June. 2009

BITRON

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CSQ UNI EN ISO/TS 9001: 2000

IQNet CERTIFIED MANAGEMENT SYSTEM

CSQ AUTO UNI EN ISO/TS 16949:2000

CSQ eco ISO 14001

SPICE FOR SMALL PROJECTS

Bitron's Experience

WITH THE AID OF ELISABETTA MASUERO / MARCO CASSOTTA BITRON'S SWQA TEAM

TWO MAIN PRODUCT BRANCHES:

COMPLEXITY

- **AUTOMOTIVE:**
  - SEAT HEATER,
  - MIRROR FOLDER,
  - SEAT BELT REMINDER,
  - DOOR LOCK,
  - WINDOW LIFTER,
  - SUNROOF CONTROL
  - CLIMATE CONTROL

COMPLEXITY

- **APPLIANCES:**
  - (DELAY) TIMERS
  - USER INTERFACES,
  - INVERTERS,
  - MOTOR CONTROLLERS,
  - MAINBOARD FOR WASHING MACHINES
  - GAS BOILERS

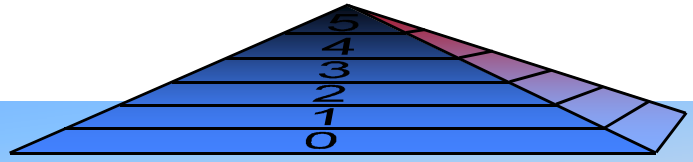
FROM SMALL PROJECTS TO BIG ONES TAKING CARE OF SAFETY AND QUALITY

IS CONFORM TO ISO/IEC 12207 INTERNATIONAL STD

ASSESSED BY I.S.T.I. -C.N.R. PISA UP TO LEVEL 3 OF ISO 15504, NAMELY "S.P.I.C.E." ACCORDING TO FIAT AND H.I.S. SCOPES

SPICE *is an acronym for*

Optimizing
Predictable
Established
Managed
Performed
Incomplete



***S**oftware **P**rocess **I**mprovement **C**apability d**E**termination*

CODING ACCORDING TO M.I.S.R.A. 2004 RULES

BITRON IS MEMBER OF LIN *CONSORTIUM SINCE 2006*

BITRON IS ONE OF THE FOUNDERS OF THE S.P.I.N. ITALY

(Software Process Improvement Network)

THE PROBLEM

TO APPLY A FULLY "SPICE COMPLIANT" DEVELOPMENT PROCESS CAN BE TOO EXPENSIVE (TIME & RESOURCES) FOR SMALL PROJECTS, LASTING TWO OR THREE MONTHES AND WITH A LIMITED BUDGET.

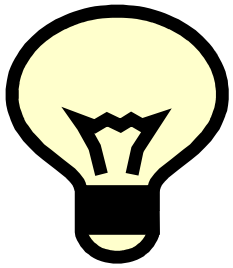
HOW TO AVOID A "QUICK AND DIRTY" APPROACH ?

STILL MAINTAINING QUALITY AND A CONSOLIDATED PROCESS.

