



Project „Flexible Assembly Processes for the Car of the Third Millennium (MyCar)“

Problem Description

Highly reconfigurable assembly solution with permanent handling systems

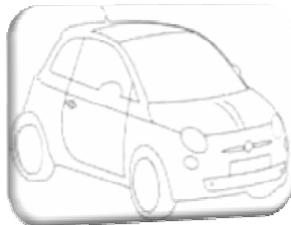


HARMS+WENDE



Problem Description

In the actual economic contest, car manufacturers require an improved **flexibility** of the production plant in order to quickly react the market variations, due to customers requests of new products. In this scenario, the chassis is the main part of a vehicle affected by the aesthetical changes.

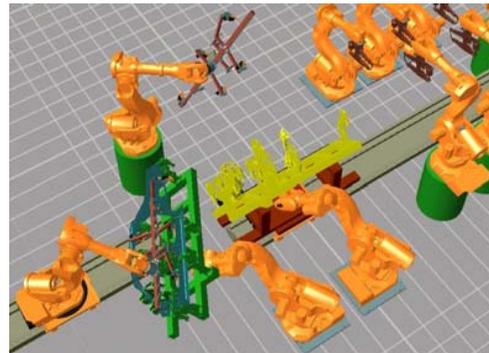


As a consequence of this flexibility, **a new production concept** must be envisaged, requiring the integration of several technologies

How Flexibility is achieved today

Current Flexible Bodyshop Trends

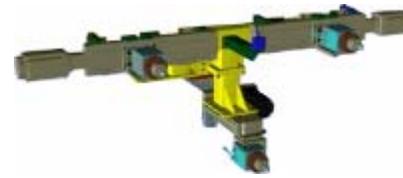
- **Highly robotic solutions** using standard and custom designed devices
- **Multi model** Geometry **End Effectors** or **tool changers** for model select.



How Flexibility is achieved today

Current Flexible Bodyshop Trends

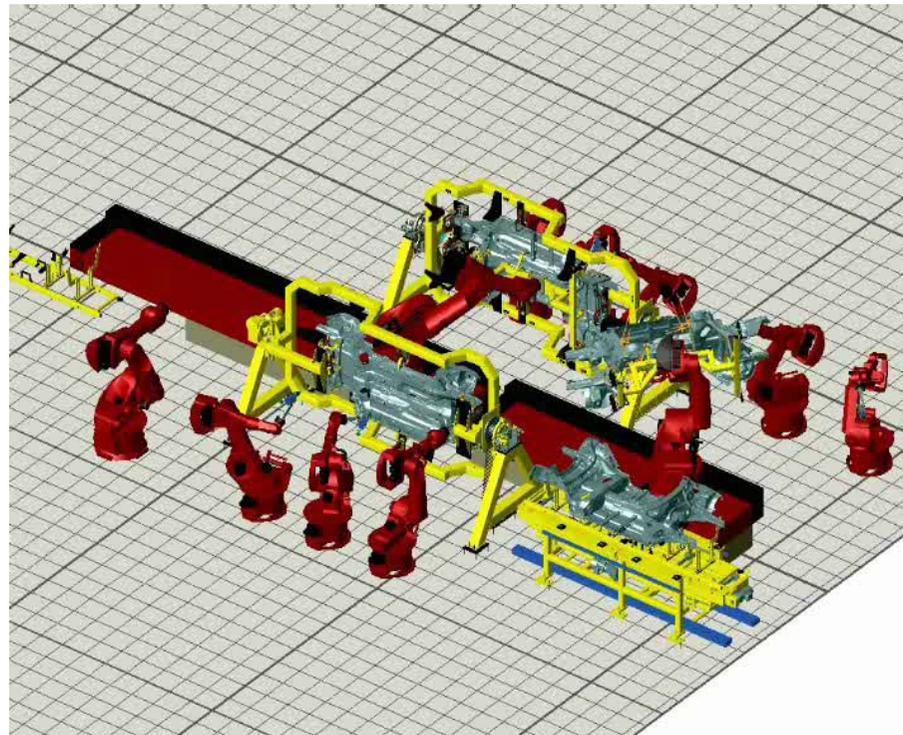
- Programmable Re-configurable tooling



How Flexibility is achieved today

Current Flexible Bodyshop Trends

- **Robot handoff systems** are replacing traditional transfer systems
- **Product path** through the bodyshops maybe **model dependent**



Problems coming from this approach

Lesson Learned OEMs (COMAU feedback)

- Current bodyshop complexity is **difficult to manage** and keep running at designed levels
 - **Monitoring and tracking** software is **required**
 - Find cycle time changes
 - Detect changes in Equipment Interaction
- **The dynamics of the bodyshop are affected as it runs and ages**
 - Robots degrade over time
 - Robot path programs will be changed
 - End effectors will be repaired
 - Strong impact in new model launch

Problems coming from this approach

Lesson Learned Line Builders

- Supplier **costs of developing and integrating new models** in robotic transfer type bodyshop solutions are **much higher than estimated**
 - Soft costs (programming, design, simulation, debug, integration) things that do not add value to the product are increased
 - The old formulas for robot integration do not apply (additional robot are not proportional to the number of models)
 - The effort required to achieve cycle time has increased
 - The supplier time in the bodyshop after shipping has increased

A NEW Production Approach

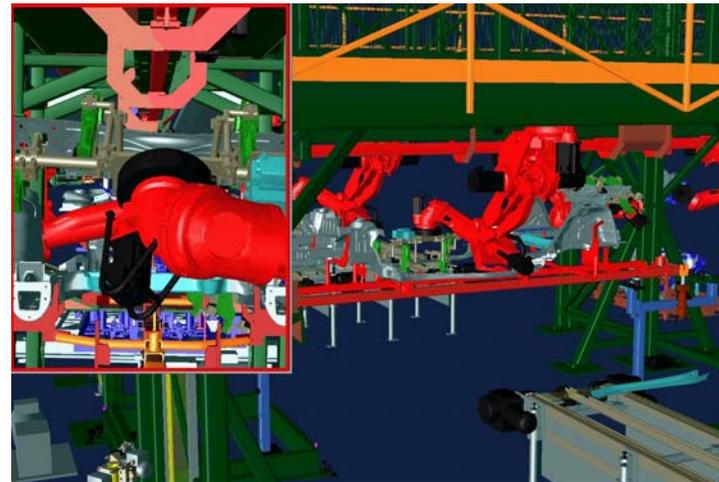
From today robotic

model depending equipment



A NEW Production Approach

... to reconfigurable Bodyshop based
on model INDEPENDENT solutions...



Targets

Production Flexibility		
	Current State of Art	MyCar
Mainlines capability	2	5
Production level	50 j/h	70 j/h
Process Reconfiguration time	slow	fast
Reconfiguration effects on the current production	yes	no
Real zero loss launch	No	Yes

Industry sustainability		
	Current State of Art	MyCar
Investment costs for process reconfiguration	Significant	-15% Investment
Running costs	Significant Maintenance costs due to complexity	Reduction >10% on maintenance, energy consumption
Passive time (handling)	up to 30% of the cycle time	Reduction up to 10% of cycle time

General	
Reduce assembly related costs by ca. 15%	
Decrease equipment contents by about 5 % (higher equipment availability)	
Costs related to rejected/faulty products - Reduction of undetected quality defects during assembly process by about 10%	