

PROPOS

optimal flow



on time
delivery

smart
software

QRM

continuous
improvement

world class
performance

lead time
reduction

cost

production
planning

lean

How PROPOS software helps you to achieve your QRM goals

Robert Peters



This presentation

- ⌘ What is PROPOS software
- ⌘ How PROPOS can support a QRM implementation:
 - Shop floor cell screen;
 - Digital POLCA;
 - MCT and QRM number.
- ⌘ Some other features that will minimize lead times, minimize overhead and help you improve:
 - Real time pull production / smart shop floor scheduling;
 - Digital attachments (e.g. drawings), pictures, work instructions where you need them;
 - Analysis / insights for continuous improvement.

**Quick
Response
Manufacturing**

What is PROPOS software

- PROPOS software is a unique solution for
 - production planning;
 - shop floor control and optimization;
 - continuous improvement of manufacturing processes.
- It is especially suited for manufacturing companies with a lot of variety (typically HMLV).
- It was developed at BOSCH Hinges in the Netherlands to support and enhance their successful QRM / Lean Mfg implementation.

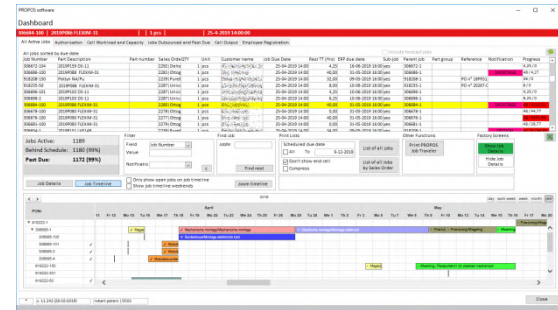


What is unique about PROPOS?

- ⌘ First QRM based software in Europe (probably in the world) -> designed for lead time reduction.

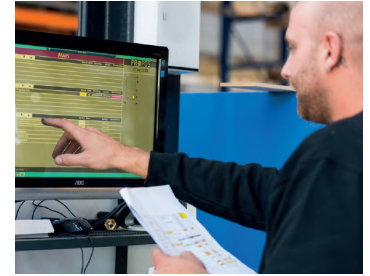
- ⌘ Three level, company wide approach
 - Shop floor (QRM cells, production management);
 - Office / QROC's;
 - Continuous improvement teams / management.

- ⌘ PROPOS can actively improve flow, detect bottlenecks and guarantee flow.



PROPOS today

- More than 20 implementations in The Netherlands, Belgium and the United States.
- At manufacturing companies that work with metal, wood, glass, plastics.
- Connected to SAP, Navision, Axapta, Epicor, Exact, PdC, Ridder, etc.
- Available in Dutch, English and French language.
- More than 400 people are using PROPOS on a daily basis.
- More than 100,000 job flow through PROPOS screens each year.



