



Martin Larsson, Purchasing Manager, Supply Chain Conference, Stockholm 2016

Future of Robotics & Improving our Supply Chain

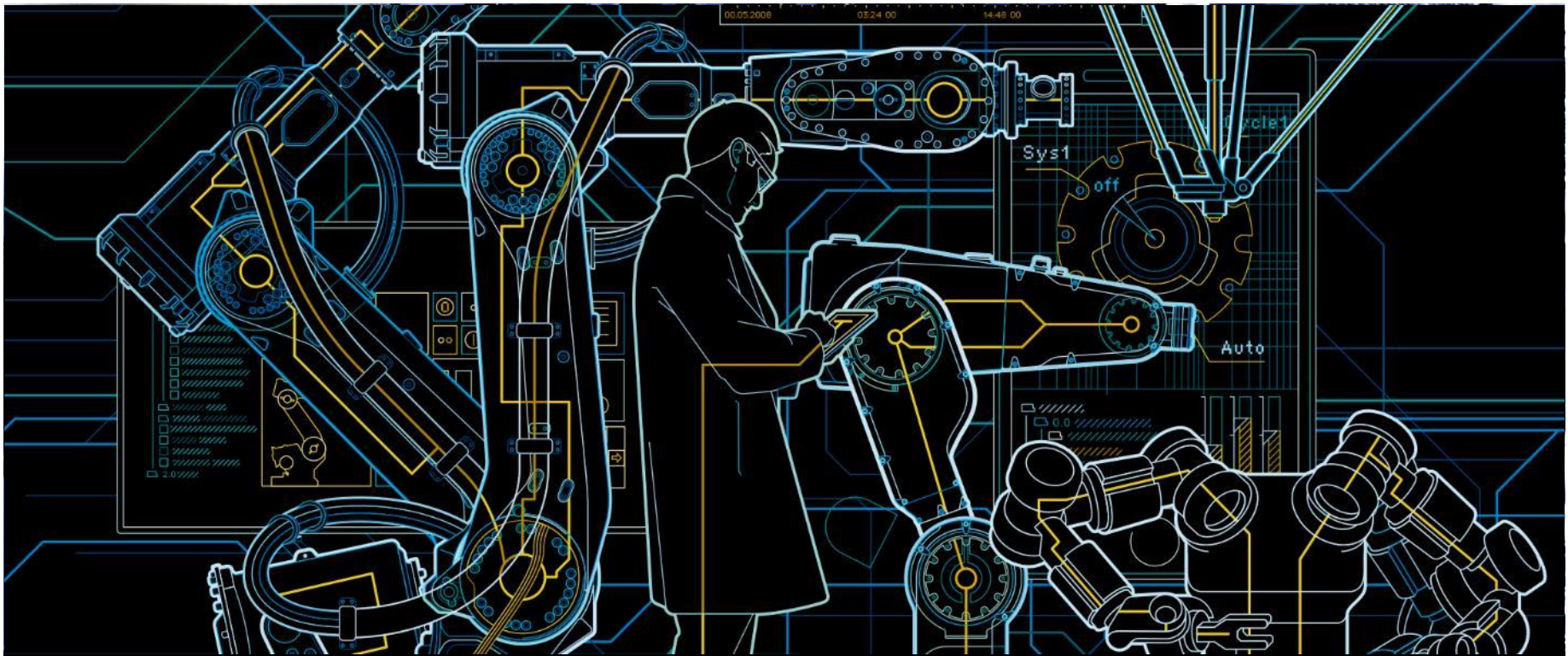
Supply Chain Conference 2016

Agenda

Future of Robotics & Improving our Supply Chain

- ABB Robotics
 - Introduction
 - About the Company
 - Our Deliverables
 - Markets Served
 - Why ABB Robotics?
- Implementation of iPlanner
 - Background of The Project
 - Our Implementation
 - The Benefits of iPlanner
- Our Future Supply Chain





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ABB Robotics

Supply Chain Conference 2016

ABB Robotics

Introduction



ABB Robotics – At your service worldwide (click photo for YouTube film)

ABB Robotics

Introduction

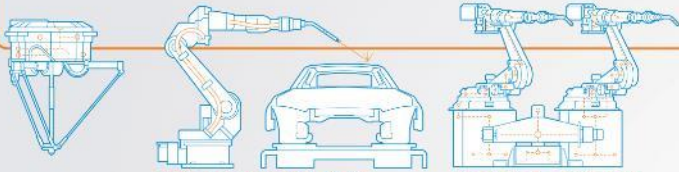
ABB Robotics

About the Company

Before robots



After robots

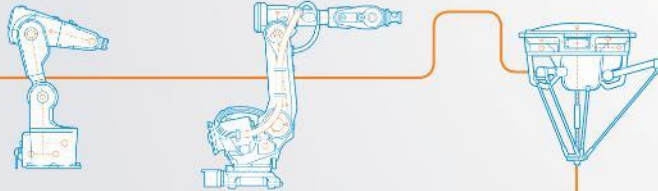


Increased productivity
Reduced operating costs

Improved efficiency
Increased product consistency

In 1974, the IRB 6 was the start of it all:
The world's first microprocessor controlled, electrically-driven industrial robot became commercially available.

