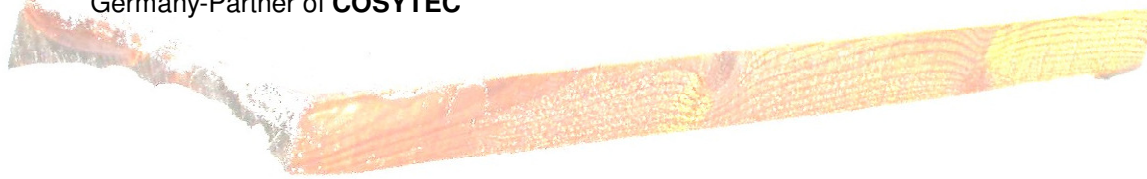


SIR Plan

*Solutions for
Information Management,
Resource Optimization and **Planning** Systems*

Germany-Partner of COSYTEC



Agility & cost optimization

– multi-purpose planning software for automotive industry –

Ulrich John, Harald Windisch

Email: {john, windisch}@sir-plan.com

- CHIP User's Meeting 2008 -

Agility & cost optimization

– multi-purpose planning software for automotive industry –

- outline -

SIR Plan GmbH

Automotive OEMs

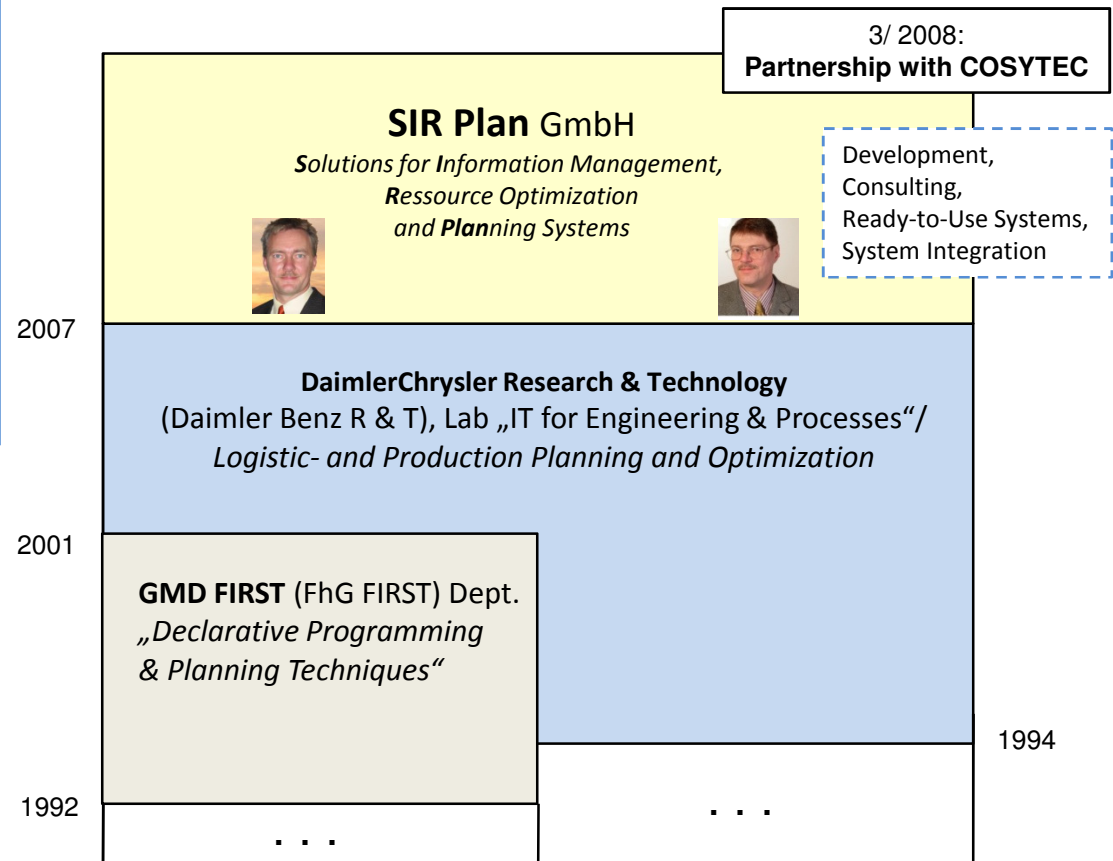
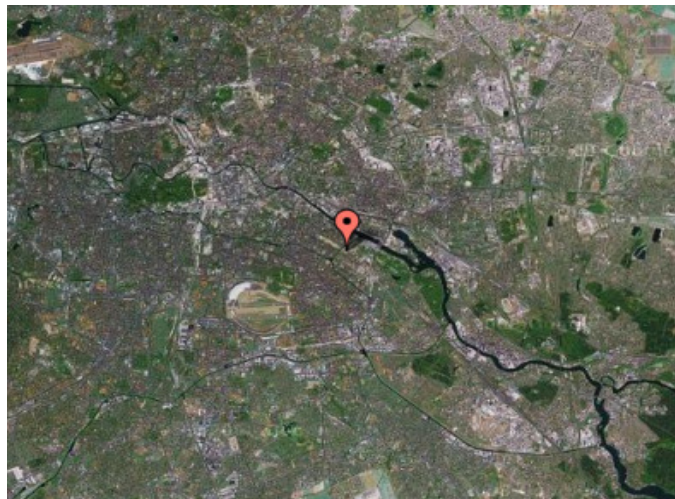
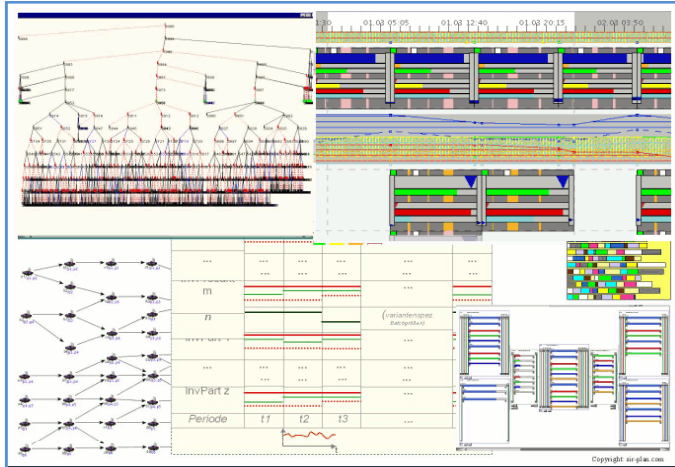
Selected planning problems
from automotive field

AutoMPP (Aspects)

