

SPAGOBİ

Fill a gap promoting a vision

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2006, July 20th

Agenda

- Business Intelligence in a nutshell
- Gap between proprietary and OS offering in the BI field
- SpagoBI fills the gap offering a BI vision
- SpagoBI overview
- Evolutionary steps
- Platform vs tool
- Integration platform vs product platform
- SpagoBI keystones: behavioural and analytical model
- Architectural choices
- SpagoBI in a nutshell

Business Intelligence in a nutshell

Semantic building of the information

- ❑ Correct and valid data
- ❑ Evidence and selectivity

Business model in a central position

- ❑ Strategic vision
- ❑ Correct display context

Common labels / items

- **Data Warehouse** - Database focused on the historical data store in an analytical-oriented way
- **ETL** - Extraction, transformation, loading data from source to target
- **Reporting** - Formatted and static presentation of data (like pdf)
- **OLAP** - On-line analytical processing. Multidimensional and dynamic analysis
- **Data Mining** – Investigation of big volumes of data by means of high-level statistics methods
- **KPI** - Key performance indicator, representative for the core business monitoring
- **Dashboard e Scorecard** – A way to present and analyze the KPIs

BI misunderstanding

- **DWH** is not the Business Intelligence
- Realizing **reporting** systems is not realizing BI systems
- A **product** is not a Business Intelligence system
- The BI does not exist without the Business competence
- Technology is not the main issue: just a prerequisite and an enabling aspect
- The **data model** keeps a primary role, because it is also the first representation of the business.



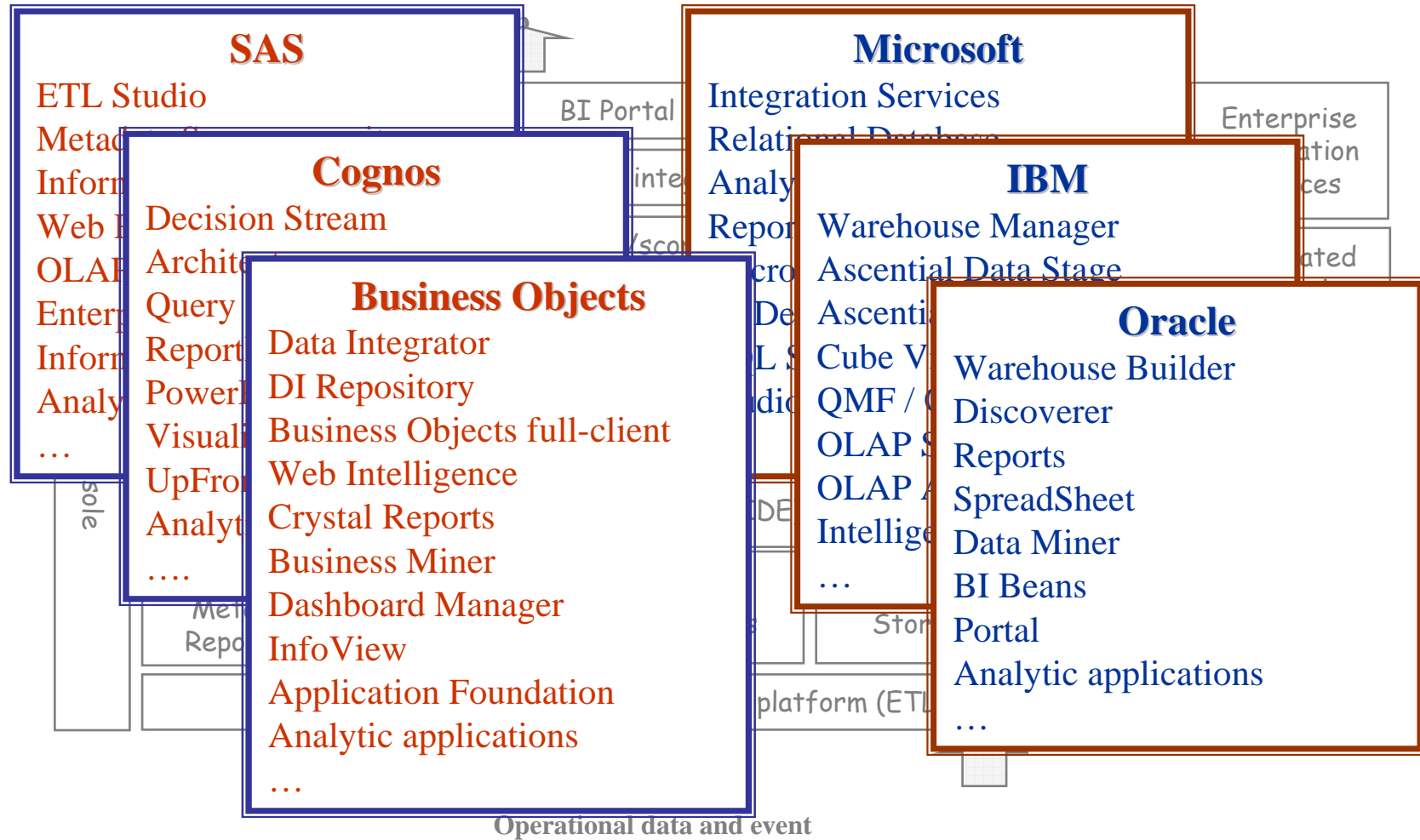
/* the Business Intelligence Free Platform */