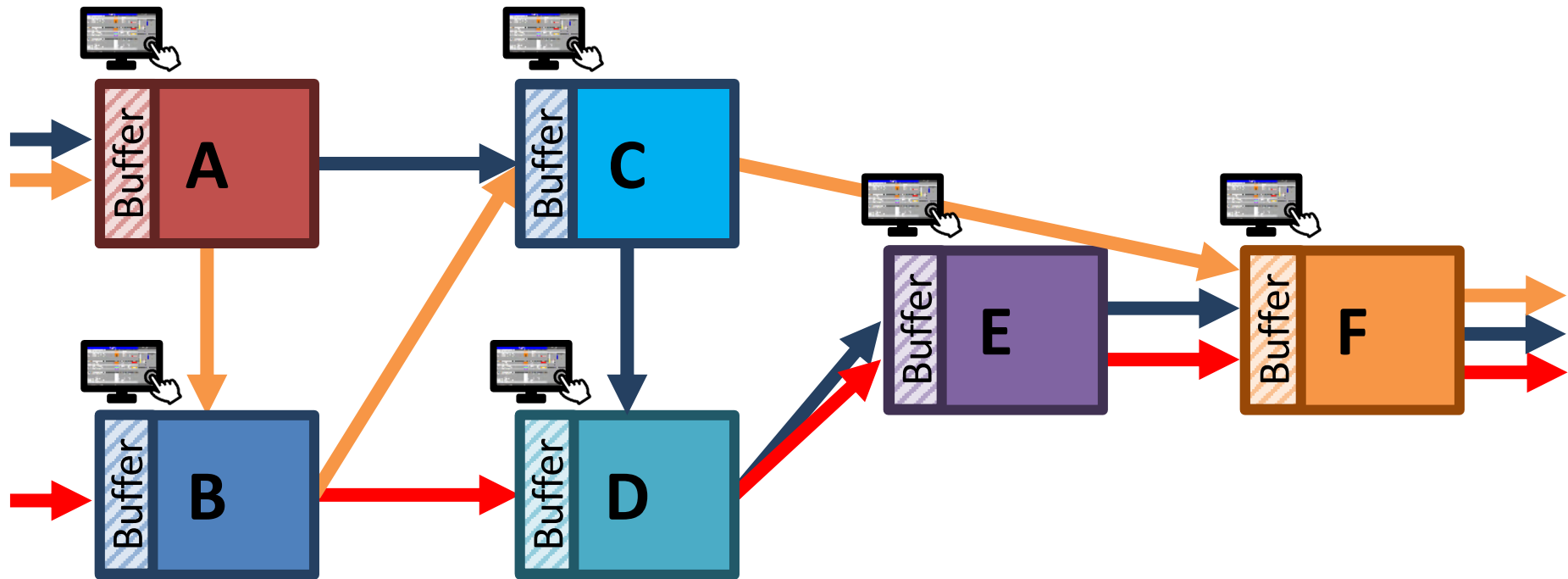
The PROPOS shop floor cell screen

- We cannot emphasize enough the importance of this screen. It supports all your manufacturing cells. It will:
 - make your manufacturing process transparent;
 - involve people in planning, meeting due dates, improving precalculated times, etc. ;
 - stimulate cross training (= better flow);
 - make sure teams are working on relevant jobs;
 - improve flow (pull, sign off in next cell, POLCA);
 - save a lot of time (scheduling, exceptions, instructions, drawings);
 - collect data for continuous improvement (MCT, OTD, actual TT).



...and easy to work with!

The PROPOS shop floor cell screen



The PROPOS shop floor cell screen

In process

In buffer

Expected

VBW

In bewerking:

| Order ID | Customer | Naar cel | #Uren | Bewerking | Uiterlijk gereed | Bijzonderheden |
|------------|-----------------------------|----------|-------|-----------|------------------|----------------|
| PD17-01814 | Sam Smith Construction 6322 | PERS | 11,1 | 0200-CNC | 28-06 | ACHTERSTAND |
| PD17-01816 | Hydro Systems Plus 10947 | HF | 3,8 | 0300-CNC | 29-06 | |
| PD18-00187 | PRV Welding 9059 | PERS | 0,5 | 0200-CNC | 02-07 | |

In buffer (18):

| Order ID | Customer | Naar cel | #Uren | Bewerking | Uiterlijk gereed | Bijzonderheden |
|------------|------------------------------|----------|-------|-----------|------------------|----------------|
| PD18-00561 | Watkins Sheet Metal 6291 | PERS | 1,8 | 0300-CNC | 15-06 | |
| PD17-02438 | Sam Smith Construction 12704 | HF | 15,1 | 0300-CNC | 02-07 | |
| PD18-00406 | Watkins Sheet Metal 12311 | PERS | 5,1 | 0300-CNC | 29-06 | WACHTEN |
| PD17-01812 | Johnson Tooling 13827 | HF | 15,1 | 0300-CNC | 06-07 | |
| PD18-00122 | Sam Smith Construction 10954 | HF | 3,5 | 0300-CNC | 29-06 | |
| PD17-01817 | Watkins Sheet Metal 10954 | HF | 3,4 | 0300-CNC | 02-07 | GEBLOKKEERD |