Becoming more useful



Small robots
For the delicate, fast and flexible tasks

Large heavy duty robots
For those applications that require the ultimate in strength and reach

IRB 360 Flexpicker™
For high speed picking and packing

Welding robots
For reaching those hard to reach spaces and delivering a quality weld every time.

Palletizing robots
For when you have to load a pallet quick and accurate

Now - becoming collaborative

YuMi® is the world's first truly collaborative robot, and represents the ultimate in what collaborative robots stand for.

- Inherent safety
- The ability to fit into existing human-sized spaces
- Meant for small parts assembly



Becoming smarter

With advances in hardware, we have delivered technology that can sense its surroundings and work more efficiently.

Integrated Vision

The gift of sight is just as good for a robot

Integrated Force Control

Know where the workpiece is and how hard to push for the perfect finish

Superior motion control

Getting from point A to point B efficiently and quickly makes all the difference

Becoming easier

Making smart robots for many uses is only half the story, the rest comes down to making implementation as easy as possible.

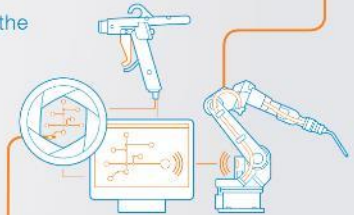
Function packages

RobotStudio®

PowerPacs

RobotWare

The underlying brains of the robot for easy optimization and high flexibility



Simplified Robot Programming
A revolution in turning manual motions into robotic paint programs.

ABB Robotics

Our Deliverables

Integrated Robot Solutions



Integrated robot solutions for:

- Material Handling
- Machine Tending
- Welding
- Cutting
- Painting
- Finishing

Engineering for Systems



Engineering for systems in:

- Press Automation
- Body-in-White
- Paint processes
- Power Train Assembly

Customer Service



Securing your productivity with a wide range of services within:

- Parts & Logistics
- Field Service
- Training
- Upgrade and reconditioning

ABB Robotics

Our Deliverables

Range suitable for a wide number of applications



ABB Robotics Markets Served

Automotive



Foundry & Forging



Metal Fabrication



Machine Tools



Plastics & Rubber



Food & Beverage



Pharmaceuticals



Transportation



Electrical & Electronics

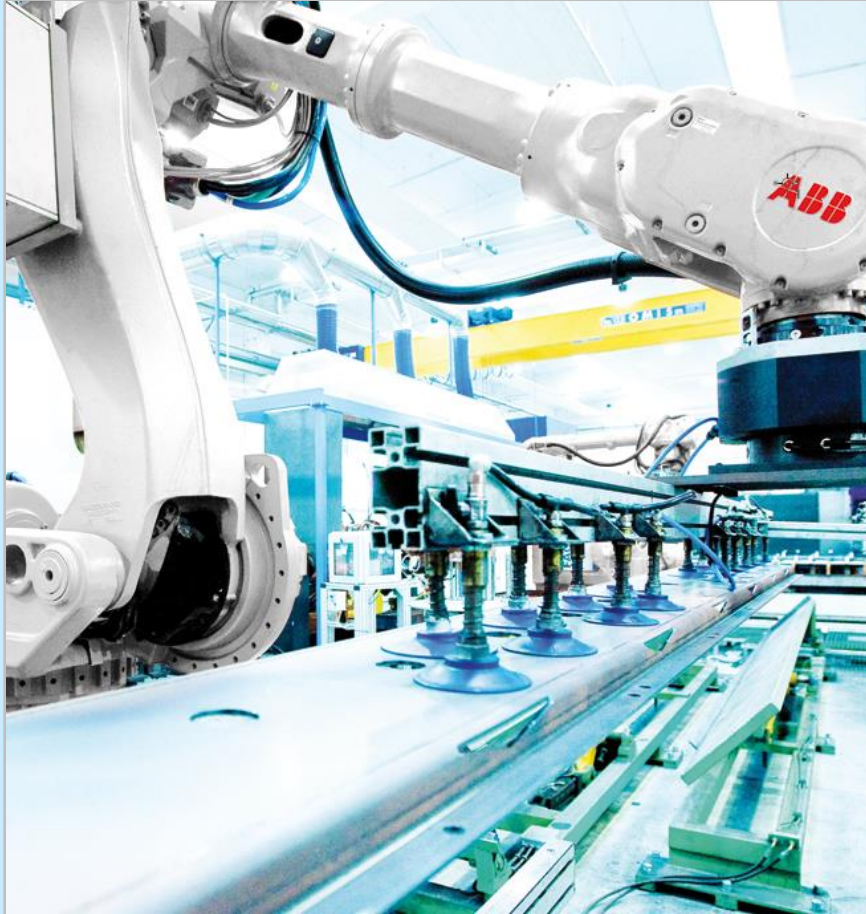


Renewable Energy



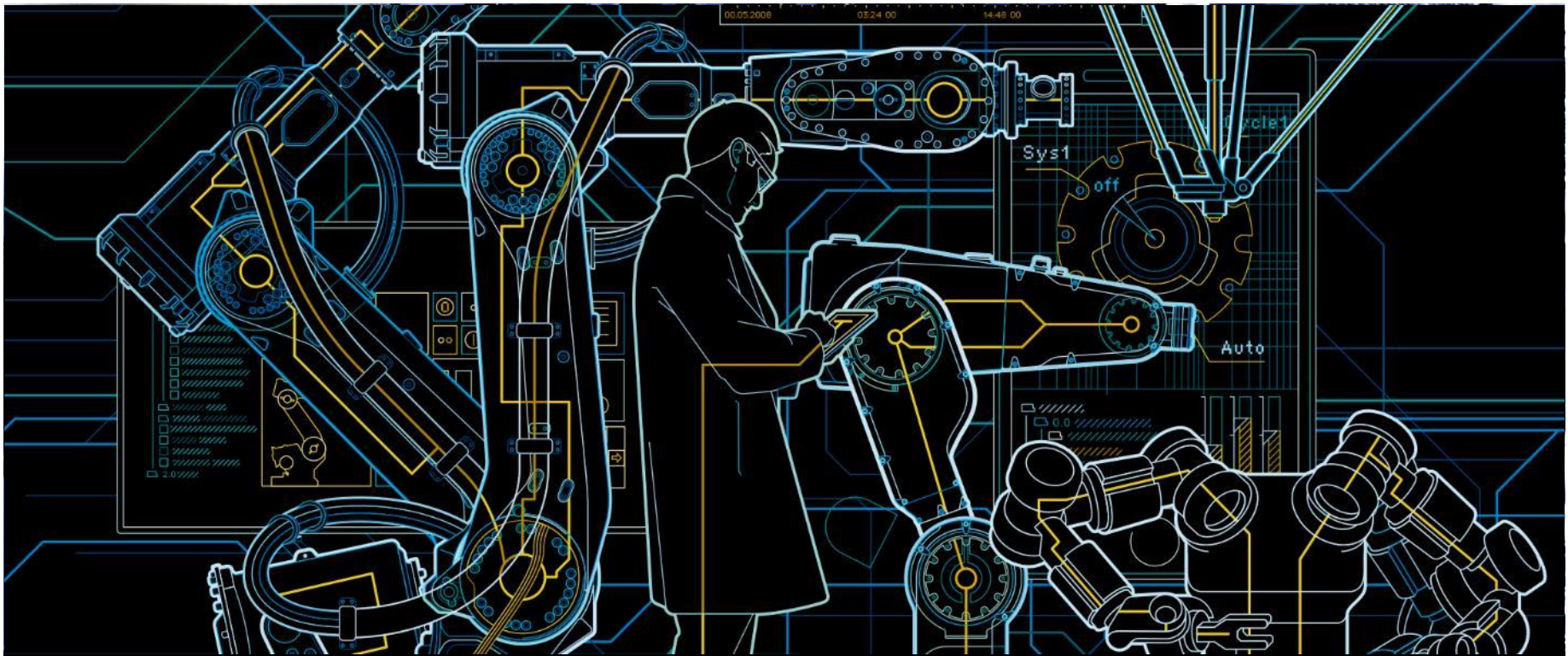
ABB Robotics

Why ABB Robotics?



Reasons for Robot Investments

- Increase production output rates
- Reduce operating costs
- Improve process quality
- Improve workplace health & safety
- Increase product manufacturing flexibility
- Reduce material waste and increase yield
- Reduce labour turnover and difficulty of recruiting workers
- Save space in high value manufacturing areas
- Reduce capital costs (inventory, work in progress)
- Improve quality of work for employees



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Implementation of iPlanner

Supply Chain Conference 2016

Implementation of iPlanner

Background of The Project

Current State

- Inefficiencies and poor performance
- Several IT-solutions
- Lack of standardized processes
- Production scheduling based on assumptions
- Lack of visibility
- Rough estimations in planning
- Difficult to highlight risks in delivery process



Future State

- An IT system that is supporting the organization to work more efficient
- Improved visibility of different production & material related issues
- Increased speed of resolution
- No fire fighting
- Accurate information shared with other departments
- More fact based decisions
- High productivity in the factory
- Effective cooperation with other departments

Implementation of iPlanner

Our Implementation

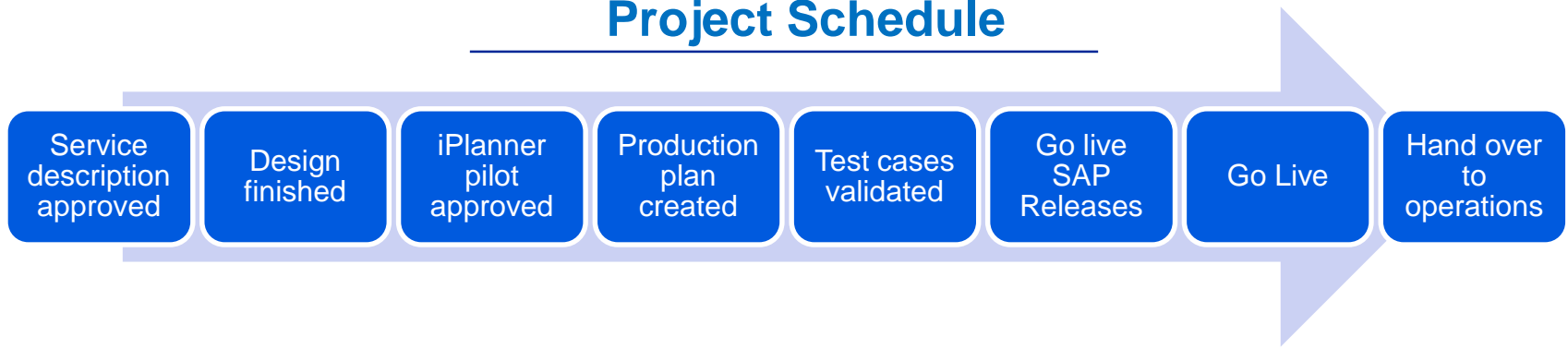
Target

Improving production & planning efficiency by optimizing the planning process with a APS system

