



DELMIA

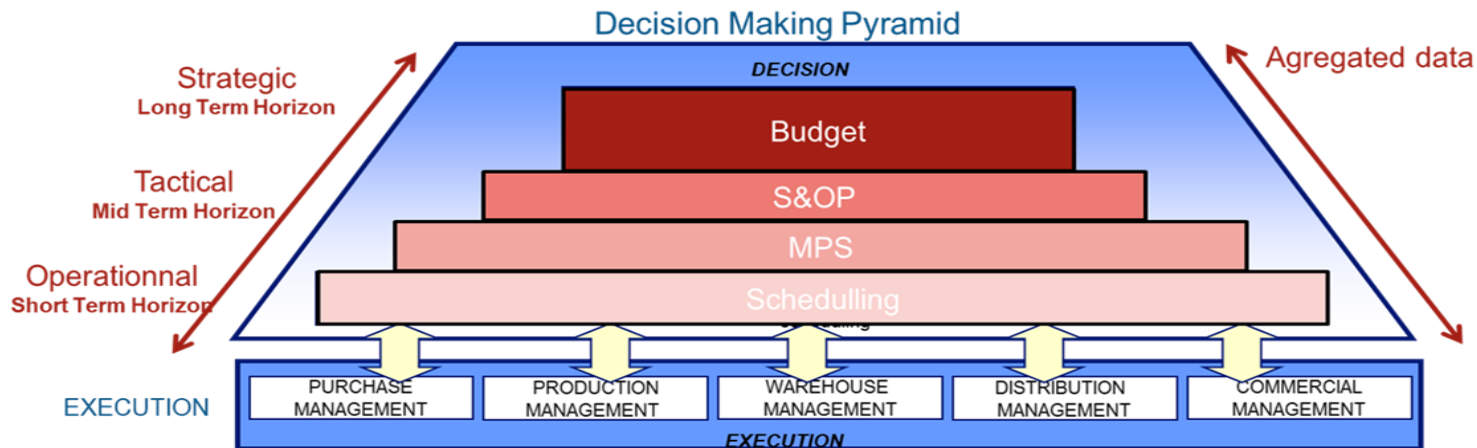
Ortems

이즈파크 황보울



Definition

Level	Target	Horizon	Updating Frequency
S&OP (Sales and Operations Plan)	This plan reflects the company's strategy in a operational way. It allows to verify the feasibility and adequacy between the production resources and financial and business objectives.	Rolling long-term from 1 to 3 years	Monthly to quarterly
MPS (Master Production Schedule)	This plan allows to anticipate balancing decisions based on available resources . It constitutes the input of MRP	Mid-term of 1 to 6 months (usually 2 to 3 times the production cycle)	Weekly
Scheduling , Manufacturing Plan, Workshop Planning	Work Orders to make in the short term and that are subject to detailed planning .	Short term, from 1 to several weeks	Daily



History

- 긴급 발주
- 신제품 출시 및 변경
- 납기/생산 일정, Penalty
- 생산 자재, 도구, 작업자, 기계
- C/T, 재고감소, 생산성, OEE



Board Planning

Mid 20th century



**MRP2
Static tools**

Push Manufacturing

1970/80's



**Excel hegemony
Non collaborative APS
Visual management not
integrated in IS**

Lean

End 20th century



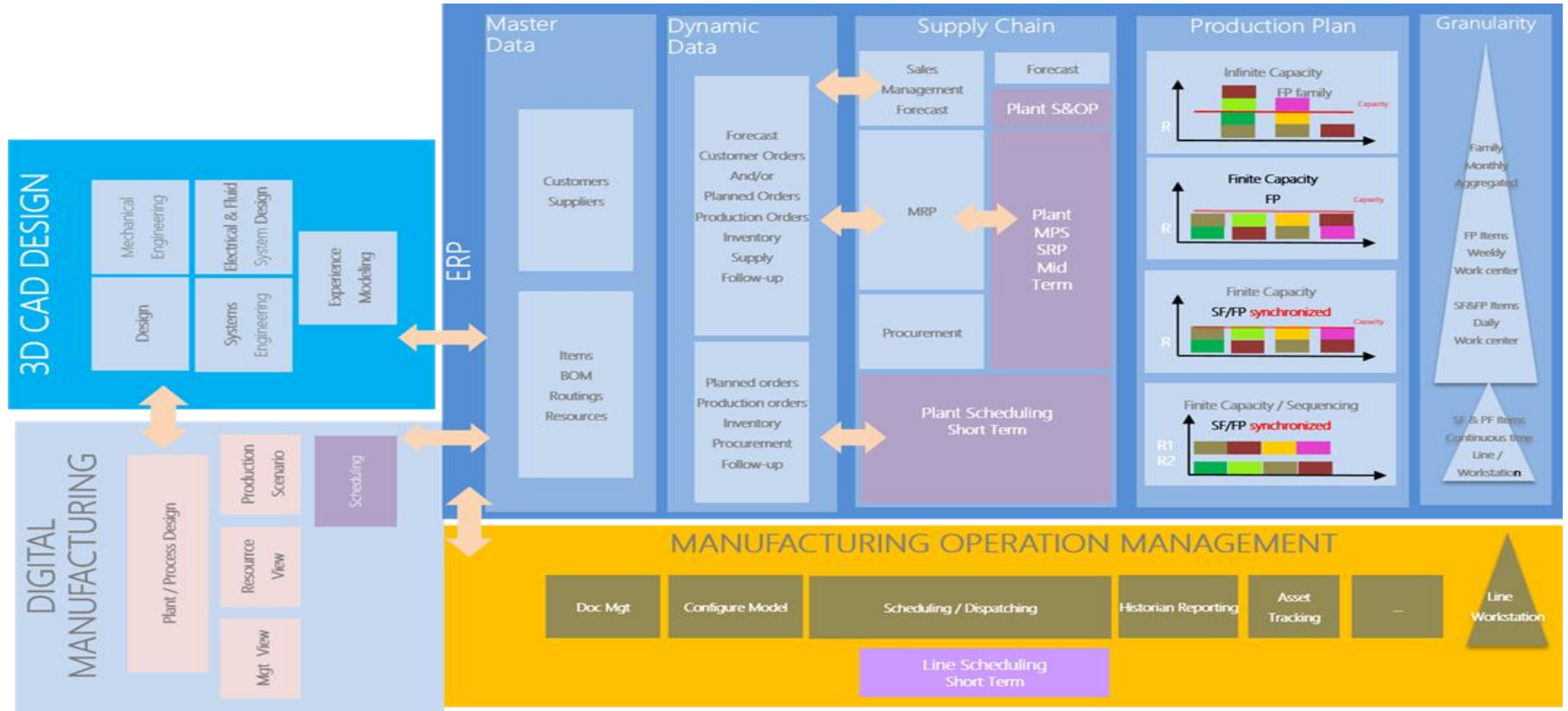
**Demand Driven, Digital
collaborative
Planning & Scheduling
Smart factory**