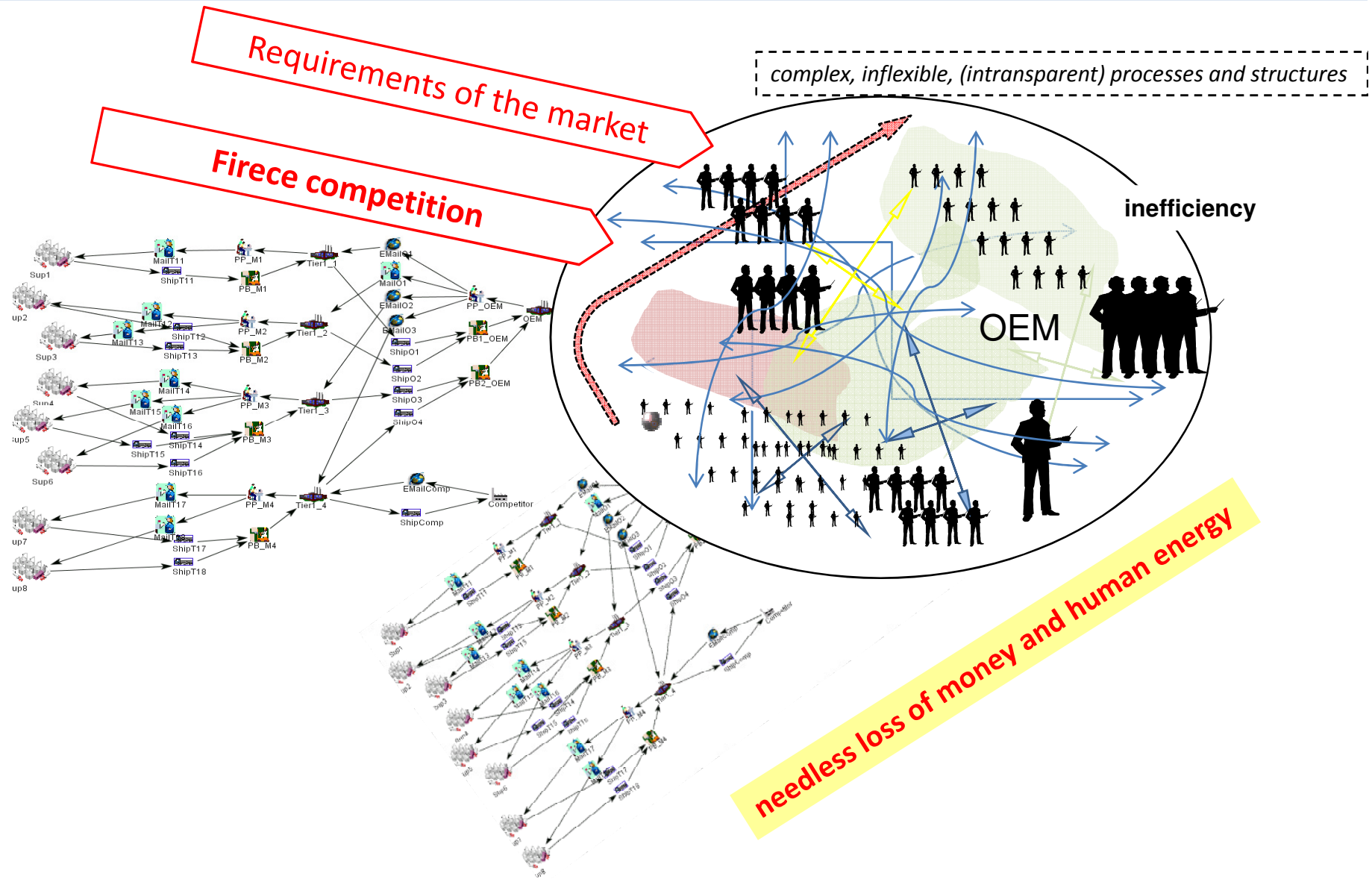
„GUI – impressions“

Conclusion

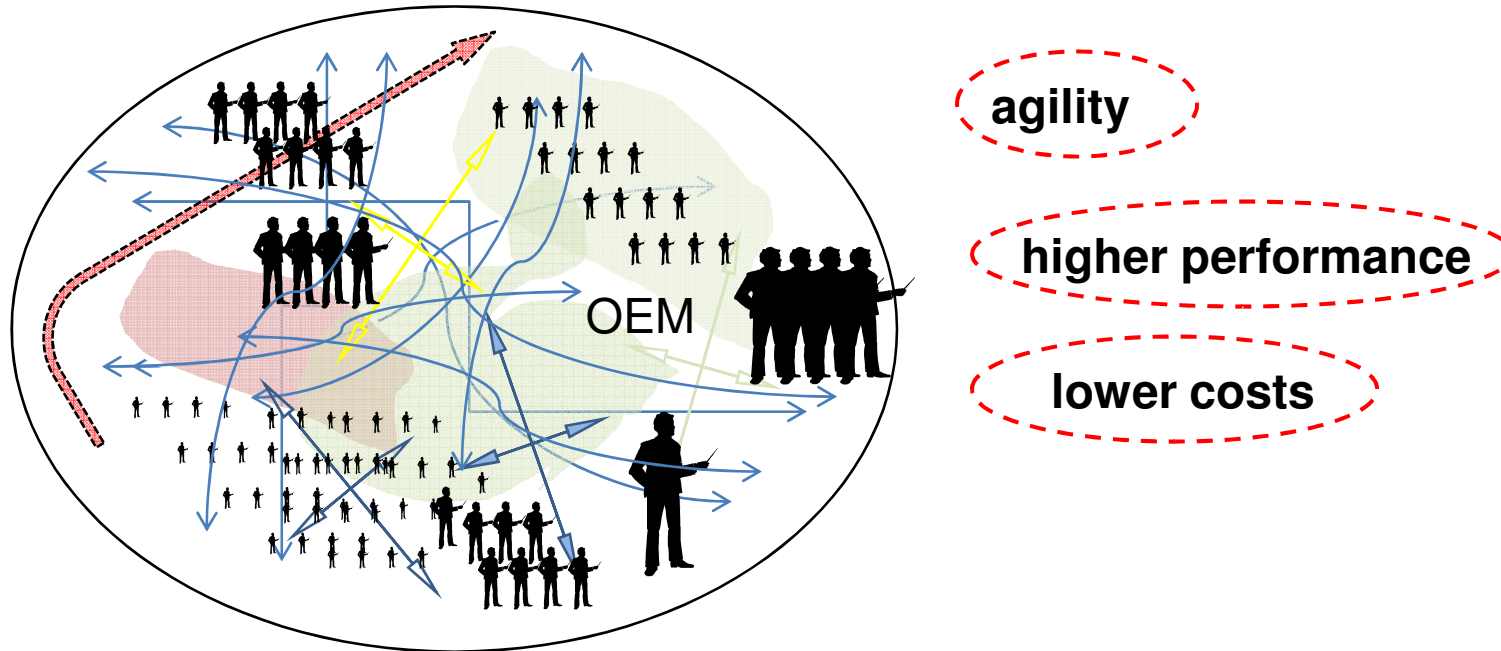
SIR Plan GmbH - Overview



Automotive Industry (OEMs – extreme perspective ☺)



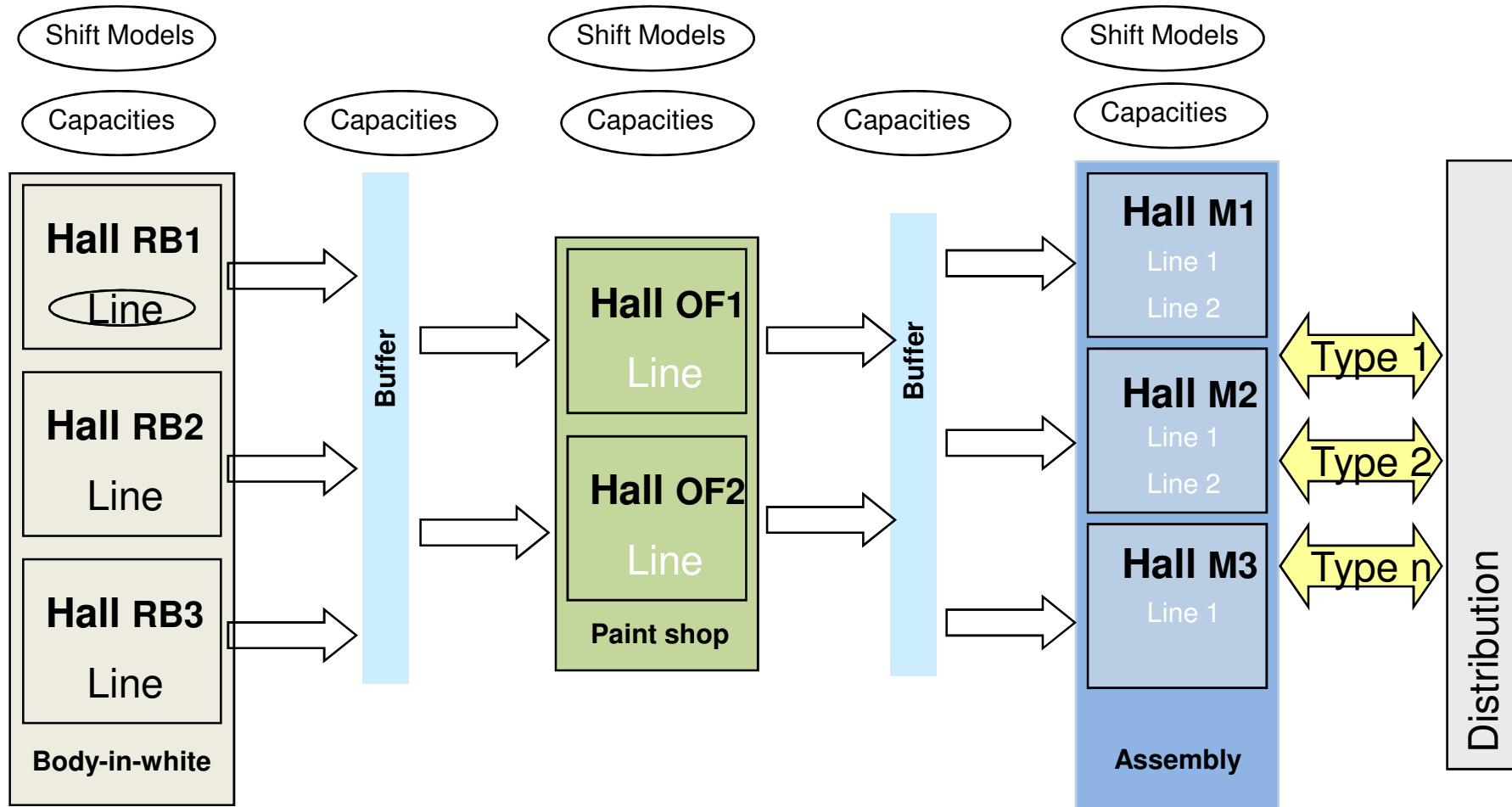
Automotive Industry – urgently needed



- introducing and management of *flexible processes*,
- transparency for the top management (and the owners),
- ***state-of-the-art planning and information management software***

Selected planning problems from Automotive Industry (restricted to chassis production)

