BPM for Quality Assurance Systems in Higher Education

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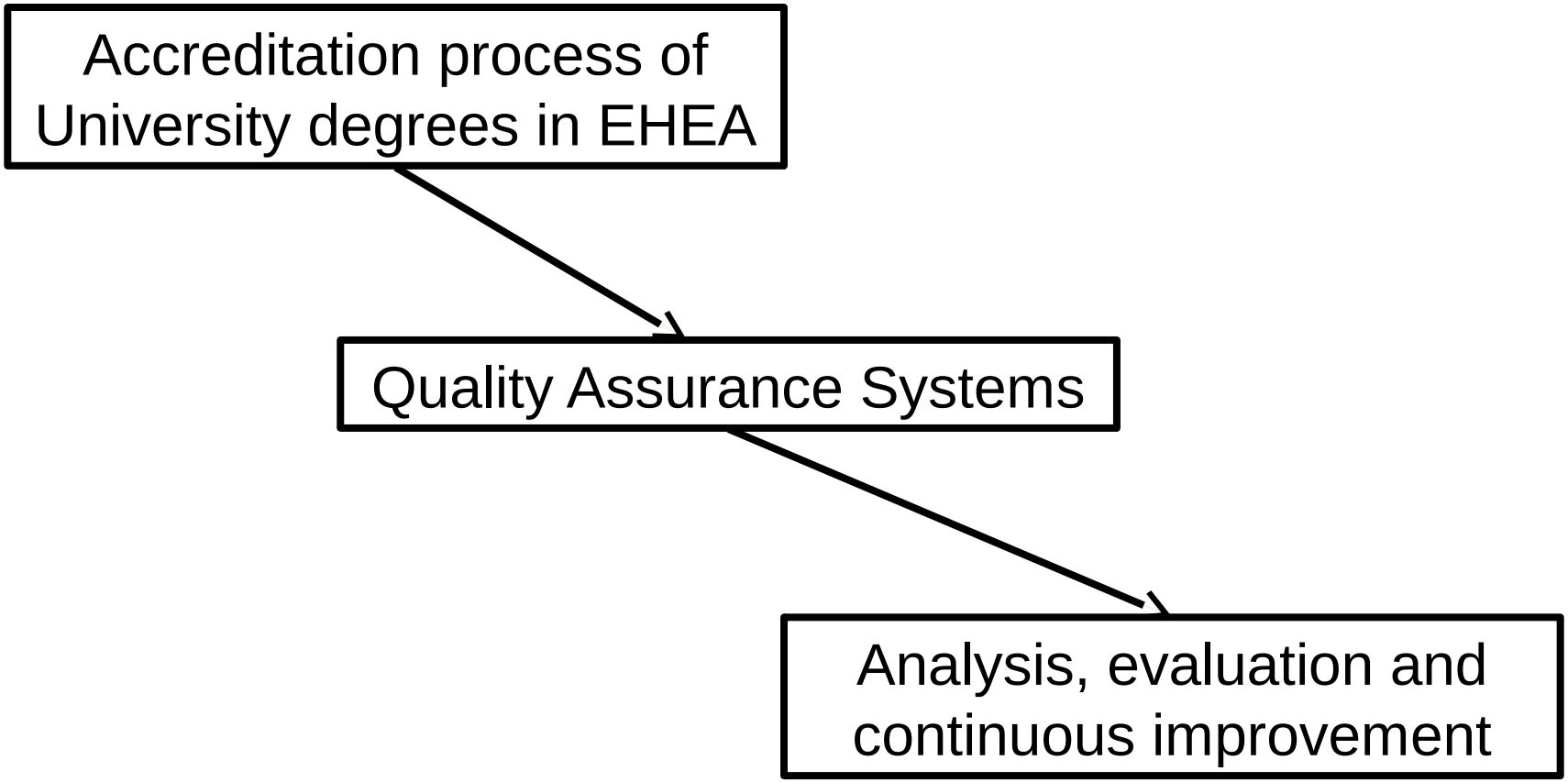
Motivation (1)

- The **European Higher Education Area** (EHEA) framework and European and Spanish national regulations establish that **institutions should guarantee the compliance of specified quality objectives in university degrees**
- Spanish Universities implement Internal Quality Assurance Systems (SGIC by its local acronym) formally established and publicly available.
- A SGIC establishes processes and evidences to conduct and document the analysis, evaluation and continuous improvement.

Quality Assurance in Higher Education



Motivation (2)

- The correct monitoring of the procedures and the proper storage of documentary evidences must be secured.
- The **most efficient way** for that purpose is a computer system using **Business Process Management (BPM)** tools.
- The design of the Quality Assurance System, technological details of the computer system and the experience of using all together during several years will be the contents of this communication.

