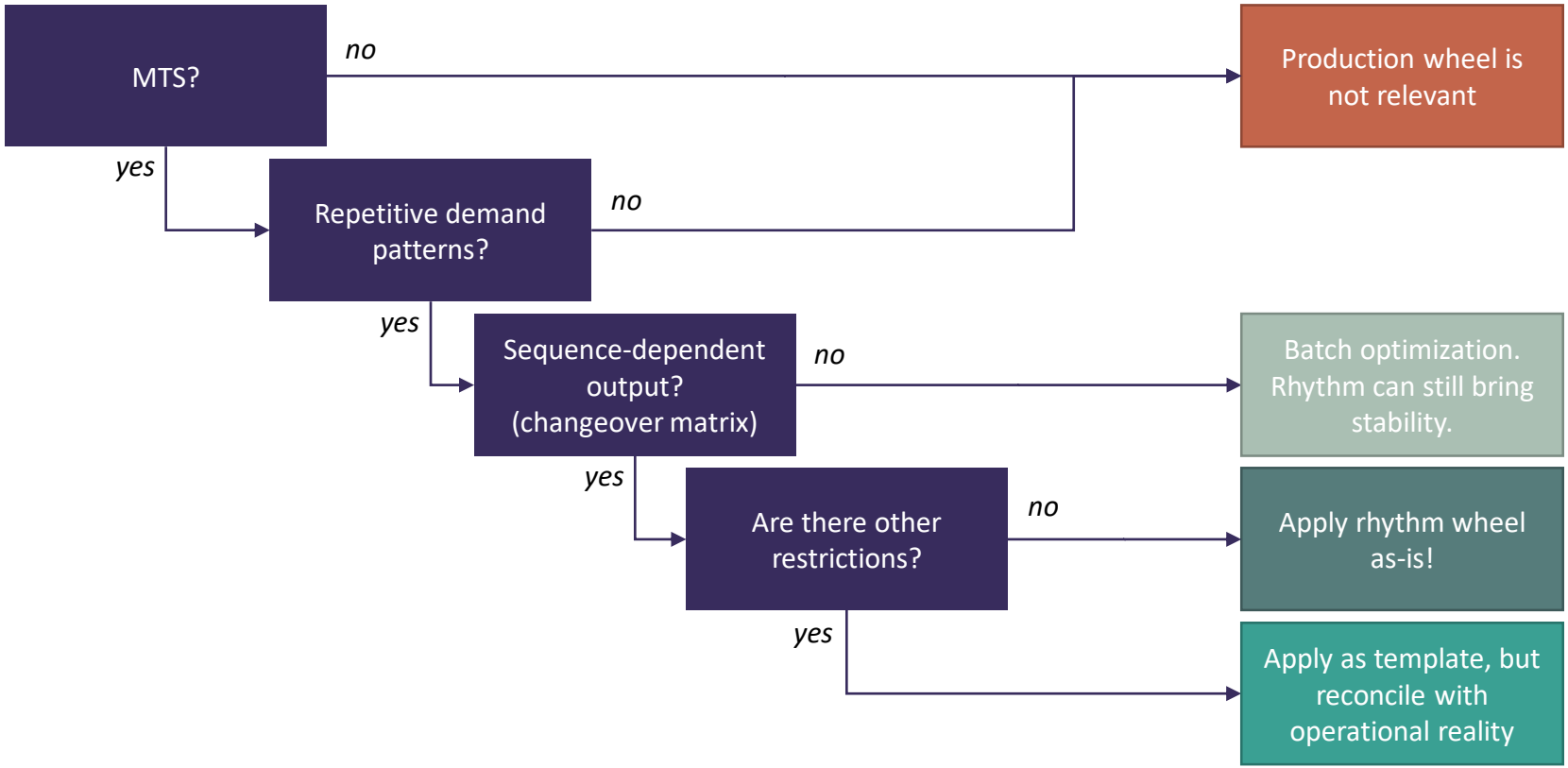
Planning Framework

impacted by production wheel

touched upon by production wheel



When is a production wheel relevant?



