Issues of a unique ICT service
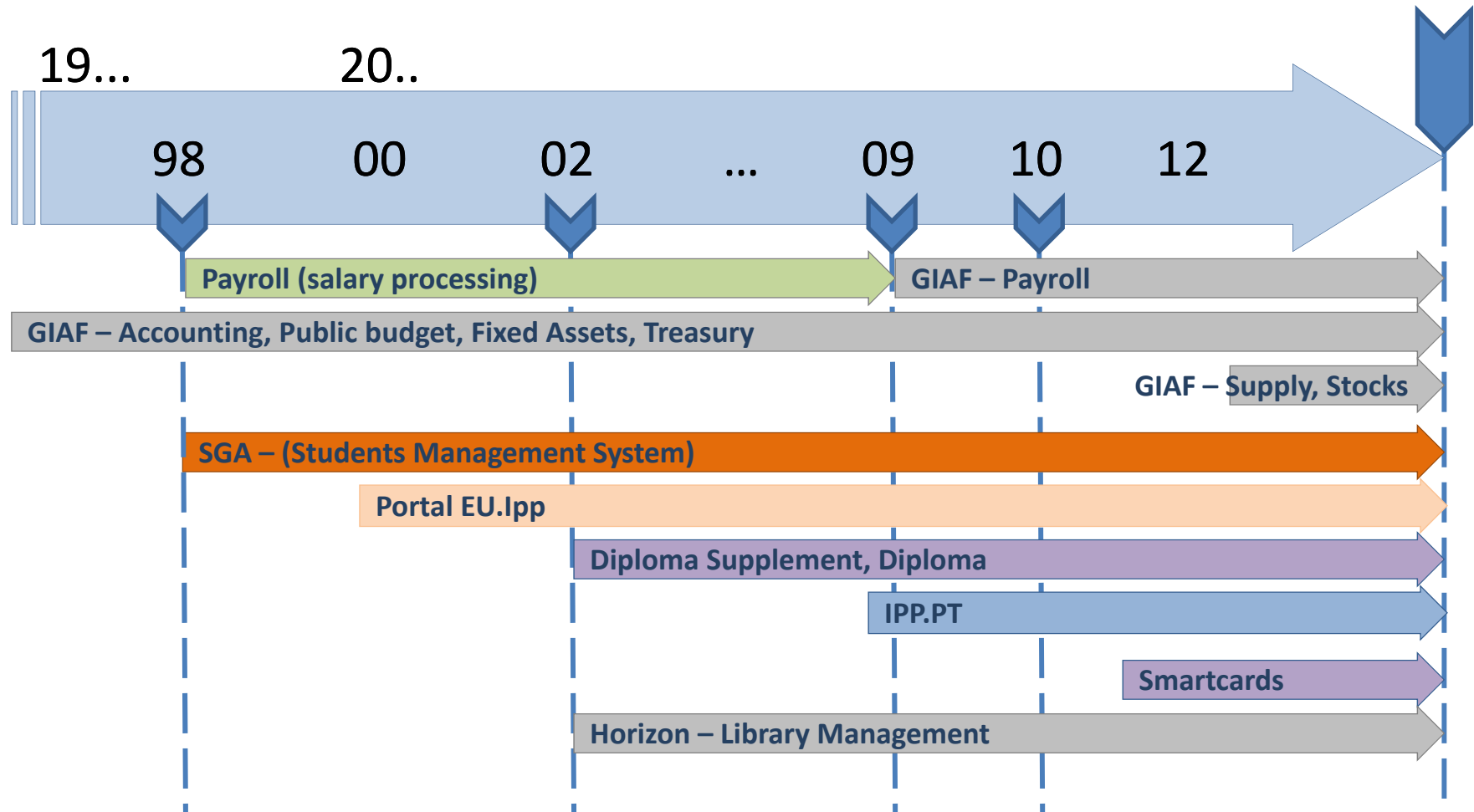
Sérgio Pires

Ćuprija |Serbia 12th – 13th March 2013

POLITÉCNICO DO PORTO

ICT SERVICES

"Instituto Politécnico do Porto" - Public Higher Education Institution

History of the IPP Solutions

Why?...

POLITÉCNICO DO PORTO

- After investing resources (time and money) in a system, it's very difficult to start all-over again!

  – The rules of the "business" change radically in a short time: Bologna, new range of legal frameworks;

  – It is easier to "mount" (add) a new rule or functionality to an existing system than implement the old rules all over again;

  – Coexistence between past and present is very difficult
    - The life cycle of a student can be (really) too long, his history must be present until the end of his life!