**PRODUCT +
PROJECT =**

SOLUTION

BI – Proprietary products

SpagoBI, the Business Intelligence Free Platform



BI – FOSS tools

SpagoBI, the Business Intelligence Free Platform

Spago (J2EE Framework)
 JasperReport, BIRT (report)
 Mondrian/JPIVOT (OLAP)
 BIE (EAI)
 KETL, CloverETL (ETL)
 EXO Portal (JSR 168)
 WEKA (Data Mining)
 Hibernate (QbE and data)
 Jackrabbit (JSR 170)
 Exo JSR 170
 Lucene
 Quartz

The image displays four screenshots of different BI tools. Top left: A data table with columns for Region, My Image, P, P0, P1, P2, Measures[0], and Measures[1]. Top right: A 'JasperViewer' window showing a report titled 'The First Jasper Report Ever' with a table of 'Northwind Order List'. Bottom left: A 'Weka Knowledge Explorer' window showing a data set with statistics and a visualization. Bottom right: A 'Weka KnowledgeFlow Environment' window showing a complex workflow diagram with various data processing and analysis components.

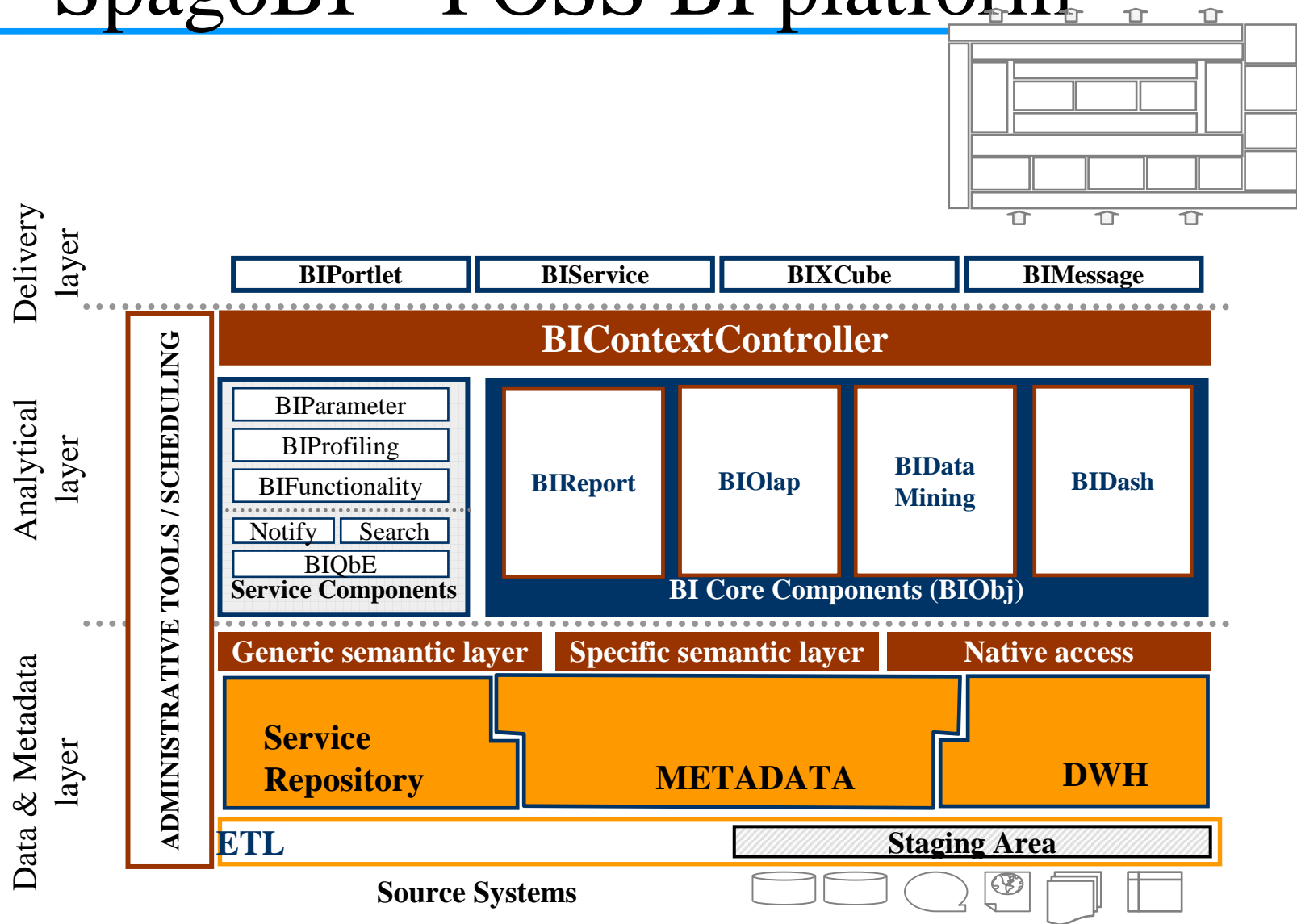
SpagoBI overview

SpagoBI, the Business Intelligence Free Platform

- **The unified platform:** a syntetic view by integration of OS solutions and proprietry product
- **The Open Source natural choice:** leveraging forthcoming open source projects
- **Holistic model:** the whole is more than the sum of its parts
- **Process and Methodological vision**
- **Capabilities:** data mining, QbE, OLAP, reporting, dashboards, ETL
- **Highlights:** uniform vision, SOA architecture, adaptive behaviour, metadata managemen