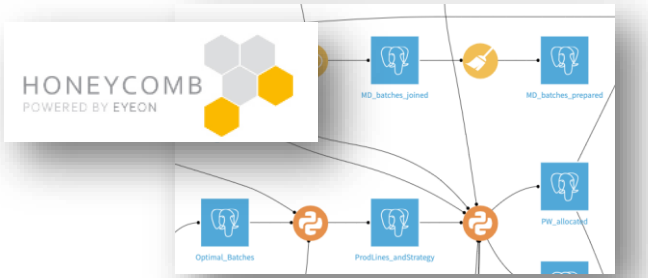
EyeOn's Production Wheel optimization toolkit

INPUT

- Inventory levels
- Demand data
- Historical production orders
- Production masterdata

Quantified costs

OPTIMIZATION MODEL



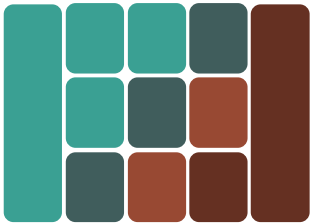
- Evaluate how to best group items - Small items can piggyback onto its bigger brothers and sisters
- Optimize batch sizes
- Optimize the sequence between and within the groups

OUTPUT

- Create understanding
- Validate results
- Go through the process together!

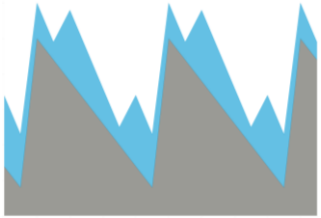
Production Wheel optimization elements

Classification



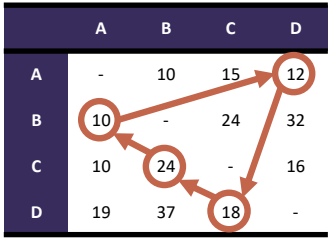
Product are classified & production strategy is determined

Leveling



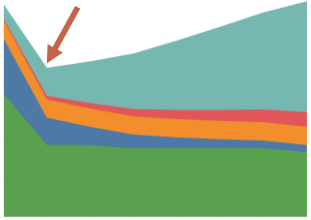
Using the optimal batch sizes and cycle times products/clusters are allocated to certain weeks to minimize & level total capacity

Sequencing



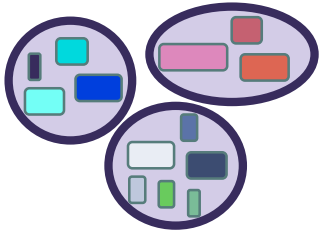
Optimal production sequence within each week is determined based on changeovers. Leveling step is repeating with updated plan.

Batch Sizing



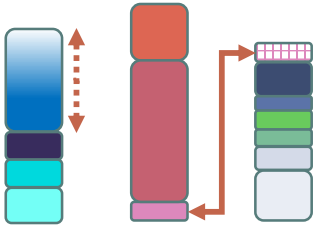
Using different cost drivers (e.g. production efficiency, inventory costs, changeovers), the optimal batch sizes are determined

Clustering



Based on changeovers, product clusters are determined and allocated to most cost-effective production lines

Operationalization

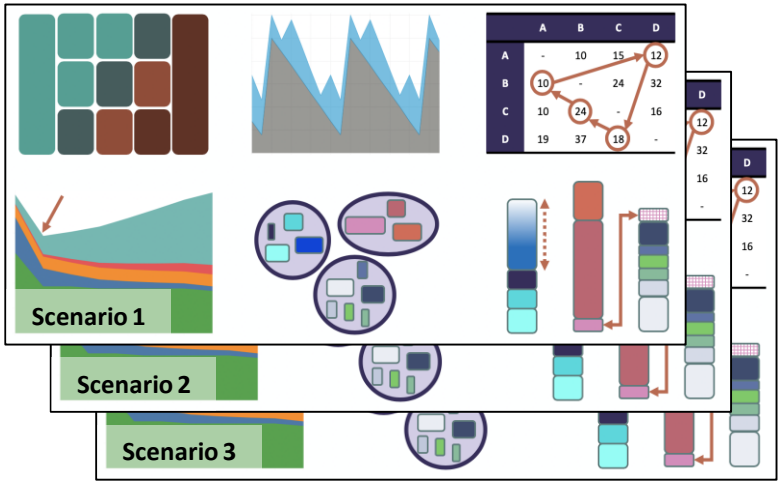


Production strategy is applied (e.g. variable quantity for fast-movers) & operational plans can be created with the developed guidelines