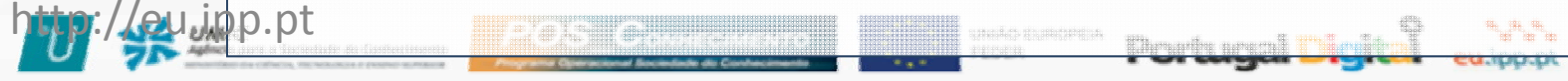   LONGLIFE LEARNING! (Re-entrance, Continuation of The Course, etc…)

IPP MAIN SOLUTIONS

PORTAL EU.IPP.PT

http://eu.ipp.pt

PORTAL EU.IPP.PT

http://eu.ipp.pt

PORTAL EU.IPP.PT

http://eu.ipp.pt

EU.Ipp: why?...

- A platform for Student Relationship Management (SRM)

- It has a broad spectrum of functionality in the areas of administrative and support classes. Besides the developed part, the system still adds other features: managing schedules and surveillances, and GIAF external solution in the financial and administrative purposes.

- Incorporates e-learning platform Moodle.

**POLITÉCNICO
DO PORTO**

- From "Secretaria Online" (Online Secretary) to EU.Ipp

    – Born in 1999 as "Secretaria Online", but has evolved to Portal EU.Ipp;

    – In general used by IPP schools;

    – Is the central system oriented to IPP active community;

    – Born from scratch in perfect harmony with SGA taking advantage of its unique characteristics;

Portal EU.Ipp.pt
http://eu.ipp.pt

POLITÉCNICO DO PORTO

Student Relationship Management

Student Lifecycle

- Registration / enrollment
- Frequency of classes
  - Classes
  - Timetables
  - Summaries
  - Attendance
  - Binding to Moodle
- Evaluations
  - Continuous
  - Final
  - Exams

- Auxiliary services
  - Helpdesk / Requests (to the School services)
  - Certificates, Diploma
  - Campus Map
  - Account Transactions
  - Additional information for the Diploma Supplement
  - Students Surveys
- Payments
  - Fees
  - Other services

Student Relationship Management

Teacher Lifecycle: the other side of services provided to students

- Frequency of classes
  - Classes: management
  - Timetables: teaching staff, dashboard
  - Summaries: registers
  - Attendance: their own and students'
  - Binding to Moodle: management

- Management of the curricular unit
  - Evaluation Model
  - Form of the Curricular Unit: preparation and approval
- Evaluations
  - Continuous
  - Final
  - Exams
- Auxiliary services
  - Helpdesk / Request (of their own to the School)
  - Teaching staff Surveys

PORTAL IPP.PT

http://www.ipp.pt

POLITÉCNICO DO PORTO

Portal IPP.PT
http://www.ipp.pt

- More focused on the General Council, the Presidency and related services
  - Publication of regulations issued by the GC and the Presidency
  - Services of Support to the Presidency

- Transversal services
  - Request to the Presidency
  - "Especialista" (Specialist) Title
  - GiCANT – canteen management

- For public in general (*IPP community and also prospects - potential "costumers"*)
  - M23
  - "Mestrados" (Masters)
  - "Concursos Especiais" (Special Contingent)

IPP.PT : why?...

- It was adopted as the corporate website of IPP par excellence;

- The Information Systems IPP.PT and EU.Ipp coexist peacefully, with well-defined purposes;

  – They share resources and services, each one in its own jurisdiction transparently to the end-user;

SGA

Students Management System

POLITÉCNICO DO PORTO

- **SGA - Students Management System**

  - The strongbox system
    - Student Form
    - Student Admissions
    - Student Classifications/Grades
    - Scheme for payment of school fees
    - Record of payments
    - Calculation of non-compliance rates
    - Equivalences of study plans

SGA: why?...

- It is the oldest system developed at IPP still active;

- It is robust and reliable;

- Contains (almost) the entire history of the Students of IPP;

- Survived Bologna with audacity

- Remains current and capable of responding to the new needs

- It is not purposed for support the teaching activity

- Is character based interface - with the limitations that this type of interface provides;

- By strategic decision of security, data transfer between SGA and EU.Ipp is accomplished by periodically synchronizing activity

SATELLITE SYSTEMS

Satellite systems

- SGSD - Graduates Management System

  - Diploma Supplement

    - Decentralized management

    - Gathering of SGA's academic path of the Student

    - Gathering of additional information from EU.Ipp Portal

    - Management of other information

    - Emission

  - Diploma

    - Centralised Management

    - Gathering of SGA's academic path of Student

    - Emission

Satellite systems

- **HorPro**: timetable management
  - Shares the databases with Portal EU.Ipp
  - Intelligent management of classes, spaces, teachers and time