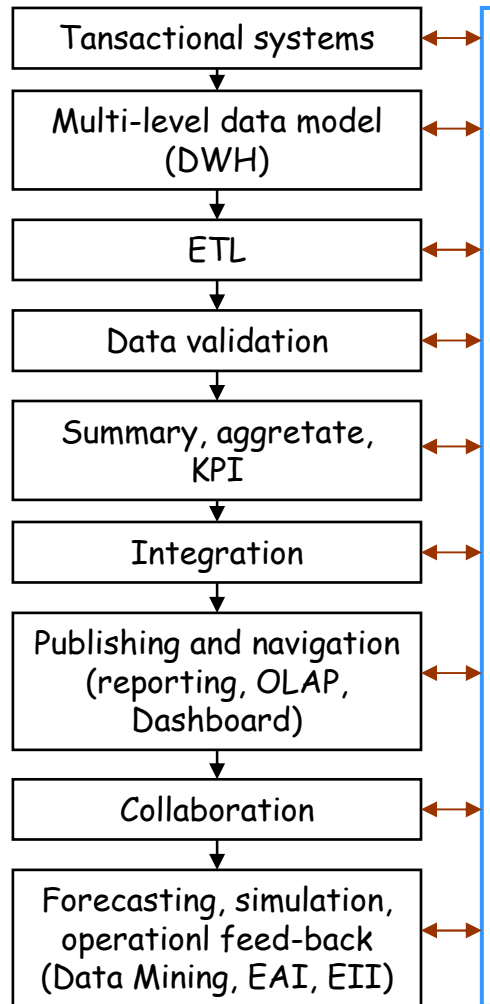
SpagoBI – FOSS BI platform

SpagoBI, the Business Intelligence Free Platform



SpagoBI Process vision

SpagoBI, the Business Intelligence Free Platform

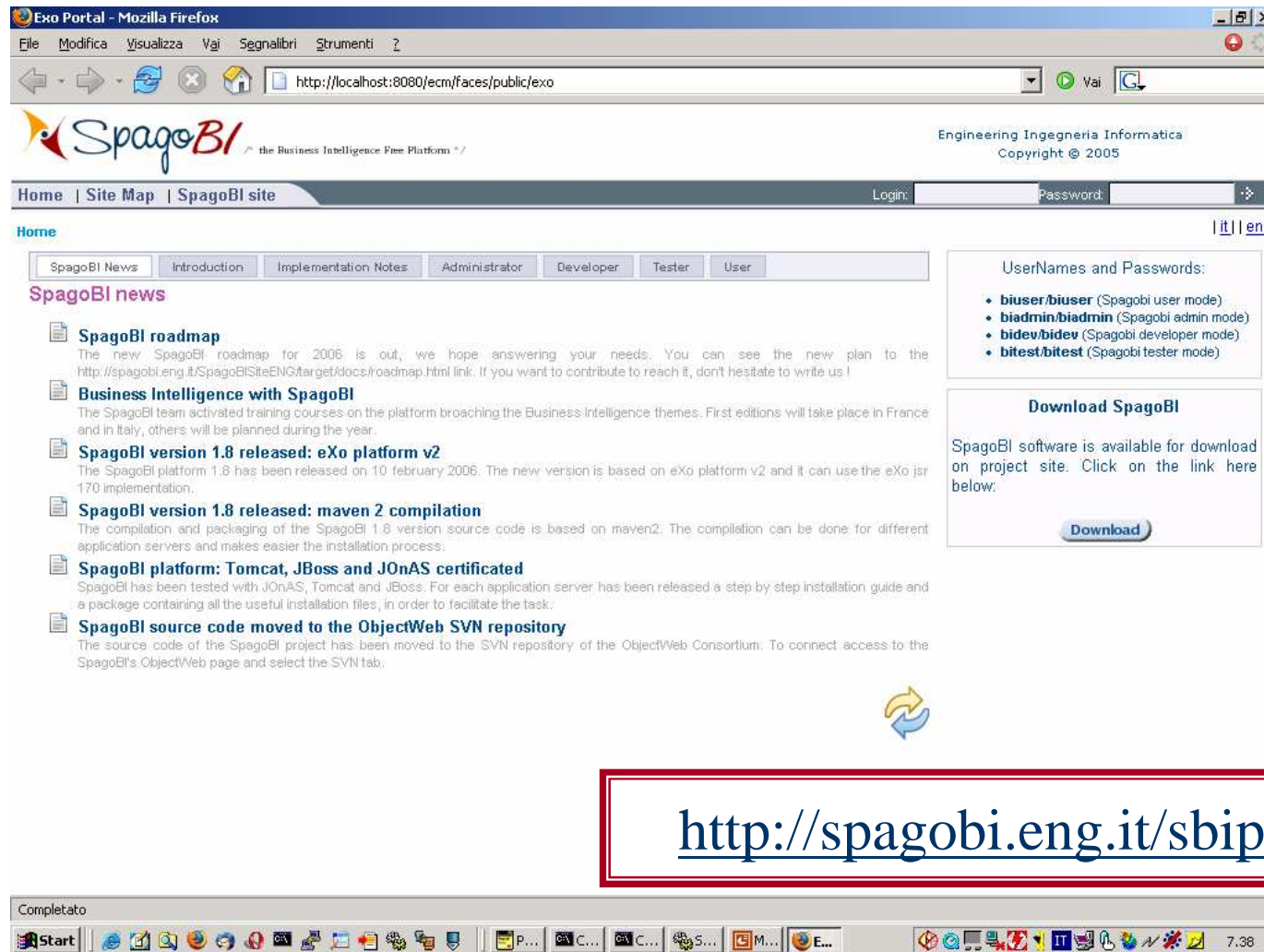


- Dynamic vision (not just showing data)
- Bidirectional relation with source systems
- Moving any time at all levels
- BI in daily work
- Certificated data and fitting views with the tool most suitable for every business need
- Sending enriched information back to the transactional systems