Scenario-based optimization

Calculating with multiple scenarios

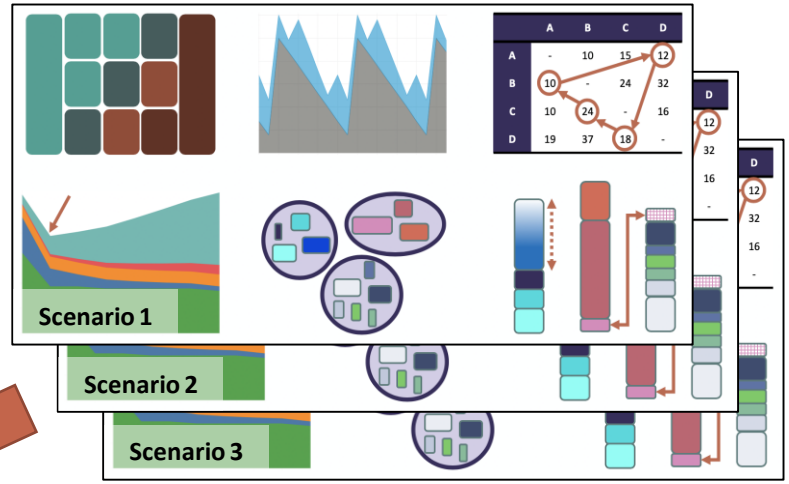
- The methodology is typically run with multiple scenarios. For example:
  - Different production strategies
  - Different cost factors
  - Different minimum production quantities
  - Different yield and/or production efficiencies
  - Different leveling factors

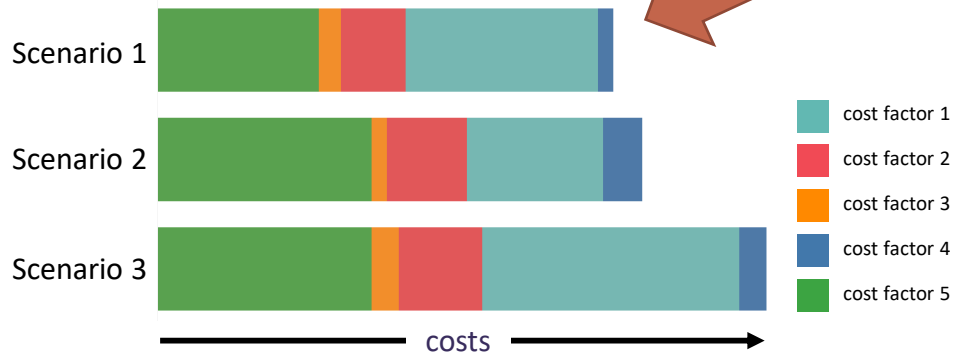


Final step – Evaluation

Calculate & compare costs of scenarios

- The last step is translating the results of the scenarios into integral costs
- This way, the impact of different settings or preferences of stakeholders can be evaluated in monetary terms





Implications

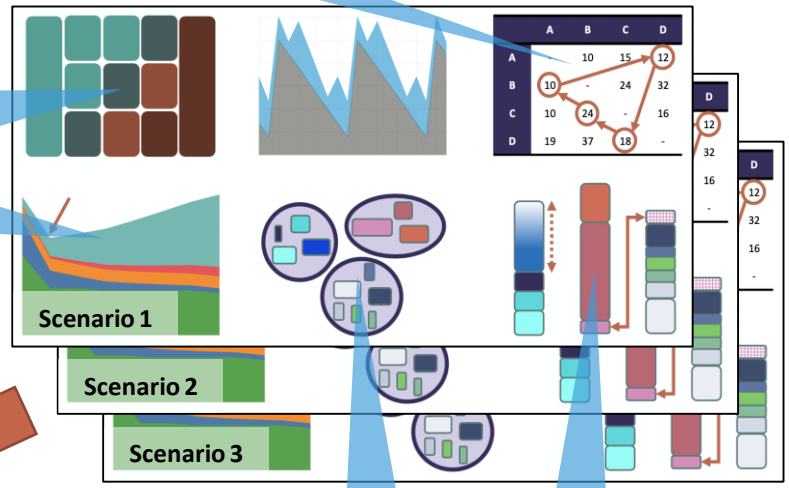
Gives insight in completeness & quality of key supply chain data

