



# Teamcenter – CATIA V5 interface in RENAULT

Eric Delaporte  
GDG specification team manager  
[eric.delaporte@renault.com](mailto:eric.delaporte@renault.com)

PRS 3331 B1



20/05/2004

- ▶▶ **Renault presentation**
- ▶▶ **GDG presentation**
- ▶▶ **History of CMI in Renault**
- ▶▶ **GDG – CATIA V5 Project**
  - ▶ **Exploratory**
  - ▶ **Project**

## PRODUCT RANGE



## KEY FIGURES 2003

Worldwide sales (PC+LCV)

**2,388,958**

Revenues

In billions of euros

**37.52**

Operating Margin

In billions of euros

**1.402**

Net Income

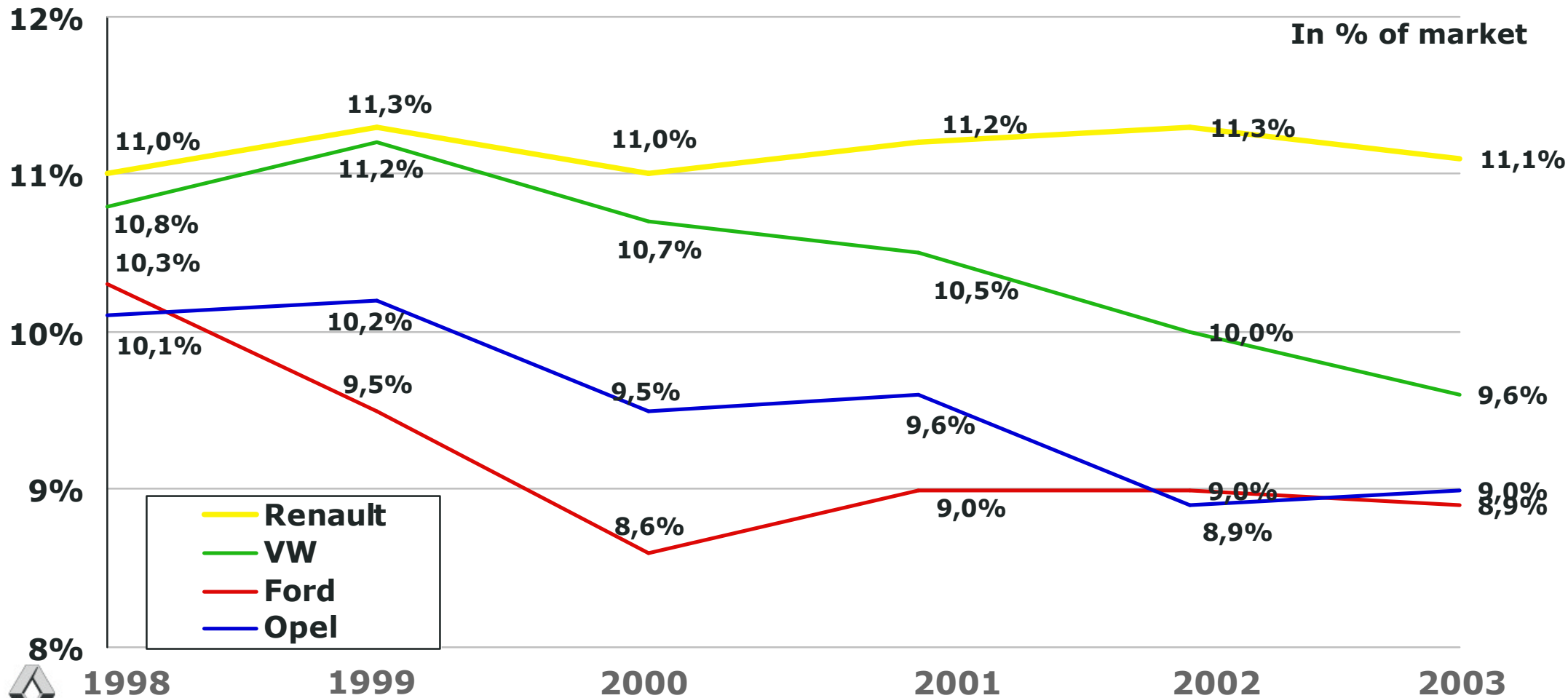
In billions of euros

**2.48**

Group Workforce Worldwide

**130,740**

## MARKET SHARES PC+LCV IN WESTERN EUROPE



## KEY FIGURES

### 2002 Revenues

in billions of euros

**93.28**

### 2003 Worldwide sales

**5,357,315**

### 2003 Worldwide Alliance market share

4.1% for Renault and  
5.2% for Nissan

**9.3%**

▶▶ **GDG stand for :**

**Gestion des Données Géométriques**

▶▶ **GDG is a PDM tool**

- ▶ **Based on Teamcenter (2.0 now)**
- ▶ **Focused on Geometrical Data Management**