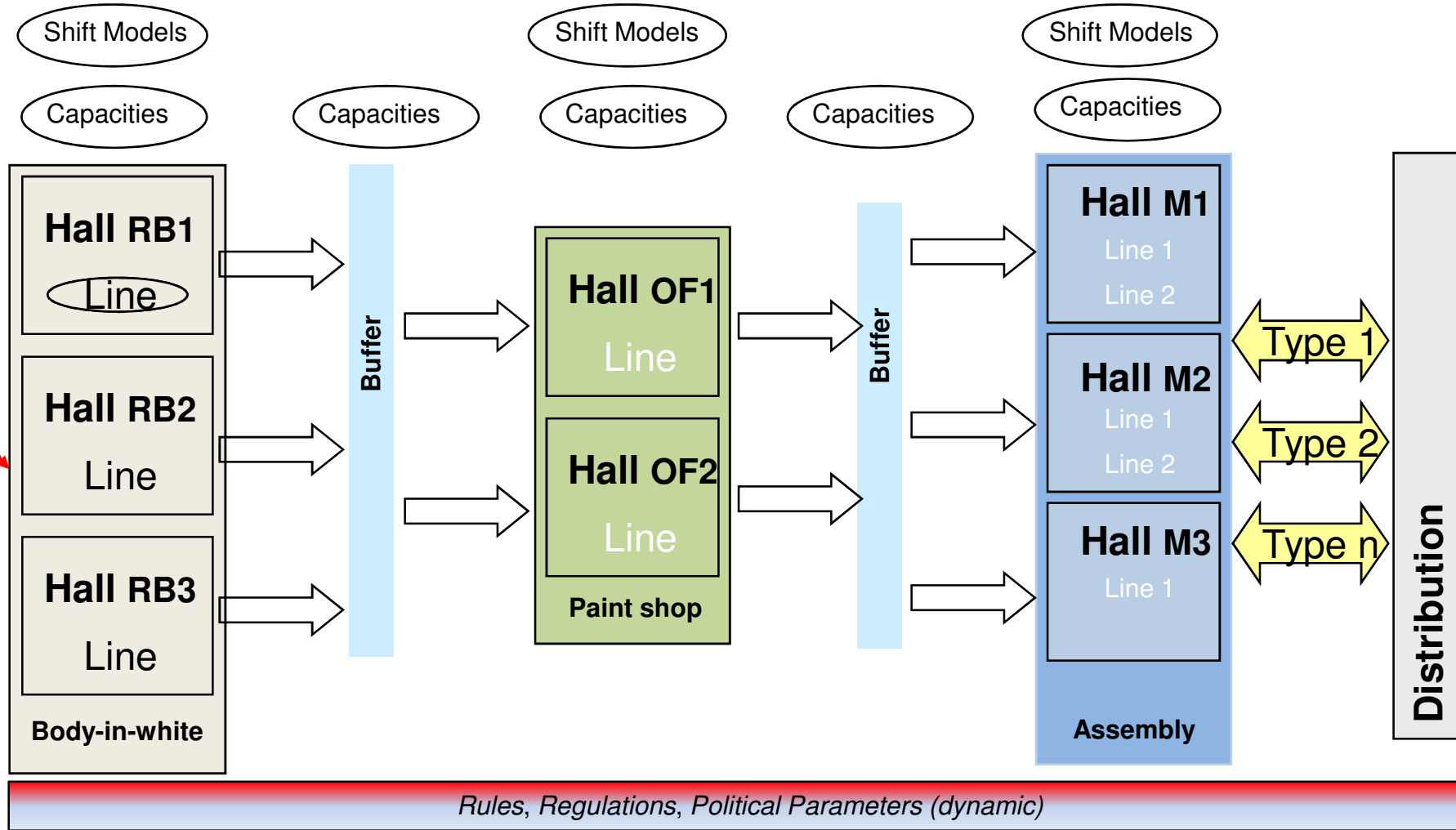
– suitable for constraint-based software approaches



Rules, Regulations, Political Parameters (dynamic)

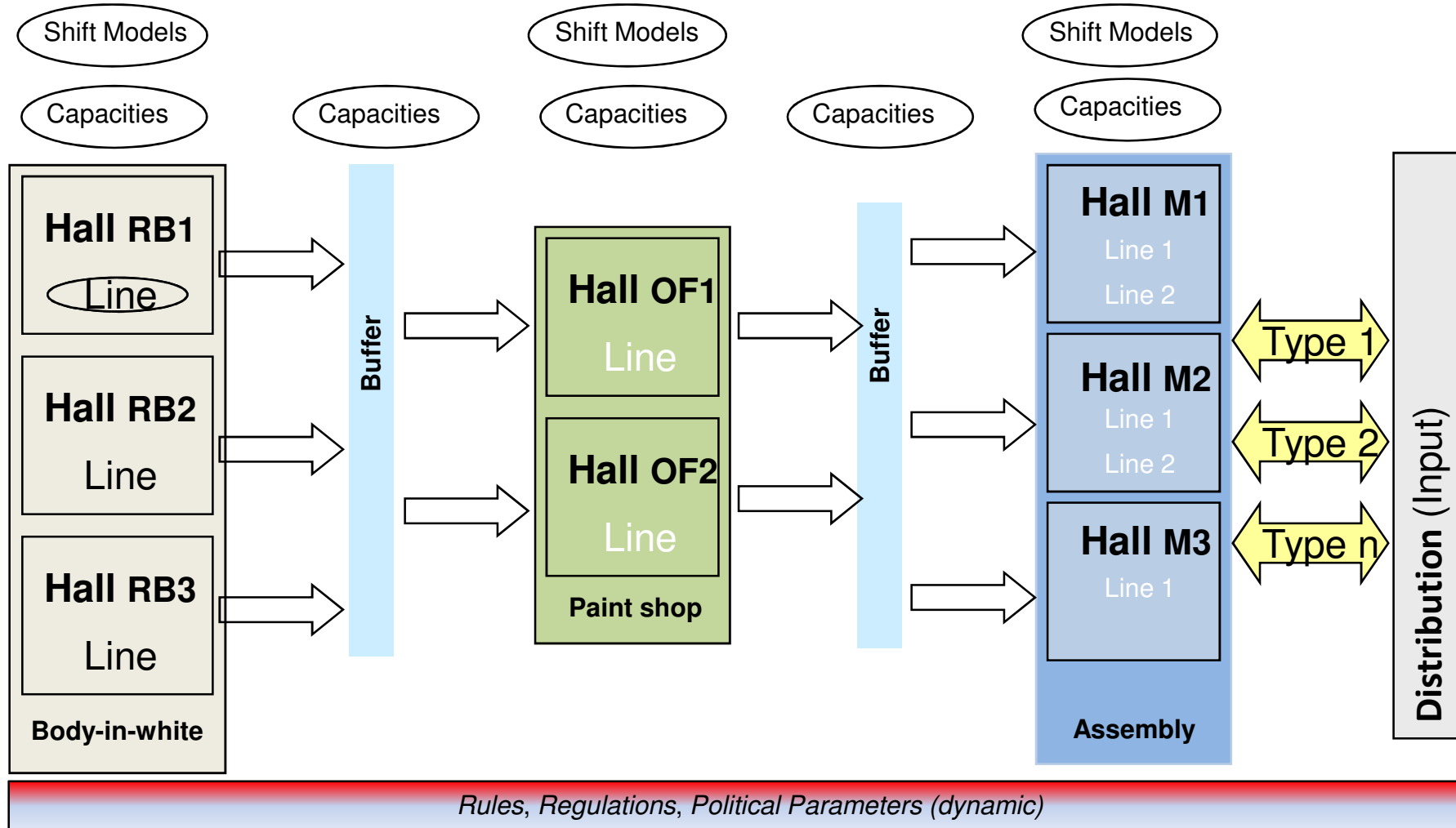
? Distribution Program of a plant (or plant group)

Supply constraints



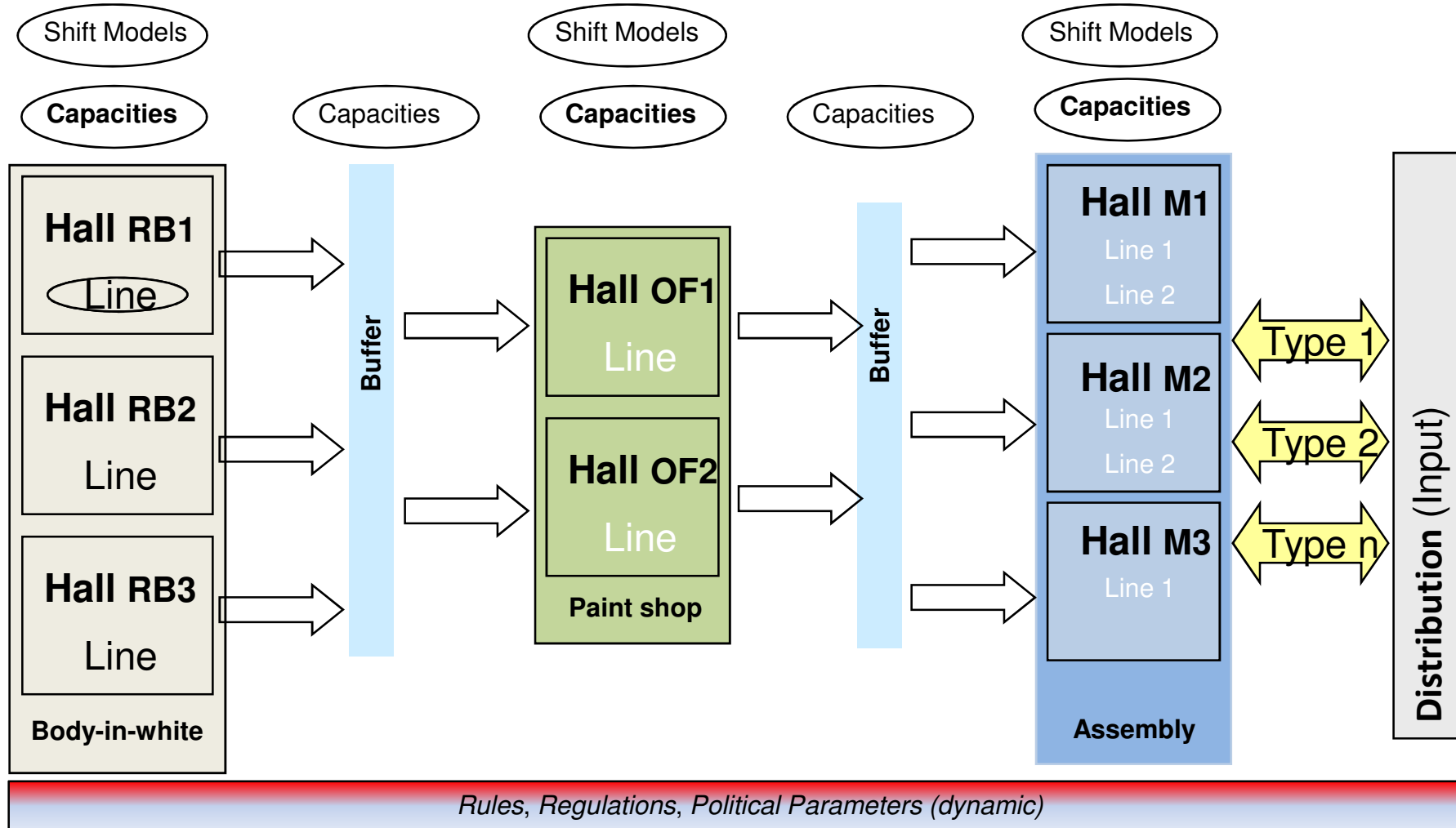
? Production Programs for each production stage