Project group

- One project Manager (ABB)
- Two ABB employees (50%)
- Three ABB employees (10%)
- One SAP expert from TCS (100%)
- One integration expert (30%)

Project Schedule

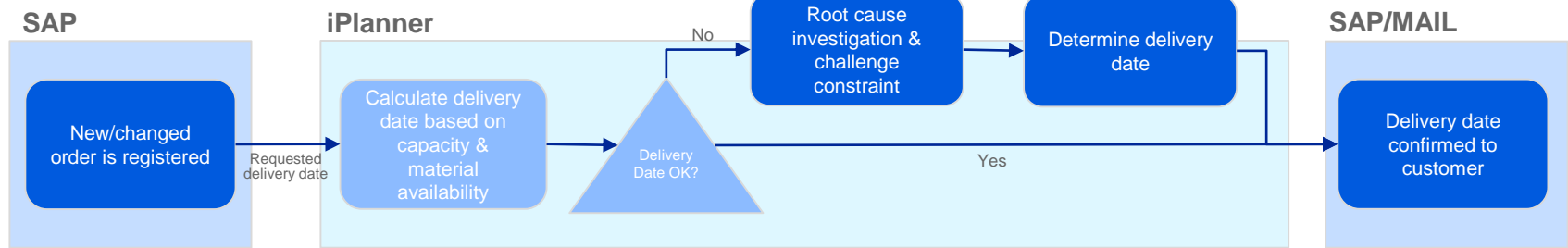


Implementation of iPlanner

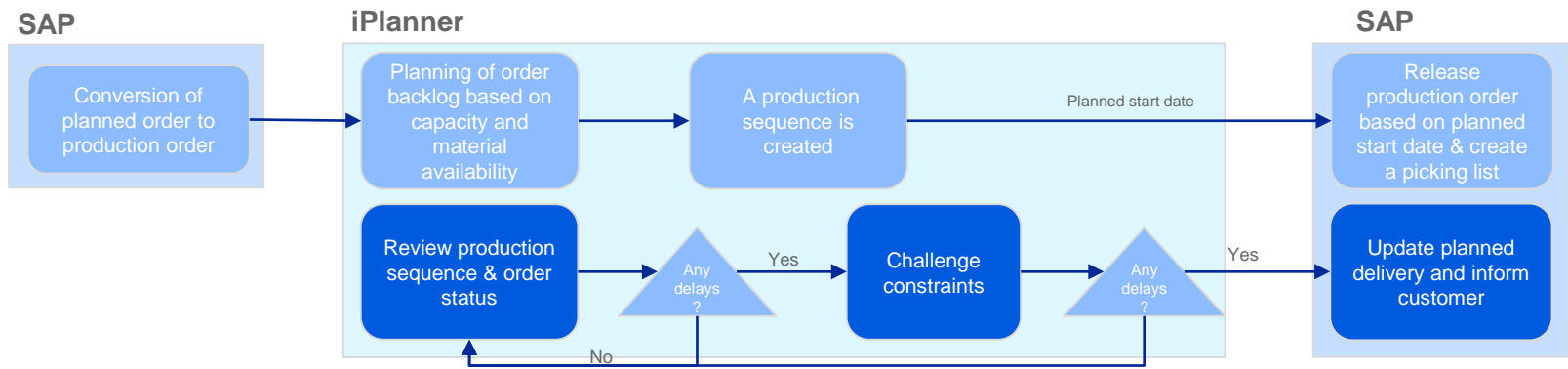
Our Implementation

Manual Task Automatic

Master Planning



Detail Planning



Implementation of iPlanner

Our Implementation

Sales Order Report

PROD:Plan

Plan Results

- Capacity
- Capacity Bottleneck Week
- Capacity Bottleneck Day
- Capacity Bottleneck Week
- Dash_SalesOrders Large Manipu...
- Dash_SalesOrders Small Manipu...
- Dash_SalesOrdersMM
- Dash_SalesOrdersMUGU
- Dash_SalesOrdersPositioner
- Dash_SalesOrdersProjectMaterial
- Dash_SalesOrdersRobotSystem
- Dash_SalesOrdersTracksMotion
- Sales Orders Not Exported
- SalesOrderNewRFC
- SalesOrders**
- Orders