- Sharing information and cooperating in decisional processes

SpagoBI Methodological vision

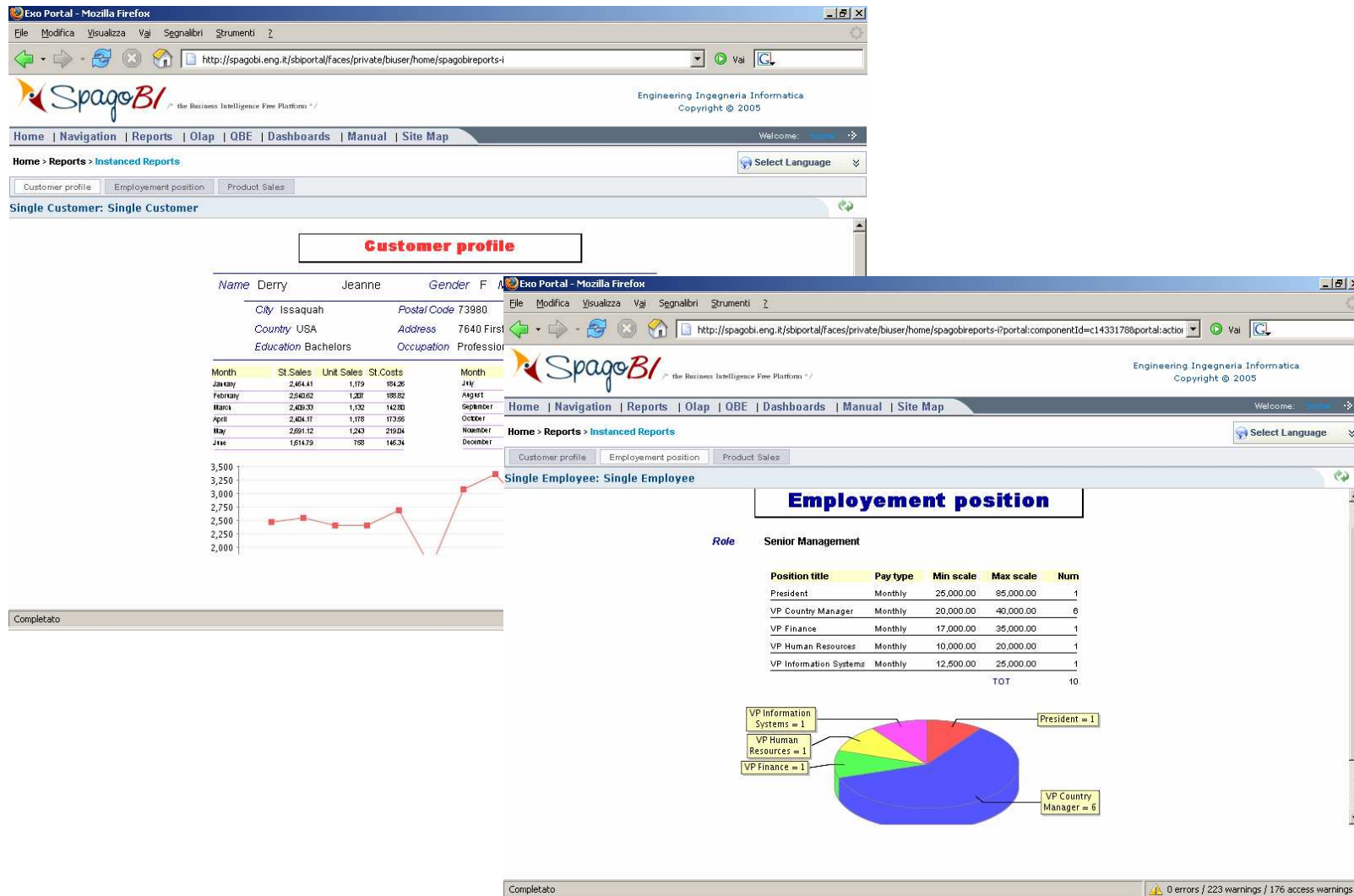
- Agile and evolutionary developments
- Modular approach
- Enterprise level envision
- Starting with a low dimension, thinking bigger
- Referring to global design (architectural, methodological, process development)
- First results quickly
- Light insertion in pre-existing environments, increasing the value of existing tools
- Project oriented: balancing the weights in the BI domain: *Solution=Product+Project*