Index of contents

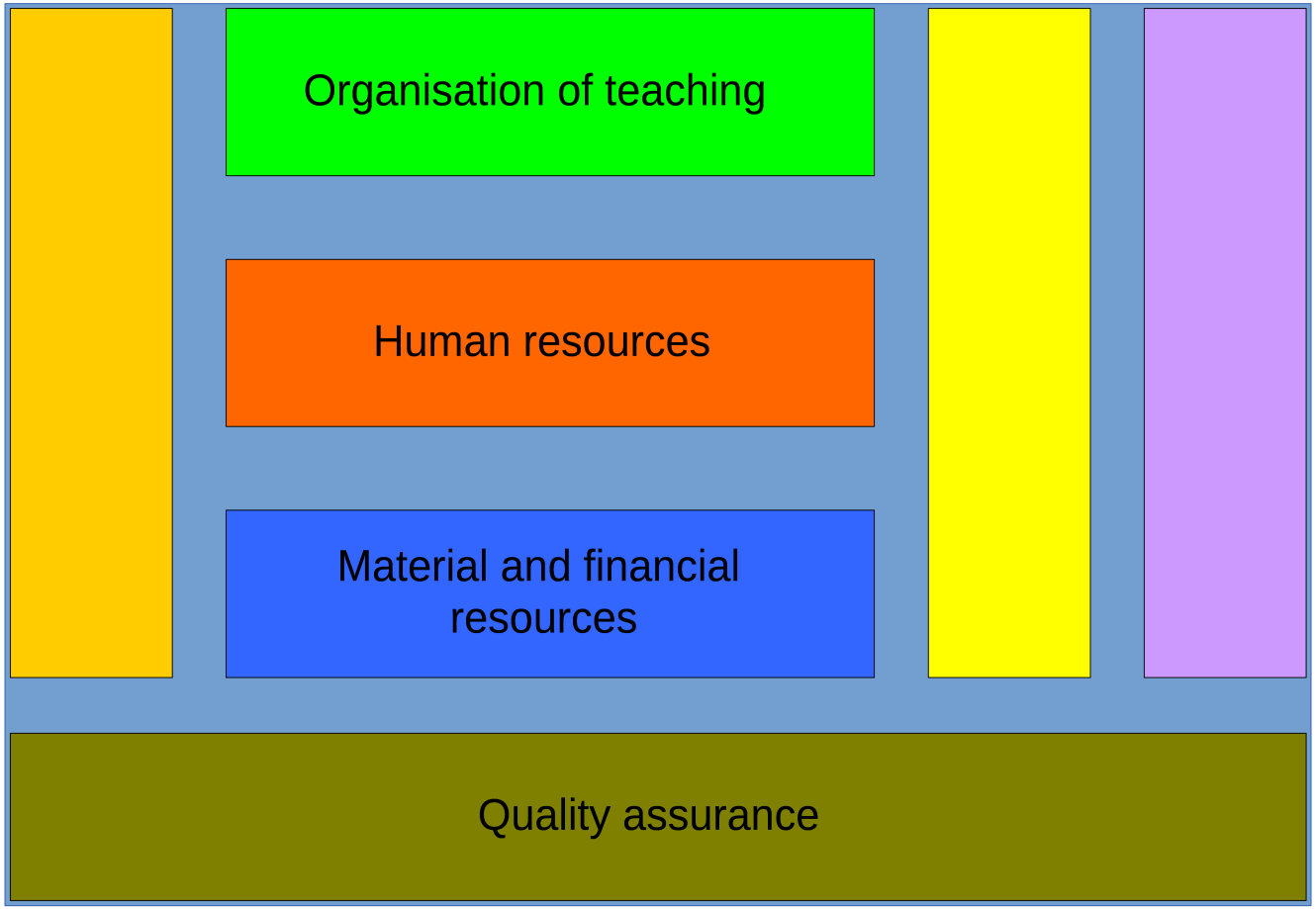
- Motivation
- Internal Quality Assurance System (SGIC)
- Business Process Management (BPM)
- SiGIC: Computer System supporting SGIC
  - SiGIC architecture
  - Technological details
- Experience, Results and Conclusions

Keywords: Quality in Higher Education, Business Process Management, Open Source

SGIC Internal Quality Assurance System

- The system to ensure the quality should facilitate the **review, control and improvement of the teaching processes** by the University and the different actors involved.
- The **University of Valencia** has designed an **Internal Quality Assurance System** (SGIC by its Spanish acronym) that indicates the processes to be followed, the responsible of each action and the documentary evidences that should be generated and stored.

SGIC: aspects to be analyzed



SGIC Internal Quality Assurance System

- Through this system the University:
  - collects and analyses periodically all relevant information,
  - promotes improvement actions, and
  - prepares for external evaluations, which supervise the effective implementation of teachings and its quality.
- The University should define a set of processes, determining the tasks to be done, the responsible of each task and the documents required.