Plan Results

Plan Results Objects

Settings PROD

Local Data

APS Inbox

APS Outbox

SAP Inbox

SAP Outbox

Simulation

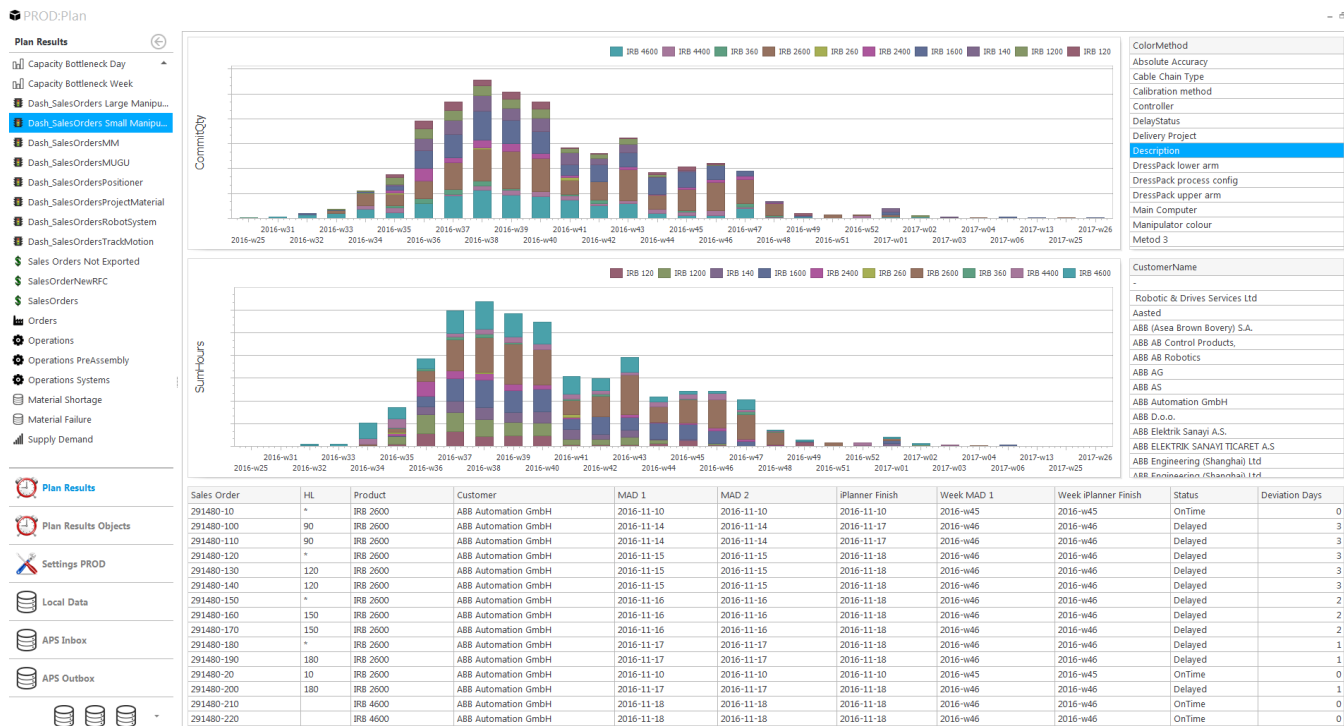
Reports Bottleneck Material

Transaction ...	Sales Order	Product	Customer	New/Changed ...	MAD 1	Week MA...	iPlanner Finish	Week iPlanner Finish	Deviation...	Bottlene...	Purchase Material
Sales Orders	28T085323-100	IRB 2600	Asea Brown Boveri S.A. Ro...		2016-09-21	2016-w38	2016-09-19	2016-w38	-2	PV4104-5	
Sales Orders	28T038918-200	IRB 2600	Bartsch GmbH		2016-09-21	2016-w38	2016-11-10	2016-w45	50	PV4104-6	3HAC024254-012
Sales Orders	28T0853508-300	Motor units and Gear u...	BENTELER ESP		2016-09-21	2016-w38	2016-11-09	2016-w45	49	PV4104...	3HAC024254-012
Sales Orders	28T7100082-700	IRBT X004 Track Motion	Volvo Car Corporation		2016-09-22	2016-w38	2016-09-14	2016-w37	-8		
Sales Orders	28T0611508-100	IRB 1200	ABB AG		2016-09-22	2016-w38	2016-09-19	2016-w38	-3	PV4104...	3HAC044533-001
Sales Orders	28T0333059-200	IRB 1200	MBB Fertigungstechnik Gm...		2016-09-22	2016-w38	2016-09-19	2016-w38	-3	PV4104...	3HAC044533-001
Sales Orders	28T0333059-100	IRB 1200	MBB Fertigungstechnik Gm...		2016-09-22	2016-w38	2016-09-19	2016-w38	-3	PV4104...	3HAC044533-001
Sales Orders	28T0666808-300	IRB 4400	ABB Engineering (Shangha)...		2016-09-22	2016-w38	2016-09-14	2016-w37	-8	PV4104...	3HAC7266-1
Sales Orders	28T8900961-200	PickMaster 3	ABB c/o Leading Technolog...		2016-09-22	2016-w38	2016-09-20	2016-w38	-2		
Sales Orders	28T0379507-100	IRB 4600	Lasco Umformtechnik GmbH		2016-09-22	2016-w38	2016-09-17	2016-w37	-5	PV4104-1	
Sales Orders	345750-10	IRCS Controller	GRRC		2016-09-22	2016-w38	2016-09-20	2016-w38	-2		
Sales Orders	343840-30	IRCS Controller	GRRC		2016-09-22	2016-w38	2016-09-20	2016-w38	-2		
Sales Orders	28T0744712-100	IRB 6650S	ABB S.p.A. Discrete Automa...		2016-09-22	2016-w38	2016-10-12	2016-w41	20	PV4104-9	3HAC027262-001
Sales Orders	343529-20	IRB 4600	Audi AG		2016-09-22	2016-w38	2016-09-19	2016-w38	-3	PV4104-1	
Sales Orders	28T0701842-600	IRB 4600	SABIT GOBAN SEVA		2016-09-22	2016-w38	2016-10-06	2016-w40	14	PV4104...	3HAC035585-001
Sales Orders	28T0690848-100	IRB 4600	Qubica Esbjerg A/S		2016-09-22	2016-w38	2016-10-06	2016-w40	14	PV4104...	3HAC035585-001
Sales Orders	343529-10	IRB 4600	Audi AG		2016-09-22	2016-w38	2016-09-19	2016-w38	-3	PV4104-1	
Sales Orders	28T0891325-100	IRB 4600	ABB Schweiz AG Industrial a...		2016-09-22	2016-w38	2016-10-06	2016-w40	14	PV4104-5	3HAC035585-001
Sales Orders	28T0891324-100	IRB 4600	ABB Schweiz AG Industrial a...		2016-09-22	2016-w38	2016-10-06	2016-w40	14	PV4104-5	3HAC035585-001
Sales Orders	343840-20	IRCS Controller	GRRC		2016-09-22	2016-w38	2016-10-03	2016-w40	11		3HAC035585-001
