Our DDMRP journey in an aerospace company: multi-sites located – international environment
Companies introduction
Partner for detailed machined parts and workpackages assemblies in aerospace
Facing continuous growth challenges

Figeac Aero Group targeted growth (€ millions)

- 31/03/13: 137
- 31/03/14: 162
- 31/03/15: 204
- 31/03/16: 255
- 31/03/17: 370
- 31/03/18: 500

Up to date growth perspective
Know how

- Machining of detailed parts
  From 10 min to 10h machining time per part
- Configured sub-assemblies (ATO)
  Several hundred assembly hours

Constraints

- Production leadtime >> Customer tolerance time
- Small batches / high product mix:
  2 to 50 parts / month in average
  7 000 Sales references, 25 000 active items

Production means

| 150 Machining equipments |
| 9 production sites |
| 1 700 people In the world |
Too many Excel files!
Too many e-mails!
High level of expediting!

Become European leader for aerospace subcontracting... with well managed supply chain

2018 Target
300 M€
OTD: 50%
New Business Unit organization
And subsidiaries creation

2011 MRPl implementation
OTD: 70%
Complexity and risks increased
Inventory explosion
WIP explosion

2012 Target
100 M€
OTD: 60%

2013 New Business Unit organisation
OTD: 85%

2015 Target
220 M€
OTD: 95%

2007 Target
60 M€
OTD: 50%

1989 Target
500 k€
OTD: ?

Focus on operational performance improvement

Industrial experts team

Supply Chain Management

agilea CONSEIL

2 Strategic activities

agilea FORMATION

R & D

1st DDMRP competence center in France

Change management
> No shared stock strategy
> Cross-sites flows not under control
> Use of additional Excel applications on top of standard MRP
> Silo organization and site focus
Agile and efficient Solution

Innovation and entrepreneurship spirit
March – May 2015

CDDP On line Training
3 people trained

Project team definition
cross-sites
10 people

Consulting team
2 people

Teams training
Team adhesion

Intuitive and attractive

Functionnalities coverage

Robustness

Scalability

Tool selection

May 2015
Multi-level BoM

Multi-sites production

Quite frequent shortages on assembly line

Issue for detailed parts WO sequencing

Pilot choice

June 2015
Simple product: Karman
- 4 Finish Product configuration
- 40 Items / 3 levels BoM
- 3 production sites
- Machining / Sheet Metal /Assembly

Complex product: A320 Floor
- 4 Finish Product configuration
- 530 Items / 11 levels BoM
- 4 production sites
- Machining / Sheet Metal /Assembly
Demand Driven Material Requirements Planning

<table>
<thead>
<tr>
<th>Strategic Inventory Positioning</th>
<th>Buffer Profiles and Levels</th>
<th>Dynamic Adjustments</th>
<th>Demand Driven Planning</th>
<th>Visible and Collaborative Execution</th>
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<tbody>
<tr>
<td>Modeling/Re-modeling the Environment</td>
<td>Plan</td>
<td>Execute</td>
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1 → 2 → 3 → 4 → 5
Disco analysis => global picture of flows cross BUs

Main flows within a BU
Karman product – 4 configurations

Material Supplier

FGA Figeac - FR
Machining – Deburring – SP

FGA Tunisia
SM cutting – HT – machining – SP – Sub-Assy

FGA Figeac - FR Final assembly

Supplier Detailed part

Cust.
A320 – T11 Floor product – 4 configurations

FGA Figeac - FR
Machining – Deburring – SP

FGA Figeac -FR
Sub-assembly

FGA Picardie -FR
Final assembly

Supplier
Detailed part

FGA Tunisia
SM cutting – HT – machining – SP– Sub-Assy

Demand Driven Material Requirements Planning

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<th>Commandement des buffers</th>
<th>Assainissement dynamique des buffers</th>
<th>Planification phasée par la demande</th>
<th>Exécution Viable et Collaborative</th>
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Material Supplier