Body-in-white-program Paint-Shop-program

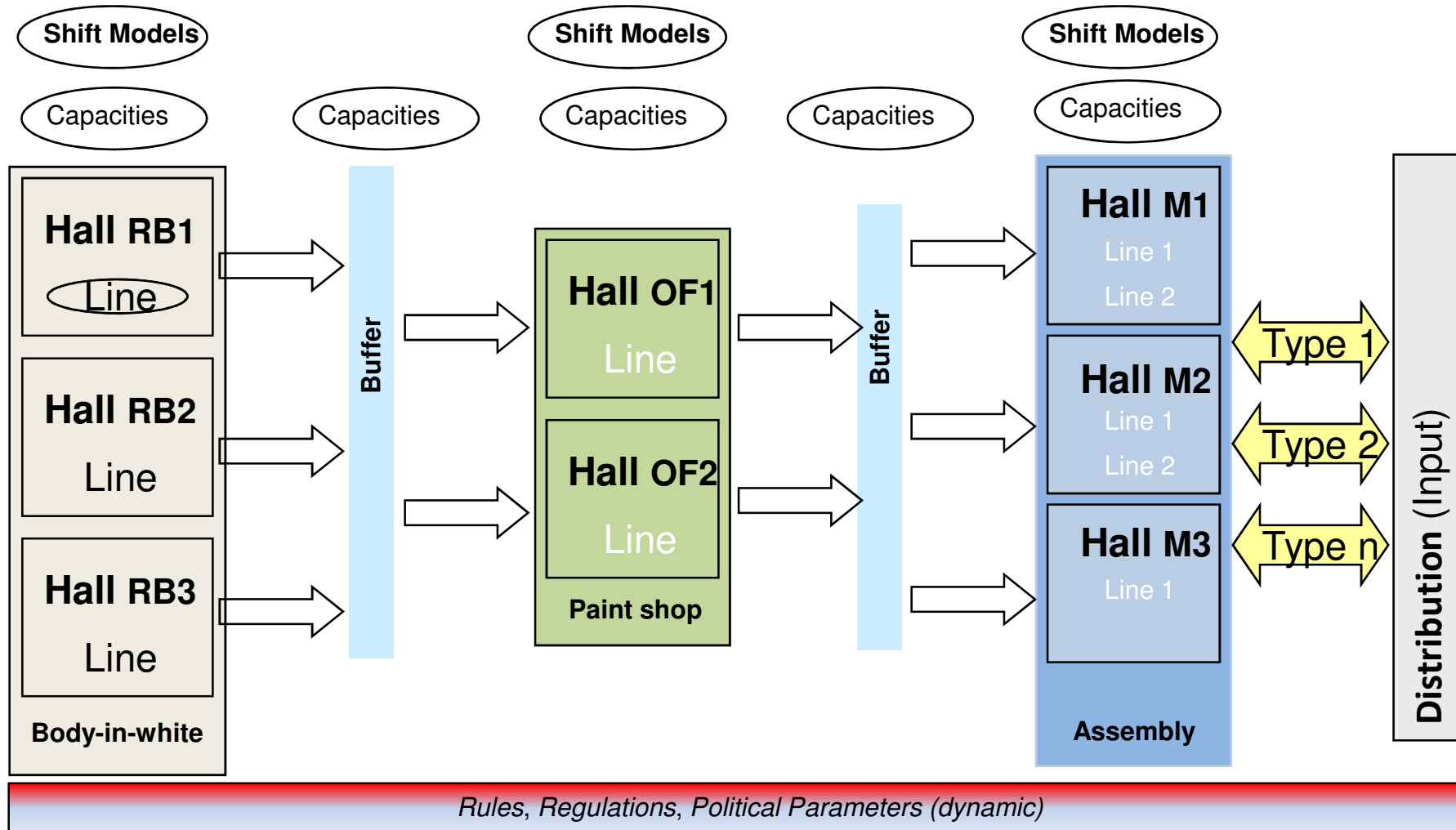


? Workforce planning

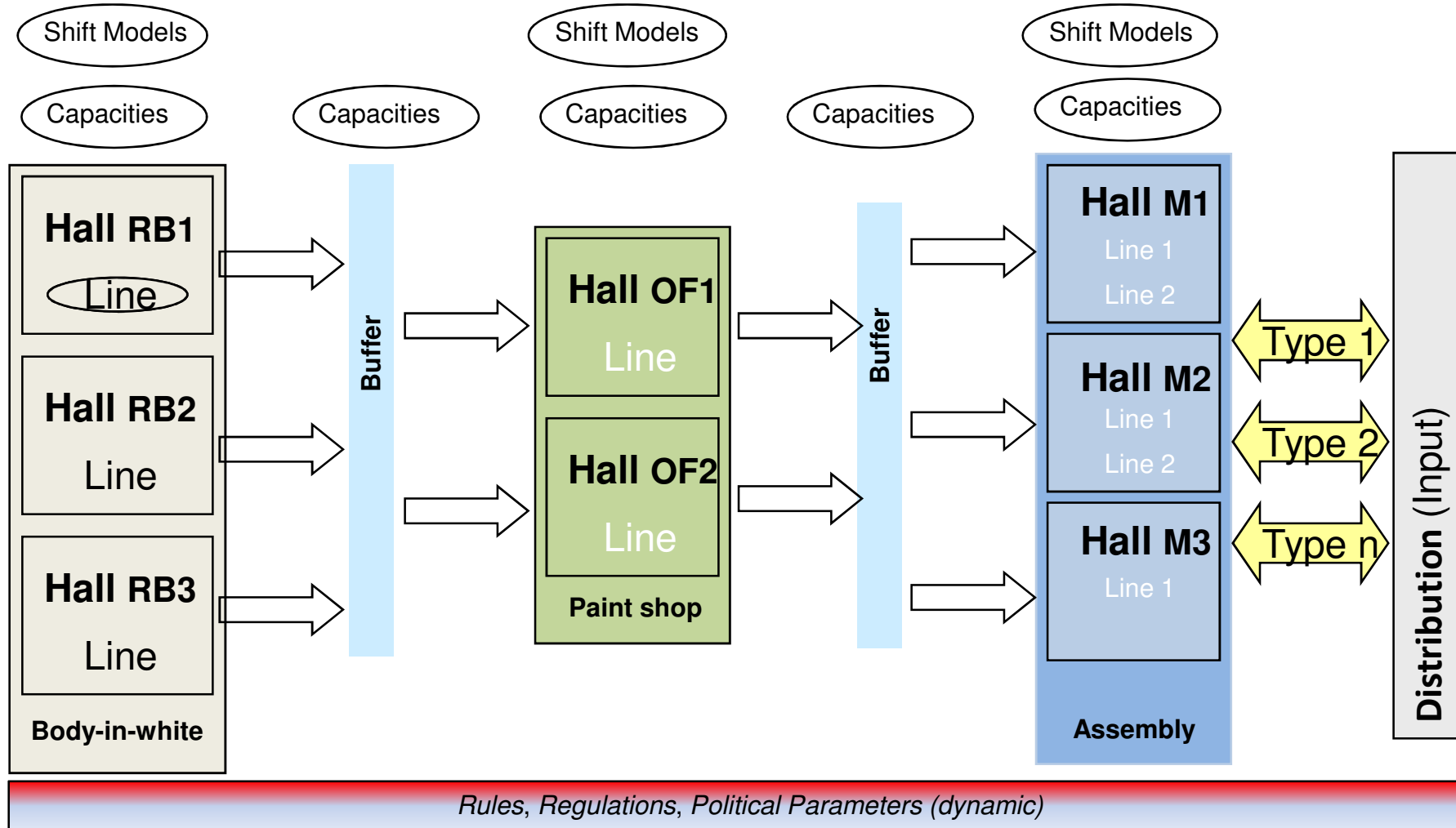
In which shift at which line, how many workers?