Sales Orders	28T9000048-100	IRB 6650S	ABB INC.		2016-09-22	2016-w38	2016-11-25	2016-w47	64	PV4104-9	3HAC053924-001
Sales Orders	28T0388027-300	IRB 140	Hella KGaA Hueck & Co.		2016-09-22	2016-w38	2016-09-14	2016-w37	-8	PV4104...	
Sales Orders	28T0388027-400	IRB 140	Hella KGaA Hueck & Co.		2016-09-22	2016-w38	2016-09-14	2016-w37	-8	PV4104...	
Sales Orders	28T0388027-500	IRB 140	Hella KGaA Hueck & Co.		2016-09-22	2016-w38	2016-09-14	2016-w37	-8	PV4104...	
Sales Orders	28T0388027-600	IRB 140	Hella KGaA Hueck & Co.		2016-09-22	2016-w38	2016-09-14	2016-w37	-8	PV4104...	
Sales Orders	28T0666882-500	IRB 2400	ABB Engineering (Shangha)...		2016-09-22	2016-w38	2016-09-16	2016-w37	-6	PV4104...	
Sales Orders	28T0333059-500	IRB 6700	MBB Fertigungstechnik Gm...		2016-09-22	2016-w38	2016-10-06	2016-w40	14	PV4104...	3HAC035585-001
Sales Orders	28T0333059-700	IRB 6700	MBB Fertigungstechnik Gm...		2016-09-22	2016-w38	2016-09-15	2016-w37	-7	PV4104...	
Sales Orders	28T7100073-1000	IRB 6700	CMA VCG		2016-09-22	2016-w38	2016-09-21	2016-w38	-1	PV4104-2	3HAC042793-001
Sales Orders	28T0333059-300	IRB 6700	MBB Fertigungstechnik Gm...		2016-09-22	2016-w38	2016-09-15	2016-w37	-7	PV4104...	
Sales Orders	28T7100073-900	IRB 6700	CMA VCG		2016-09-22	2016-w38	2016-11-09	2016-w45	48	PV4104...	3HAC042793-001
Sales Orders	28T7100073-1400	IRB 6700	CMA VCG		2016-09-22	2016-w38	2016-11-09	2016-w45	48	PV4104-8	3HAC042793-001
Sales Orders	28T0381157-100	IRB 6700	Bayerische Motoren Werke ...		2016-09-22	2016-w38	2016-09-15	2016-w37	-7	PV4104-6	3HAC042494-001
Sales Orders	28T0686196-100	IRB 6700	ABB S.r.o.		2016-09-22	2016-w38	2016-09-15	2016-w37	-7	PV4104-6	3HAC042495-001
Sales Orders	28T0387437-100	IRB 1600	Klöckner Desma		2016-09-22	2016-w38	2016-09-15	2016-w37	-7	PV4104...	
Sales Orders	28T0853423-200	IRB 6700	RENAULT ESPANA S.A.		2016-09-22	2016-w38	2016-09-15	2016-w37	-7	PV4104-8	3HAC042495-001
Sales Orders	28T0966264-400	IRB 1600	Stow International NV		2016-09-22	2016-w38	2016-09-14	2016-w37	-8	PV4104...	
Sales Orders	28T7100073-1300	IRB 6700	CMA VCG		2016-09-22	2016-w38	2016-11-09	2016-w45	48	PV4104-7	3HAC042793-001
Sales Orders	28T7100073-1200	IRB 6700	CMA VCG		2016-09-22	2016-w38	2016-11-09	2016-w45	48	PV4104-7	3HAC042793-001
Sales Orders	28T0381157-200	IRB 6700	Bayerische Motoren Werke ...		2016-09-22	2016-w38	2016-09-15	2016-w37	-7	PV4104-7	3HAC042495-001
Sales Orders	28T0376109-100	IRB 6640	Bayerische Motoren Werke ...		2016-09-22	2016-w38	2016-10-06	2016-w40	14	PV4104-8	3HAC035585-001
Sales Orders	28T0666882-600	IRB 2400	ABB Engineering (Shangha)...		2016-09-22	2016-w38	2016-09-16	2016-w37	-6	PV4104...	
Sales Order...	28T0666882-400	IRB 2400	ABB Engineering (Shangha)...		2016-09-22	2016-w38	2016-09-16	2016-w37	-6	PV4104...	