Agile

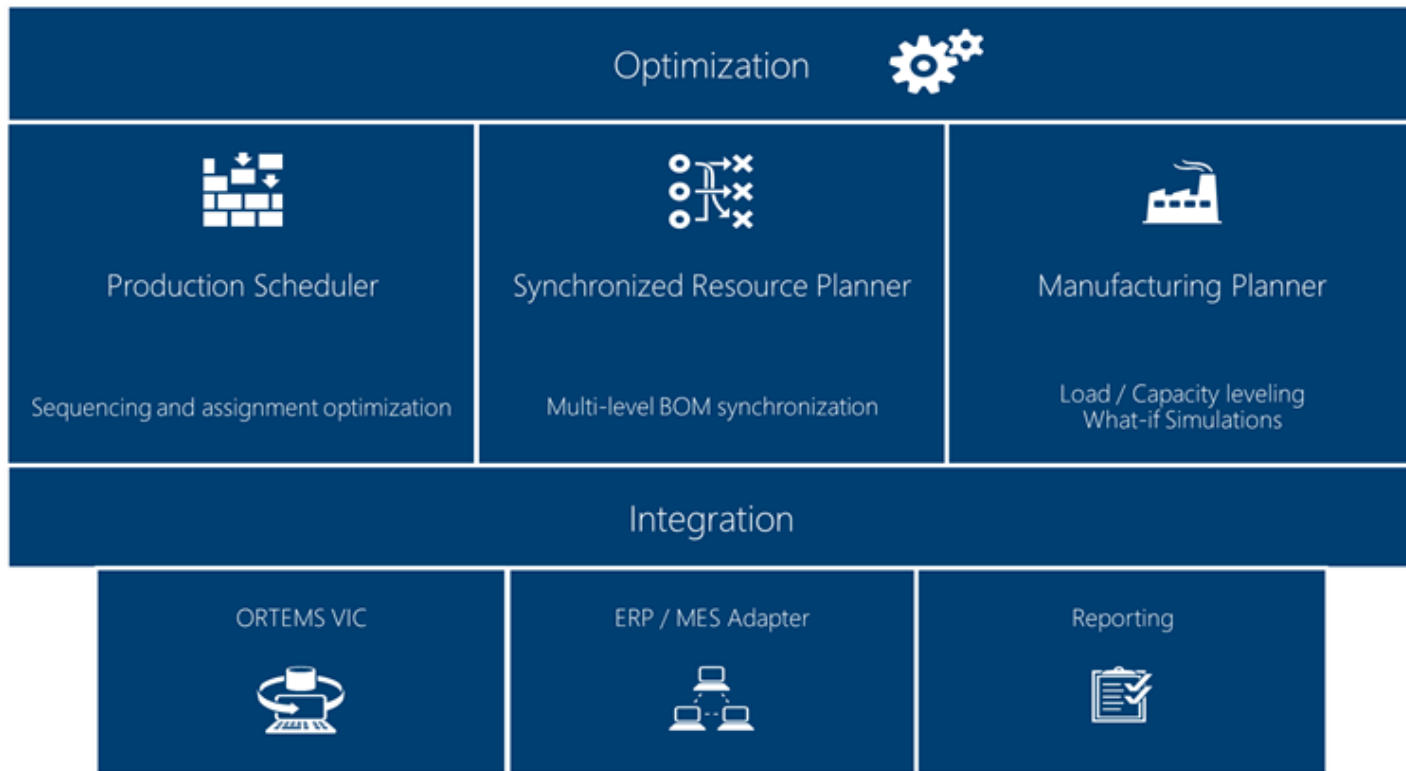
21st century

Degree of Complexity

Positioning



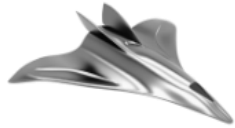
Module













Process

1. Manufacturing & scheduling constraints modeling
2. Multi-constraints Define
3. Highlight bottleneck issues
4. Flow synchronization & Gantt Chart
5. Cutting edge optimization engine: Load levelling & scheduling
6. « What if » production scenarios, Unlimited simulation
7. Collaborative & Planning optimum