Data Collection

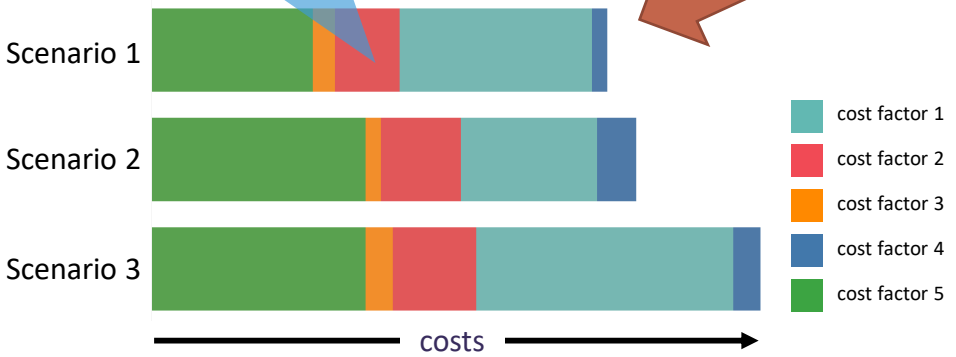
Helps understanding current as-is scenario, the product portfolio and gives guidelines in logical production strategies

Quantifies costs and translates that to guidelines to improve batch sizes and cycle lengths