## ▶▶ Reduce time to market

- ▶ Internationalization, data sharing (suppliers, partners)
- ▶ Digital Mock-up Design Reviews using composition (static configuration)
- ▶ Work in progres management

## ▶▶ Quality

- ▶ CAD Quality control
- ▶ Life Cycle States and workflow management

## ▶▶ Decrease cost

- ▶ Reduce the number of physical prototypes
- ▶ Commonality
- ▶ Standard parts



**BOM-PDM  
integration**

**Create , Query... Part  
Number and revision distribution  
Enterprise rules  
Legislation, Normalized part names  
Diversity  
Standard parts**

**Geometric data  
production**

**Multi-cad integration**

**Geometric data  
management**

**Life cycle management  
CAD and structure consistency check  
Validation work-flow  
Multi representation  
Multi files formats**

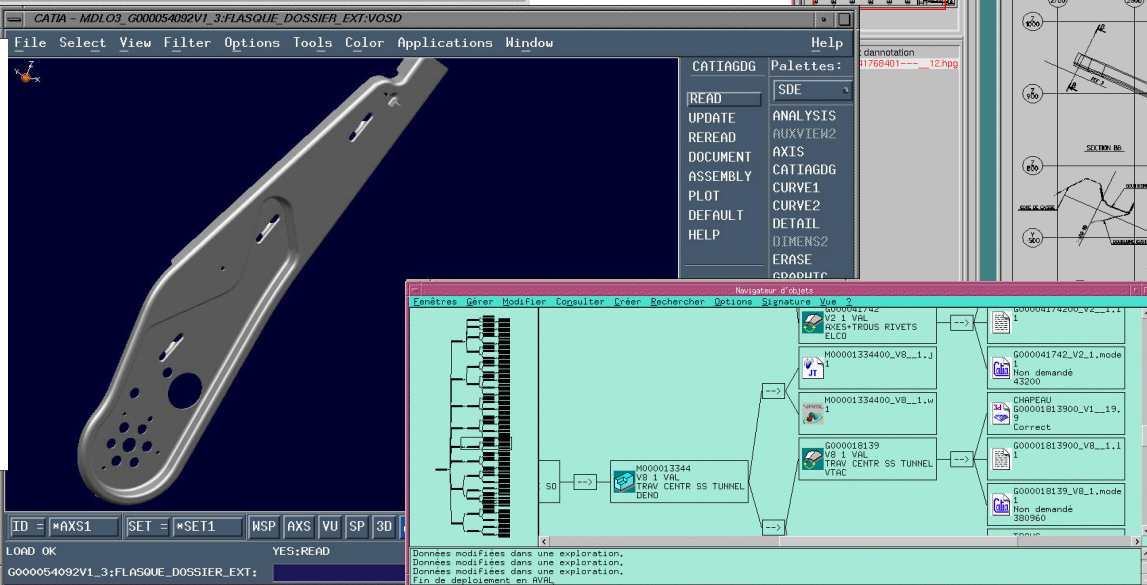
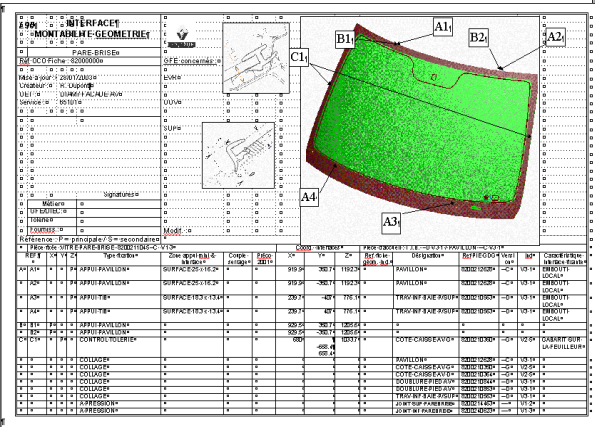
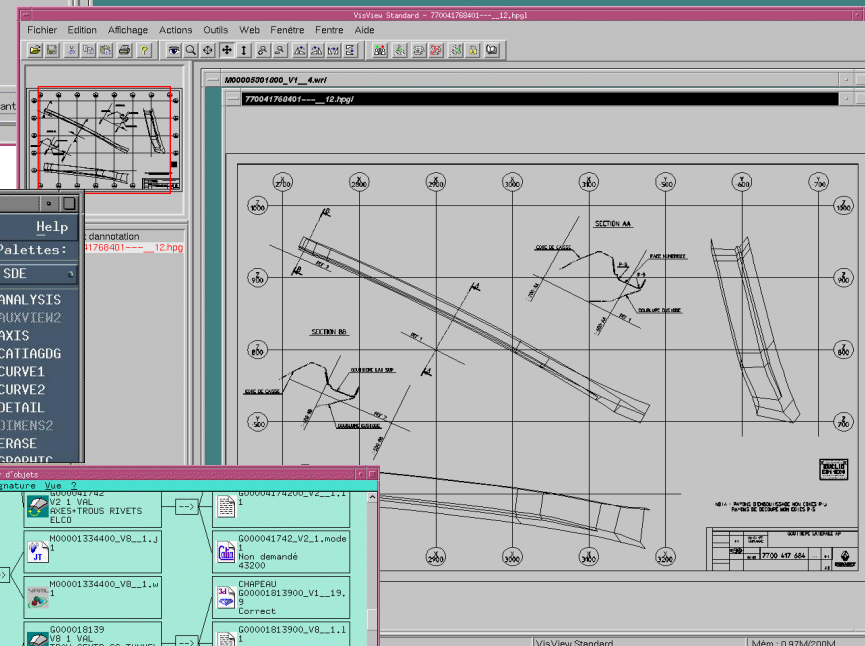
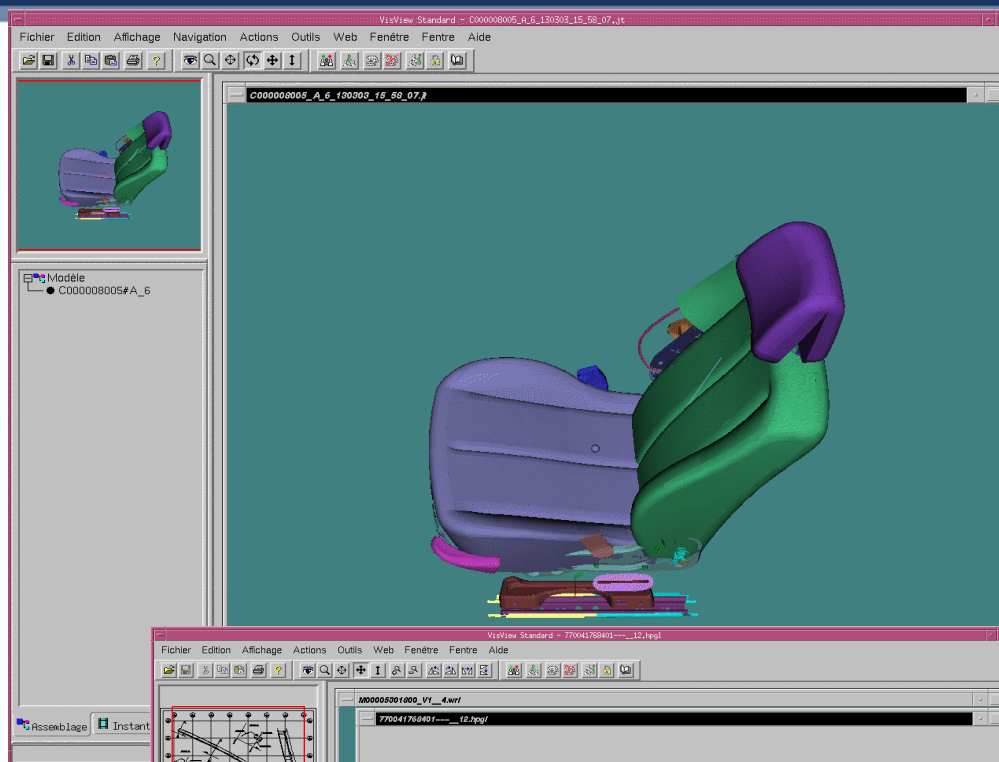
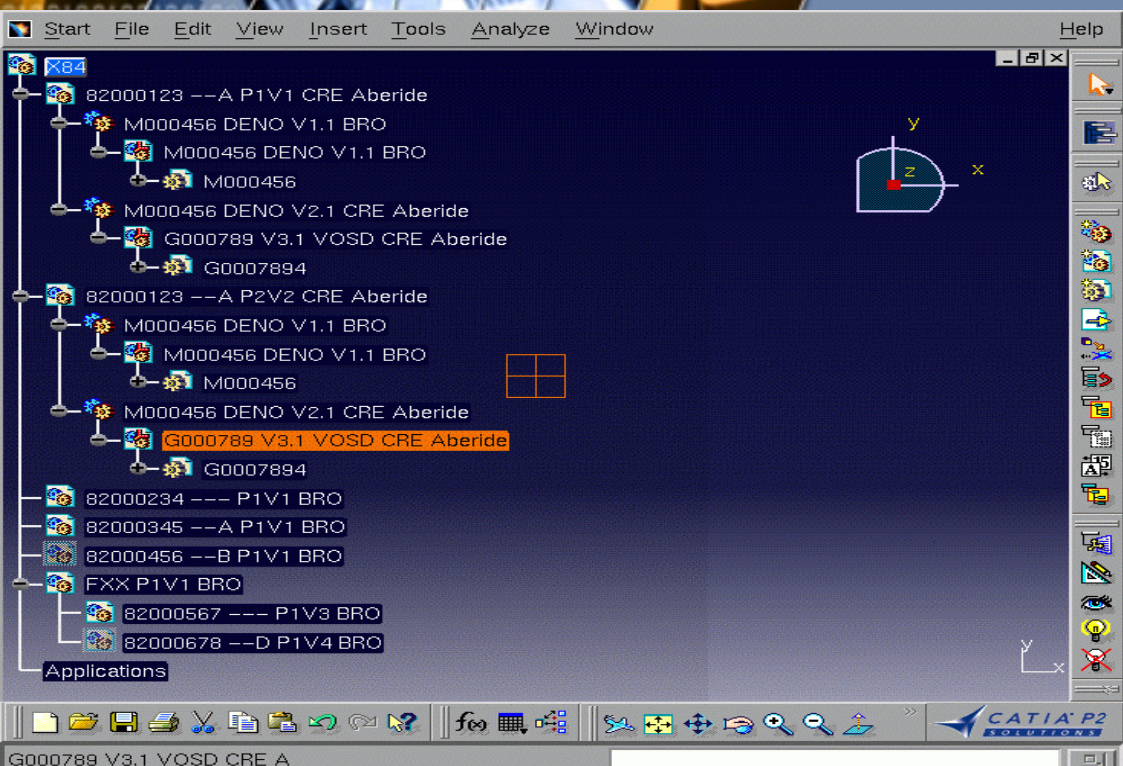
**Geometric data  
availability**