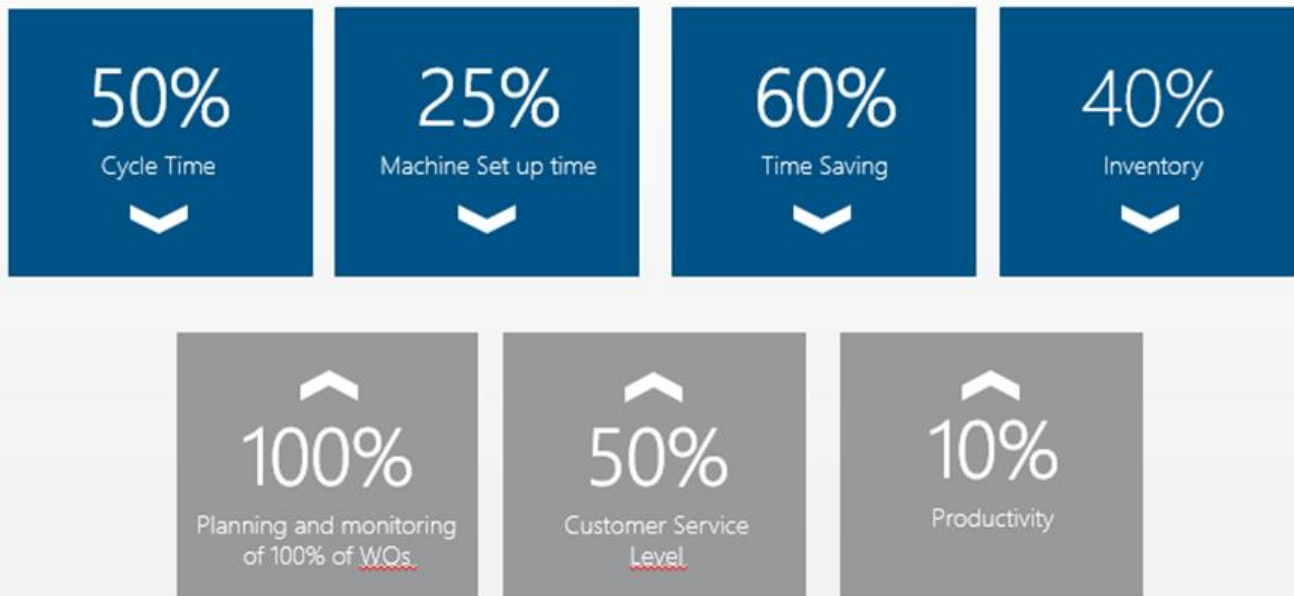
Reference



Benefits

	<ul style="list-style-type: none"> • 15% in stock reduction • Improvement of machine efficiency • Enhancement of delivery lead time • Reduction of time planning by 30% 		<ul style="list-style-type: none"> • 20% packaging stock reduction. • Better management of pulling of supplies • 25% work in progress stock reduction
	<ul style="list-style-type: none"> • Stock reduction by 30%. • Service level improvement by 20%. • Production capacity increase by 18% 		<ul style="list-style-type: none"> • 43% scheduling cycle time reduction • Reduction of the inventory number of days by 10%.
	<ul style="list-style-type: none"> • Productivity increased : + 5% • 25% setup time reduction • Administrative time divided by 6 		<ul style="list-style-type: none"> • lot size decrease : from -13% to -2% • Service level increase by 2 point
	<ul style="list-style-type: none"> • Better Productivity : 10 points • Due date confirmation in less than 48H • 75% of items deliveries in less than 48Hours • Reduction of setup times by 50% 		<ul style="list-style-type: none"> • Stock reduction from 10 to 40% and Cycle time reduced up to 50% • ROI in 6 months
	<ul style="list-style-type: none"> • Productivity increased : + 10%; • 25% Set up time reduction 		<ul style="list-style-type: none"> • WIP stock reduction due to 30% production cycle time reduction • .

Benefits-General





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“고객의 가치가 곧 우리의 가치”