- Attendance Management
  - Time clock
  - Reports for payroll

- **Horizon** - Library management
  - Centralization of all IPP libraries into a single system;
  - In use since 2002, actually it continues maintaining user satisfaction

Satellite systems

- Smartcards Management - **IPP Card**
  - Integration with the national cards issuer - SIBS
  - Card Management
  - Integration with external systems based on IPP Card
  - Integration with Portal EU.Ipp (periodic synchronization)

- **MOBI.Ipp**: financial management of staff and student mobility
  - integrated with Portal EI.Ipp

GIAF

POLITÉCNICO DO PORTO

- Accounting
- Public budgets
- Payroll
- Property and equipment
- Budget management
- Treasury
- Supply / stocks (in implementation)
- Contract Management (in implementation)

INTERACTION BETWEEN SYSTEMS

Interaction between systems

POLITÉCNICO DO PORTO

Legend

⚡ Webservices

◀◀◀ RSS

↔ Scheduled Synchronization between databases

GIAF

↔ Accounting information

← Get accounting document
→ Provide accounting document

← News Clippings
← Institutional documents

IPP.pt

EU.Ipp

→ Payments of the Student
→ Payment scheme
→ Course Plan
← Student Form
← Student Enrollment
← Payments per Student
← Student grades

← Additional Information
↔ General Information of qualifications

SGA

← Finalist Data
← Data of course conclusion
← Curricular units
← Documents Delivery
→ Documents Emission

SGSD

IMPORTANT!

- Authentication of users via LDAP was a fundamental decision that:

  – Allowed transparency between applications to the user;

  – Allowed the centralization of the authentication process, regardless of platform;

  – Allowed the decentralization of account management: the technicians of each school manage their own users;

  – Enables simple integration of new systems (if they support this technology);

  – Allow the "jump" of final-user between platforms with "single sign-on";
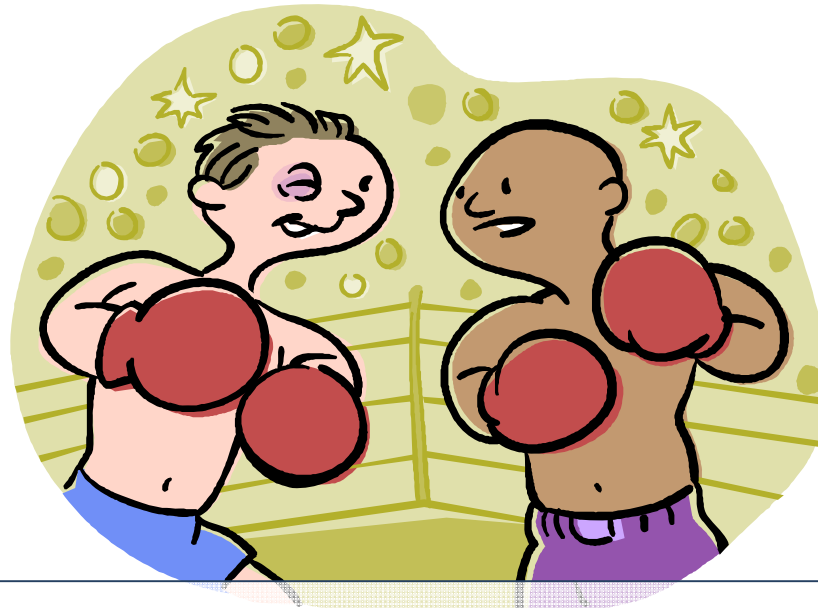
MULTI-SCHOOL VS MONO-SCHOOL

System typology

multi-school *vs* mono-school SGA

POLITÉCNICO DO PORTO

- SGA assumed from the beginning a multi-school behaviour. However, actually there are three instances of this application running:
  - One at School ISEP (maintenance of the ancient data - remember? …)
  - One at School ISCAP
  - One at the Central Services serving the other schools

  – For now (since 1998!), there are no complains about it's multi-school behaviour;

  – School ISCAP assumes as a strategic decision to maintain its instance to run "indoors" – with mono-school behaviour;

multi-school *vs* mono-school EU.Ipp

- The Portal EU.Ipp is assumed from the start as a single-school system:

  - Advantages:
    - Autonomy of the school's particular data;
    - Autonomous systems running in separate instances (despite sharing servers);
    - Allows "stop" and "start" instances of a particular school without affecting the others;
  - Disadvantages :
    - The need of replicating user accounts to cross-Schools in each of the databases;
    - Data segmentation for each of the schools, which complicates common data extraction of the Institution;
    - The need to maintain the common issues replicated in each system;

multi-school *vs* mono-school EU.Ipp

- The Portal EU.Ipp is assumed from the start as a single-school system :

    - The database SOL (*translation*: Sun, *acronym for Secretaria On-Line*)
        - The tables in this database are shared with all Schools;
        - It is the solution to common data and functionality;

multi-school or mono-school?