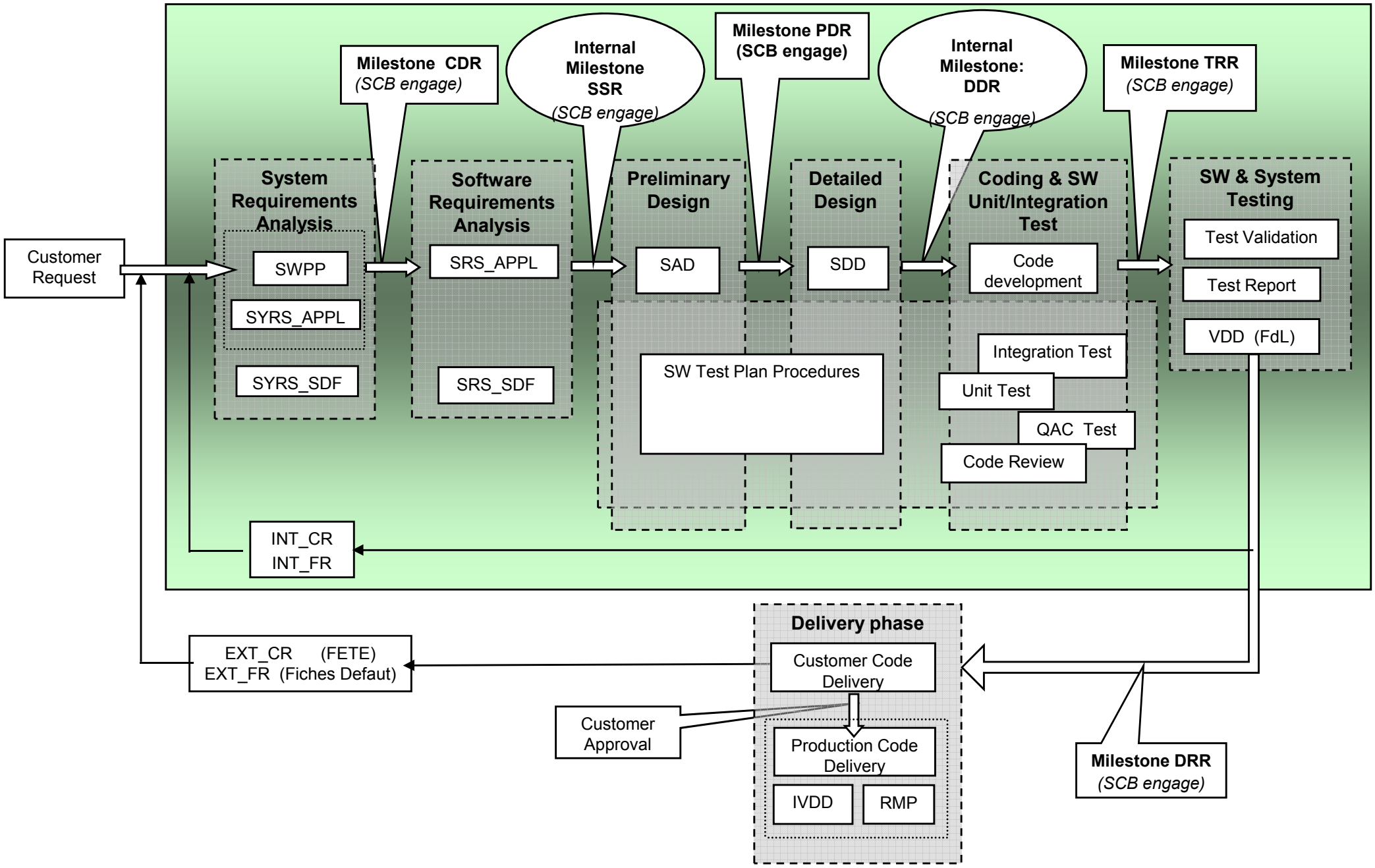
BITRON SOLUTION

IS TO CUSTOMIZE THE SOFTWARE LIFE CYCLE TAKING CARE OF PRODUCT'S BEING DEVELOPED COMPLEXITY AND ACCORDING TO CUSTOMER REQUESTS. THEREFORE WE HAVE DEFINED:

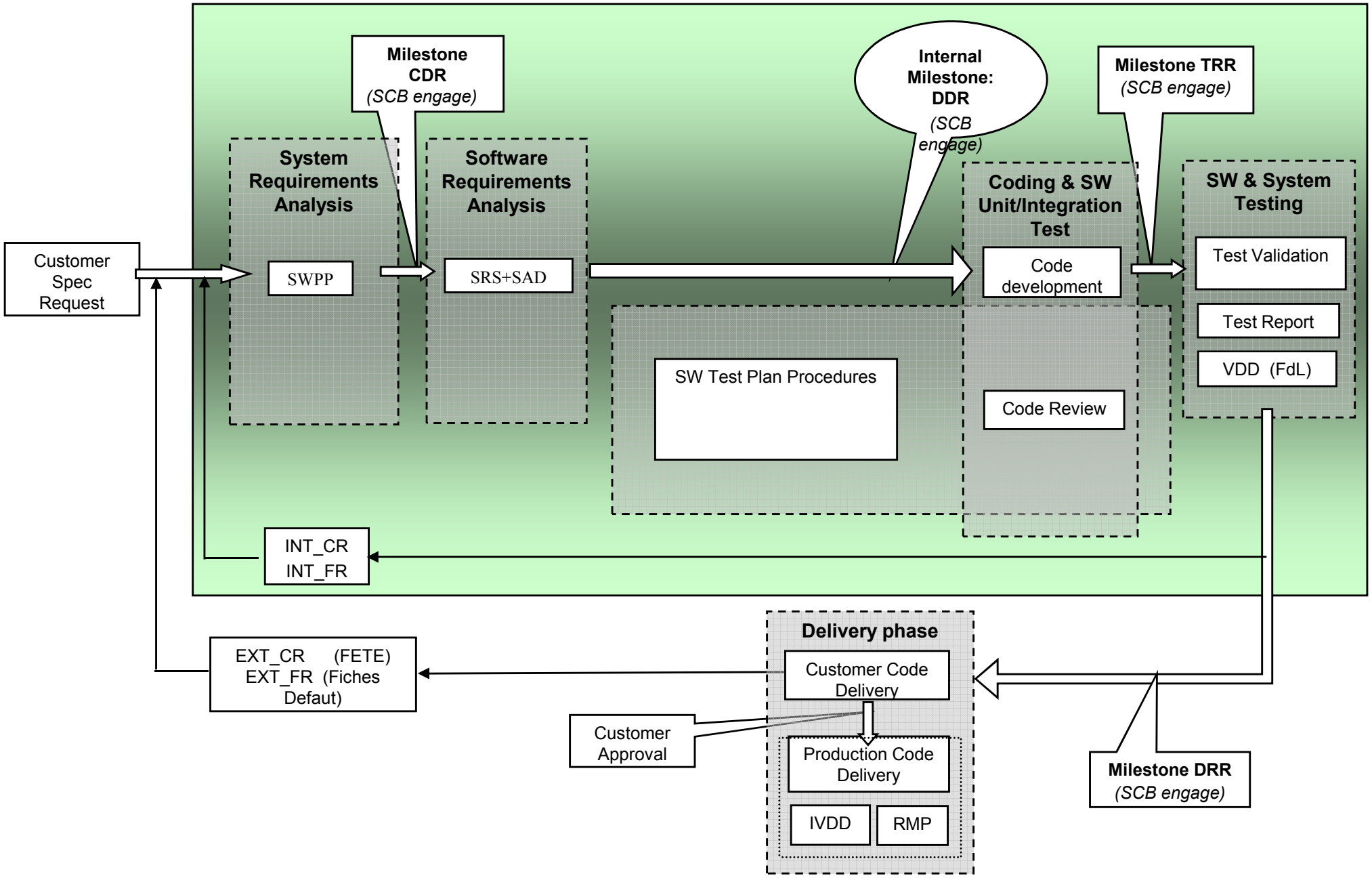
- *Full Process LifeCycle*
- *Short Process LifeCycle*