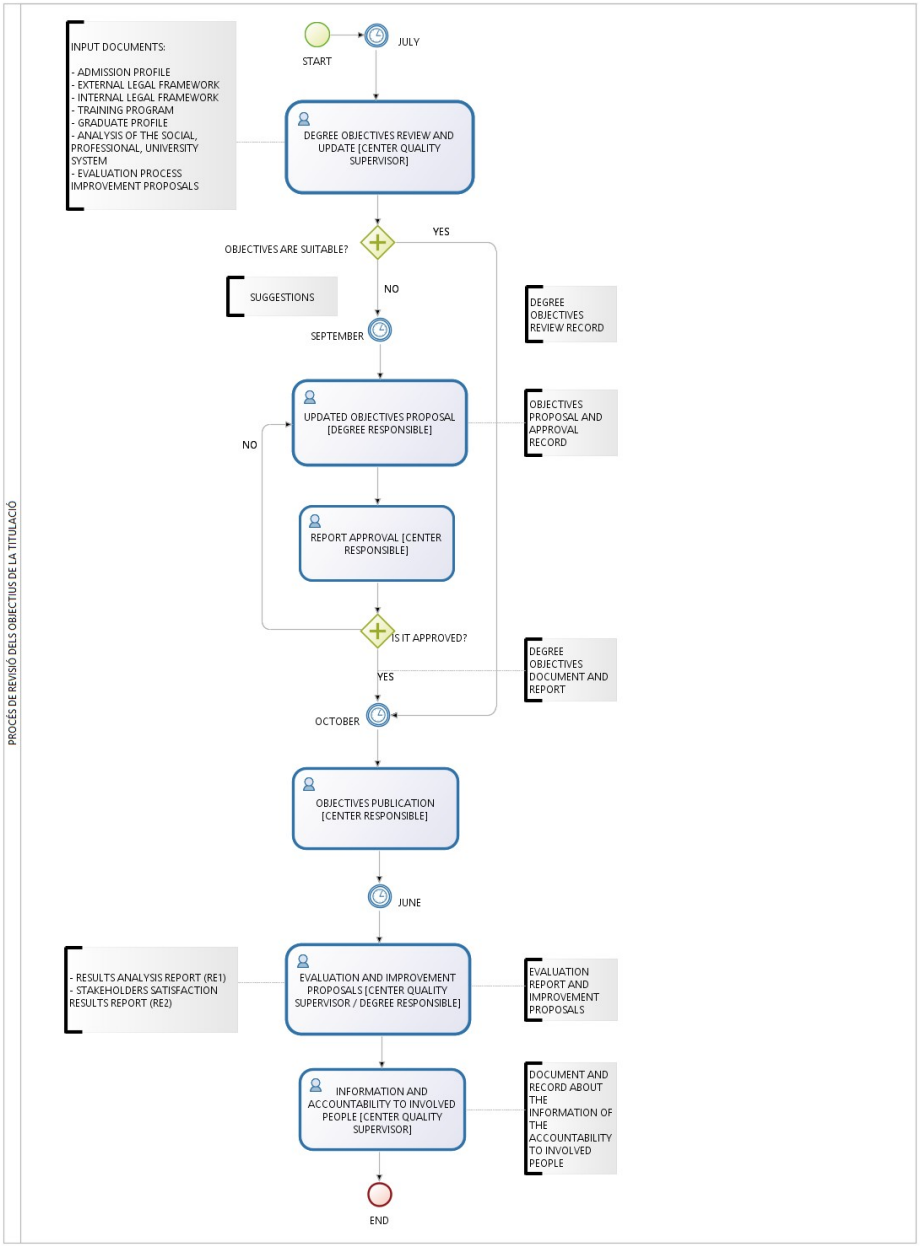
BPM: Business Process Managemt.

- *"Business Process Management (BPM) is a discipline involving any combination of modeling, automation, execution, control, measurement and optimization of business activity flows, in support of enterprise goals, spanning systems, employees, customers and partners within and beyond the enterprise boundaries."*
- BPM is done by people primarily concerned with the improvement of the processes.

BPM

Process design

- Tasks
- Actors
- Deadlines
- Workflow
- Evidences



SiGIC: Computer System for SGIC

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Internal Quality Assurance Computer System

- We designed an open source tool that integrates proven quality components in a modular an flexible approach.
- **SiGIC** integrates Business Process Management with document repository technologies for tracking quality processes and storing resulting documents.
- The computing system should be developed to cover the following functions:

SiGIC requirements (1)

- Control of the workflow so that the tasks are accomplished on time by the right actors also following the established sequence.
- Storing in a structured way, for its further analysis or consultation, the information generated or used in each task.
- Allowing users to check whether they have to perform any task, and providing them with the information needed to carry them out.