Implementation of iPlanner

Our Implementation

Production Line Dashboard



Implementation of iPlanner

Our Implementation

Order Sequence Report

PROD:Plan

Plan Results

- Capacity Bottleneck Day
- Capacity Bottleneck Week
- Dash_SalesOrders Large Manipu...
- Dash_SalesOrders Small Manipu...
- Dash_SalesOrdersMM
- Dash_SalesOrdersMUGU
- Dash_SalesOrdersPositioner
- Dash_SalesOrdersProjectMaterial
- Dash_SalesOrdersRobotSystem
- Dash_SalesOrdersTrackMotion
- Sales Orders Not Exported
- SalesOrderNewRFC
- SalesOrders
- Orders
- Operations
- Operations PreAssembly
- Operations Systems
- Material Shortage
- Material Failure
- Supply Demand

Plan Results

Plan Results Objects

Settings PROD

Local Data

APS Inbox

APS Outbox

SalesOrderNr	HL	MaterialName	OrderType	OrderNum...	MaterialNu...	MaterialTy...	Product...	Producto...	Bucket	StartDate	EndDate	Deman...	Seq...	Deviatio...	LatestOper...	LatestOperati...	Materi...	OptionSearch
28T0367641...		Manipulator IRB 2600	Production	Pr-11012813	3HAC0506...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	1	4			PV1	Options CABCOLOUR=ABB...
28T0367641...	*	Manipulator IRB 2600	Production	Pr-11012804	3HAC0506...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	2	4			PV1	Options BULLSEYE_M4 X 1...
28T0375023...		Manipulator IRB 4600	Production	Pr-11013657	3HAC0436...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	3	10			PV1	Options APPLINTSIGNCON...
28T0375023...	300	Manipulator IRB 4600	Production	Pr-11011655	3HAC0436...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	4	12			PV1	Options APPLINTSIGNCON...
28T0375023...	*	Manipulator IRB 4600	Production	Pr-11011652	3HAC0436...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	5	12			PV1	Options APPLINTSIGNCON...
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28T0686185...		Manipulator IRB 4600	Production	Pr-11012755	3HAC0436...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	7	7			PV1	Options APPLINTSIGNCON...
28T0744647...		Manipulator IRB 4600	Production	Pr-11012052	3HAC0436...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	8	11			PV1	Options APPLINTSIGNCON...
28T0666557...		Manipulator IRB 260	Production	Pr-11014130	3HAC0240...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	9	0			PV1	Options CABCOLOUR=ABB...
28T0739317...		Manipulator IRB 4600	Production	Pr-11012750	3HAC0436...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	10	7			PV1	Options CABCOLOUR=ABB...
28T0666866...		Manipulator IRB 140	Production	Pr-11015792	3HAC6816-1	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	11	0			PV1	Options CABCOLOUR=ABB...
28T0744648...		Manipulator IRB 4600	Production	Pr-11012055	3HAC0436...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	12	11			PV1	Options APPLINTSIGNCON...
28T0744366...		Manipulator IRB 4600	Production	Pr-11011592	3HAC0436...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	13	12			PV1	Options APPLINTSIGNCON...
28T0375023...		Manipulator IRB 4600	Production	Pr-11011290	3HAC0436...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	14	13			PV1	Options APPLINTSIGNCON...
28T0375023...		Manipulator IRB 4600	Production	Pr-11011287	3HAC0436...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	15	13	PV1104-80/...	2016-08-31 15...	PV1	Options APPLINTSIGNCON...
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28T0666866...		Manipulator IRB 140	Production	Pr-11014477	3HAC6816-1	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	17	-2			PV1	Options CABCOLOUR=ABB...
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28T0853401...	*	Manipulator IRB 2600	Production	Pr-11013147	3HAC0506...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	21	4			PV1	Options AWMATCABINET_...
28T0666863...		Manipulator IRB 2400	Production	Pr-11014153	3HAC6670-1	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	22	3	PV1108-0/1...	2016-08-31 15...	PV1	Options CABCOLOUR=ABB...
28T0380980...	100	Manipulator IRB 140	Production	Pr-11014857	3HAC6816-1	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	23	-3			PV1	Options CABCOLOUR=ABB...
28T0666863...		Manipulator IRB 2400	Production	Pr-11014455	3HAC6670-1	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	24	0	PV1108-0/70	2016-08-31 13...	PV1	Options CABCOLOUR=ABB...
28T0388173...		Manipulator IRB 140	Production	Pr-11014163	3HAC6816-1	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	25	-1			PV1	Options CABCOLOUR=ABB...
28T0666863...		Manipulator IRB 2400	Production	Pr-11014458	3HAC6670-1	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	26	0	PV1108-0/60	2016-08-31 14...	PV1	Options CABCOLOUR=ABB...
28T0388173...		Manipulator IRB 140	Production	Pr-11014483	3HAC6816-1	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	27	-2			PV1	Options CABCOLOUR=ABB...
28T096239...	*	Manipulator IRB 1600	Production	Pr-11014080	3HAC0213...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-08-...	28	-1			PV1	Options ABSOLUTEACCUR...
28T0666863...		Manipulator IRB 2400	Production	Pr-11015240	3HAC6670-1	Manipulator	100	PV1	2016-09-01	2016-09-...	2016-09-...	2016-08-...	29	-2			PV1	Options CABCOLOUR=ABB...
28T0874515...		Manipulator IRB 4600	Production	Pr-11015169	3HAC0436...	Manipulator	100	PV1	2016-09-01	2016-09-...	2016-09-...	2016-08-...	30	-2			PV1	Options APPLINTSIGNCON...
28T0686197...		Manipulator IRB 1600	Production	Pr-11017007	3HAC0213...	Manipulator	100	PV1	2016-08-31	2016-08-...	2016-09-...	2016-09-...	31	-8			PV1	Options APPLINTSIGNCON...
28T0369046...		Manipulator IRB 1600	Production	Pr-11014388	3HAC0213...	Manipulator	100	PV1	2016-09-01	2016-09-...	2016-09-...	2016-08-...	32	-2			PV1	Options APPLINTSIGNCON...