Verwacht:

| Order ID | Customer | Nu in cel | #Uren | Bewerking | Uiterlijk gereed | Bijzonderheden |
|------------|-----------------------------|-----------|-------|-----------|------------------|----------------|
| PD18-00562 | IMP Inc 13895 | ZAGEN | 0,3 | 0300-CNC | 15-06 | ACHTERSTAND |
| PD17-01815 | Hydro Systems Plus 11833 | ZAGEN | 10,1 | 0200-CNC | 28-06 | |
| PD18-00574 | Watkins Sheet Metal 12761 | ZAGEN | 0,9 | 0300-CNC | 02-07 | |
| PD18-00180 | Sam Smith Construction 5611 | XL | 9,9 | 0300-CNC | 10-07 | |
| PD18-00181 | Johnson Tooling 14264 | XL | 1,7 | 0300-CNC | 10-07 | |

PROPOS
27 jun 15:50

Celstappen

| Bewerkingen groep | Operatie | Uren |
|-------------------|-------------|-----------|
| 1 | 0200-BEWERK | 3,70 uren |
| 2 | 0200-CNC | 7,42 uren |

SLUITEN



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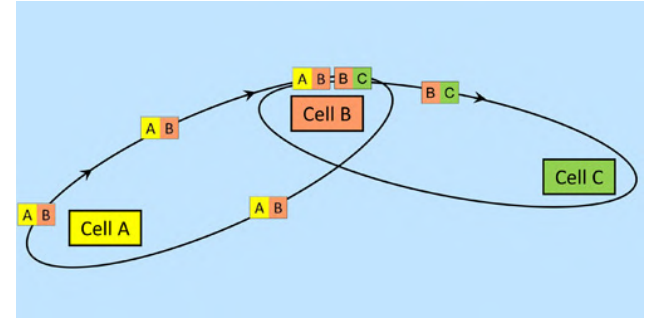
The PROPOS shop floor cell screen

- ⌘ How much work will there be this week? How much capacity do we need?
- ⌘ Do we have enough capacity for next week or should we ask for help?
- ⌘ What kind of capacity do we need?
- ⌘ What is the most important job for my team (for the company)?
- ⌘ Are there any exceptions that we should pay attention to (critical jobs, inventory, subs)?
- ⌘ We have finished a job, let's get it to the next cell as soon as possible.
- ⌘ If we have spare capacity now or next week, which team should we help?



Digital POLCA

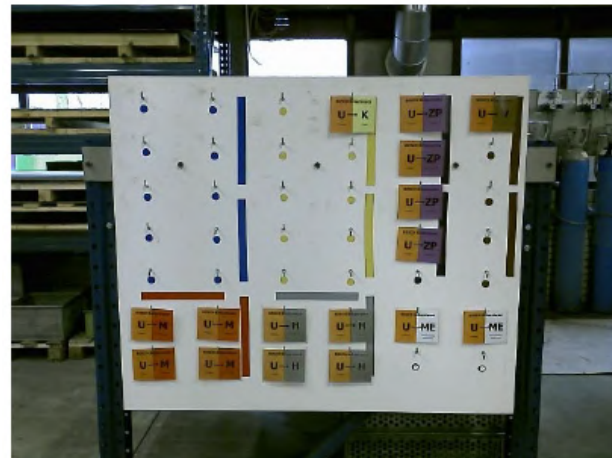
- POLCA was developed by dr. Suri as part of QRM.
- It is a mechanism/tool that uses capacity signals (cards) between cells or departments.
- It makes sure that jobs are only started when the can be processed by the downstream cell
→ flow is guaranteed.
- The other way around, it will stop jobs that cannot be processed by the downstream cell
→ bottleneck detection.