? Shift modell planning (AZM)

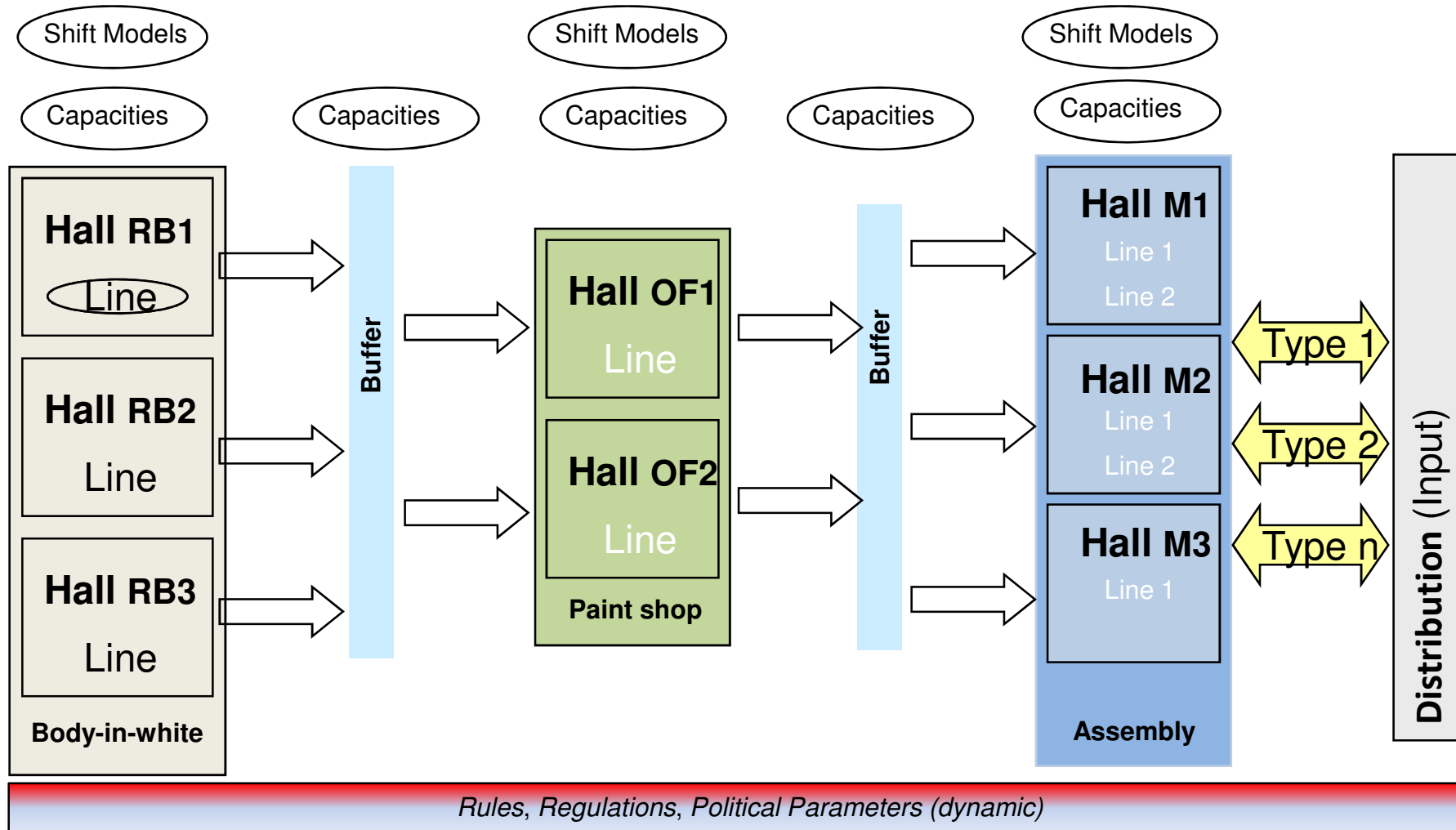


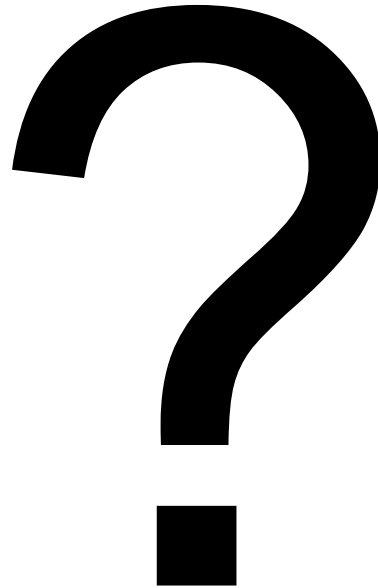
? Ramp up/ Ramp off



Strategic production planning

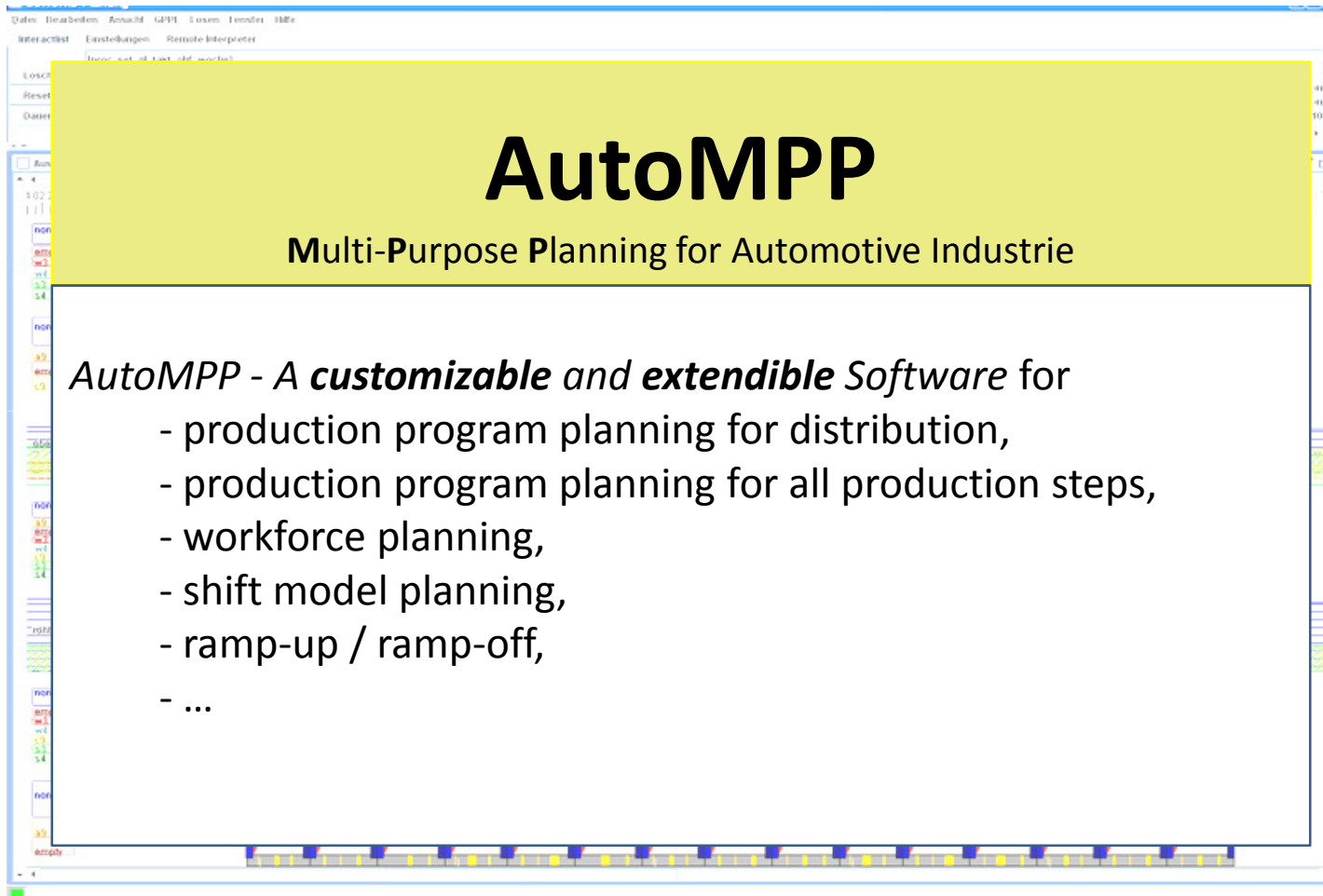
? New production lines, new buffers, buffer dimensioning





Constraint Programming/ CHIP

Our offer - *under development*



The screenshot shows a software window titled 'AutoMPP' with a menu bar (Datei, Bearbeiten, Ansicht, GUI, Layout, Fenster, Hilfe) and a toolbar. The main content area displays a presentation slide with a yellow header and a white body. The slide text is as follows:

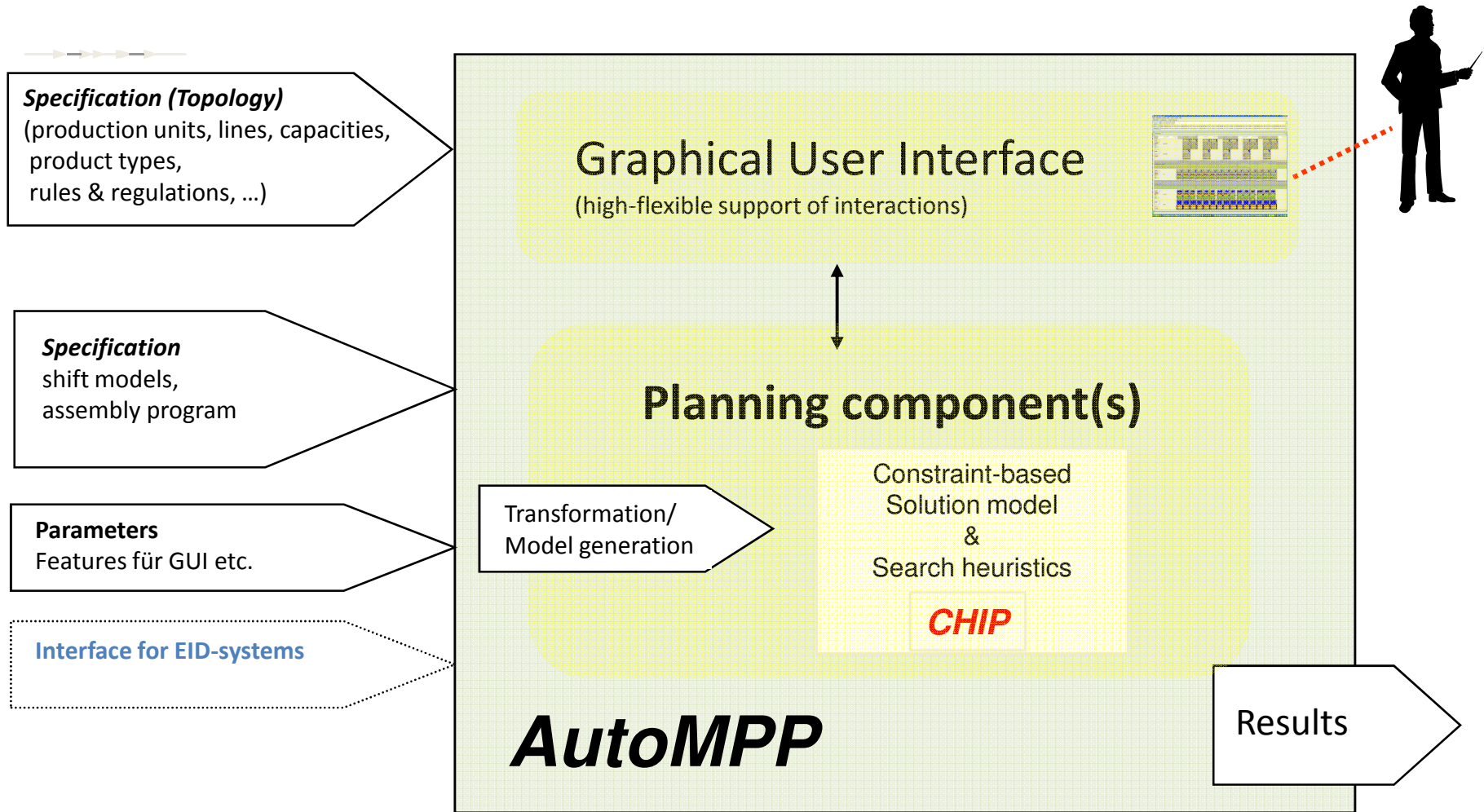
AutoMPP

Multi-Purpose Planning for Automotive Industrie

AutoMPP - A customizable and extendible Software for

- production program planning for distribution,
- production program planning for all production steps,
- workforce planning,
- shift model planning,
- ramp-up / ramp-off,
- ...

AutoMPP (architecture)



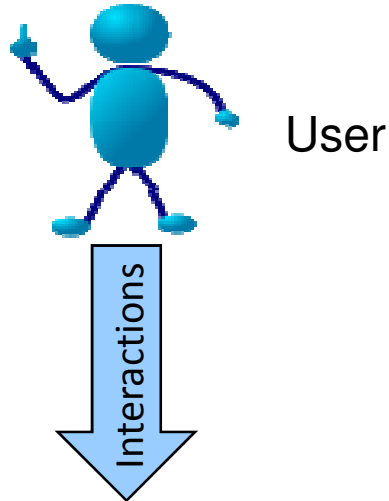
AutoMMP (examples for possible input)

- Given assembly program,
- Given clock pulses for production,
- Allowed buffer variabilities,
- Mix modification demands,
- ramp-up demands,
- Production capacities,
- Preferred shifts for shut off,
- Cycle times, ...

Further objectives:

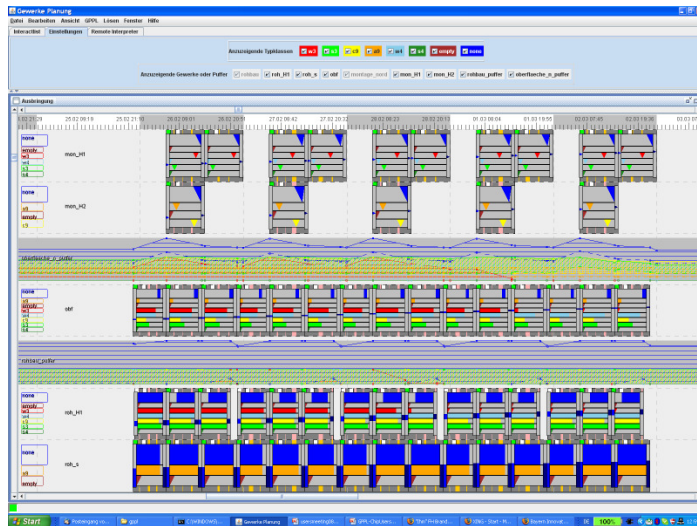
- Flexible maintenance of specification,
- Support of High-Level-Interactions,
- What-If-Analyses

AutoMPP – GUI/ planning component

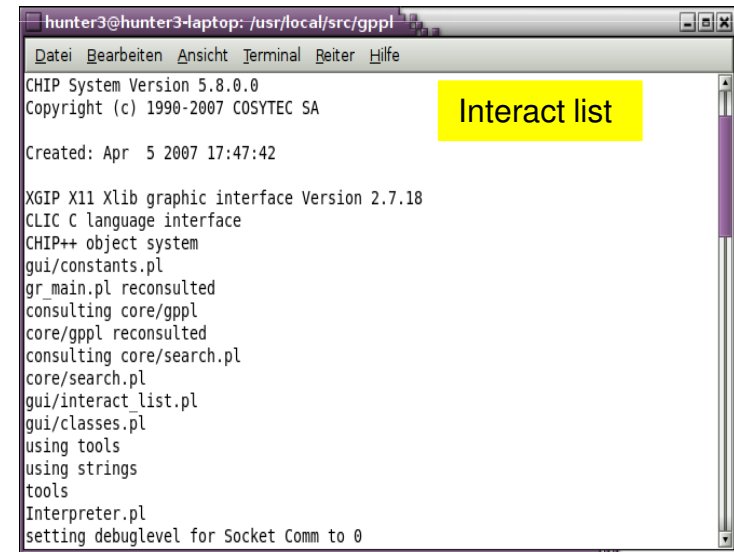
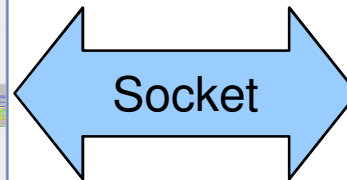


Interaction cycle:

- User interacts with java GUI
- Java GUI sends interaction (procedure calls) to Chip Process
- Chip Process calls socket.recv() to get user interaction
- Chip Process processes user interaction
- Chip Process sends result to Java GUI
- Java GUI shows new state and is ready for next user interaction