**Visualization, printing  
Title block, conversions  
Automatic exports to other systems  
Multi-sites  
Exchanges with suppliers**

**Virtual prototype  
structure**

**Part instance management  
Composition management**

# Multi CAD



- 180 projects
- 23 sites
- 15 replicated sites
- 8500 declared end-users
- 5700 active end-users
- 1500 connections by day + x GDGWeb connections
- 1200 simultaneous connections
- 8000 registered hosts

- 40 Servers
- 2.8 million public registered files + 4DNAV files
- 3.4 Tb of files on central vault server
- 5 Tb of replicated files
- 4 Gb of files checked-in by day
- 13000 new files by week

- GDG started in 1996
- 25 - 45 I.S. people full time, depending on version complexity
- 13 people design / specification
- 16 people in the Development team
- 12 people for administration, support, Technical architecture
- 3 people in Management, Quality, ...

- ▶▶ **First CATIA – GDG interface :**
  - ▶ **CATIA V4 / Metaphase interface needed : CMI**
  - ▶ **Project started in 1997-98 (GDG 3.0).**
- ▶▶ **Several improvements, including :**
  - ▶ **Resolving performance issues (1999)**
  - ▶ **Specific CMI adaptation to GDG Data-model (GDG 3.2 – GDG 3.6)**
- ▶▶ **Digital Mockup export from GDG to CATIA**
  - ▶ **Project in 2000 (GDG 3.8)**
- ▶▶ **Each time using T-Systems resources on-site**
  