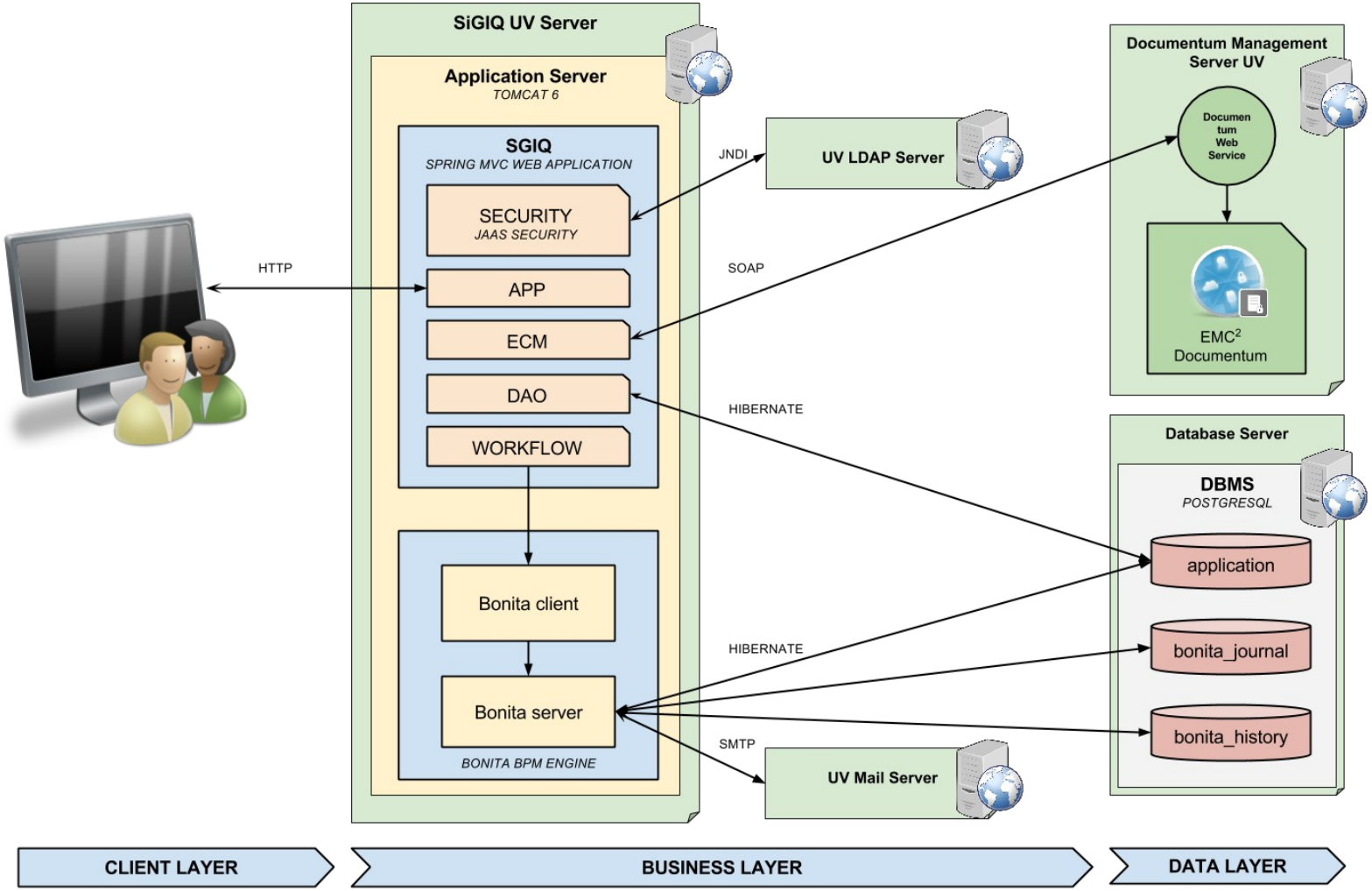
SiGIC requirements (2)

- Proactively notifying users when they have a task to perform and when the deadline expires.
- Informing the user in charge of each center (School/Faculty) and also the university quality management team about:
  - the status of each process,
  - the users responsible for the active tasks and
  - the deadlines to perform it.
- Allowing the responsible users to view all the information stored so far.

SiGIC architecture

- SiGIC uses a three layer architecture:
  - At the **presentation layer** client technologies are used such as HTML5 and JavaScript.
  - The **business layer** resides on an application server running the SGIC application (with its different modules) and the Bonita BPM Engine (the selected workflow engine), and interacts with the UV LDAP server and the UV Mail server.
  - The **data layer** includes a PostgreSQL database storing the application data and the workflow engine data and also the Document Repository server.

SiGIC architecture



Technological details (1)

- The SGIC web application follows the standards for Java Enterprise Edition.
- The Spring Framework has been used since it allows light application servers like the selected Apache Tomcat 6.
- The application is composed of several packages:
  - SECURITY, APP, WORKFLOW, DAO, ECM