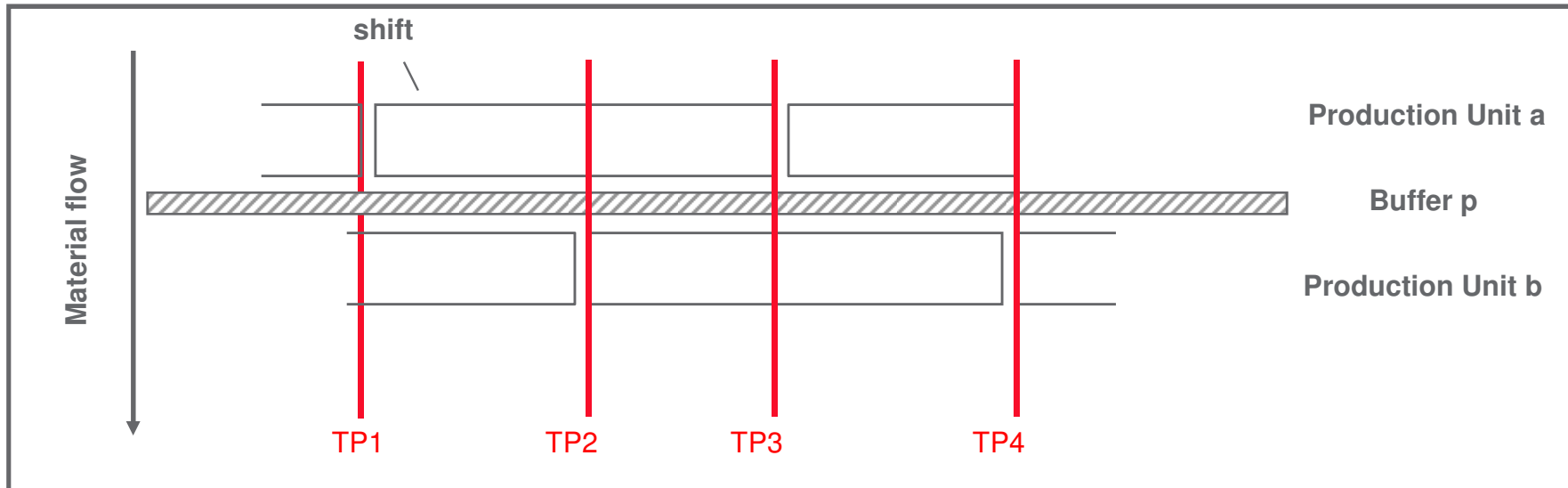


Java GUI

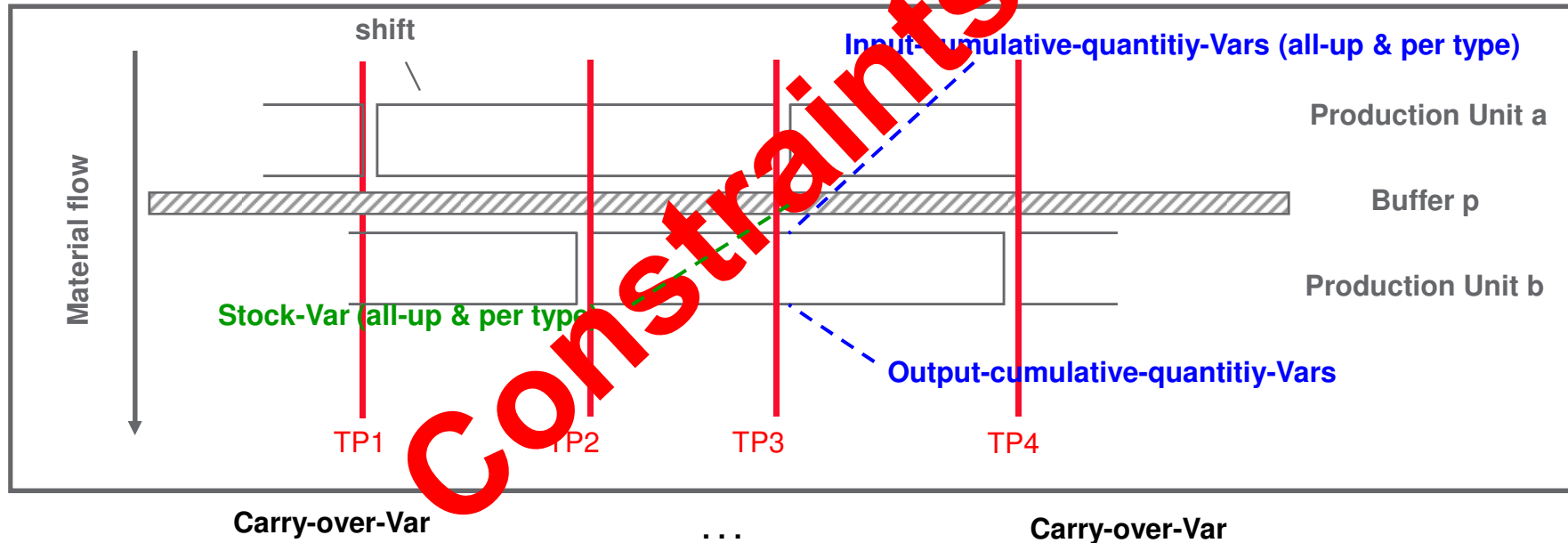


Chip Process

AutoMPP – relevant time points

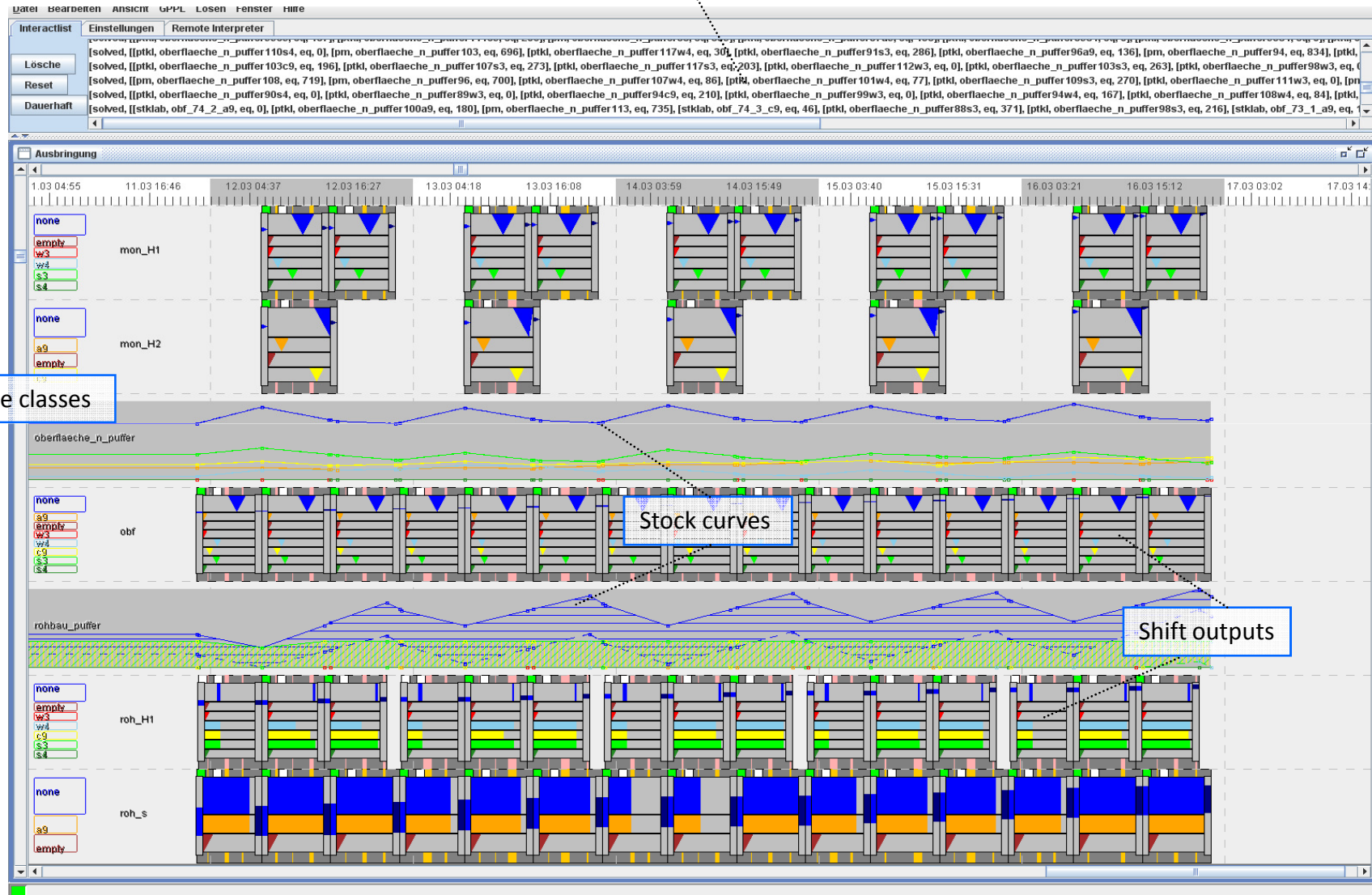


AutoMPP – Constraint Variables of frame model (selection)