- ▶▶ **Now : CATIA V5 interface**

**The GDG – CATIA V5 interface was designed with**

**2**

**main constraints :**

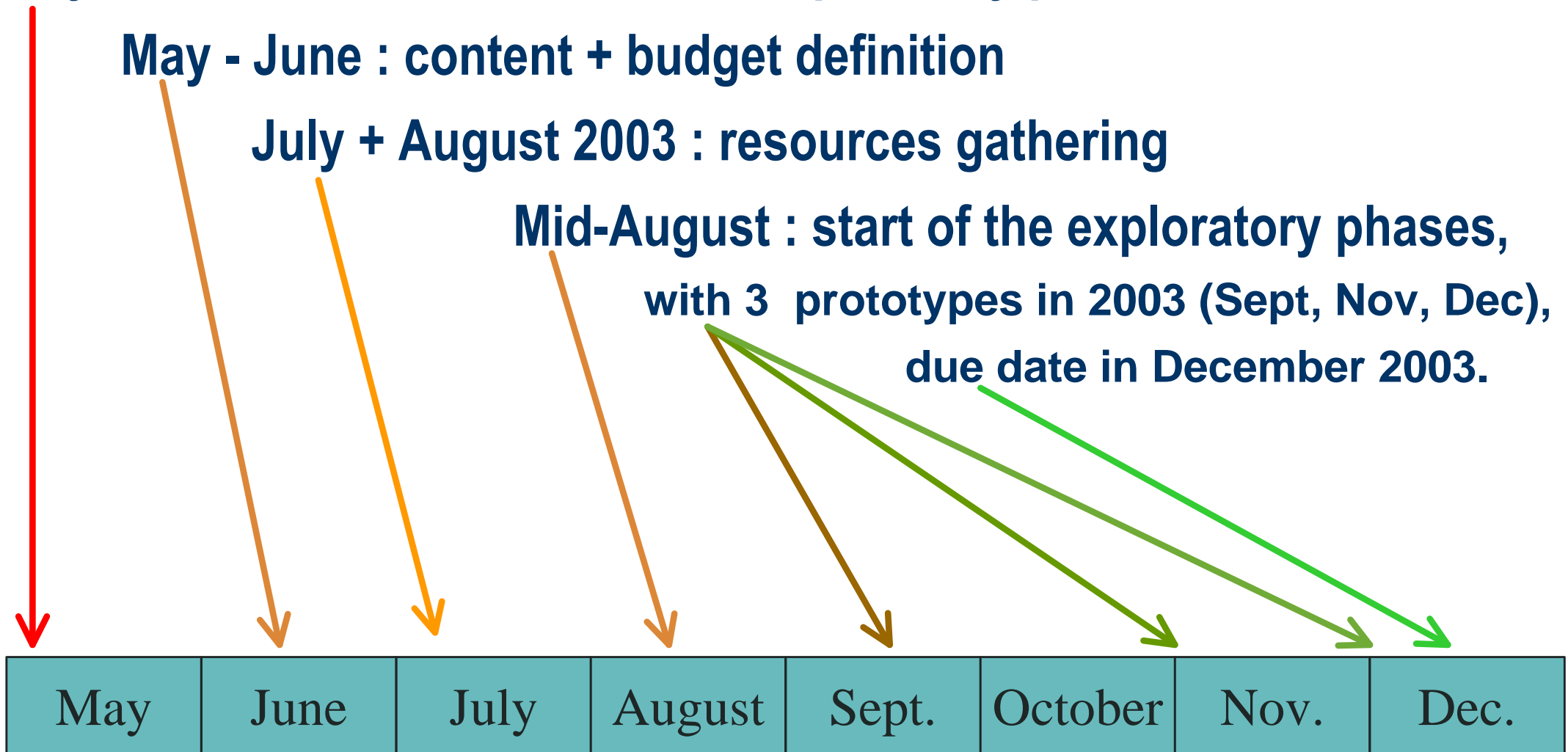
- ▶ **The project deadline is “end of 2004” (first vehicle and power train projects using CATIA V5 starts early 2005)**
  - **Exploratory phase in 2003**
  - **Project phase in 2004**
  
- ▶ **The GDG – CATIA V5 interface should support the full CATIA V5 functionalities, and should not put limits on the benefits expected from using CATIA V5.**
  - **This implies full support of Multi-Model Link**

**May 2003 decision to work on the exploratory phases.**

**May - June : content + budget definition**

**July + August 2003 : resources gathering**

**Mid-August : start of the exploratory phases,  
with 3 prototypes in 2003 (Sept, Nov, Dec),  
due date in December 2003.**



## ▶▶ The 5 month exploratory phase produced

### ▶ User scenario

### ▶ A list of user requirements, that have been divided in sub-project

### ▶ 3 prototypes :

- First one in September was the “standard CMI”
- 2nd in November included specific code to adapt CMI to the GDG data model
- 3rd one (December) included Composition (GDG structure) export to CATIA