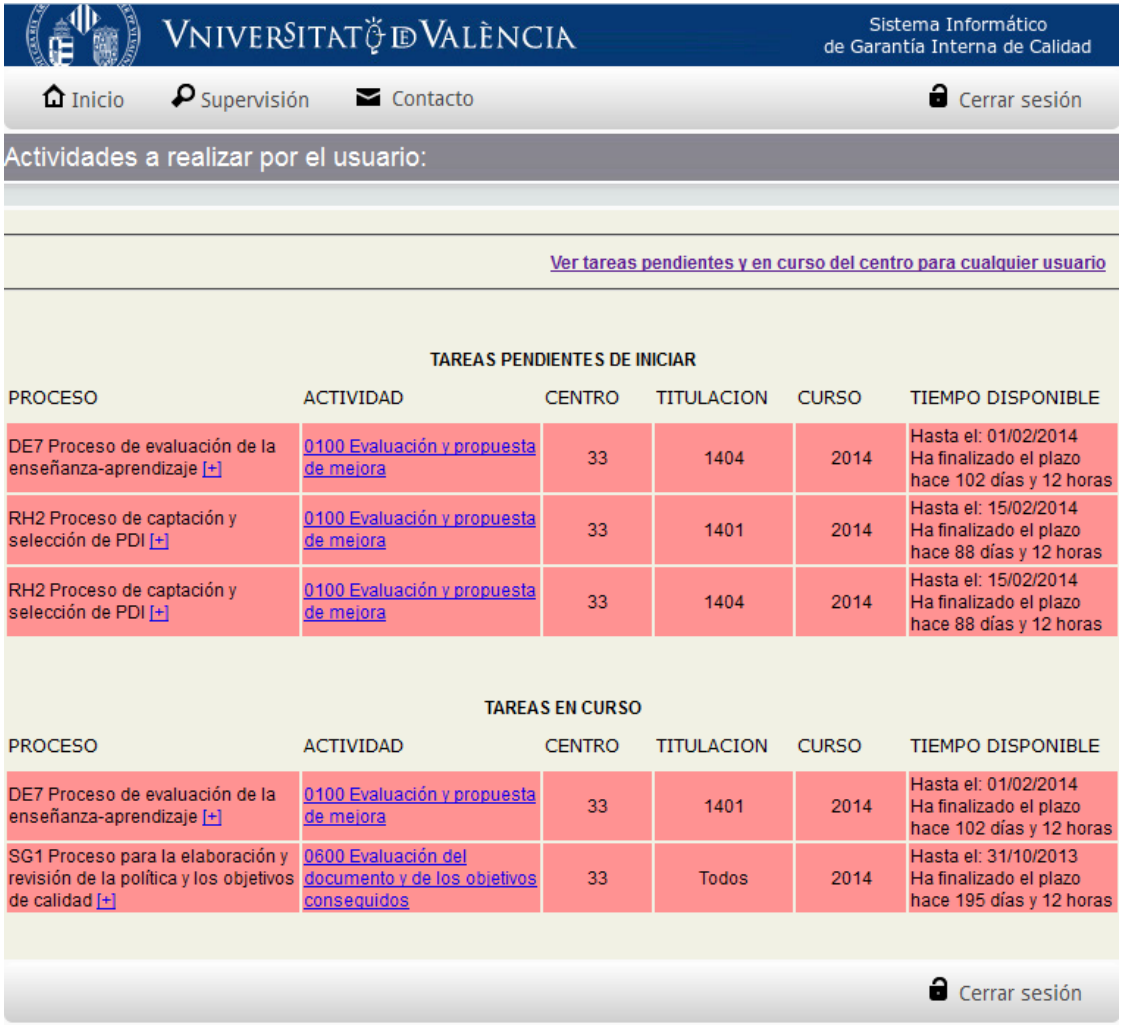
Technological details (2)

- Bonita BPM is used at the core of the SiGIC:
  - Bonita BPM Engine implements and instantiates the processes (here quality processes), and controls the workflow and the aspects involved (roles, deadlines,…)
  - Process definition is done off-line with the graphical environment Bonita BPM Studio
- SiGIC interacts with the Corporate Content Repository through a web service using SOAP (Simple Object Access Protocol)
  - This configuration allows interaction between independent systems, such as Alfresco or Documentum.

User interface

- SiGIC uses a Web based client at the presentation layer.
- End users need only a simple browser.
- Users may use almost any browser on any Operating System.
- Users are authenticated via LDAP and get, according to their roles:
  - Lists of tasks to be done and interface to perform them.
  - Overall information of processes and their details.

User interface: tasks-activities list



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TAREAS PENDIENTES DE INICIAR

PROCESO	ACTIVIDAD	CENTRO	TITULACION	CURSO	TIEMPO DISPONIBLE
DE7 Proceso de evaluación de la enseñanza-aprendizaje [+]	0100 Evaluación y propuesta de mejora	33	1404	2014	Hasta el: 01/02/2014 Ha finalizado el plazo hace 102 días y 12 horas
RH2 Proceso de captación y selección de PDI [+]	0100 Evaluación y propuesta de mejora	33	1401	2014	Hasta el: 15/02/2014 Ha finalizado el plazo hace 88 días y 12 horas
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TAREAS EN CURSO

PROCESO	ACTIVIDAD	CENTRO	TITULACION	CURSO	TIEMPO DISPONIBLE
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SG1 Proceso para la elaboración y revisión de la política y los objetivos de calidad [+]	0600 Evaluación del documento y de los objetivos conseguidos	33	Todos	2014	Hasta el: 31/10/2013 Ha finalizado el plazo hace 195 días y 12 horas