SpagoBI – Portal



<http://spagobi.eng.it/sbiportal>

SpagoBI - Report



SpagoBI – OLAP & QbE

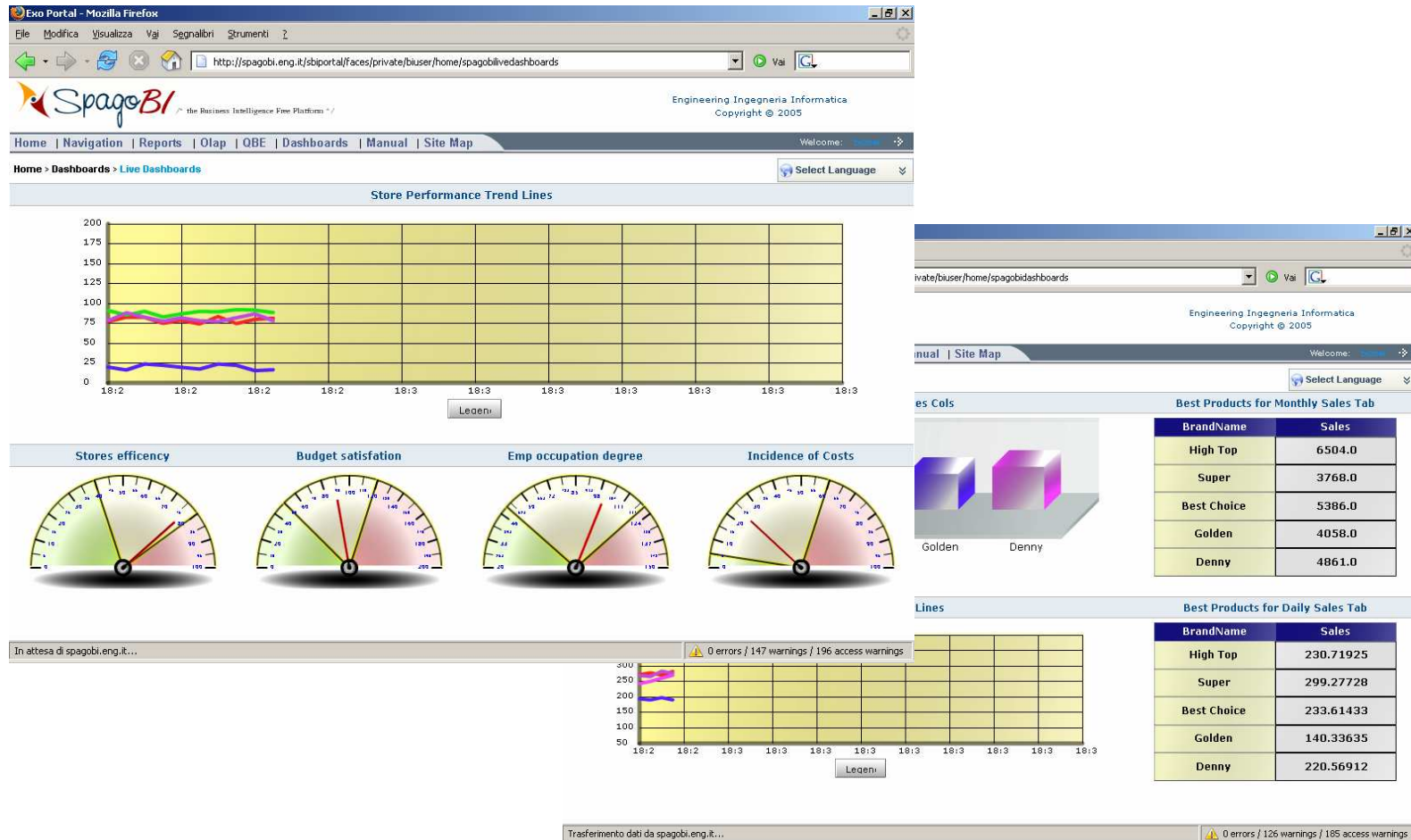
SpagoBI, the Business Intelligence Free Platform

The top screenshot shows the SpagoBI web interface in a Mozilla Firefox browser. The address bar displays the URL: <http://spagobi.eng.it/sbiportal/faces/private/biuser/home/spagobiolap?portal:componentId=olap1&portal:type=action&...>. The page title is "Product analysis 03: Online analysis about product sales". The interface includes a navigation menu with links like Home, Navigation, Reports, Olap, QBE, Dashboards, Manual, and Site Map. A sidebar on the left shows a tree view of product categories: Product (All), Product Family (Non-Consumable), Product Department (Carousel, Checkout, Health and Hygiene, Household, Periodicals). The main content area shows a "Slicer: [Year=1997]" and a "Completo" button.

The bottom screenshot shows the SpagoBI web interface in a Mozilla Firefox browser. The address bar displays the URL: <http://spagobi.eng.it/sbiportal/faces/private/biuser/home/spagobiqbe?portal:componentId=qbe1&portal:type=action&...>. The page title is "FOODMART DATAMART : FOODMART DATAMART - [- QUERY COMPOSITION - FIELD SELECTION]". The interface includes a navigation menu with links like Home, Navigation, Reports, Olap, QBE, Dashboards, Manual, and Site Map. A sidebar on the left shows a tree view of product categories: Product (All), Product Family (Non-Consumable), Product Department (Carousel, Checkout, Health and Hygiene, Household, Periodicals). The main content area shows a "Field Selection" interface with a list of fields and their corresponding data types. The fields are: Annual Sales Fact.Surname, Annual Sales Fact.Name, Annual Sales Fact.Title, sum(Annual Sales Fact.Store Sales), sum(Annual Sales Fact.Store Costs), sum(Annual Sales Fact.Unit Sales), and distinct. The interface also includes a "Completo" button and a status bar at the bottom showing "0 errors / 47 warnings / 308 access warnings".