Biz Partner Value Consulting

DELMIA

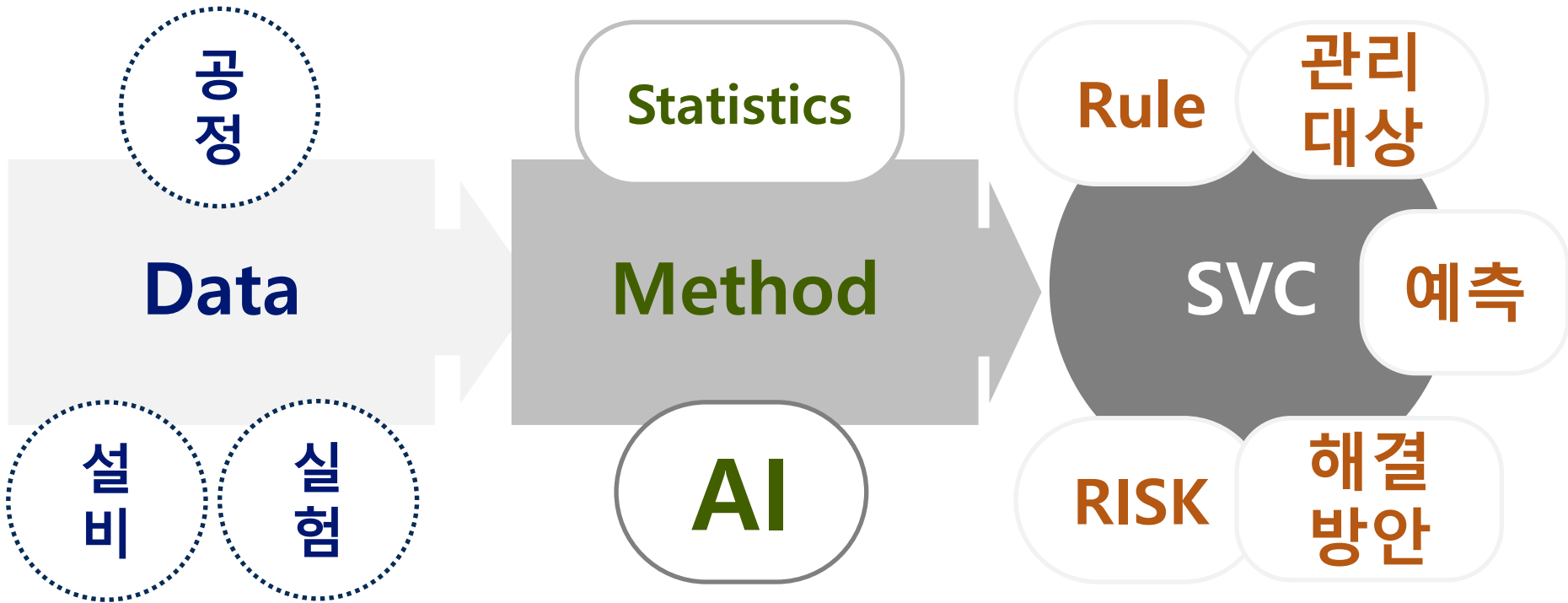
Operational Intelligence

이즈파크 황보울



Overall

Data, Method, SVC



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Method Comparison

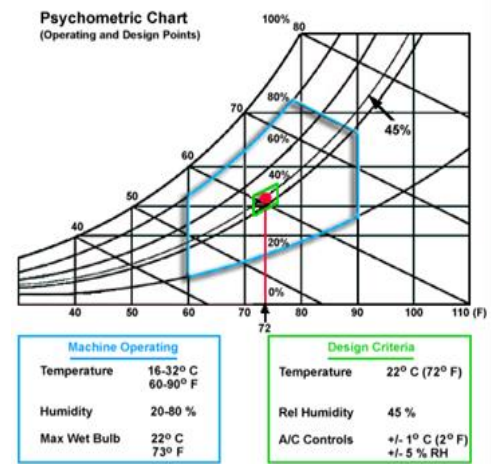
Different Way

가설 수립

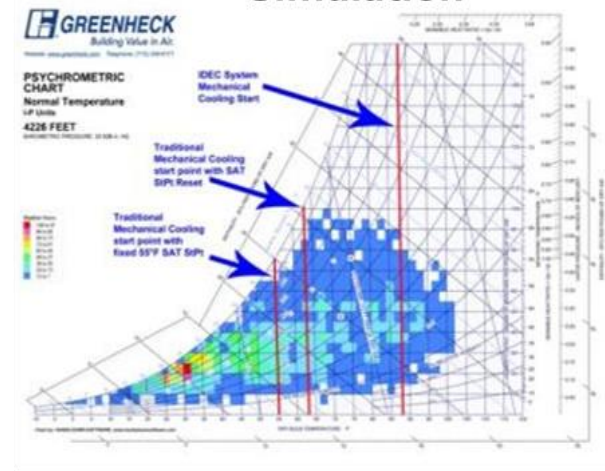
분석

현상 관찰

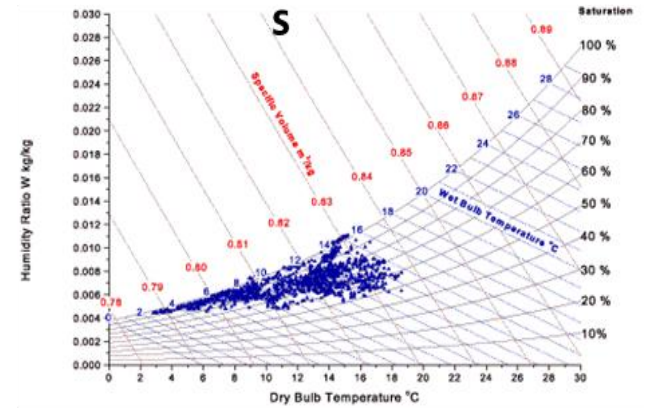
Model



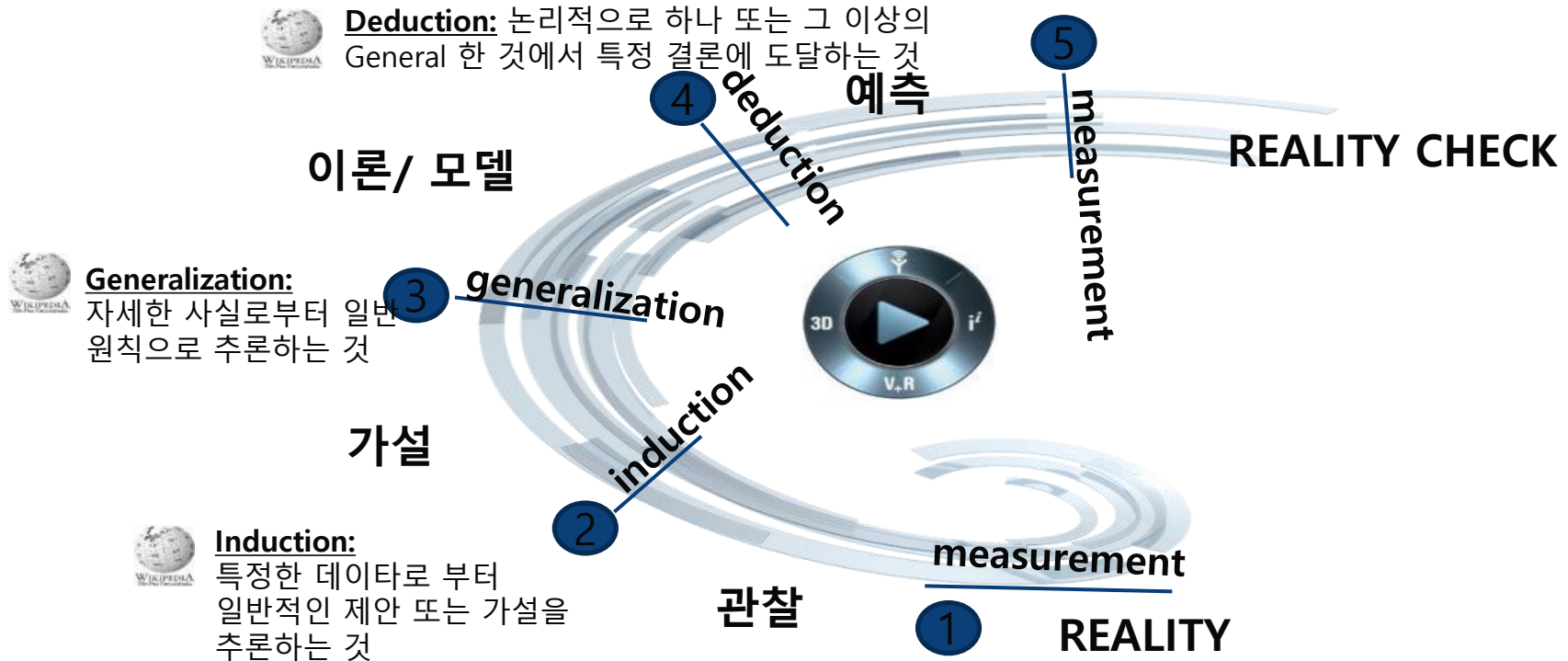
Simulation



Observation



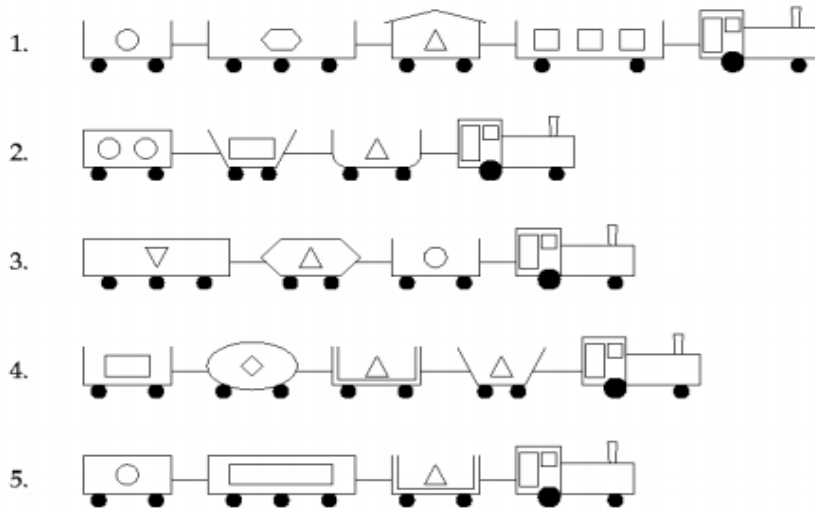
Method - OI From Reality



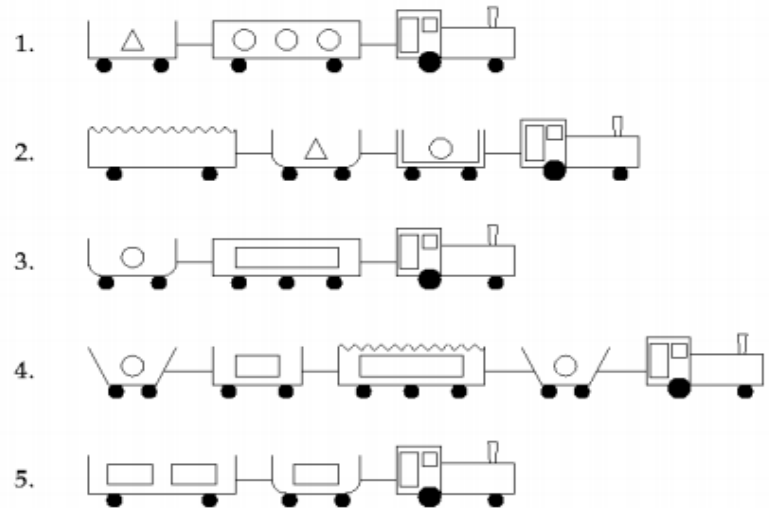
Example

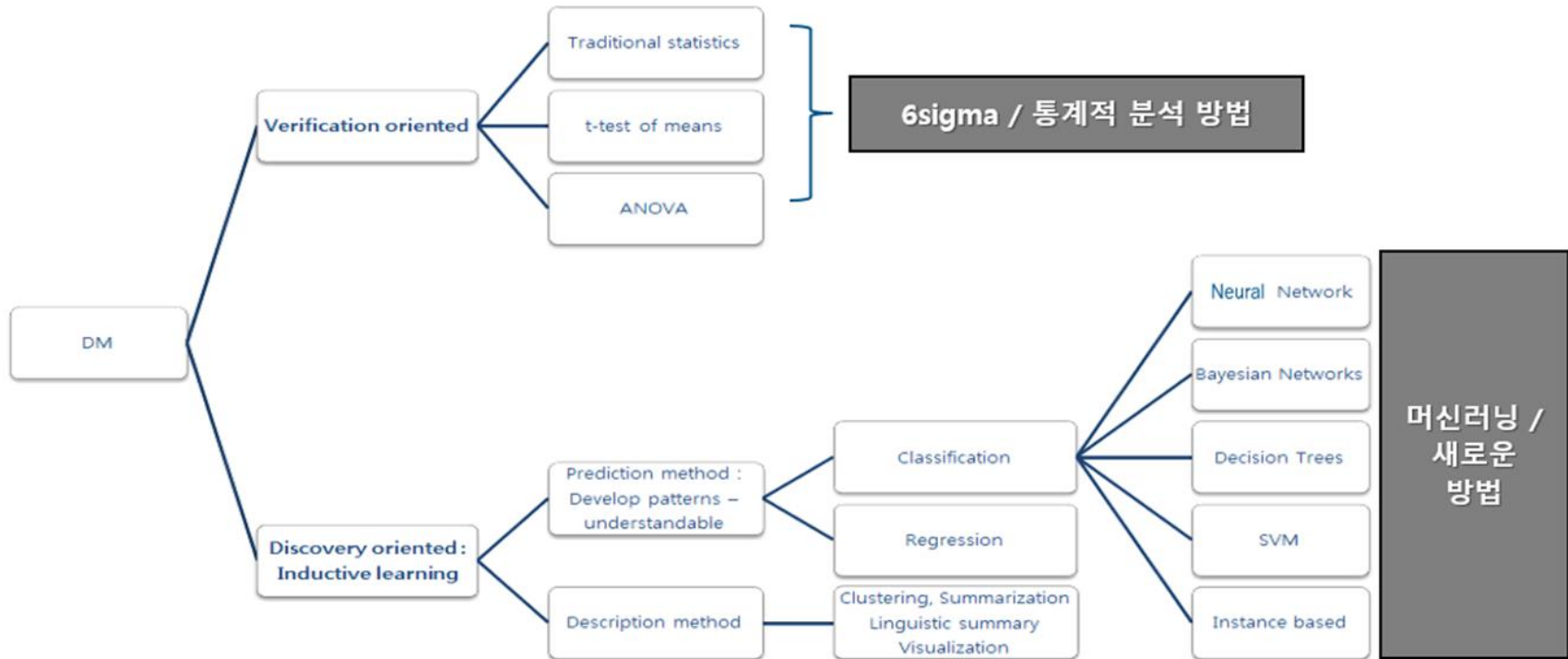