Gives a detailed plan with sensible leveling and changeovers

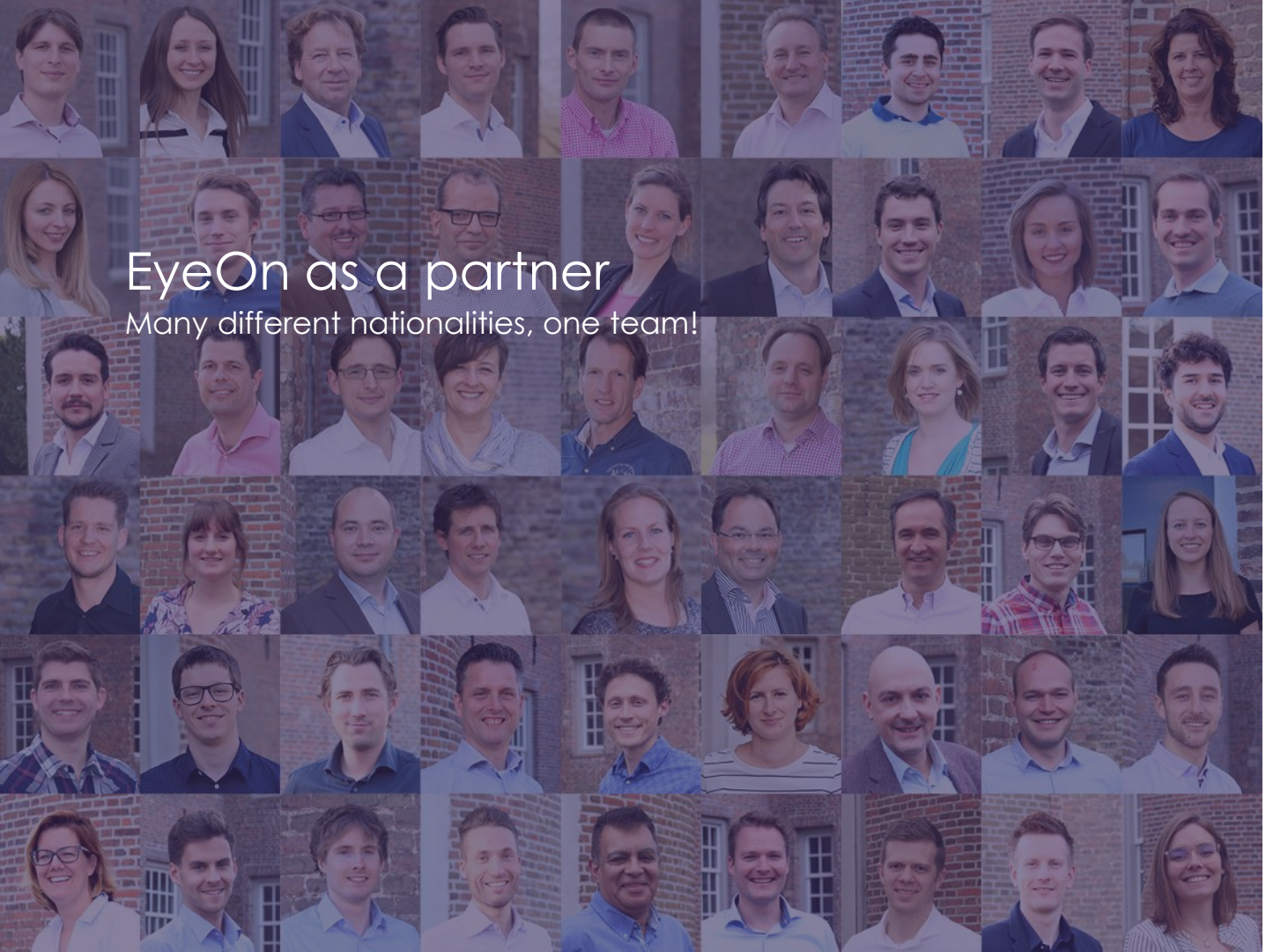


Gives the ability to "play around" and get insight in the overall cost implications of certain decisions



Gives guidelines which products should be planned together on a production line or production run

Makes the proposed plan more realistic and gives insight in the feasibility of actual implementation



EyeOn as a partner

Many different nationalities, one team!

500+

Years of combined experience

12

Nationalities Consultants with different backgrounds: SCM, finance, sales & marketing, data science

89

Companies where projects were delivered in 2018

10

Countries where we operated in 2018

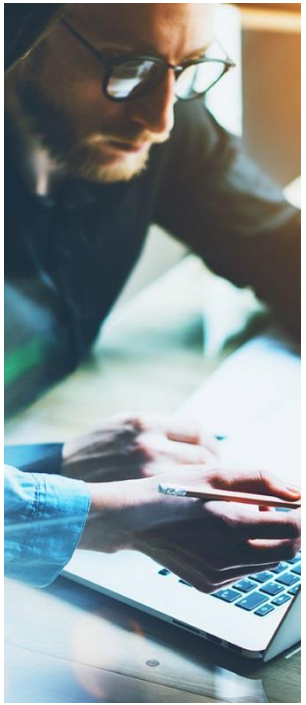
EyeOn Years Ahead in Planning & Forecasting

- In order to be successful, large companies continuously have to combat increasing internal complexity. EyeOn helps its clients to control this complexity by designing, implementing and executing excellent planning processes as a discriminating factor for success.
- EyeOn bundles, develops and shares top level knowledge about planning and forecasting, resulting in continuous efficiency for its clients.
- EyeOn is active in the Consumer Products, Complex Products & Systems, Process, and Life Science industry and has a global customer footprint.

EyeOn Company profile

70 Specialists in realizing forecasting and planning improvements

- Focus on design and implementation
- Line management experience (f.e. Sales, SCM & Finance) and university educated
- Cross functional & hands-on mentality
- Proven track records in interim management
- Data science team with experts in planning and forecasting modelling
- System independent
- Industry focus; industrial companies, its suppliers and customers
- Network facilitator
- Deliver concrete projects with a short throughput time (max. 100 days) and clear deliverables