IMPORTANT!

A key decision to be taken initially!

SWOT ANALYSIS

SWOT Analysis
General perspective

POLITÉCNICO DO PORTO

STRENGTHS

- Autonomy in implementing solutions;
  - High response capacity;

- Separation solutions by scope;

- Wide range of services to the community;

- Stability and reliability of solutions;

- The usual operations available online;

WEAKNESSES

- Autonomy in implementing solutions;
  - Need for software development team;

- Great variety of technology platforms :
  - Replication of infrastructures;

  - Segmentation of technical staff by technology :
    - more technical staff needed;
    - Lower capacity of team balancing;

POLITÉCNICO DO PORTO

SWOT Analysis
General perspective

OPPORTUNITIES

- To Improve the skills of the development team;

- Expansion of services not only to IPP community, but also to society in general;

- Reviewing scopes established by the strategic objectives of the Presidency of IPP in order to identify opportunities to explore;

- Analyze the available services to identify different application areas that can benefit from them

THREATS

- The development team may not able to provide the appropriate response to all requests;

- A technology being dominated by just one technician, getting the IPP strategic resources in a critical situation in case of illness, vacation or resignation of that technician;

- Each technician master only one or two technologies, making impossible to balance the strength of the team;

SWOT Analysis
IPP.PT

STRENGTHS

– Flexible permits management;

– Multy-school typology
  • Transversal services to the schools;

– The IPP's Presidency institutional communication channel;

– Central repository of documentation;

WEAKNESSES

– Multy-school typology:
  • As the volume of stored data increases, the responsiveness of the database becomes more critical;

– Mixture of sub-systems on the same portal
  • Requirements for the presidency;
  • Canteen management;
  • "Especialista" (Specialist) Title
  • Candidacies;

– Proprietary technology (Microsoft)
  • The tendency for radical replacement of bas technology increases the risk of rapid obsolescence of developed modules;

POLITÉCNICO DO PORTO

SWOT Analysis
IPP.PT

OPPORTUNITIES

- Take advantage of the target community to promote the quality and variety of courses offered by IPP;

- Take advantage the infrastructure to increase the number of services provided by IPP;

- Increase the targeted community of IPP through the portal;

- Dematerialize via scanning old paper-based documents for preservation;

THREATS

- With the increasing amount of information stored, the system may give an unacceptable response;

- The institutional scope of this portal be faded by the other services also provided;

- Covering services of Portal EU.Ipp scope;

- Emerge from Microsoft a new version or platform incompatible with the infrastructure used;

- Microsoft may stop supporting the infrastructure used;

SWOT Analysis
EU.Ipp

POLITÉCNICO DO PORTO

STRENGTHS

– Scalable;

– Mono-school typology
  - Independence between system instances of each school;
  - Privacy of each school data;
  - Lower risk of damage in case of cyber attack;
  - Data Segmentation by independent databases promotes the ability to better respond to an enormous volume of data

– Open-source technology : JAVA
  - Despite the existence of ancient modules the system keeps running

WEAKNESSES

– Mono-school typology :
  - Redundancy of transversal information and operations;

– Antiquity - size and complexity of code
  - Besides a well object-based structure, the revision of the modules becomes complex due to their connection to each-other;

  - With the constant change of paradigms of GUI (fashions) maintenance of user interfaces is also a constant a challenge

SWOT Analysis
EU.Ipp

POLITÉCNICO DO PORTO

OPPORTUNITIES

– Take advantage of the scalability of the system to enhance response capacity in times of seasonal overload;

– Centralizing in the transversal database SOL the tables whose centralized advantage is evidenced;

– Reviewing the GUI to reflect fashion trends

THREATS

– Having systematic requests for transversal information which is scattered among different databases, causing overload in the technical team;

– May have a tendency to move services to the Portal IPP.PT, losing the goal of each of the portals

SWOT Analysis
SGA

POLITÉCNICO DO PORTO

STRENGTHS

- Strongbox
  - Access is conditioned only to non-teaching staff;
- Very reliable:
  - "If SGA says, is because it's true"

- The entire history in one place;

- Multi-school typology
  - Transverse data management

- Deferred data synchronization
  - "Waterproof" access from outdoor

WEAKNESSES

- Proprietary technology : Pro-C, PL-SQL
  - It is hard to find technicians who master the technology: high dependence on a single person;
  - The migration of functionality to the latest technologies requires total reconstruction of the modules implemented;