SpagoBI - Dashboard

SpagoBI, the Business Intelligence Free Platform



SpagoBI – Versioning&Doc Mng

SpagoBI, the Business Intelligence Free Platform

The screenshot displays the SpagoBI web interface within a Mozilla Firefox browser. The address bar shows the URL: `http://spagobi.eng.it/sbiportal/faces/private/biuser/home/spagobinavigation`. The page header includes the SpagoBI logo, the text "the Business Intelligence Free Platform", and "Engineering Ingegneria Informatica Copyright © 2005". A navigation bar contains links: Home | Navigation | Reports | Olap | QBE | Dashboards | Manual | Site Map. A "Welcome: biuser" message and a "Select Language" dropdown are also present.

The main content area is titled "EXECUTION OBJECTS TREE" and shows a hierarchical tree structure on the left:

- Objects Tree
 - Functionalities (Areas)
 - Business Departments
 - Analytical Areas
 - Static Reporting
 - Dimensional Analysis
 - Product analysis 03
 - Data Mining Models
 - Dashboard
 - Products profitability
 - Emp occupation degree
 - colsquery
 - Queries
 - Foodmart Datamart

The right pane shows the "DOCUMENT DETAILS" section for a document labeled "SALES-X-CITY". The "Version Template" table lists the following versions:

Version	Date	Time	Timezone	File Name	Actions
1.3	Wed Sep 28	16:44:16	CEST	Sales_x_city.jrxml	Download
2005					
1.2	Tue Sep 27	11:10:16	CEST	2005 Sales_x_city.jrxml	Erase Download
1.1	Tue Sep 27	10:43:09	CEST	2005 Sales_x_city.jrxml	Erase Download
1.0	Tue Sep 27	10:16:22	CEST	2005 Sales_x_city.jrxml	Erase Download

Below the versioning details, the "DOCUMENT PARAMETER DETAILS" section shows the following parameters:

Parameter	Value
Title	Output format
Parameter	Output Type
Url Name	param_output_format

The status bar at the bottom indicates "0 errors / 103 warnings / 204 access warnings".



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SpagoBI – Admin Support

The screenshots show the SpagoBI Admin Support interface. The top screenshot displays the 'ENGINES LIST' table with columns: LABEL, NAME, and DESCRIPTION. The middle screenshot shows the 'FUNCTIONALITY DETAILS' section with fields for Label, Name, and Description. The bottom screenshot shows the 'PARAMETER DETAILS' section for 'COUNTRY_CD' with fields for Label, Name, Description, and Type, along with a 'PARAMETER USE MODE DETAILS' section.

LABEL	NAME	DESCRIPTION
OLAP-BO-DEV	Business Objects DEV	Business Objects Engine for Development Environment
OLAP-CST-ORA-DEV	Custom Oracle Engine DEV	Custom engine for Oracle rdms in Development Environment
OLAP-JP-MD-DEV	Jpivot-Mondrian DEV	Jpivot-Mondrian OLAP Engine in Development Environment
OLAP-JP-MD-REL	Jpivot-Mondrian REL	Jpivot-Mondrian OLAP Engine in Release
REP-BIRT-DEV	Birt Report Engine DEV	Eclipse Birt Report Engine in Development Environment
REP-JASP-DEV	Jasper Report DEV	Jasper Report Engine for static reporting
REP-JASP-REL	Jasper Report REL	Jasper Report Engine for static reporting

Label	Name	Description
Analytical Areas	Analytical Areas	Structural Classification

Roles	Development	Test	Execution
/spagobi/admin (The spagobi admin group)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
/spagobi/dev (The spagobi developers group)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
/spagobi/test (The spagobi testers group)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
/spagobi/user (The spagobi users group)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
/spagobi (The spagobi developers group)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
/spagobi/share (the /spagobi/share group)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Label	Name	Description	Type
COUNTRY_CD	Country Code	Parameter for Country Code selection	String

Label	Name	Description
STATE_FREE	State from list	State to choose from predefined list of values

Roles Associations	Development	Test	Execution
/spagobi/admin	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
/spagobi/dev	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
/spagobi/test	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
/spagobi/user	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
/spagobi/share	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Completato 0 errors / 71 warnings / 214 access warnings



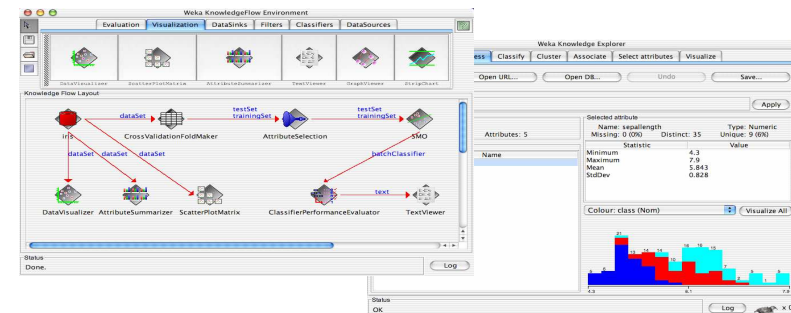
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SpagoBI – Data Mining