FIRST MODEL : FULL PROCESS LIFECYCLE



SECOND MODEL : SHORT PROCESS LIFECYCLE



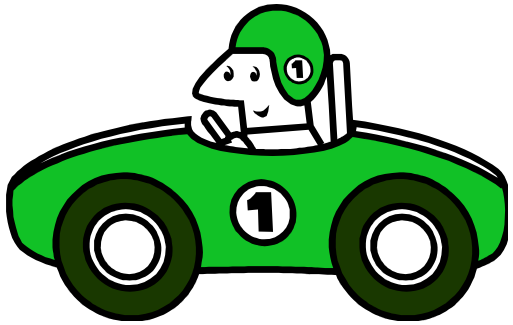
SW LIFE CYCLE SELECTION CRITERIA

THE DECISION WHETHER TO APPLY THE FULL OR THE SHORT MODEL IS BASED UPON SEVERAL KEY FACTORS AMONG WITH :

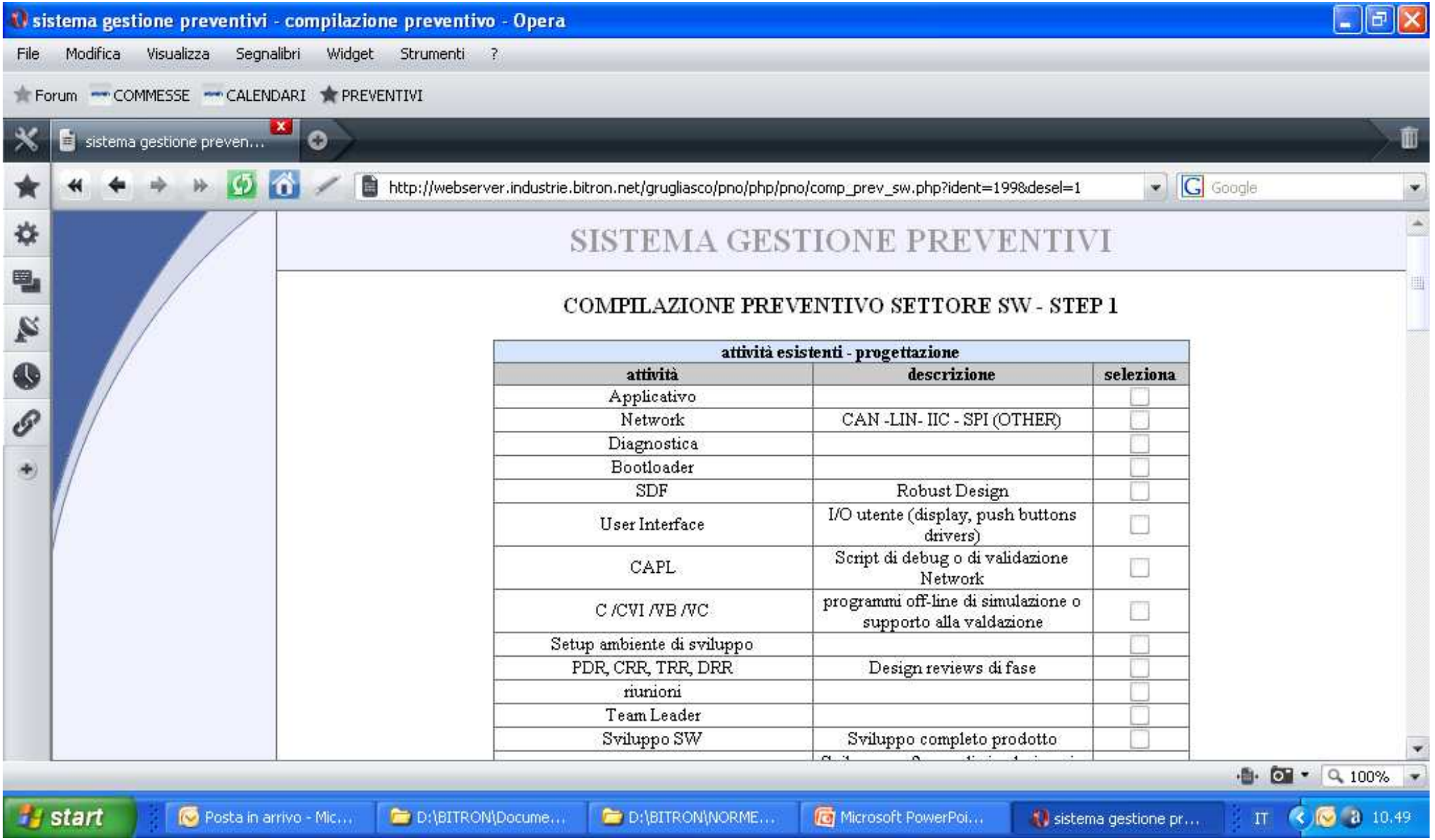
- ***AUTOMOTIVE OR DOMESTIC APPLIANCE (USUALLY LESS DEMANDING)***
- ***CUSTOMER REQUIREMENTS***
- ***SHORT DEVELOPMENT TIME***
- ***COMPLEXITY & SAFETY OF ECU***
- ***BUDGET vs COST***

THE DESIGNATED PROJECT LEADER TOGETHER WITH QUALITY PEOPLE, THE SOFTWARE DEPARTMENT RESPONSIBLE AND THE PRODUCT'S PROGRAM MANAGER TAKE THE DECISION.

ONCE THE DECISION HAS BEEN MADE, TO SPEED UP THE WHOLE PROCESS (EITHER IN THE FULL OR IN THE SHORT MODEL), SEVERAL TOOLS ARE USED.