Michalsk's Train spotting

Eastbound trains



Westbound trains





Performance Predictive

OAD / Bayes / Regression



Machine별 불량 예지 및 관리시스템

The screenshot displays the ISPark SDC OI Service interface. At the top, there is a navigation bar with tabs for '관리자' (Admin), 'Operator', 'Monitor', and 'Analyzer'. Below this, the 'Target Data 연결' (Target Data Connection) section contains a text input field with a dropdown arrow and a '실패' (Fail) dropdown menu. The 'Checkpoint 설정' (Checkpoint Setting) section features three machine configuration panels for M1, M2, and M3. Each panel includes a 'Machine Name' field, a '체크포인트 선택' (Checkpoint Selection) dropdown, and radio buttons for 'Auto' and 'Manual' settings. At the bottom of the interface, there are 'Start', 'Pause', and '저장' (Save) buttons.

<p>목적</p>	<ul style="list-style-type: none"> 품질 불량원인을 조기 발견하여 수율 향상과 품질 안정의 조기 달성
<p>절차</p>	
<p>결과</p>	<ul style="list-style-type: none"> 품질 및 수율 향상 불량제거로 공정 Loss 절감 및 생산 Capa 증가

성공 Point

- 문제 해결을 위해 제조 Big Data 활용 (6시그마 방법론의 통계분석의 한계를 인지하고 이의 머신러닝 기법을 기존 분석업무의 선진화 도구로 적극 활용)
- Data 분석의 효율성 제고를 위한 Data 축적 및 Mining 중요성 인식 (문제해결을 위해 도움이 된 Data는 전체의 30%에 불과함을 발견하고 전사 Data 효율화 작업 진행 中)