Digital POLCA

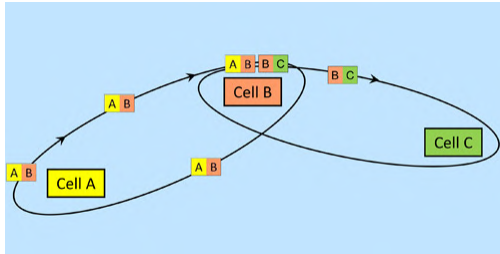


Rajan Suri and Godfried Kaanen
at BOSCH's first POLCA board.



Improved POLCA board
with help from Rajan Suri.

Digital POLCA



PROPOS software

Load Balancing Settings

Main settings

Load Balancing Activated

Load Balancing System ▼ Digital POLCA Classic

Quantum ▼ hours touch time

Show status in factory cell screens

Save Main Settings

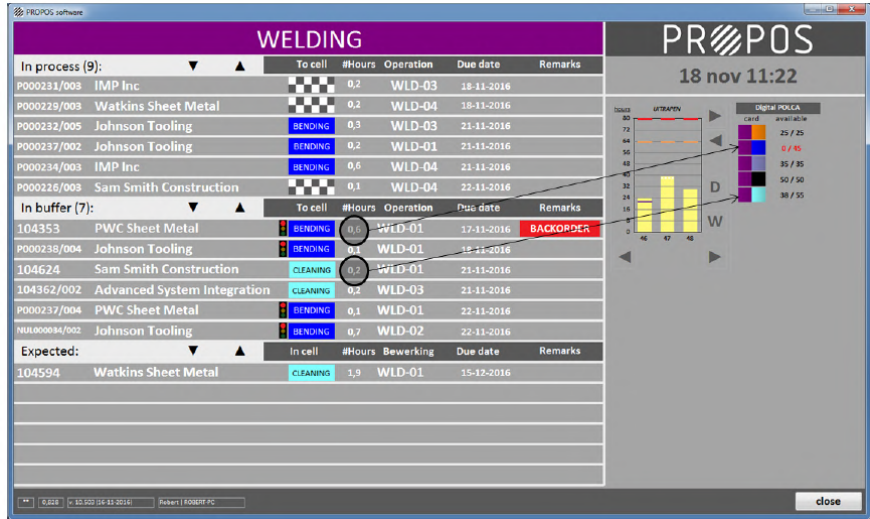
POLCA cards POLCA cell settings

| POLCA Loop From cell | To cell | # Cards | Nr of Temp Cards | Temp Cards Valid From | Temp Cards Valid Thru | Temp Cards Description | # Cards In System | # Cards Occupied | # Cards Free |
|-------------------------|-------------|---------|---------------------|--------------------------|--------------------------|------------------------|-------------------------|---------------------|-----------------|
| LASER-PLAAT | LASER-BUIS | 10 | 0 | 8-7-2015 | 8-7-2015 | | 10 | 0 | 10 |
| PLOOIEN | LASER-BUIS | 106 | 0 | 20-8-2013 | 20-8-2013 | | 106 | 0 | 106 |
| UITRAPEN | LASER-BUIS | 15 | 0 | 29-3-2017 | 29-3-2017 | | 15 | 0 | 15 |
| VOORBEREIDING | LASER-BUIS | 30 | 0 | 20-8-2013 | 20-8-2013 | | 30 | 0 | 30 |
| LASER-BUIS | LASER-PLAAT | 203 | 0 | 20-8-2013 | 20-8-2013 | | 203 | 0 | 203 |
| LASSEN | LASER-PLAAT | 10 | 0 | 13-7-2017 | 13-7-2017 | | 10 | 0 | 10 |
| LASSEN-CL | LASER-PLAAT | | | | | | | 0 | 0 |
| PLOOIEN | LASER-PLAAT | 203 | 0 | 20-8-2013 | 20-8-2013 | | 203 | 0 | 203 |
| STUV | LASER-PLAAT | 20 | 0 | 19-9-2017 | 19-9-2017 | | 20 | 0 | 20 |
| TRANSPORT | LASER-PLAAT | | | | | | | 0 | 0 |
| VOORBEREIDING | LASER-PLAAT | 20 | 0 | 27-5-2015 | 27-5-2015 | | 20 | 0 | 20 |
| LASER-BUIS | LASSEN | 400 | 0 | 13-7-2017 | 13-7-2017 | | 400 | 0 | 400 |
| LASER-PLAAT | LASSEN | 20 | 0 | 13-7-2017 | 13-7-2017 | | 20 | 0 | 20 |
| PLOOIEN | LASSEN | 81 | 61 | 13-7-2017 | 30-12-2017 | | 81 | 0 | 81 |
| STUV | LASSEN | 40 | 0 | 19-9-2017 | 19-9-2017 | | 40 | 19 | 22 |