- ***THE QUOTATION PROCESS IS AUTOMATED BY MEANS OF A DATABASE REPOSITORY LAYING ON THE INTRANET (PROPRIETARY)***
- ***ALL PROJECTS PHASES AND RELATED DOCUMENTS ARE MANAGED BY THE CONFIGURATION MANAGEMENT TOOL (SERENA)***
- ***DESIGN, TEST & QUALITY DOCUMENTS' TEMPLATES HAVE BEEN PREPARED***
- ***SW MODULES LIBRARY PROVISION FOR REUSABLE SOFTWARE***
- ***SW TEST AUTOMATIZATION WITH A GENERAL PURPOSE TEST BENCH***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SISTEMA GESTIONE PREVENTIVI
COMPILAZIONE PREVENTIVO SETTORE SW - STEP 1
attività esistenti - progettazione
attività | descrizione | seleziona
Applicativo
Network | CAN -LIN- IIC - SPI (OTHER)
Diagnostica
Bootloader
SDF | Robust Design
User Interface | I/O utente (display, push buttons drivers)
CAPL | Script di debug o di validazione Network
C /CVI /VB /VC | programmi off-line di simulazione o supporto alla valdazione
Setup ambiente di sviluppo
PDR, CRR, TRR, DRR | Design reviews di fase
riunioni
Team Leader
Sviluppo SW | Sviluppo completo prodotto
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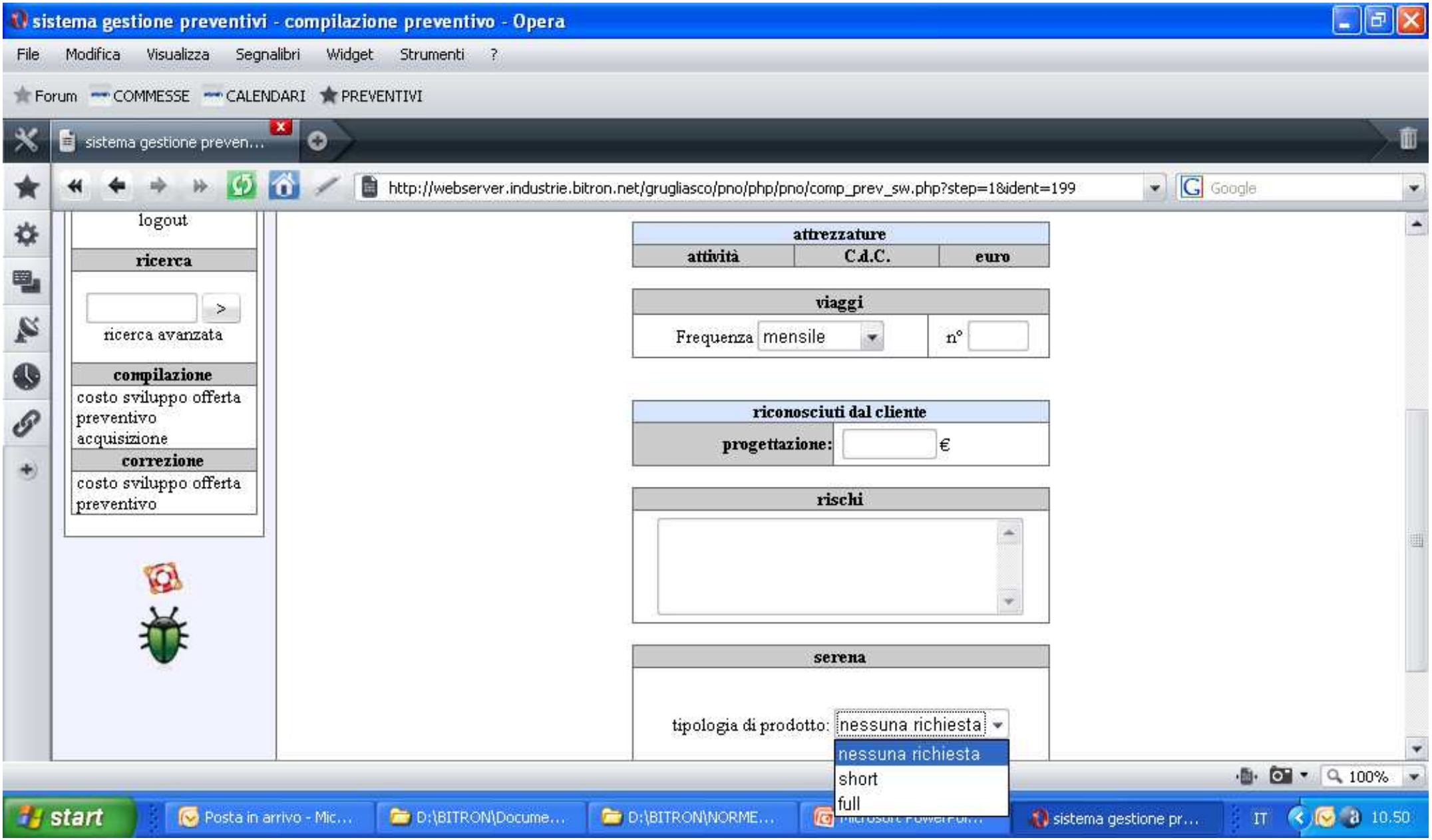
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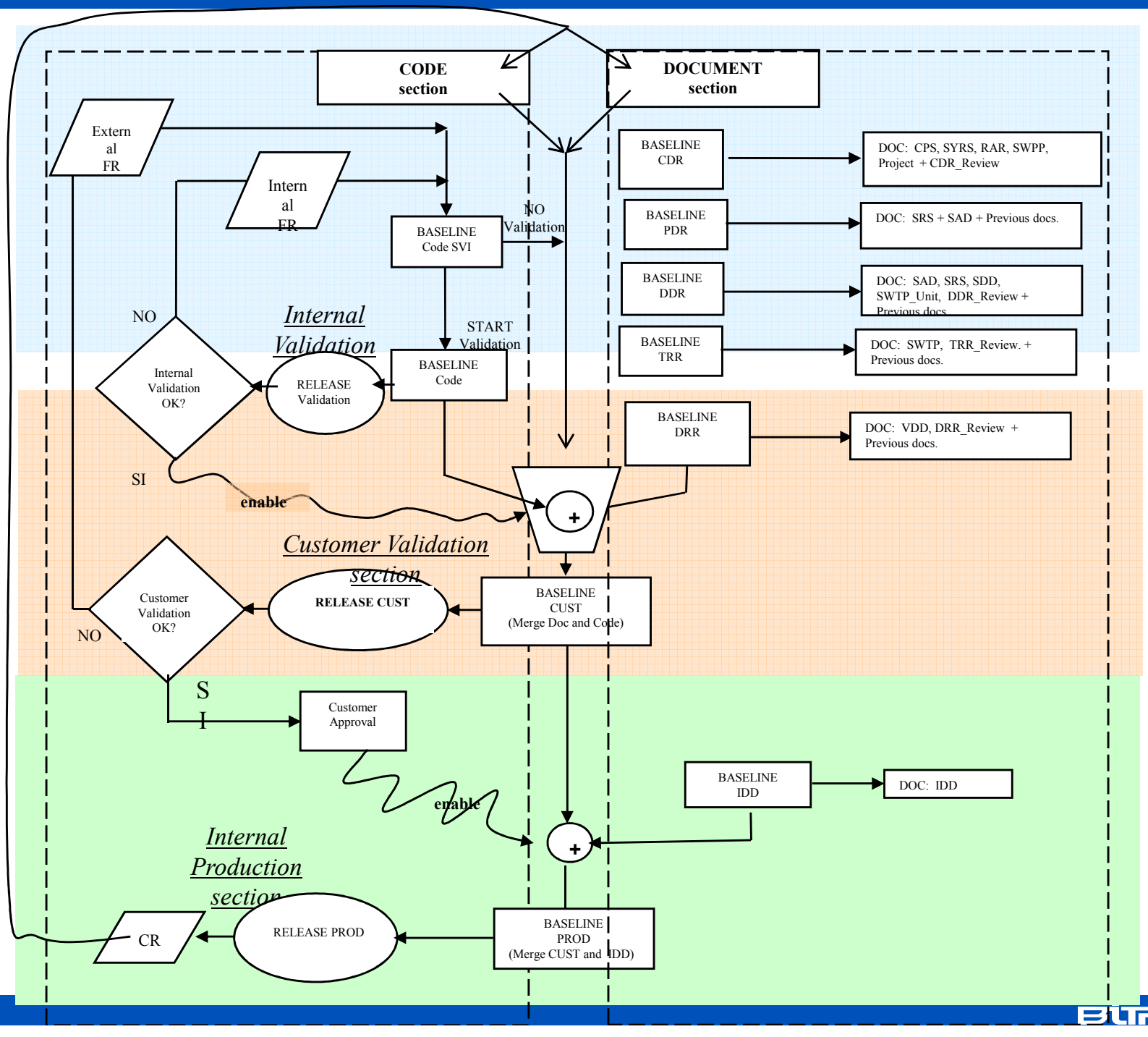
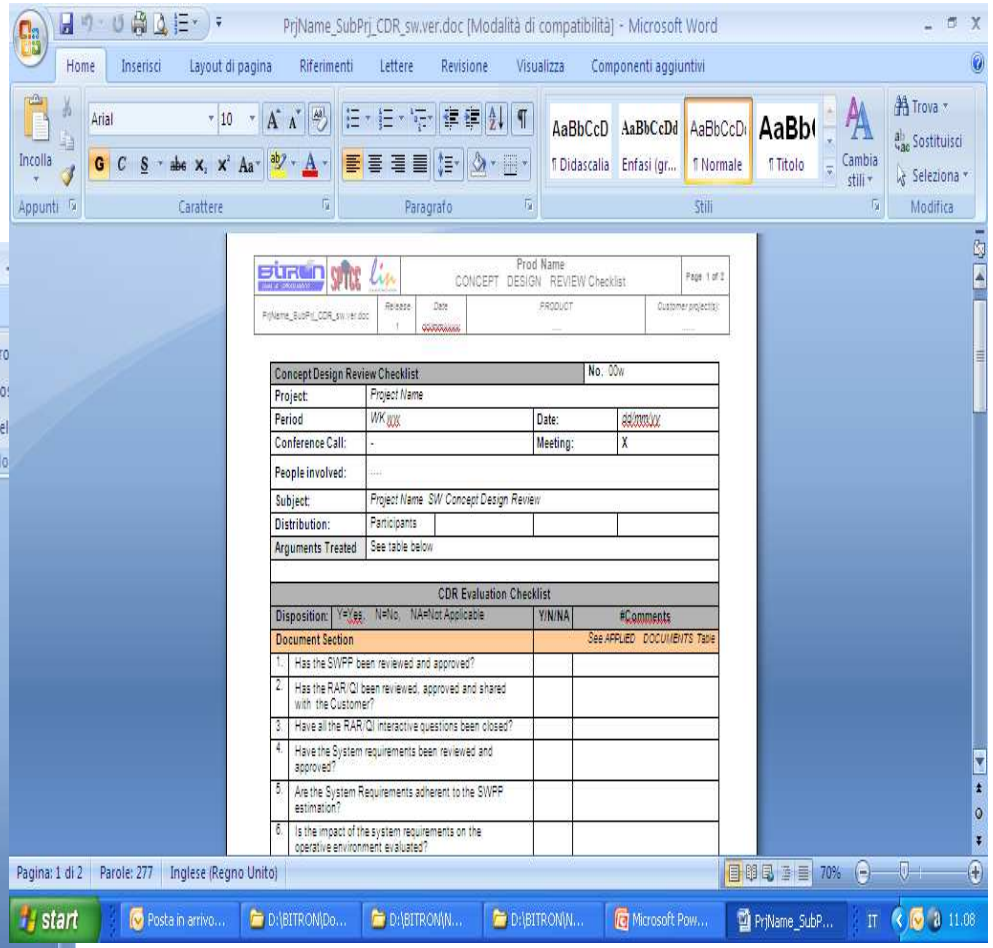
CONFIGURATION TOOL CUSTOMIZATION