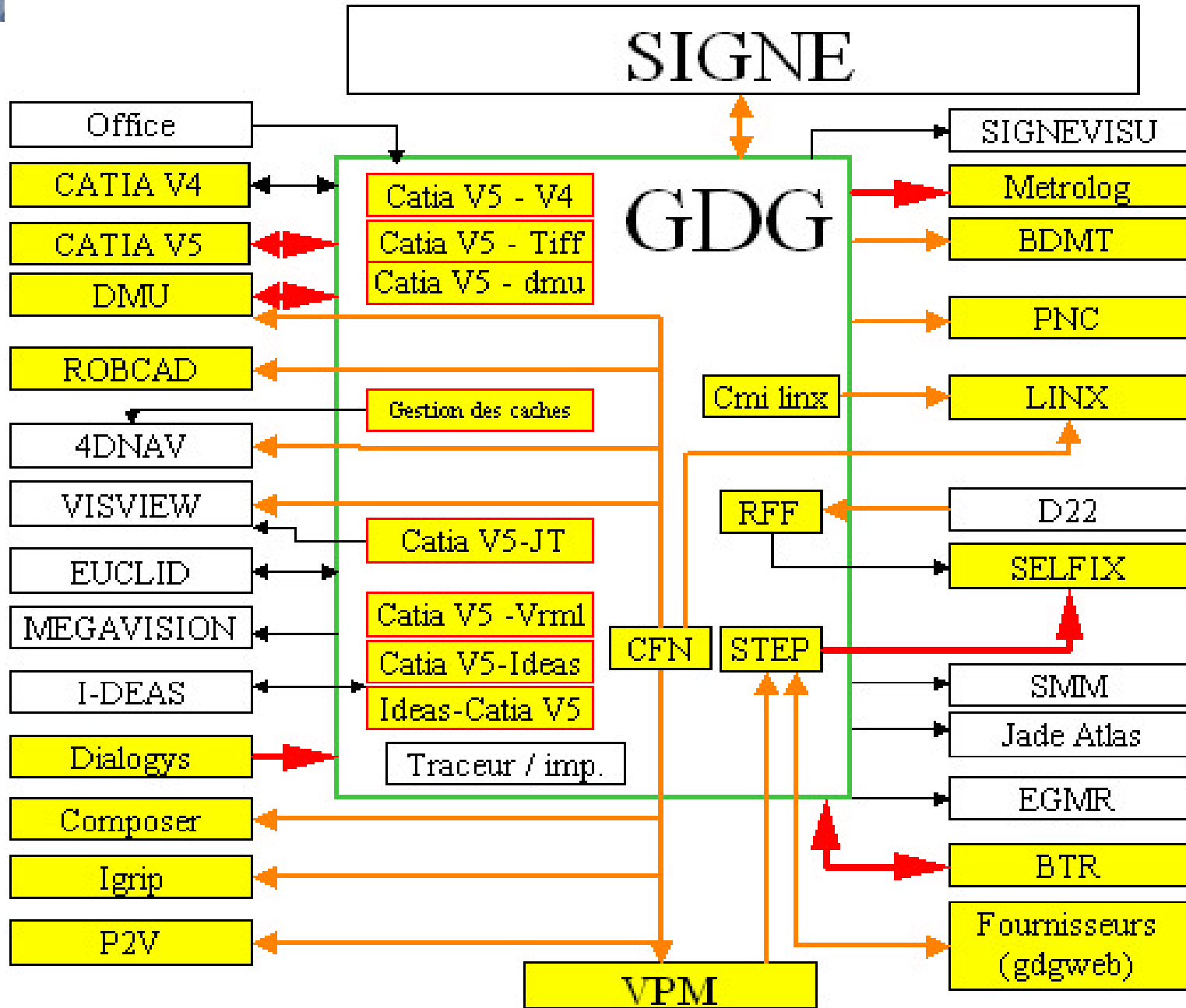
### ▶ A list of ameliorations needed in CMI

- DMU integration and cache management
- CATIA Structure (CATProduct) synchronization