- Character-base interface
  - Face it: it's ugly;
  - Based on key-stroke combinations: slow learning curve
  - Limited display capabilities of information;

SWOT Analysis
SGA

POLITÉCNICO DO PORTO

OPPORTUNITIES

– Take advantage of the know-how of portal EU.Ipp to progressively migrate functionalities for JAVA technology;

– Provide SGA a graphical interface

THREATS

– IPP may loose the only technical that masters the technology Pro-C and PL-SQL, becoming responsiveness to a strategic resource;

SWOT Analysis
GIAF

POLITÉCNICO DO PORTO

STRENGTHS

- Proven solution;

- Ensures adequacy of the legal requirements;

- Healthy relationship with the supplier;

- Robust system: Oracle tools;

- The various solutions implemented are fully integrated with each other;

- Many years of use:
    - Accustomed users

WEAKNESSES

- External development:
    - Limited regarding new features;
    - New stuff is expensive;
    - Strategic features for IPP are dependent of the Supplier;

- Closed database
    - Data synchronization must be made by WebServices – new webserves, new stuff

SWOT Analysis
GIAF

POLITÉCNICO DO PORTO

OPPORTUNITIES

- Enhancing data sharing with IPP systems via Webservice;

- Eliminate redundant functions performed by the Portal and GIAF EU.Ipp;

- Explore GIAF features not yet implemented at IPP;

THREATS

- Provider may cease to exist or to assist the product;

- The prices may become unaffordable;

- There is a limitation to a possible decision to change the solution;

- The supplier may not be able to meet the legal requirement on time

- The information in the database is in the hands of the supplier;

- The vendor may denie requests for access to data via webservice

POLITÉCNICO DO PORTO

- It is confirmed that the breakneck speed of new ICT leads the high-tech solutions of yesterday into obsolescence.

- The experience of the past 15 years witnesses an enterprise carried out daily, always with the future as horizon;

- Past is a heavy link chain to be carried daily: today's decisions will inevitably have repercussions in the future;

- The future is too uncertain: the actions taken today will be our best safeguard in the future