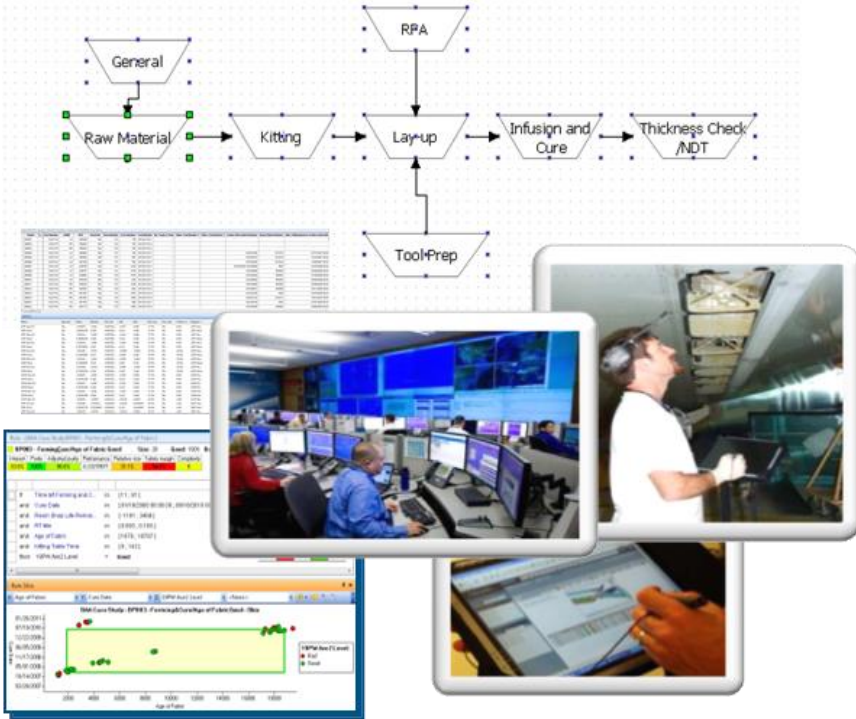
보전

목적	<ul style="list-style-type: none"> ▪ 핵연료 재처리 공정을 담당하는 설비의 Predictive Maintenance 도입으로 기존 Preventive Maintenance 업무 비효율 제거
목표	<ul style="list-style-type: none"> ▪ Simplest production scheme to reduce time to output ▪ Input 상태에 따른 재처리설비 Risk예측을 통한 이상 발생 전 정비 방안 도출
이슈	<ul style="list-style-type: none"> ▪ 기존 Preventive Maintenance 업무의 비효율 발생 국가별 핵 폐기물(Input)의 다양성(mechanical, chemical, neurotic...) 때문에 재처리 반응이 상이하여 설비보전 계획 설정에 어려움 발생 ▪ 실시간 핵폐기물 처리 상태를 알 수 있는 부산물 Clogging의 측정이 어려움 핵반응이 일어나고 있는 재처리 공정을 현재 기술로 모니터링 할 수 없음 ▪ 기존 전문가 그룹에서 수행한 scientific study를 통해서도 PdM을 위한 유의미한 분석 결과를 도출하지 못함 상호 인과관계의 복잡도 증가로 다양한 핵폐기물의 연속적인 공정의 결과를 설명하지 못함

도입 결과

- 다양한 전문가로 구성된 Stakeholder들의 공통된 문제 인지
 - 문제점 정의, data 정리 과정에서 통일된 문제 인식
- 분석 목적에 맞는 Data set 구성
 - 기존 변수 3,000개 → 83개로 압축
 - 100,000,000 raw data → 1,230 실험
- LGG기반 논리분석으로 인지하지 못했던 문제원인에 대한 재발견
 - ✓40개 Rules Discovery (12 변수로 구성 되었으며, 5개의 controllable 변수를 포함)
- Rule에 근거한 성공적인 Clogging level risk monitoring

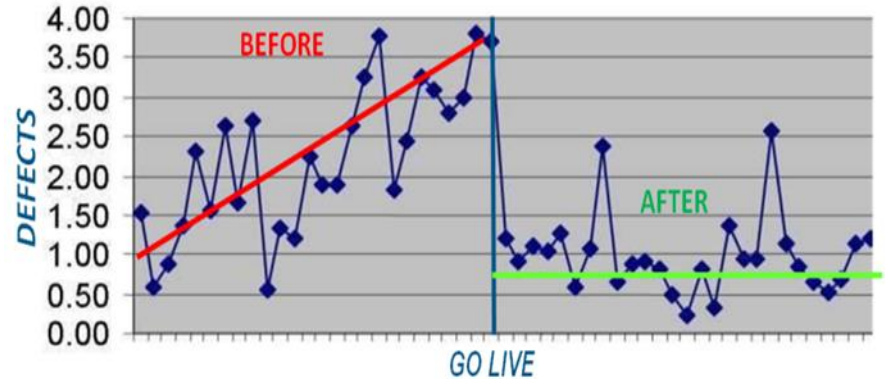
생산



Delmia Oi AT BOEING AEROSTRUCTURES

Composite Landing Gear Door :

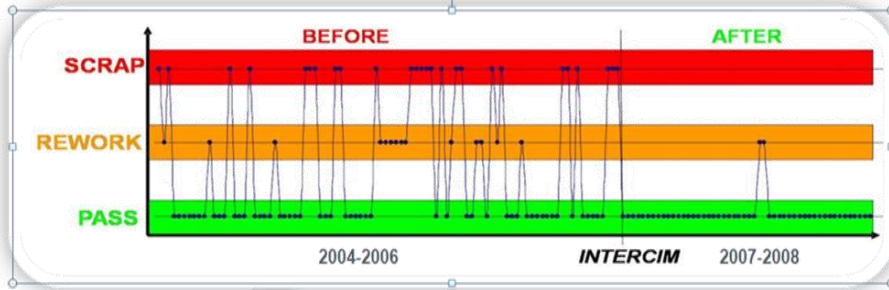
- 40% reduction of cost of repair and rework
- cycle time reduced from 89 days to 59 days



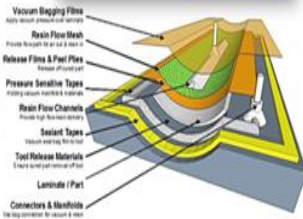
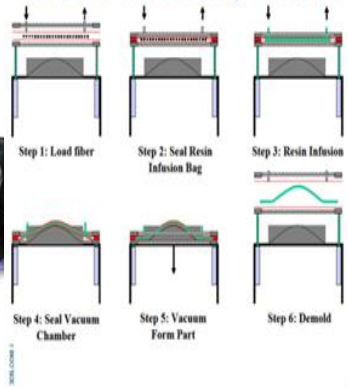
Composites ATLANTIC