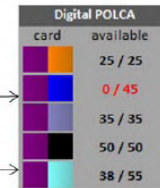
Close

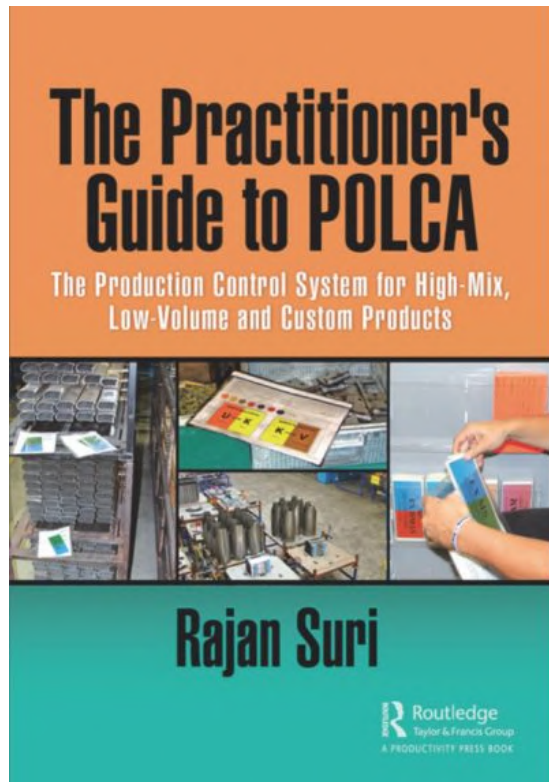
Digital POLCA

- Routes are detected by PROPOS and POLCA cards can be created easily.
- If no POLCA cards left then routes are automatically blocked.
- Load based POLCA is easy to implement.
- Cards are returned fast and automatically.
- Cards cannot get lost.