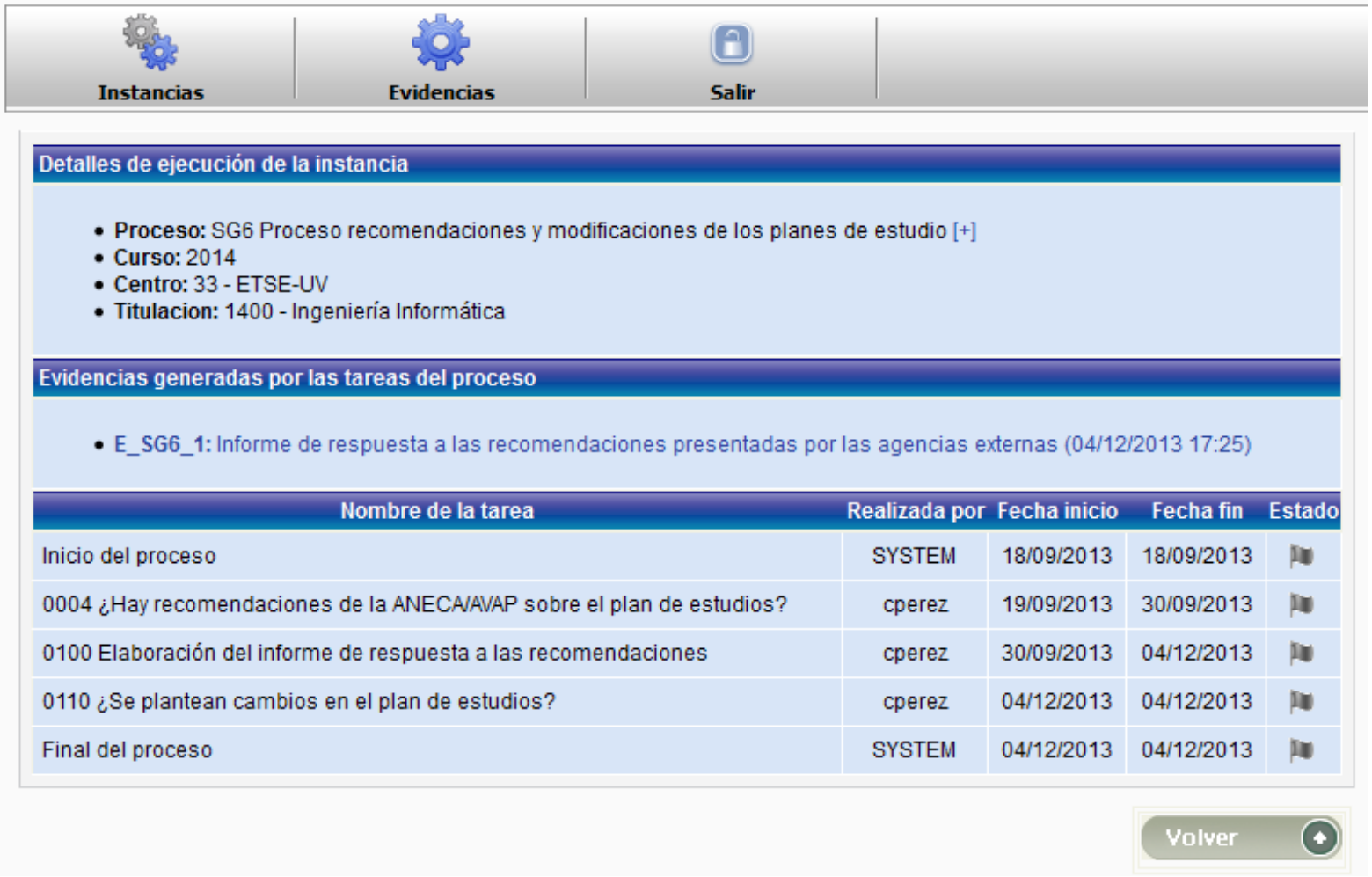
Cerrar sesión

User interface: performing the task

User interface: supervision

Curso	CentroTitulación		Nombre proceso	Fecha inicio	Fecha fin	Estado
2014	33	1400	RH2 Proceso de captación y selección de PDI	10/01/2014		0200 Información y rendición de cuentas a los implicados
2014	33	1400	SG6 Proceso recomendaciones y modificaciones de los planes de estudio	18/09/2013	04/12/2013	Final del proceso
2014	33	1400	DE7 Proceso de evaluación de la enseñanza-aprendizaje	20/12/2013		0200 El Comité de Calidad de Centro informa y rinde cuentas a los implicados. Para la rendición de cuentas el Comité de Calidad informa a la Junta de Centro.
2014	33	1401	RH2 Proceso de captación y selección de PDI	10/01/2014		0100 Evaluación y propuesta de mejora
2014	33	1401	SG6 Proceso recomendaciones y modificaciones de los planes de estudio	18/09/2013	18/11/2013	Final del proceso
2014	33	1401	DE7 Proceso de evaluación de la enseñanza-aprendizaje	20/12/2013		0100 La Comisión de Título con la supervisión y apoyo del Comité de Calidad de Centro, realiza una evaluación señalando propuestas de mejora de todo el proceso.
2014	33	1402	RH2 Proceso de captación y selección de PDI	10/01/2014		0200 Información y rendición de cuentas a los implicados
2014	33	1402	SG6 Proceso recomendaciones y modificaciones de los planes de estudio	18/09/2013	26/11/2013	Final del proceso
2014	33	1402	DE7 Proceso de evaluación de la enseñanza-aprendizaje	20/12/2013		0200 El Comité de Calidad de Centro informa y rinde cuentas a los implicados. Para la rendición de cuentas el Comité de Calidad informa a la Junta de Centro.