The Data Mining integration aims to release a common analytical instrument, normally used, not only for specific analysis:

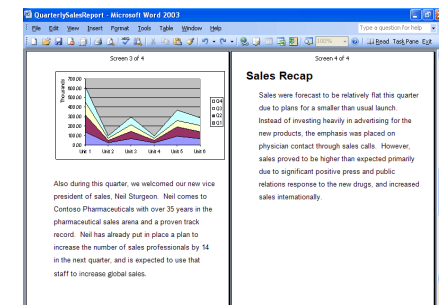
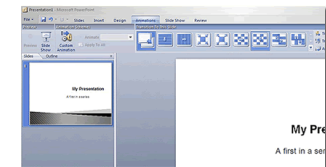
- industrial process for data sets production
- off-line execution (parameters and process schedulation)
- results' analysis using the other platform's instruments (report, olap, ...)
- results validation
- results acquired by the analytical or transactional dwh for simulation or consolidation



SpagoBI – Collaboration

The improvement of communication and cooperation in decisional processes is a qualifying element adding value to a BI process:

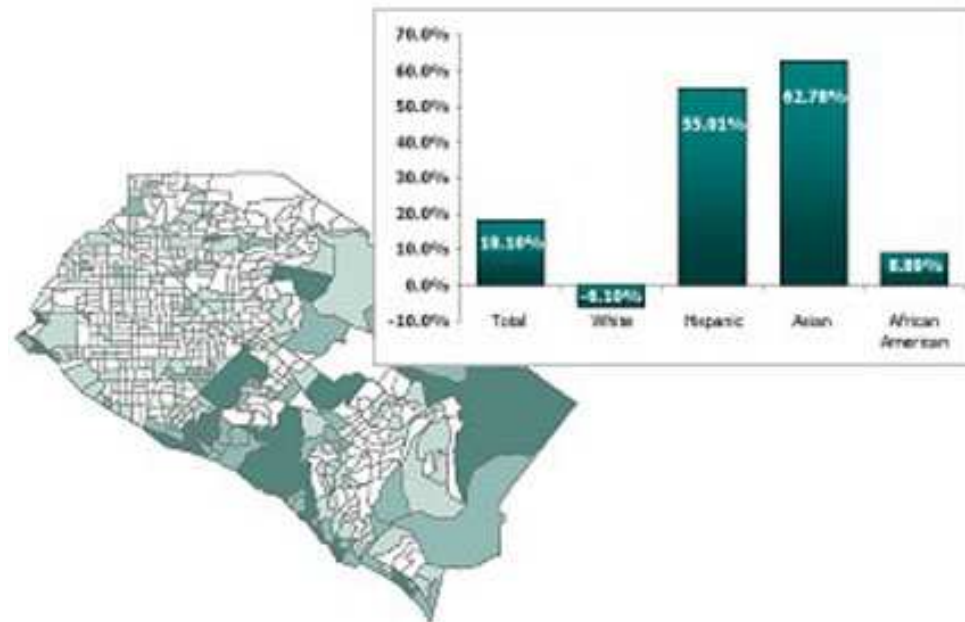
- share results and suggestions
- create booklet from analytical documents managed by SpagoBI
- enhance booklet content's by a collaborative WF process
- delegate analysis for areas, with annotations
- booklet versioning
- export booklet as document or presentation
- send final booklet to specific users



SpagoBI – Geo-referenced Analysis

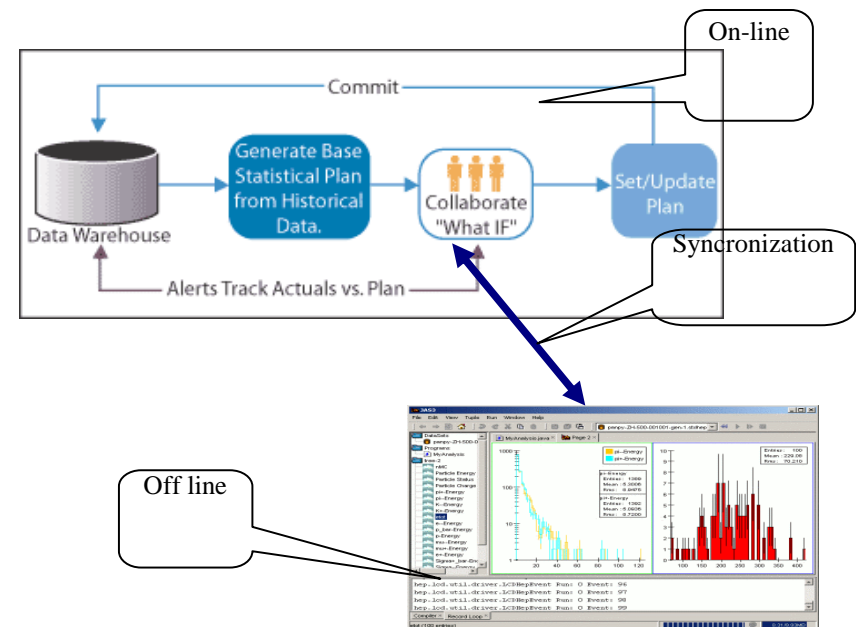
SpagoBI, the Business Intelligence Free Platform

SpagoBI will support the integration of the most important products of cartography, using geo-ref information and mapping them with geographical dimension in dwh.