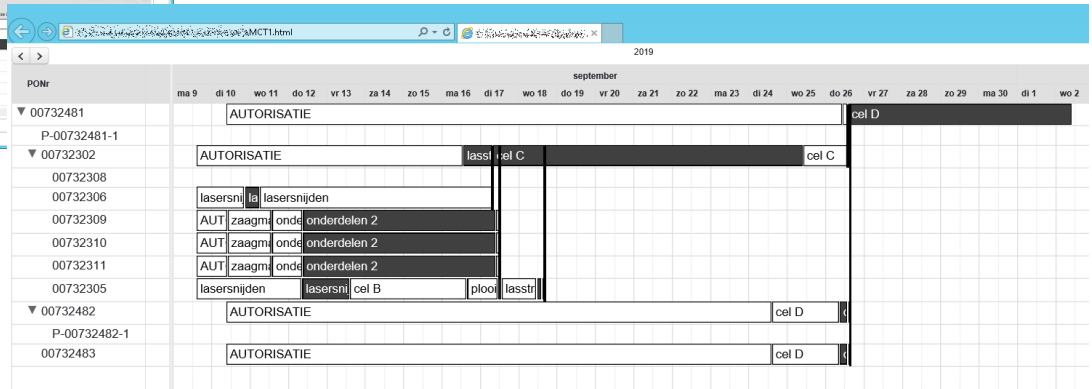
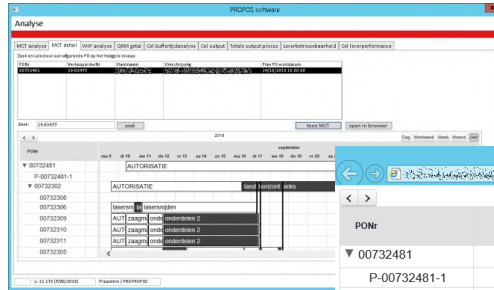
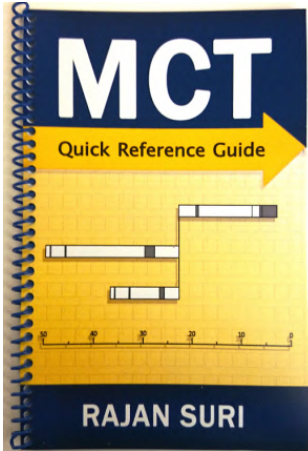
| | | | | |
|---------------|-----------------------------|--------------|--------|------------|
| 104353 | PWC Sheet Metal | BENDING 0,6 | WLD-01 | 17-11-2016 |
| P000238/004 | Johnson Tooling | BENDING 0,1 | WLD-01 | 18-11-2016 |
| 104624 | Sam Smith Construction | CLEANING 0,2 | WLD-01 | 21-11-2016 |
| 104362/002 | Advanced System Integration | CLEANING 0,2 | WLD-03 | 21-11-2016 |
| P000237/004 | PWC Sheet Metal | BENDING 0,1 | WLD-01 | 22-11-2016 |
| NUL000034/002 | Johnson Tooling | BENDING 0,7 | WLD-02 | 22-11-2016 |





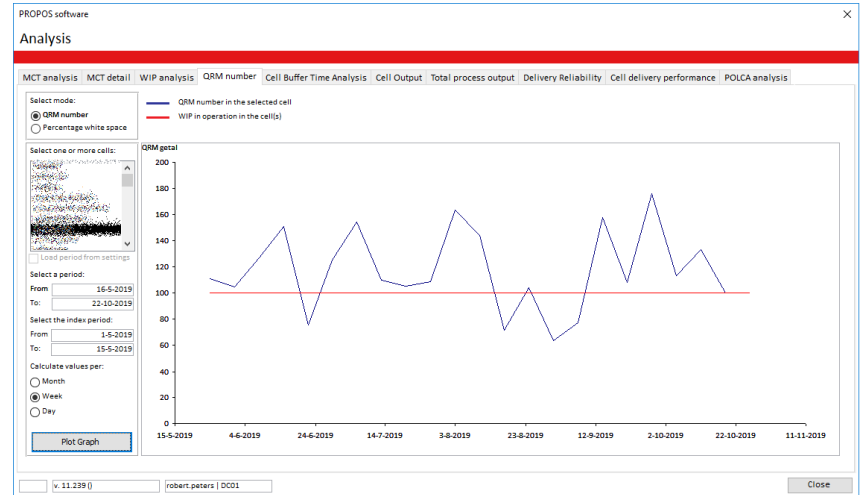
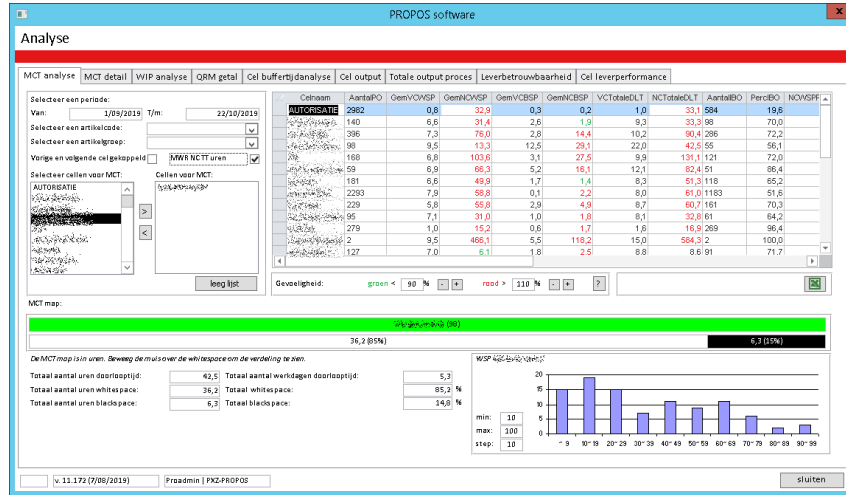
MCT: Manufacturing Critical-path Time