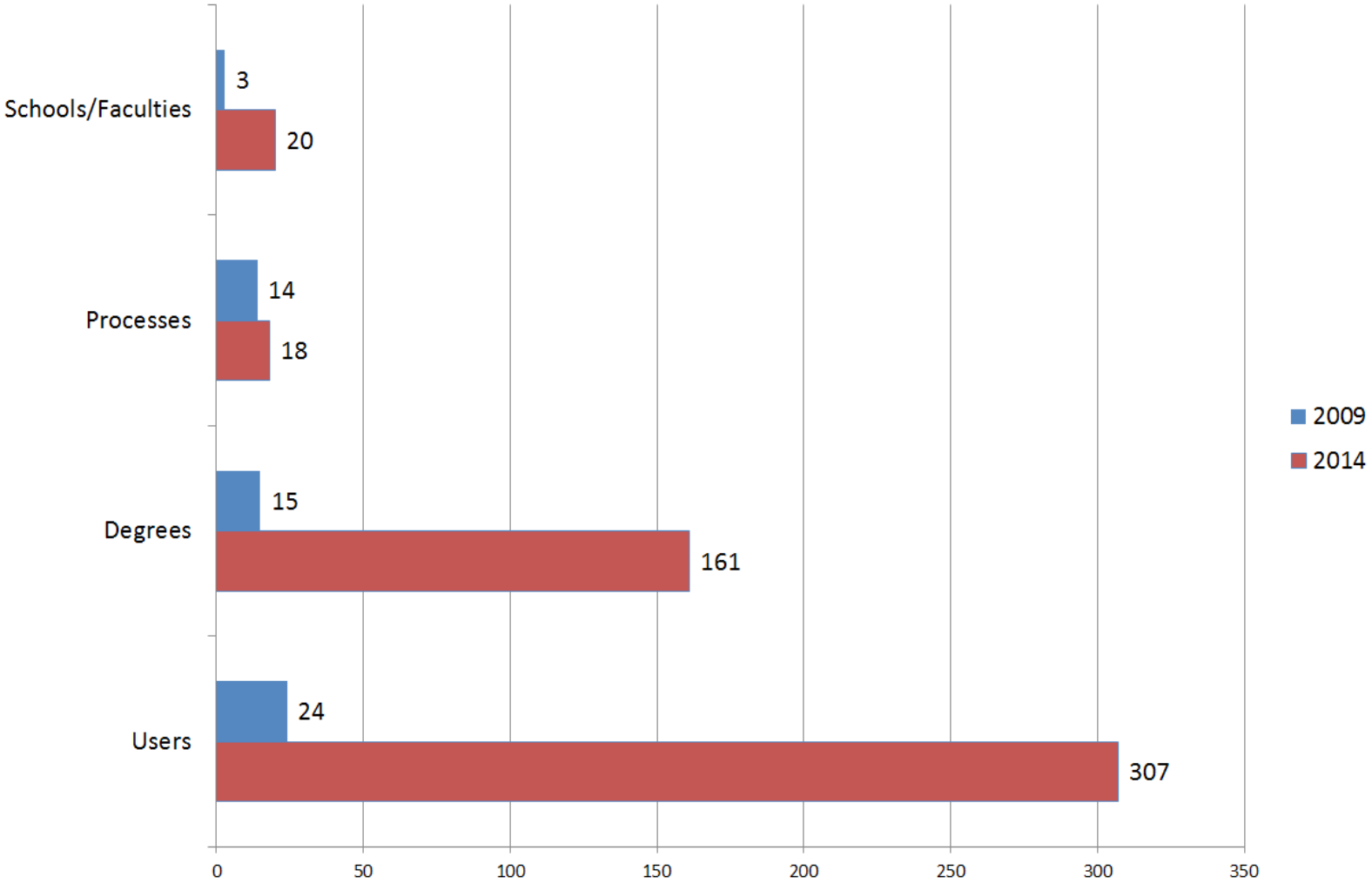
User interface: supervision details



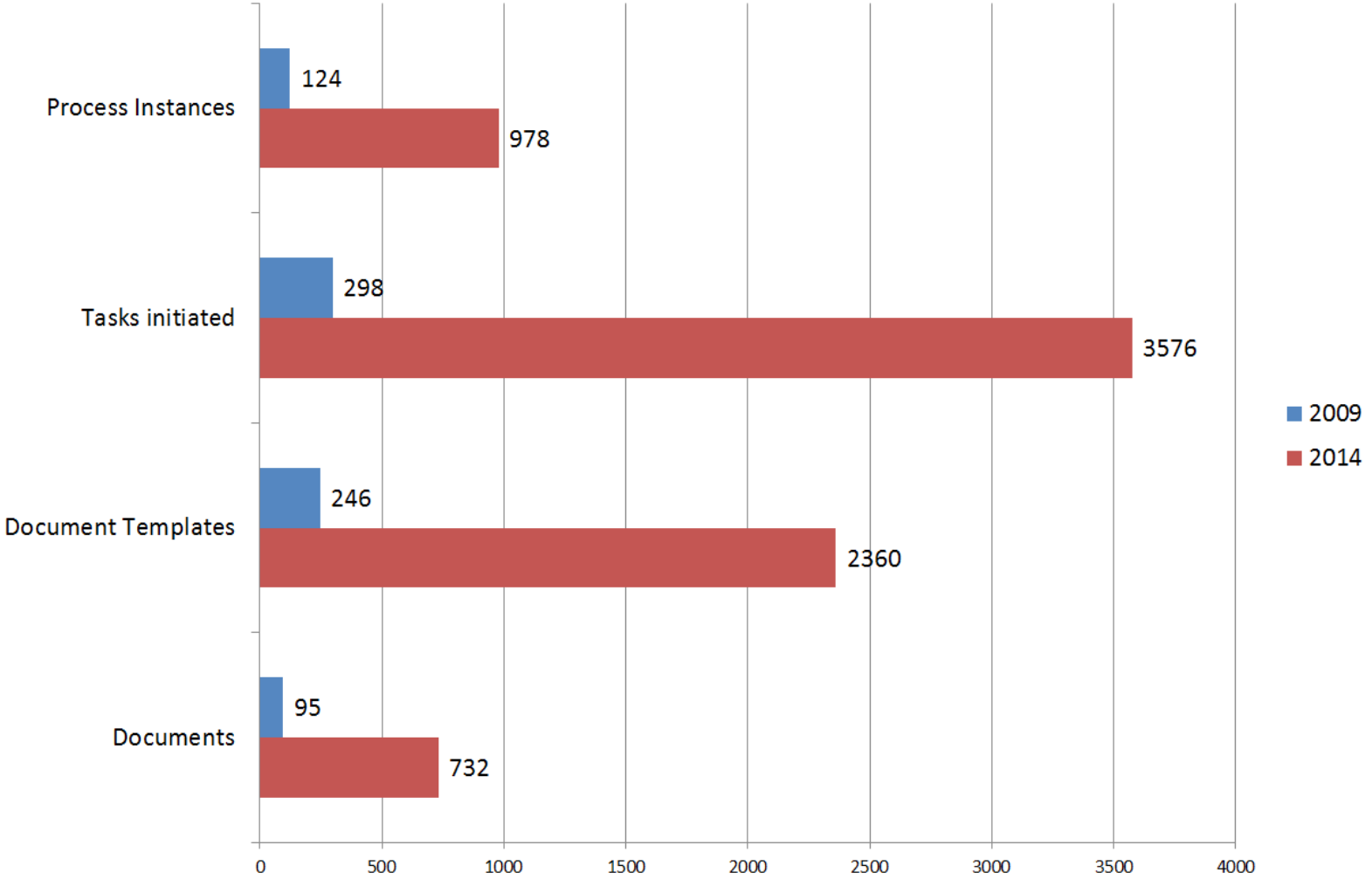
Experience evaluation

- The system has been gradually introduced
  - The first pilot test was conducted at 3 schools (including the School of Engineering) in 2009.
- The system has been already applied to all Schools, Bachelor and Masters degrees of the University of Valencia.
- The users agree that having such a system helps and facilitates the quality objectives and the compliance of processes that should be done in any case.

Experience evaluation (2)



Experience evaluation (3)



Conclusions (1)

- The University must ensure and facilitate the compliance of actions for continuous improvement.
- Quality systems, and overall functioning of organizations, may be supported by Business Process Management (BPM) software systems:
  - a workflow engine should be used;
  - process development should be documented with documentary evidences that should be organized in structured content repository.

Conclusions (2)

- Quality systems should not be seen as an additional source of workload;
  - instead, they help make all the work of analysis, planning and evaluation that higher education institutions perform in any case.
- The users' experiences prove that a computer supported quality system based on BPM helps and facilitates the compliance of quality processes.
- The computerized implementation will also allow further improvement of the whole quality system and its processes, an overall concern of BPM.

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