EyeOn - Full service offering in forecasting and planning

Project

Develop & implement tailored planning & forecasting solutions

Interim

Execute & improve planning processes with temporary resources

Academy

Advance forecasting & planning specialists in their career

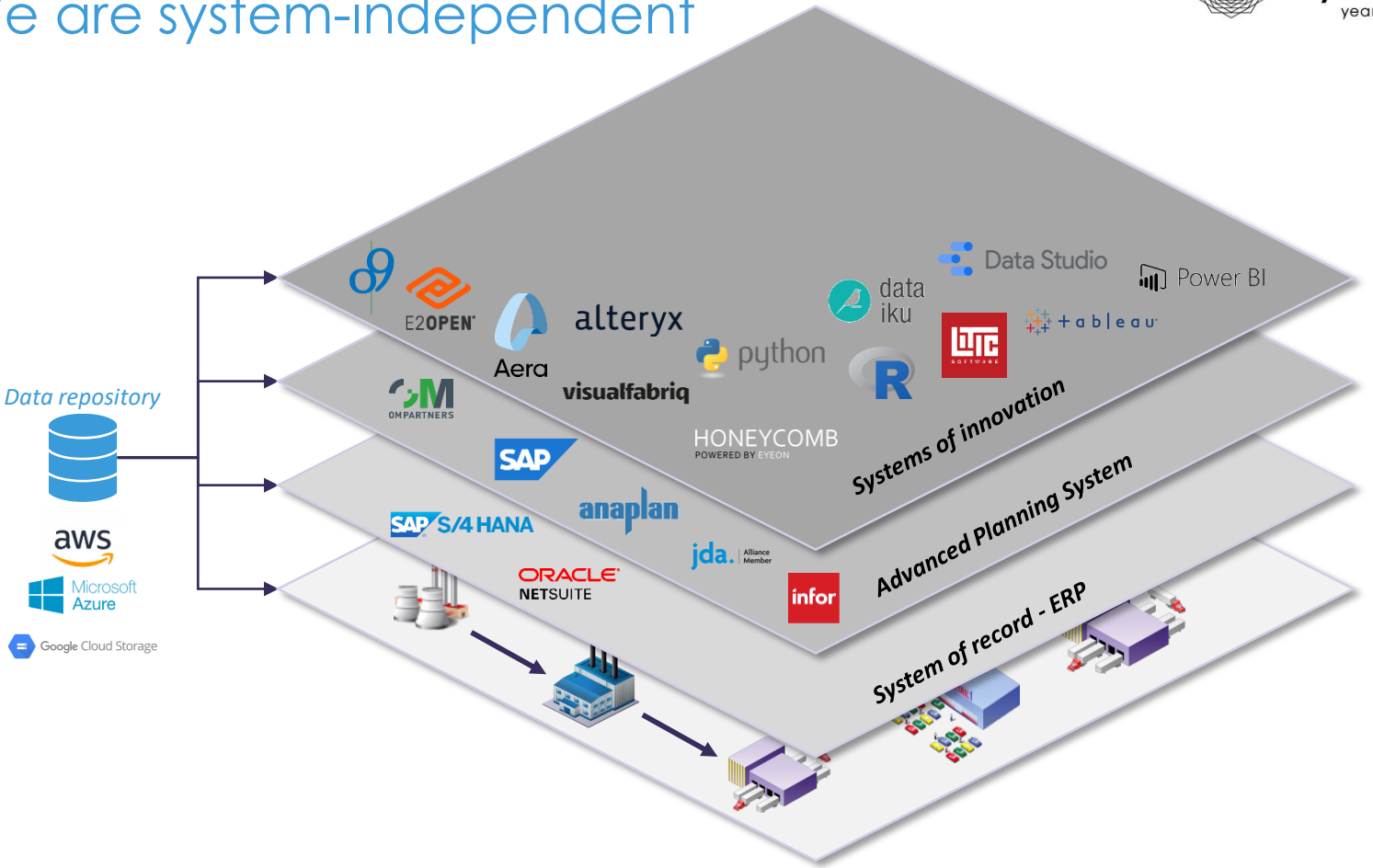
Managed Services

Deliver best possible forecast. Optimize inventory parameters

Data Science & Solutions

Deliver technology and models solving key customer challenges in turnkey solutions.

We are system-independent



Our experience in various industries

eyeon years ahead

Consumer products	Complex products & systems	Process	Life science	Others
Coca-Cola	VANDERLANDE	DSM	astellas	vbz
JUMBO	LELY	Cargill	ÖSSUR	MEDECINS SANS FRONTIERES
KraftHeinz	NXP	ROCKWOOL	aspen	EFMI Business School
Henkel	BOSCH	ARCHROMA	stryker	TIAS
Unilever	ASML	Corbion	Allergan	JADS
Vion FOOD GROUP	océ A CANON COMPANY	TATA STEEL	janssen	ALFA-COLLEGE GRONINGEN
HEINEKEN	voortman STEEL GROUP	EASTMAN	FRESENIUS MEDICAL CARE	
TPVISION	PHILIPS	kemira	MEDIQ	
LambWeston	DAMEN	RECTICEL	AMGEN	
Royal Swinkels family brewers	marel	TANATEX CHEMICALS	ALEXION	
Etos	Schneider Electric	Berry PET Power	Johnson & Johnson	
colruyt	AMPLEON	ROQUETTE	CSL Behring	

Towards the self-driving supply chain

EyeOn vision - No touch planning requires different building blocks

Integral E2E processes for immediate and fact-based decision making

- Along E2E value chain
- Integrating functional areas
- Linking strategy to execution

Demand

Inventory

Supply

E2E, S&OP, IBP

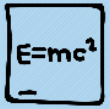
Making the change

- Along E2E value chain

Excellent data

Application enabled

High quality analytics



Organizational readiness

Decision focused culture

Let's invest in the future together

EyeOn. years ahead

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