Record 1 of 228

Filter: [ProductionLine] = PV1

Implementation of iPlanner

Our Implementation



Learnings

- Be an expert of your own ERP system
- Integrations are complex and time consuming
- Get control of the whole integration flow
- Define a project to work with master data updates
- Secure full time resources in the project within relevant fields

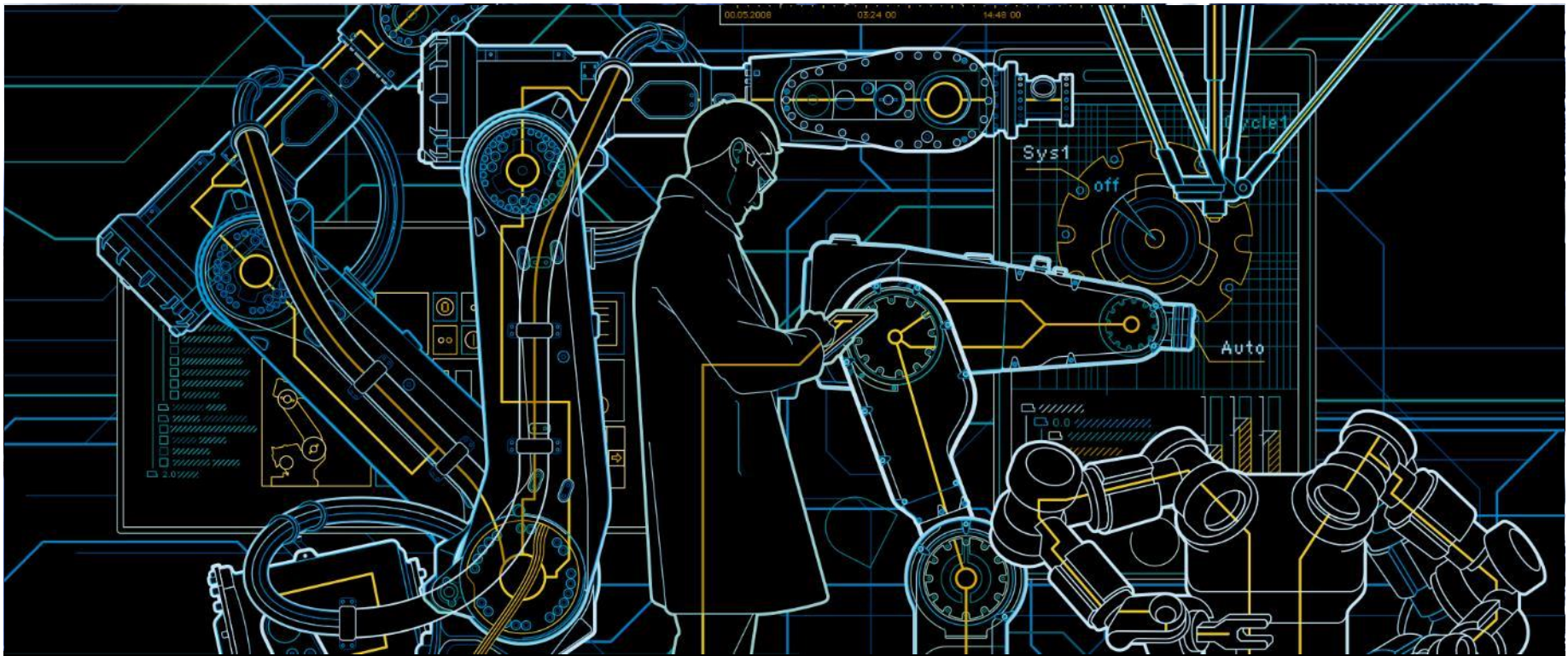
Implementation of iPlanner

The Benefits of iPlanner

Benefits

- Fully automated process steps within planning
- Higher production volumes with the same amount of personnel
- Easily accessible and visible information
- Improved speed of resolution and more accurate answers
- Possible to predict future capacity and material constraints
- Excellent control of master data
- Improved cooperation
- World class customer service






Martin Larsson, Purchasing Manager, Supply Chain Conference, Stockholm 2016

Our future supply chain

Supply Chain Conference 2016

Our Future Supply Chain

What's Coming Next



What's coming next?

Automated order flow

Higher degree of integrations

More transparency of information

Different VMI/HUB solutions

Globalized planning & purchasing functions

Large amount of robot automation

Power and productivity
for a better world™

