

# PLANEAMENTO DO TRANSPORTE DE MADEIRA INTEGRADO COM A RECEPÇÃO FABRIL

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How is your developer team composed and organized in order to develop computer-based tools (institutional framework, composition, size, specialists, roles/functions, network, trends, ...) ? What is your role/function/position ?

### **Team for Research and commercial projects**

- ✓ Forest Research Centre (ISA): Experts on forest planning and OR: 1-2 pex
- ✓ IT Company (Link Consulting): IT developers: 3-4 pex
- ✓ Client/stakeholders: Forest based companies, associations, public administration,...: 3-20 pex

**My role:** Project manager (either in ISA or Link): combine expertise on forest planning and OR with experience of IS design and coding. Tasks:

- ✓ Project management and results dissemination
- ✓ Interface with clients/stakeholders: process design, data gathering, tests
- ✓ Interface with ISA: OR models and methods, pseudocode
- ✓ Interface with developers: Use-Cases, story boards, coding support, tests

What are the computer-based tools that the developer team (or yourself) has already developed or is yet to develop (brief overview, domains of application), and who are the (potential) users of these tools (education level/background) ?

### **SAD developed:** *(on FORSYS wiki)*

- ✓ SAGflor. 2000: strategic forest planning: all types of decision-makers
- ✓ SADPOF. 2008-2011: tactical and operational planning: integrated P&P company

### **SAD designed with Enterprise Architecture methodology:**

- ✓ PSis. 2005: Pulpwood supply information system for Celbi (P&P company)

(In: Marques AF, Borges JG, Sousa P, Pinho A, 2010. An enterprise architecture approach to forest management support systems design. An application to pulpwood supply management in Portugal. European Journal of Forest Research (published online)).

- ✓ SIFP. 2005-2007: Integrated Forest Planning System for Portucel-Soporcel (P&P)
- ✓ RFMDSS. 2009: Regional Forest Management Toolbox: all types of decision-makers

(In: Marques AF, Borges JG, Pina JP, Lucas B, Garcia J. 2010. A participatory approach to design a regional forest management planning decision support toolbox. European Journal of Forest Research (prep))

- ✓ CAMTEC. 2010-2011: Integrated IT platform to support the wood supply chain

(In: Marques AF, Borges JG, Sousa P, Fonseca M. 2011. An Enterprise Architecture Approach for Designing an Integrated Wood Supply Management System. In: Varajão J, Cunha M. (Eds.) CENTERIS 2010 – Conference on ENTERprise Information Systems. IGI Global (invited for publication); Marques AF, Borges JG, Sousa P, Fonseca M, Garcia R, Batista G. 2010. Applying enterprise architecture to the design of the integrated forest products supply chain management system. In: Varajão, Cunha M. (Eds.) Proceedings of the CENTERIS 2010 Conference, Part II, CCIS 110, Springer-Verlag Berlin Heidelberg 2010, pp. 32-40.)

## DSS components?

- ✓ BD (spatial and alphanumeric)
- ✓ GUI interfaces: scenario generation, OR parameterization; Scenario analysis and reporting (spatial and alphanumeric)
- ✓ Modular Applicational layer: Data consolidation; Scenarios queue management; Simulation & Optimization (OR tools)

What is the IT-environment of these tools (operating system, programming language) and what types of tools are they (stand-alone desktop application, browser-application, app, ...) ?

- ✓ Windows, .NET
- ✓ Preferably: web-based; users access control; integration with other systems (e.g. accounting)

Which kinds of techniques are used to ensure decision support (optimisation algorithm, MCDM, KM, ...) ? How is interoperability ensured ? How is the user- friendliness of the GUI ensured ?

- ✓ Optimization algorithms: Simulation annealing; case-specific heuristics; CPLEX for exact solution
- ✓ KM: workshops with end-users for process specification; EA reports; DSS documentation
- ✓ PP: EA methodology can be considered a “case” of pp for DSS design
- ✓ Interoperability is assured through: 1) the engagement of all stakeholders into DSS design for correct process and data exchange identification; 2) IT experts develop the best SOA and implement the most adequate technology to support the process and data exchange; 3) parallel training and support for address new collaboration schemas
- ✓ User-friendliness of GUI: only if commercial product; comply IS best-practices

# What sort of methodology is applied to develop the tools (reference) ? Enterprise Architecture

- ✓ FPSC Framework
- ✓ Process rep.
- ✓ SC agents analysis

- Workshops with SC agents
- Private process meetings

PROCESS ARCH.

- Brainstorm for Info. Entities identification and description

INFORMATION ARCH.

TECHNOLOGICAL ARCH.

APPLICATIONAL ARCH.

- Tecnology survey and analysis

- EA experts meetings for CRUD matrix manipulation

- ✓ Info. Entities id & description
- ✓ IE relationship diagram

- ✓ Modules description
- ✓ Integrated SC manag. System rep.

- ✓ Technological requirements
- ✓ Prototypes



How is the development process structured (overview of the main processes) ? What are the main modelling techniques used to design the IT-solutions ? How does the team (or yourself) ensure the proper transfer of the tools to potential users ? How is the proper maintenance of the tools ensured and how is the support for users organised ?

✓ DSS production cycle:

- EA architecture
- DSS detailed specification
- DSS design
- DSS development & documentation
- DSS testing (functional, technological, users)
- DSS deployment
- DSS users training
- DSS maintenance and user support

✓ Modelling techniques: BPMN, flow-charts, Use-cases, E-R diagrams, story-boards

✓ Tools: transfer of the tools to potential users ? Engagement across the DSS development; training; user support (help desk); documentation; dissemination events,...

✓ Questions related to the development of guidelines:

✓ ~~What is specific to sustainable forest management (SFM) in the development of the tools ?~~ What were the adaptations, respectively the extensions you made to the generic development of computer-based tools ?

## Are stakeholders involved in the development of the tools ? If so, who, when, how, which role/function ?

- ✓ All responsible for current and future business processes = IT profiles + business profiles
- ✓ Requires 1 project owner on the client side
- ✓ Engaged across the entire DSS architecture and development;
  - Participate on workshops
  - Part of the EA team
  - Periodic DSS status follow-up
  - Responsible for data gathering
  - Responsible for internal (and external) DSS dissemination
  - Responsible for users tests, training
  - Assure help desk for functional features

## Questions related to the development of guidelines:

✓ What is specific to sustainable forest management (SFM) in the development of the tools ? What were the adaptations, respectively the extensions you made to the generic development of computer-based tools ? **OR techniques specific for SFM**

✓ What is the effective contribution of the tools to SFM ? What was/is essential to ensure this effective contribution ? What are the key factors for success ? Check-list ? What are the recommendations you propose to ensure the proper development of DSSs for SFM ? Do guidelines to develop and apply DSSs already exist ?

**Decision-makers/stakeholders involvement; case-test for example and benefits quantification; hide complexity of the model/algorithm; short run-time; flexible/easy to use; GUI for parameterization of the SFM model; high range of indicators for results exploitation; GIS reporting; god scenarios dynamics (and scenarios queuing processors),...**