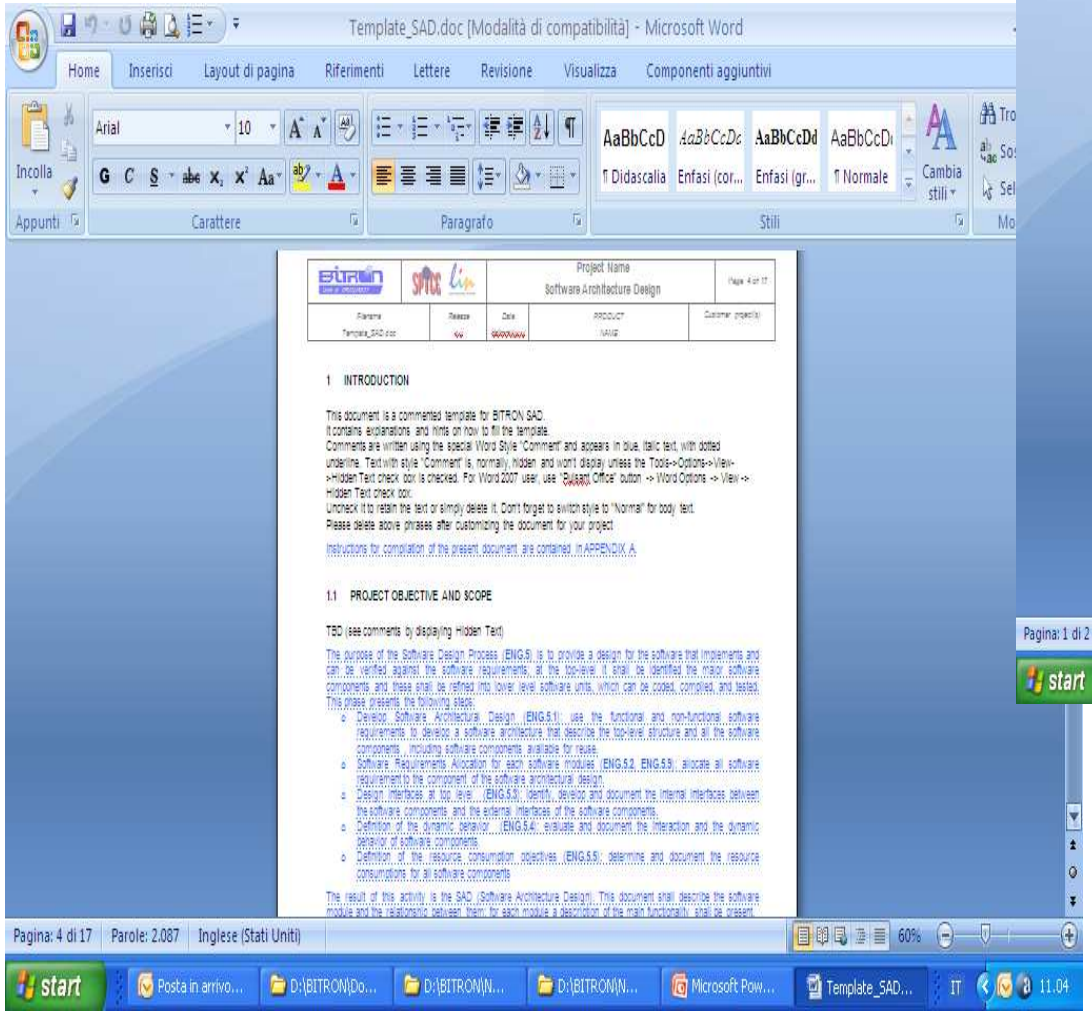
THE CONFIGURATION MANAGEMENT TOOL HAS BEEN CUSTOMIZED TO BE BEST SUITABLE TO OUR PROCESS.