ROI

INTERCIM AT COMPOSITES ATLANTIC



Composite Manufacturing - Case #3



- ✓ Absorbed all shipping delays on Q400 leading edges
- ✓ Reduced scrap from 13% to 0% in just 3 months
- ✓ Reduced rework from 28% to 1%
- ✓ ROI 3 times faster than planned



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원인



Complex Engine Malfunction

- 1 Flight failure = 5 test bench campaigns
- = 162 tests (5 malfunctions)
- = 7,938 data points
- = 1 hidden solution

« *Pertinence Suite has become a very valuable asset. The usage over the last twelve months confirms its capacity to quickly identify the relationship of a combination of multiple parameters to the occurrence of a complex anomaly*»

Joseph Berenbach,
Program Director at European Space Agency

- Ignition conditions on bench
- + Valve sequence(s) and speeds
- + Fuel circuits (Delta Pressures)
- + Thermal gages
- + Turbopumps operating points
- = PERFORMANCE LEVEL



Maximize Fuel Efficiency and On-Wing time

“Our work on databases and statistical methodologies such as Six Sigma did not lead to the expected results. Pertinence Suite brings a new approach in addition to others. Exploring databases, detecting rules, and looking for new areas of improvement is now much easier”

Didier Verté, Engineering Manager, 747 Engines

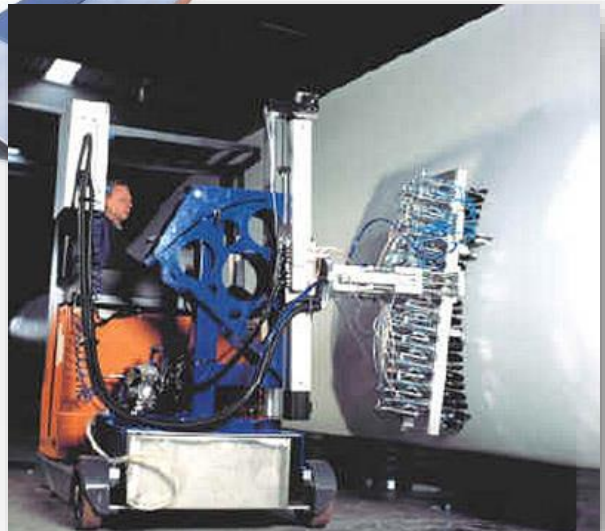
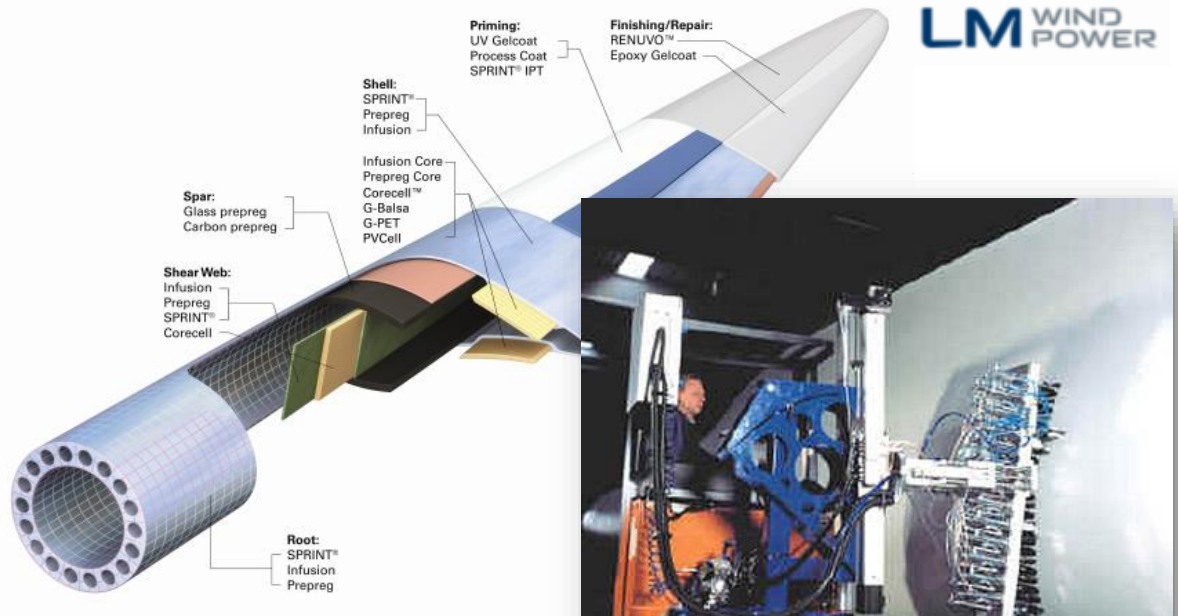
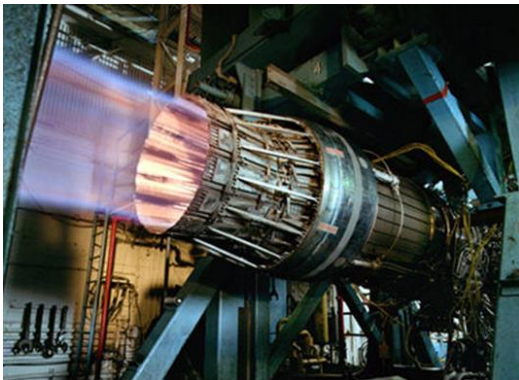
“We obtained tangible results that demonstrated a direct impact on the engine temperature and consumption. With Pertinence Suite, we are able to implement a program of continuous improvement which enables us to enrich our knowledge and to better address our customers’ expectations.”

Emmanuel D. du Louÿ, Director of Powerplant Engineering



기타

Aircraft Related







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Biz Partner Value Consulting

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