- /// MCT is a time-based metric that supports continuous improvement processes.
- /// PROPOS will generate MCT maps for your jobs or complete projects.

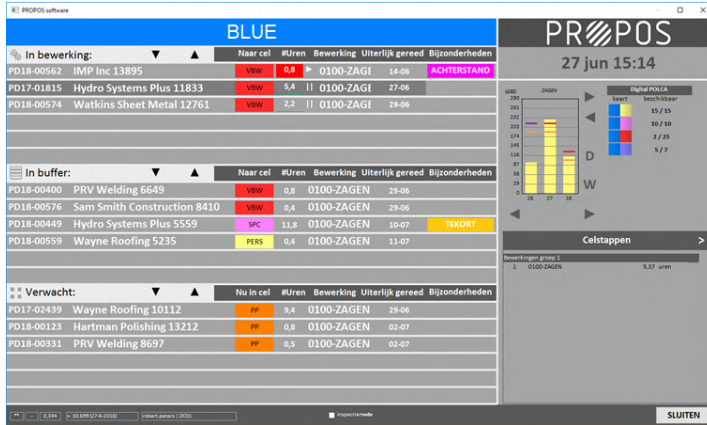


MCT

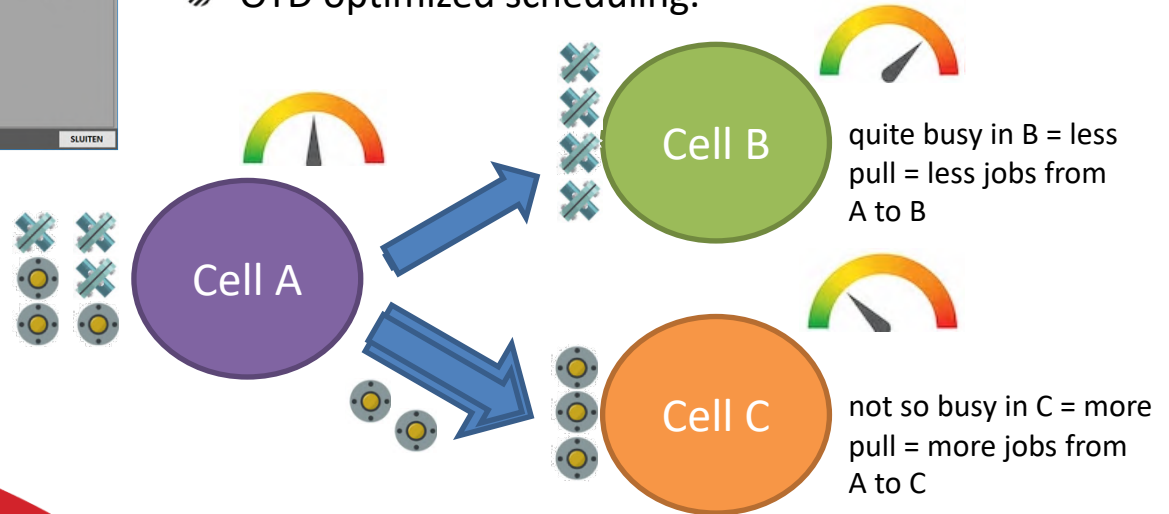
- PROPOS will help you analyze your white space per cell or for a certain route over a certain period of time, for certain items or for certain groups.