POLITÉCNICO
DO PORTO

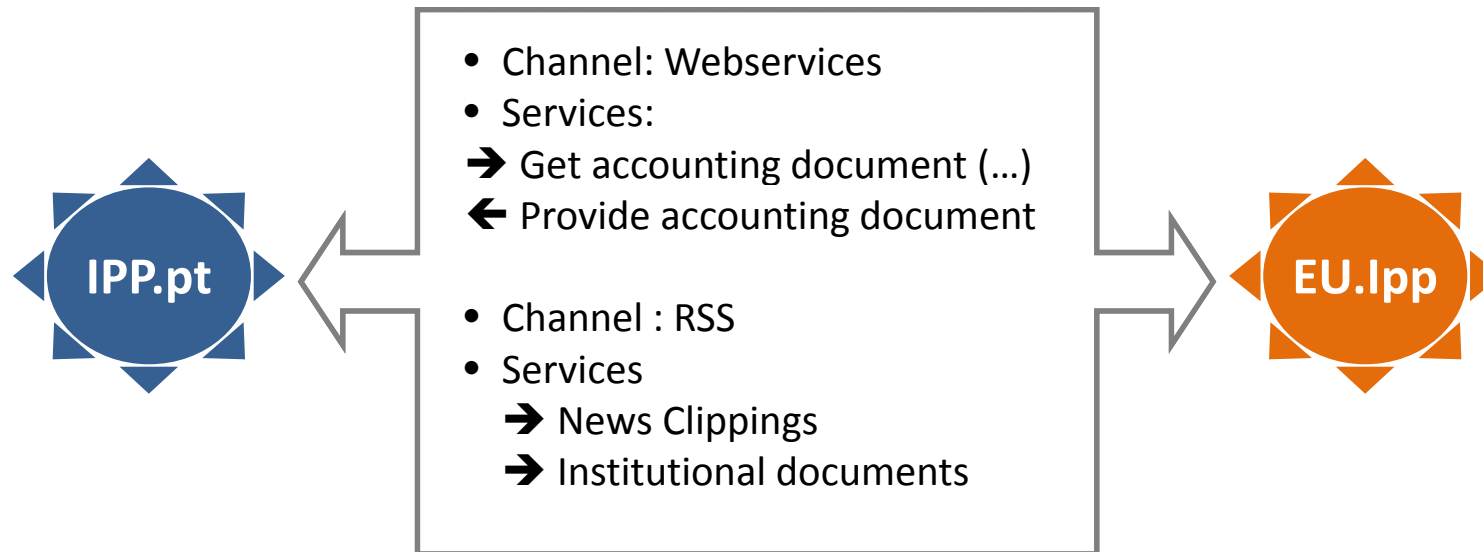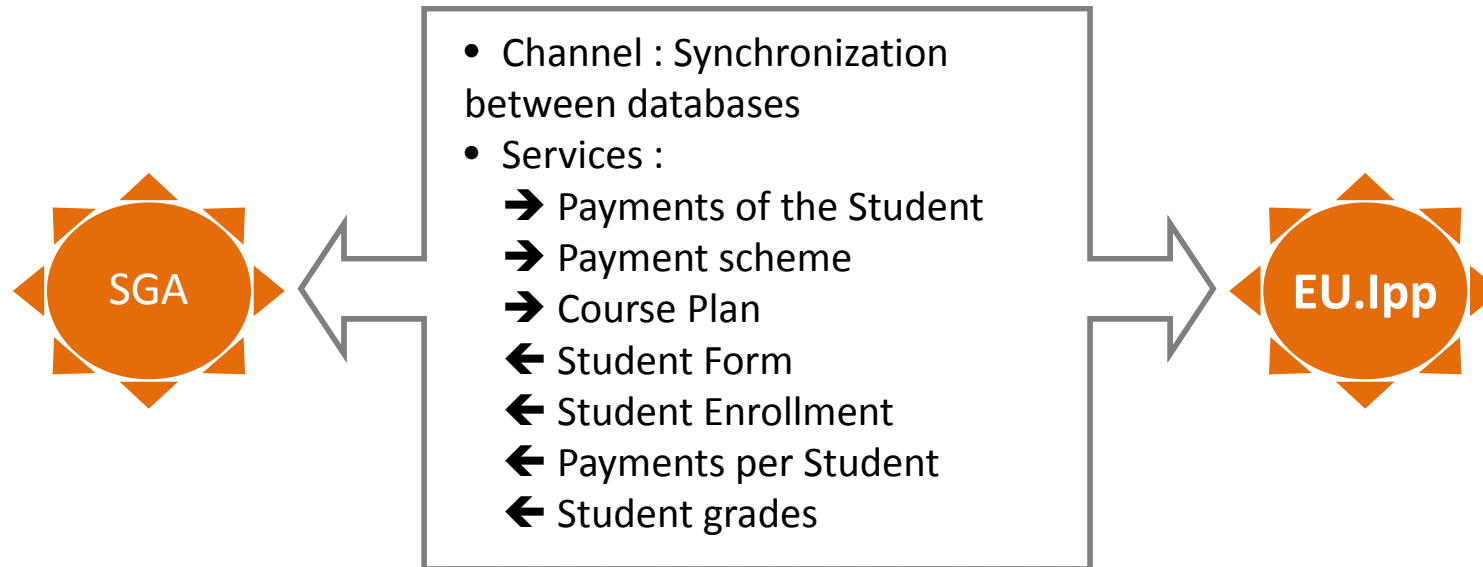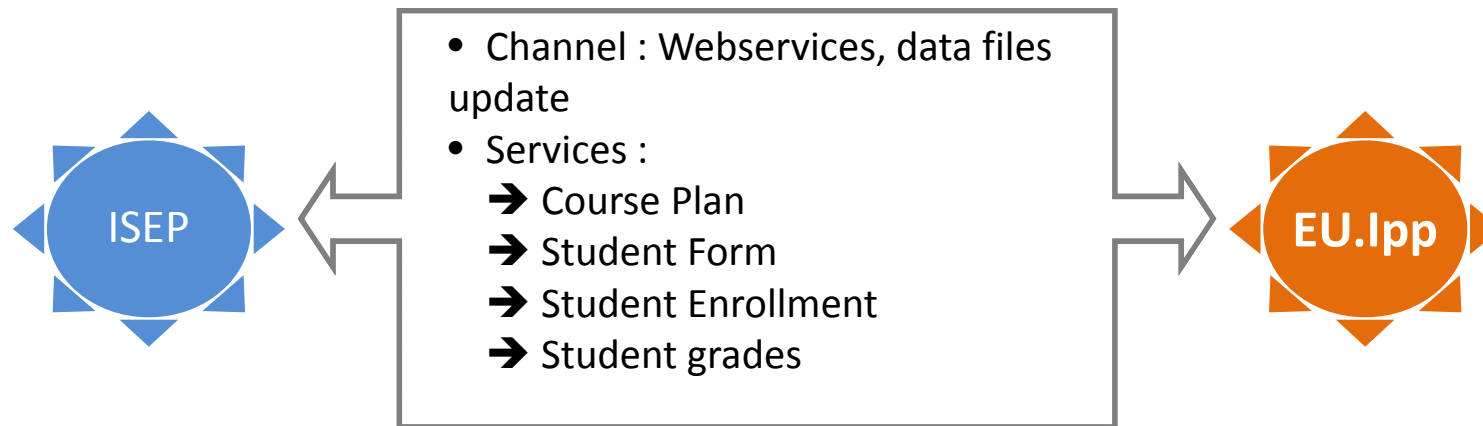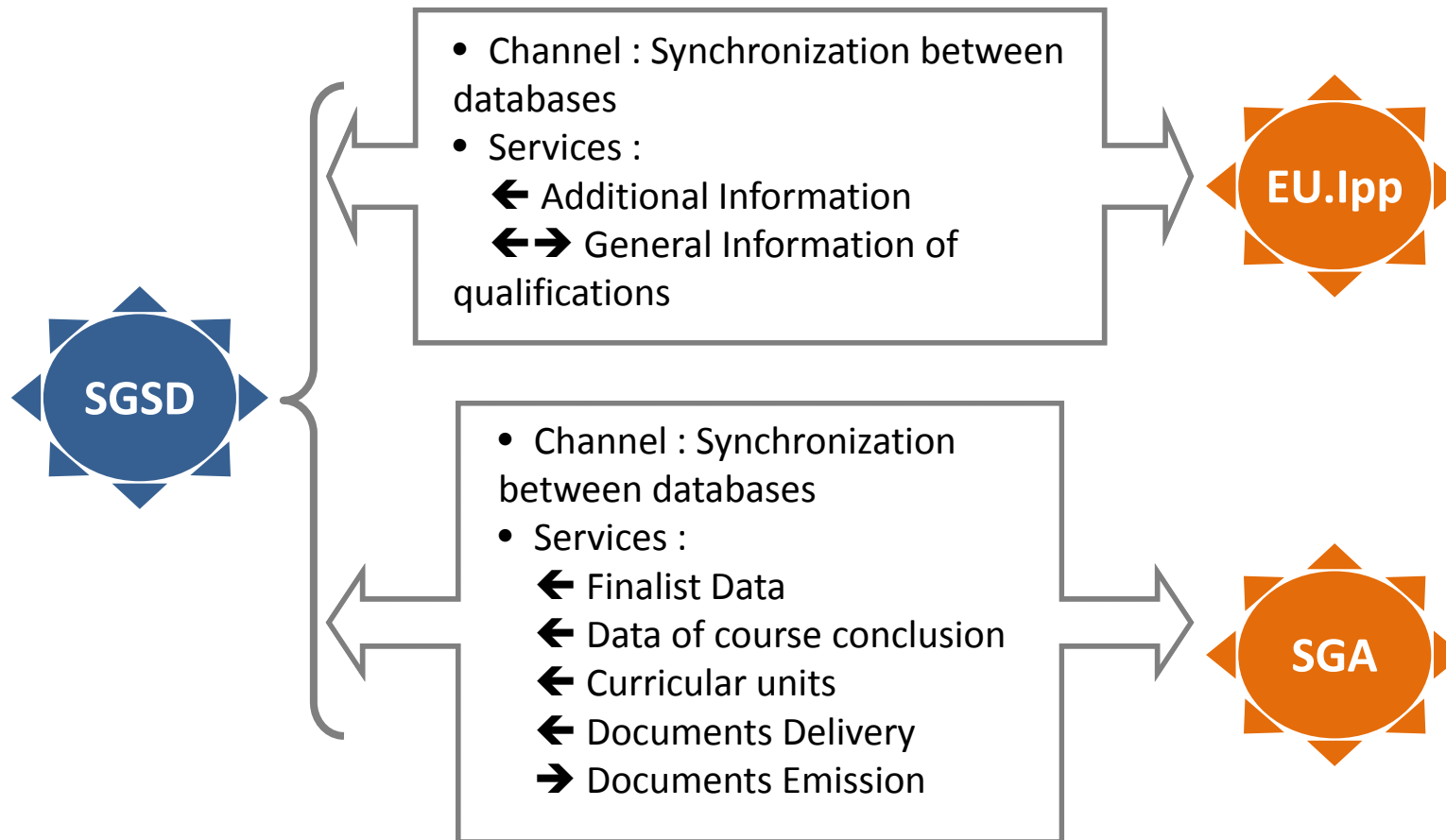INSTITUTO
POLITÉCNICO DO PORTO
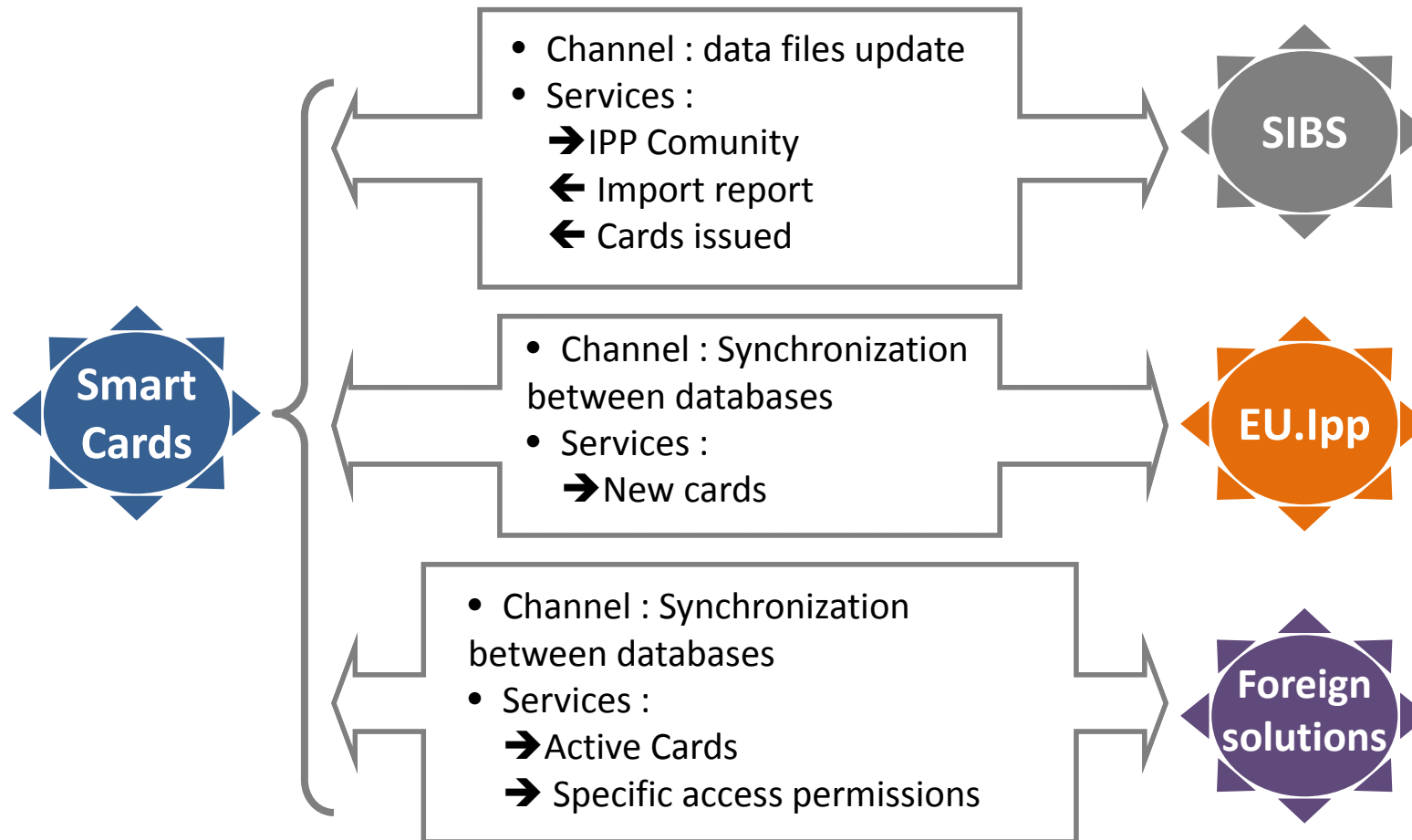
THANK YOU!

INSTITUTO
POLITÉCNICO DO PORTO

Interaction between systems

POLITÉCNICO DO PORTO

SGA

- Channel : Synchronization between databases
- Services :
  - ➜ Payments of the Student
  - ➜ Payment scheme
  - ➜ Course Plan
  - ← Student Form
  - ← Student Enrollment
  - ← Payments per Student
  - ← Student grades

EU.Ipp

Interaction between systems

* Channel : Webservices, data files update
* Services :
  * ➔ Course Plan
  * ➔ Student Form
  * ➔ Student Enrollment
  * ➔ Student grades

ISEP

EU.Ipp

Why?...

- The Diploma Supplement Project

  – Was based on a template provided by the University of Minho, but quickly gained shape and integrated in existing systems while maintaining their autonomy and functionality;

  – Nowadays it is used in all schools of IPP, having the process been decentralized: each school manages its own diploma supplements;

  – There were however maintained the centrally manage of some features for quality management required by IPP;

  – Subsequently the solution was also extended to the diploma management;