### ▶ A list of GDG modules and interfaces impacted by CATIA V5



SYNOPTIQUE GDG 4.3 -4.4  
JPC- version du 12 12.2003



A créer en 4.3

Impacté par 4.3

Pas impacté

**50% off  
all GDG  
modules  
and  
interfaces**

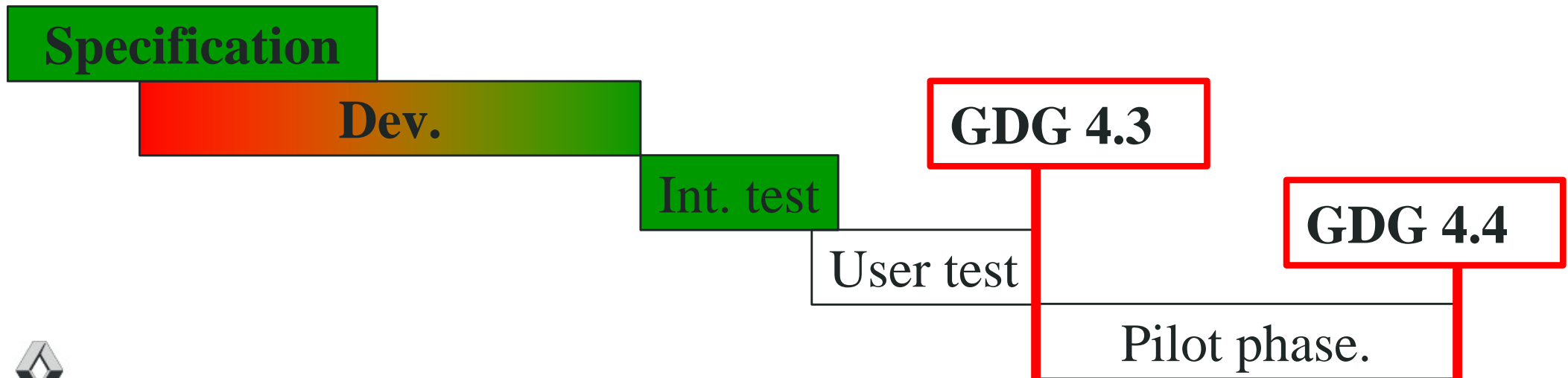
NB : tous les modules internes ne sont pas représentés...



## ▶▶ Project Starts in January 2004 :

- ▶ Specifications from January to February
- ▶ Development from February to mid April
- ▶ Internal testing mid April to 21th of May
- ▶ User testing from 24th may to 25th June
- ▶ All CATIA V5 - GDG interface in the 28th June 2004 version (4.3)
- ▶ 6 months pilot phase until December 2004 (next GDG version).

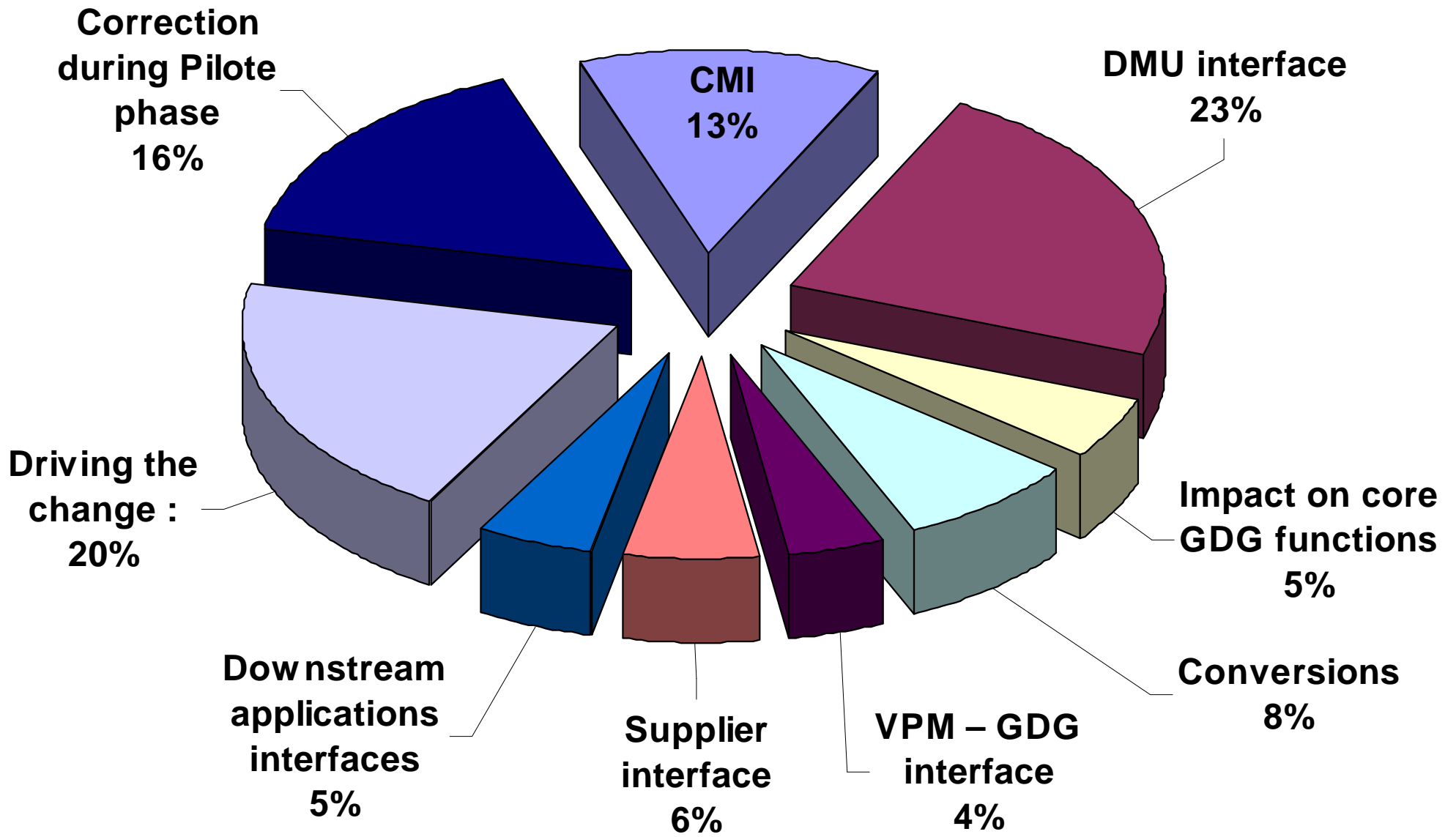
## ▶▶ Effective use of the interface from January 2005.