THE AUTOMATED MAILING SYSTEM WARNS EVERY TEAM MEMBER ABOUT ACTIVITIES AND DOCUMENTS.

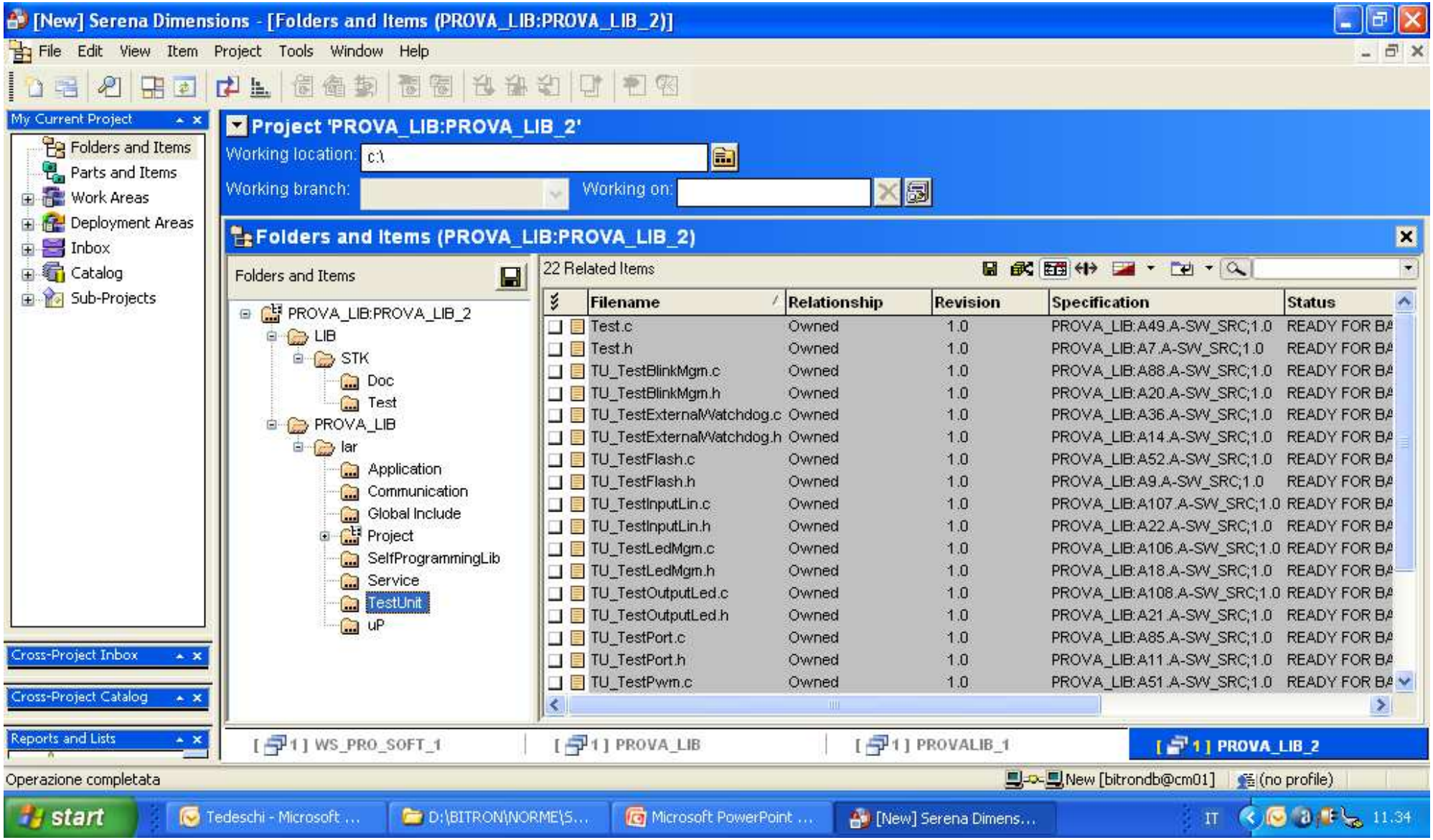


DESIGN, TEST AND QUALITY





SW LIBRARY PROVISION



BITRON HAS DEVELOPED AN AUTOMATIC TEST BENCH USING NATIONAL INSTRUMENTS COMPONENTS IN ORDER TO EXECUTE:

THE LIN TEST CASES PLANNED BY THE LIN CONSORTIUM

THE CAN TEST CASES (3 rd Q. 2010)

THE SPECIFIC TEST CASES OF THE APPLICATION

.

MAIN REQUIREMENTS OF THIS PROJECT ARE:

- TO BE ABLE TO EXECUTE TEST CASES IN A FAST, RELIABLE AND REPETITIVE WAY

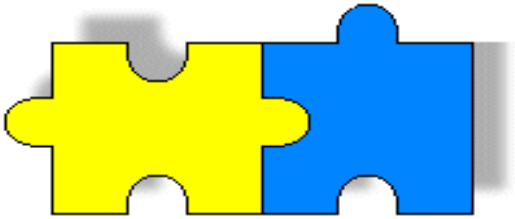
- THE CAPABILITY TO BE ADAPTABLE TO EVERY ECU IN SHORT TIME

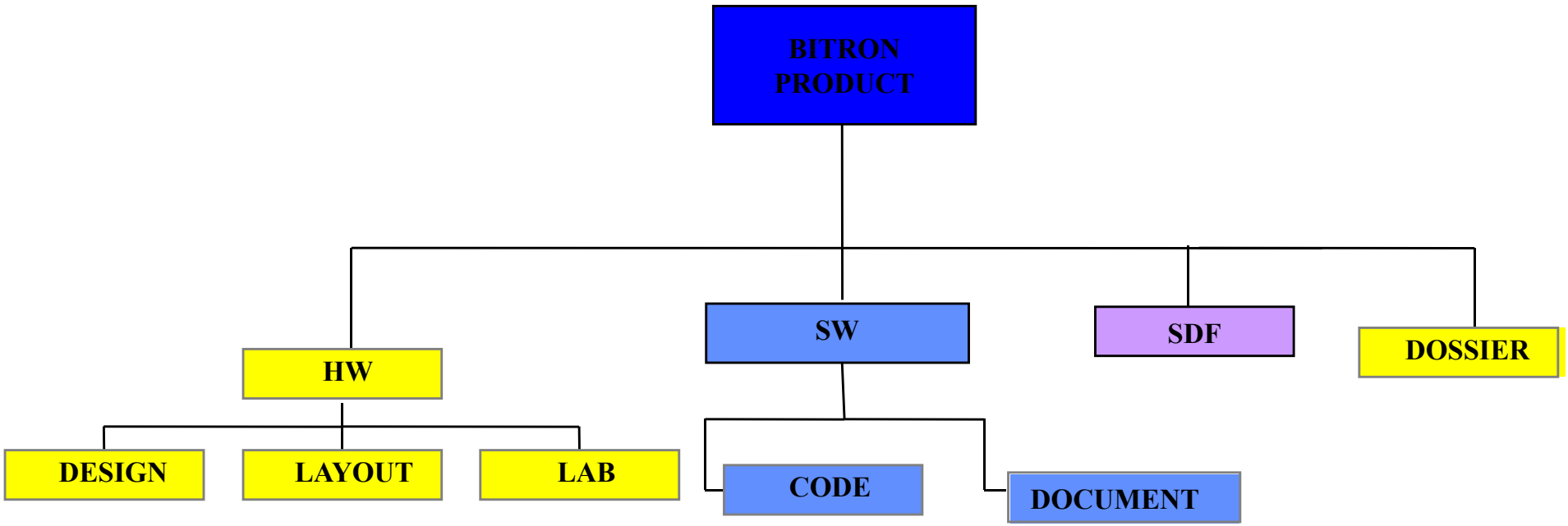
- THE CAPABILITY TO PROVIDE AUTOMATICALLY DETAILED TEST REPORT

- THE CAPABILITY TO LOG EVERY BUS ACTIVITY

INTEGRATION WITH HW TEAM

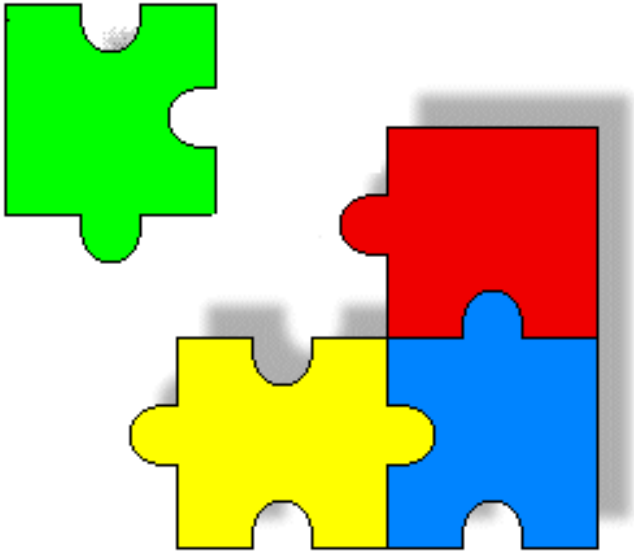
TO IMPROVE THE EFFICIENCY THE HW & SW PROJECT DOCUMENTATION IS JOINED INTO THE CONFIGURATION CONTROL AND THE COMMON DOCUMENTS ARE EXCHANGED AND MANAGED AUTOMATICALLY WITHIN THE TEAM



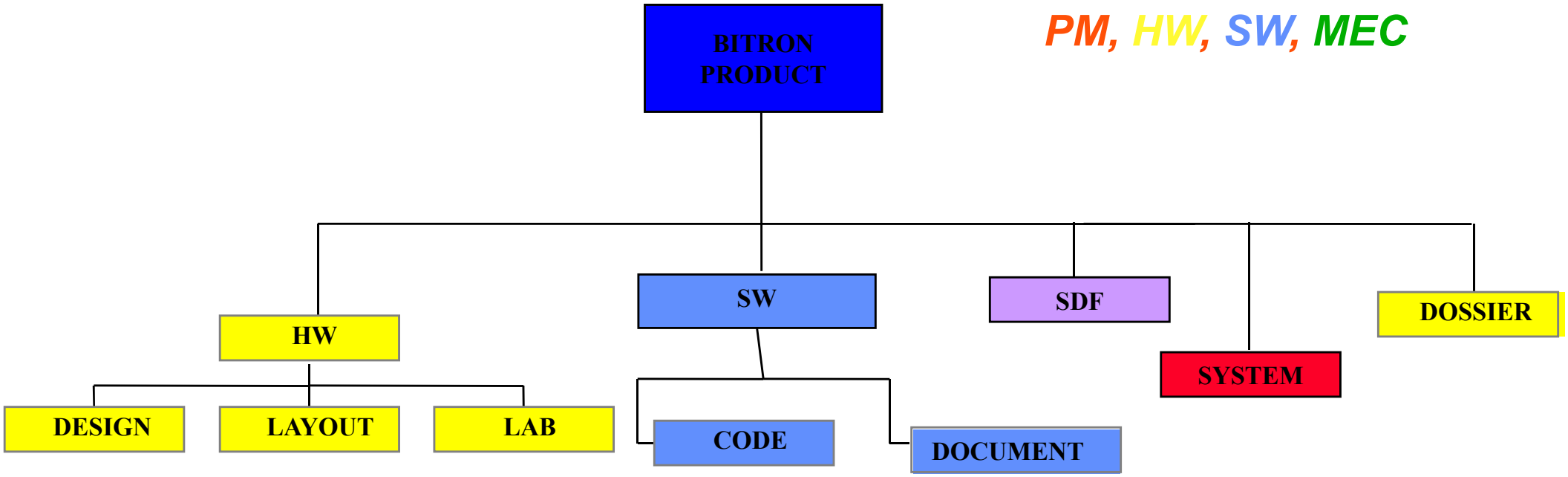


NEXT TARGET :

TO INTEGRATE ALSO THE ACTIVITIES OF THE PROGRAM MANAGERS AND MECHANICAL DESIGNERS SINCE THE EARLY PHASES OF THE PROJECT.



PM, HW, SW, MEC



CONCLUSION:

IN CASE OF A SMALL COMPANY THAT HAS TO COPE WITH SMALL PROJECTS, IT IS MANDATORY TO APPROACH'EM IN A VERY PRAGMATIC WAY.

A TAILORING OF THE PROCESS CAN BE A GOOD WAY TO REACH THE TARGET: THE RATIONALE OF THIS CUSTOMISATION MUST BE CLEAR TO ALL TEAM MEMBERS.

THE STRUCTURE OF THE ORGANISATIONAL UNIT MUST BE ABLE TO FOLLOW THE NEEDS OF THE INTEGRATED DEVELOPMENT.

SOFTWARE TOOLS AND AUTOMATION OF ACTIVITIES MUST BE APPLIED.

Thank you for your attention

Schiara Ugo

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