Cust.
Material Supplier

FGA Tunisia
SM cutting – HT – machining – SP – Sub-Assy

Cumulative leadtime 100 days

FGA Figeac - FR
Machining – Deburring – SP

FGA Figeac -FR
Sub-assembly

FGA Picardie Assembly

Demand leadtime: 15 days

Supplier Detailed part

Demand Driven Material Requirements Planning

1. Positionnement stratégique des stocks
2. Commandement des stocks
3. Assainissement des stocks
4. Planification des commandes
5. Exécution, veille et collaboration
Material Supplier

**FGA Figeac - FR**
- Machining – Deburring – SP

**FGA Figeac -FR**
- Sub-assembly

**FGA Picardie**
- Assembly

**FGA Tunisia**
- SM cutting – HT – machining – SP – Sub-Assy

**Supplier Detailed part**

**Demand leadtime : 15 days**

**10 days**

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**Demand Driven Material Requirements Planning**

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<th>Modification / Evolution de l'environnement</th>
<th>Planification</th>
<th>Exécution</th>
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Buffer sizing considerations

> **ADU:**
  - 6 months rolling forecast for level 0, BoM explosion for lower level components

> 15 buffer profiles:
  - low / high variability
  - DLT / procurement leadtime families
  - BUs independant

=> Need to update leadtime and transit time!
Parts Replenishment

**MRP2 engine**

- **Av.:** 15.2
- **σ:** 6.8
- **Range:** 25

**DDMRP engine**

- **Av.:** 7.9
- **σ:** 3.9
- **Range:** 10

**Machining** → **Assembly** → **Finish product**

**Demand Driven Material Requirements Planning**

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- **Preparation**
- **Demand Creation**
- **Demand Planning**
- **Order Generation**
- **Order Processing**
Parts inventory level

**MRP2 engine**

- **Av.:** 9.9
- **σ:** 5.8
- **Range:** 22

**DDMRP engine**

- **Av.:** 8.6
- **σ:** 3.7
- **Range:** 15
Adjustements:

> ADU:
  * Weekly dynamic adjustment
  * No PAF

> Robustness of buffer profiles simulated with past demand information

> Phase-in / phase-out: manual adjustment process
> Users training: DDMRP principles and R+
> Short term planning rituals
> Visual management
> Inventory control with control card, by exception

- Multi-sites
- Inter-operability
- Robust

User friendly
Visual
Simple to use
> Simple interface with ERP / manual

> Weekly -> Daily WO generation process

> Relative priority for execution by workcenter
Adjustment of buffers during deployment

- Real variability
- Leadtime profiles => leadtime updated
- Spike detection treshold : 80% of Red Zone
  
  (batching of customer order)
> Request from other sites / BU to deploy in their units...
> ... and on additional parts

> # references in DDMRP scope extended
> Extension to major Supply Chain stakeholders: (subsidiaries, external suppliers)
Collaboration
Anticipation
Visibility
Serenity

Accountability

amélioration continue
-25%
+20%
-90%

stocks
OTD
rupture de chaîne
Lessons learnt
> First small perimeter: lack of flow BUT ability to identify and fix quickly all potential issues (ADU, Special cases, ...)
>
> Transition phase: load & capacity – supplier forecast considerations
  • Tag DDMRP Orders
  • Load based on planned orders => mechanism to plan realistic load / supplier visibility – SS = red zone
>
> Configured products with low ADU: LTM => Stock Buffer (decoupling power)
>
> Training .... Training ... training...
>
> Daily management discipline => management involvement
>
> Buffer at the point of use = shared visibility
70% of assemblies under DDMRP calculation
To successfully achieved the demand driven transformation ...

- Unit Cost
- OEE culture

Flow-centric culture
Cash velocity per constraint resources

> On going plan for CDDL in house training

Timer buffer and DBR+ ?

Deployment
End 2016
QUESTIONS?

... Enjoy your DDMRP journey