## The project was subdivided in 3 main topics :

- 1. The core (CMI):**
  - 1. Catia V5 interface** (data model change, GUI change)
  - 2. DMU interface**  
(architecture, Global Cache usage, structure synchronization)
  - 3. Impact on core GDG functions :**  
Check-in / Check-out rules, drawing management, Quality Control Tool
- 2. Impact on all interfaces between GDG and linked subsystems**
  - 4. Conversions** (Catia V5 to : Catia V4, CGR, VRML, JT, IDEAS)
  - 5. VPM – GDG interface**
  - 6. Supplier interface** (WEB client, SAM V5)
  - 7. Downstream applications interfaces** (tooling, manufacturing)
- 3. Driving the change :**
  - 8. Methodologies definition, Training, Communications**

# Weight of the different sub-project



The main improvements, based on CMI 8.5, are :

## ▶▶ Global cache management :

- ▶ Use Global Caching mechanism from CATIA V5 (R13 ?)
- ▶ Use pre-computed CGR file stored in PDM Vault
- ▶ Send to CATIA in visualization mode (send to DMU)

## ▶▶ Structure synchronization

- ▶ GDG (PDM) contains assemblies (structures)
- ▶ CATIA V5 contains assembly information through CATProduct
  - There is a necessity to synchronize the 2 structures
- ▶ CMI knows how to synchronize from PDM to CATIA, but it's not fully compatible with CGR usage in DMU
  - Synchronization from CATIA to PDM is still an issues in GDG
  - Several API missing from Dassault Systèmes to enable T-Systems to “do the job”

- ▶▶ **Development finished** (on-time delivery of CMI 8.5.0)
- ▶▶ **Internal testing on the way**
  - ▶ **Some CMI patches needed**, (good reactivity of T-Systems)
- ▶▶ **Performance tests still to be done**
- ▶▶ **User tests starts end of May**
- ▶▶ **Pilot phase starts in July**
- ▶▶ **Production use start Q1 2005, after the next GDG version**  
(December 2004)
  - ▶ **This version will contains improvement, bug fix and some functionalities that where not “critical”.**

**Some new user scenario showed up after the end of exploratory. We are working on them now**

- ▶ **ELECTRICAL Data management**
- ▶ **CALCULATION Data management (CATAnalysis)**
- ▶ **Catalogs management (CATCatalog)**
- ▶ **CATIA Structure (CATProduct) synchronization with PDM product structure (composition in GDG)**

**Those scenario implies some development for T-Systems, but they need also new API on CATIA V5 from Dassault Systèmes.**

- ▶ **A meeting with T-Systems and Daimler-Chrysler showed a convergence of needs on several topics,**  
(including product structure / CATProduct synchronization)