AutoMPP – GUI impressions

Interact List



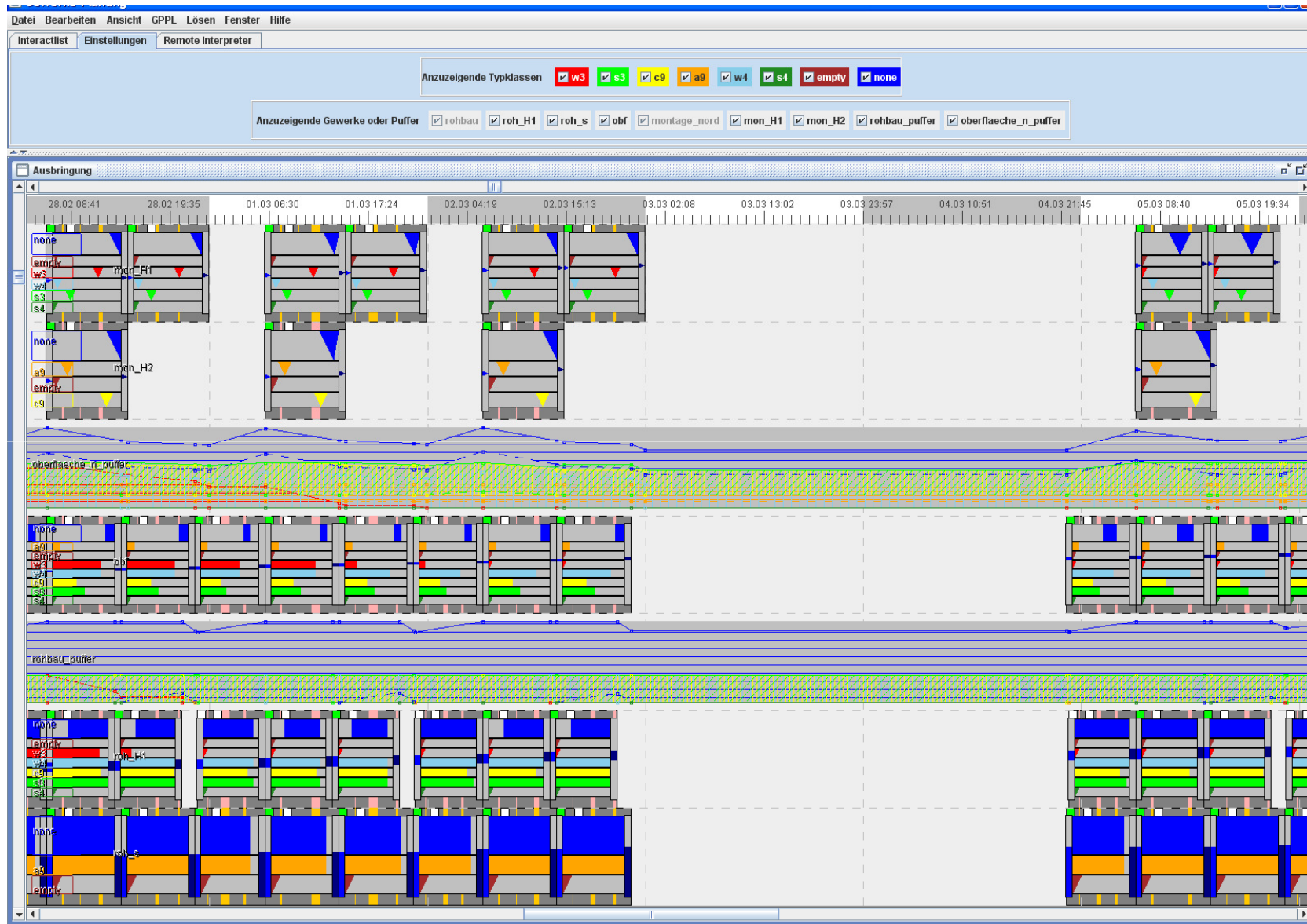
AutoMPP – 4 weeks without types



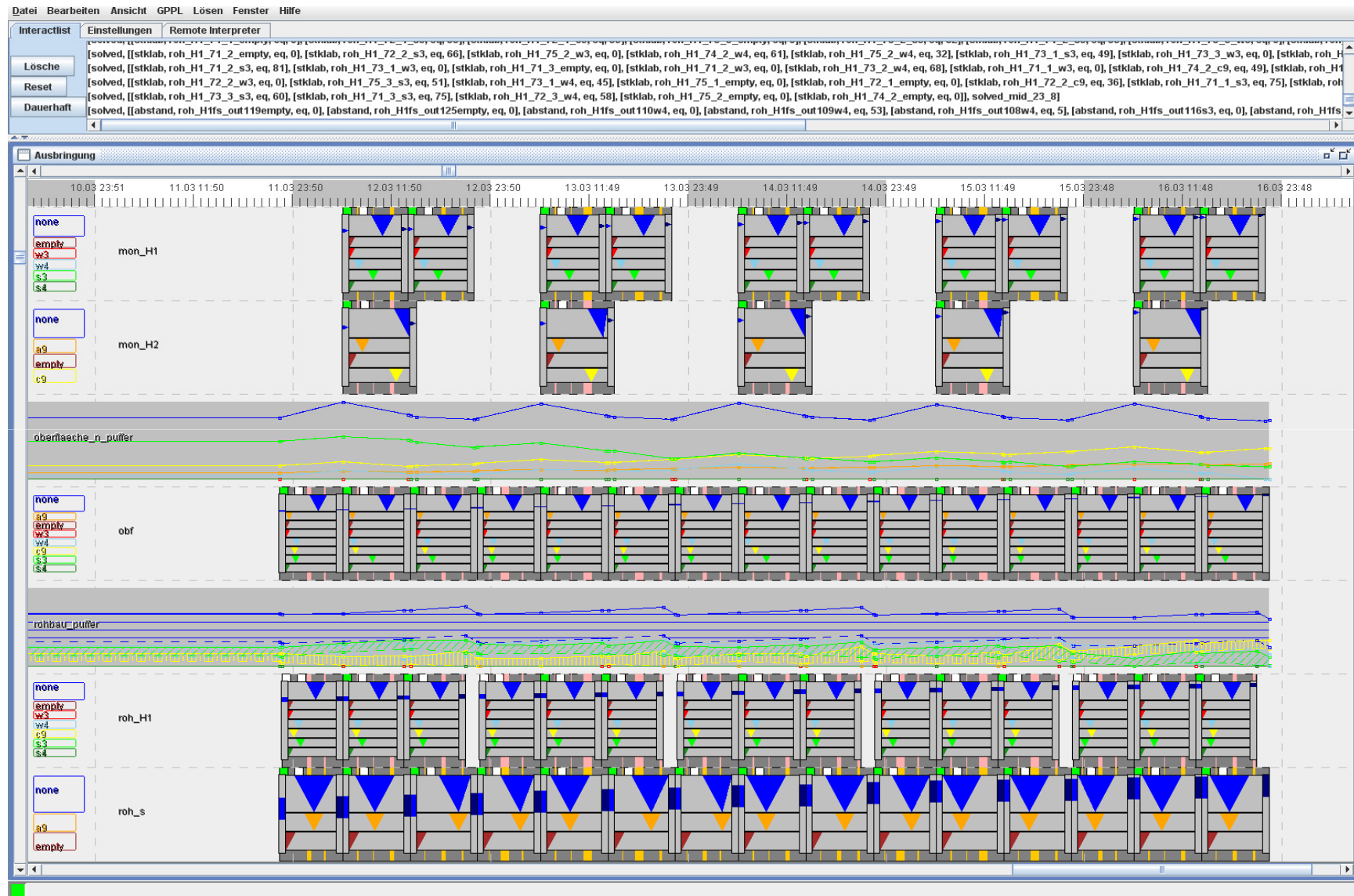
AutoMPP – 4 weeks with types



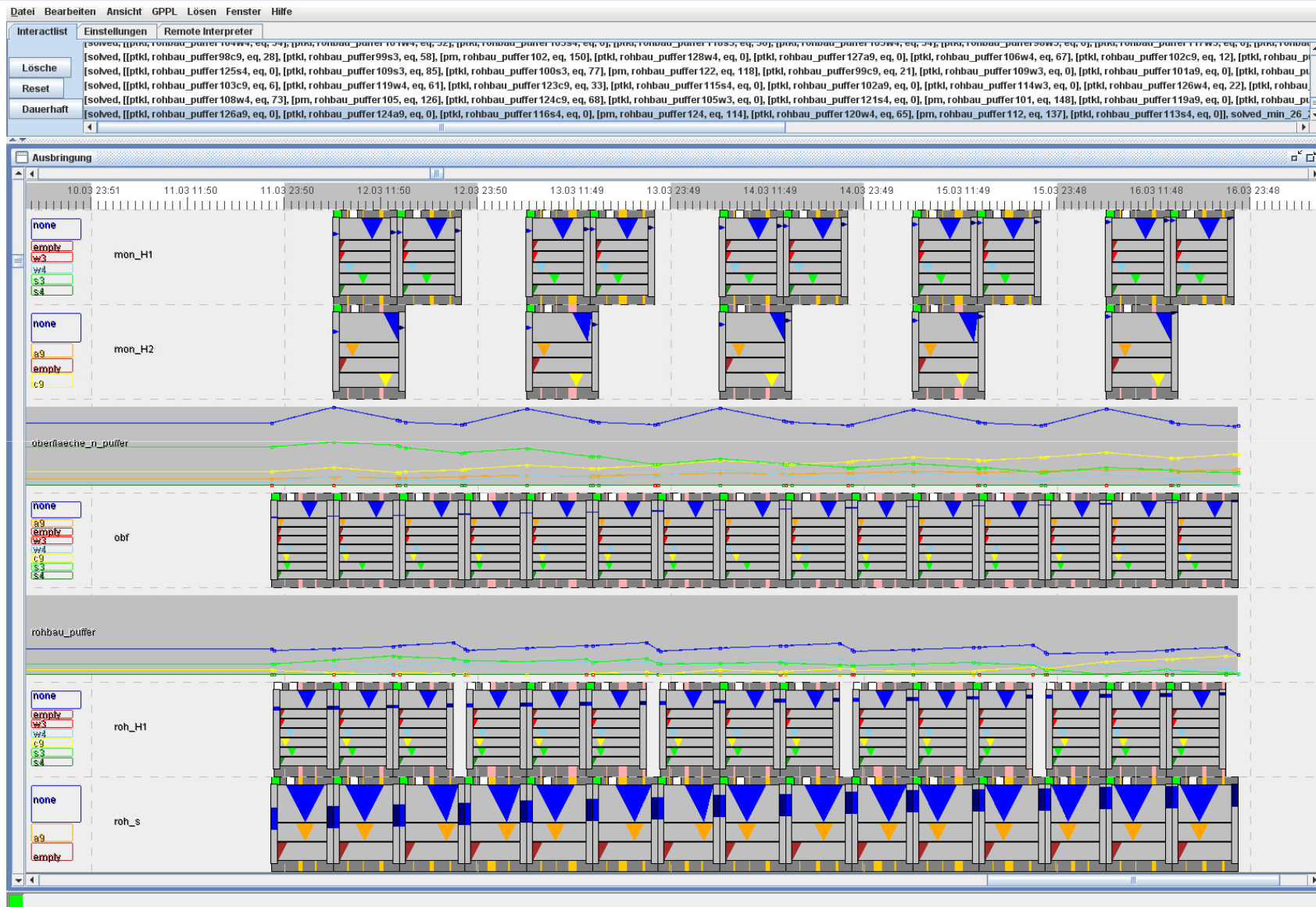
AutoMPP – ramp off



AutoMPP – impression II (partial solution)



AutoMPP – impression III (solution)



Conclusion

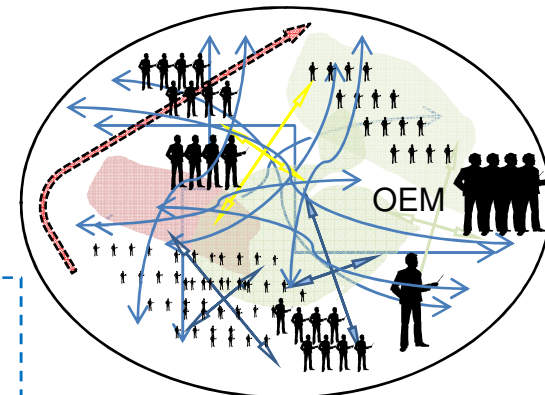
- *AutoMPP:*

- *CHIP-based planning software adresses some essential problems in automotive industry,*
- *flexible, customizable, extendible,*
- *contribution for **agility and cost-optimization***

- *State/ Future: evaluation, debugging, improvement/ enrichment of search heuristics, integration of scalability, ...*

- Other automotive-industry problems suitable for CP:
 - powertrain field: batch optimization, line balancing, layout planning, ...

- ? Synergies



AutoMPP

Multi-Purpose Planning for Automotive Industrie