Real time pull production / smart scheduling



- Capacity pull production: real time load balancing.
- Small jobs automatically pass normal/larger jobs.
- OTD optimized scheduling.



Digital attachments

- Work instructions, drawings, pictures, etc. can be attached to each cell for each job.
- Pop-up can appear when starting a job.
- PDF files can be printed automatically (or on demand), saves time and paper.

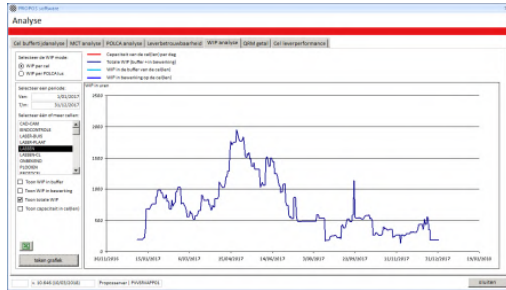
The screenshot displays the PROPOS software interface for a job. The window title is "PROPOS software". The main header shows "Job info" with a red bar, followed by "EN000399/001" and "Advanced System Integration ASI 10329 | Advanced System Integration ASI". The "Job Due Date: 22-11-2019" is displayed in the top right. Below the header, there is a "Custom apps:" section with a button labeled "ABC" and a "Print all PDF attachments" button.

The main content area is divided into four panels:

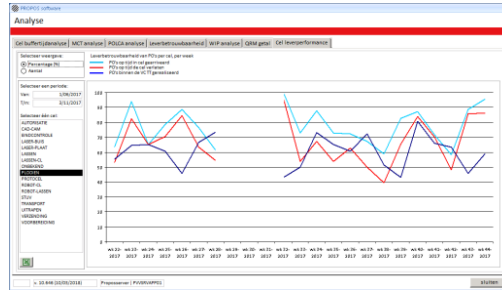
- JOB DETAILS:** A list of job parameters including Buffer Location, Current cell (LASSEN), Operation (3400_A), QTY (10), Est.TouchTime (2,83), Drying hours (0,00), Op. Due Date (5-11-2019 12:00:00), and two Characteristic fields.
- General job notes:** A section for "General work instructions for this job" with a scrollable text area and up/down arrow buttons.
- Cell operations:** A table showing "Operations to perform 1" with a single entry: "1 3400_A 2,83 hours".
- Attachments:** A section titled "Attachments" showing a list of files, with "Tekening123.pdf" visible. It includes up and down arrow buttons for scrolling.

At the bottom of the interface, there is a navigation bar with a left arrow, a right arrow, and four thumbnails labeled "300306-2-1", "Part1", "Part2", and "Part3". A "Close" button is located in the bottom right corner.

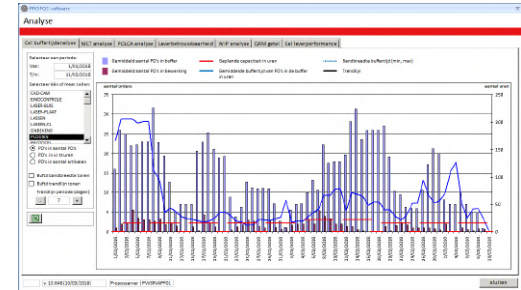
Analysis / insights for continuous improvement



- WIP charts to detect bottlenecks over time / excessive WIP.



- Per cell OTD performance.



- Average waiting times in relation to nr. of jobs and capacity.

Conclusion, wrap up

- Based upon QRM and its successes, PROPOS software offers unique features that directly support QRM implementations:
Support for QRM cells, digital POLCA, MCT maps and QRM number.
- Together with other features, PROPOS helps you to shorten lead times, improve OTD and cut overhead costs.
- If anyone needs our help with further improvement, using and understanding the analysis module, etc. please feel free to contact us.

Thank you for your attention.

Any questions?