SpagoBI – What-if

- What was → what if
- Two What-if simulation levels:
 - **calculation parameters** update and new results evaluation
 - **reclassification** of the main units
- Related items:
 - collaborative processes
 - Data Mining
 - target operational systems

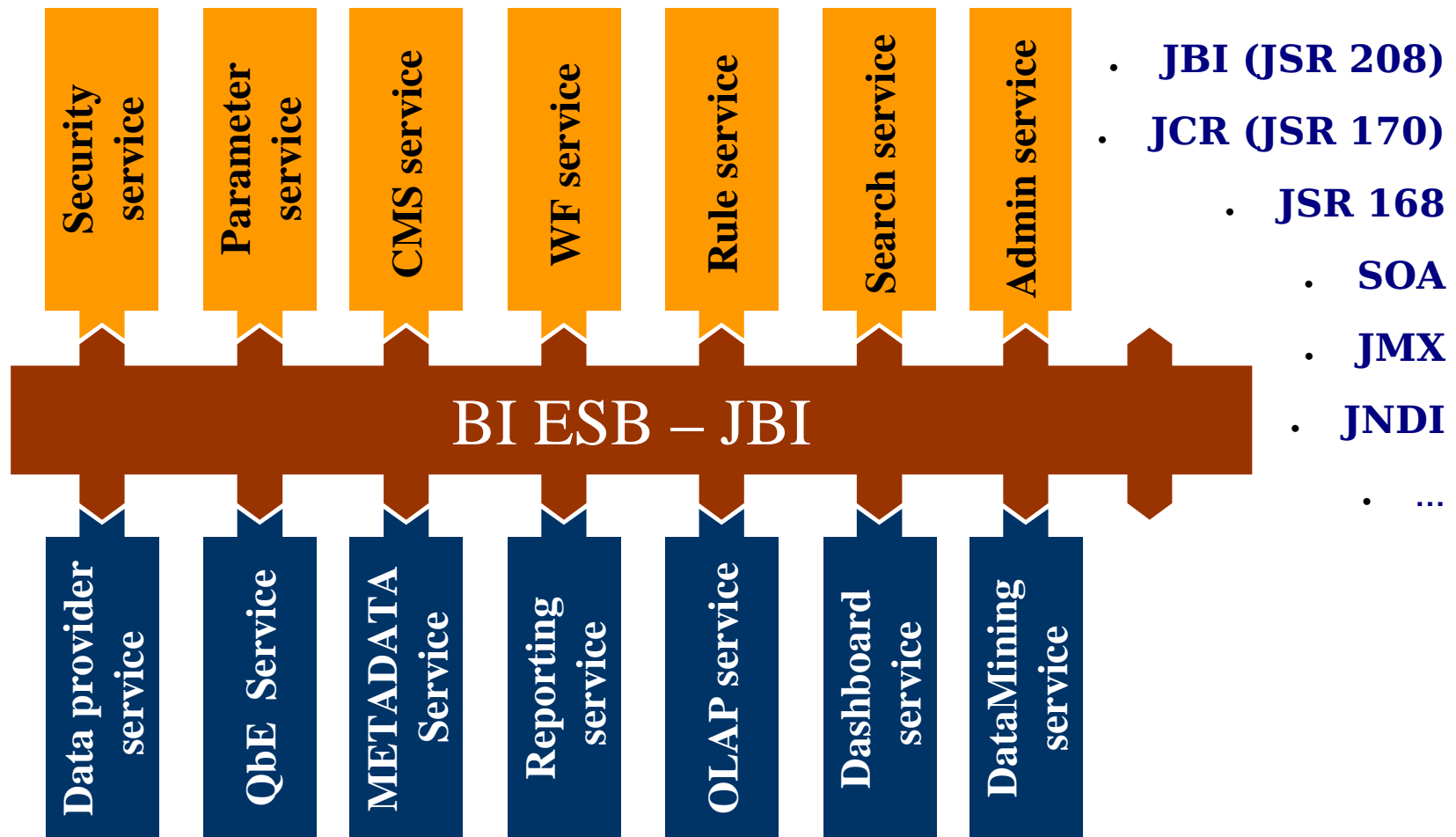


SpagoBI – next steps

- **Analytical thought**
 - Limited and evident interesting position (alert and notification, KPI explosion)
 - Cross navigation (from report to report, from OLAP to OLAP, etc.) inheriting settings during navigation
 - Communication and collaboration
 - Recovery of hypothesis and actions
- **Business Intelligence closed-loop**
 - Intelligent center of all interesting systems (operational too)
 - Retrieve data, give out information
 - Operative actions
- **Shared points of view**
- **Enterprise's behavioural model consolidation**
- **Enterprise's analytical model consolidation**

SpagoBI – next steps

SpagoBI, the Business Intelligence Free Platform



Platform vs Tools

- **SpagoBI uses FOSS tools “just” as basic engines**
- **SpagoBI build a platform:**
 - It raises sectional tools to a BI vision
 - It raises personal tools to a enterprise level
 - It manages an adaptive behaviour of the documents based on the users’ roles
 - It adds modules (Dashboard, QbE) and corrective effects on the existing ones
 - It creates a homogeneous vision (also in terms of administration and pubblication) of all the analytical areas
 - It creates a single behavioural model, product-independent

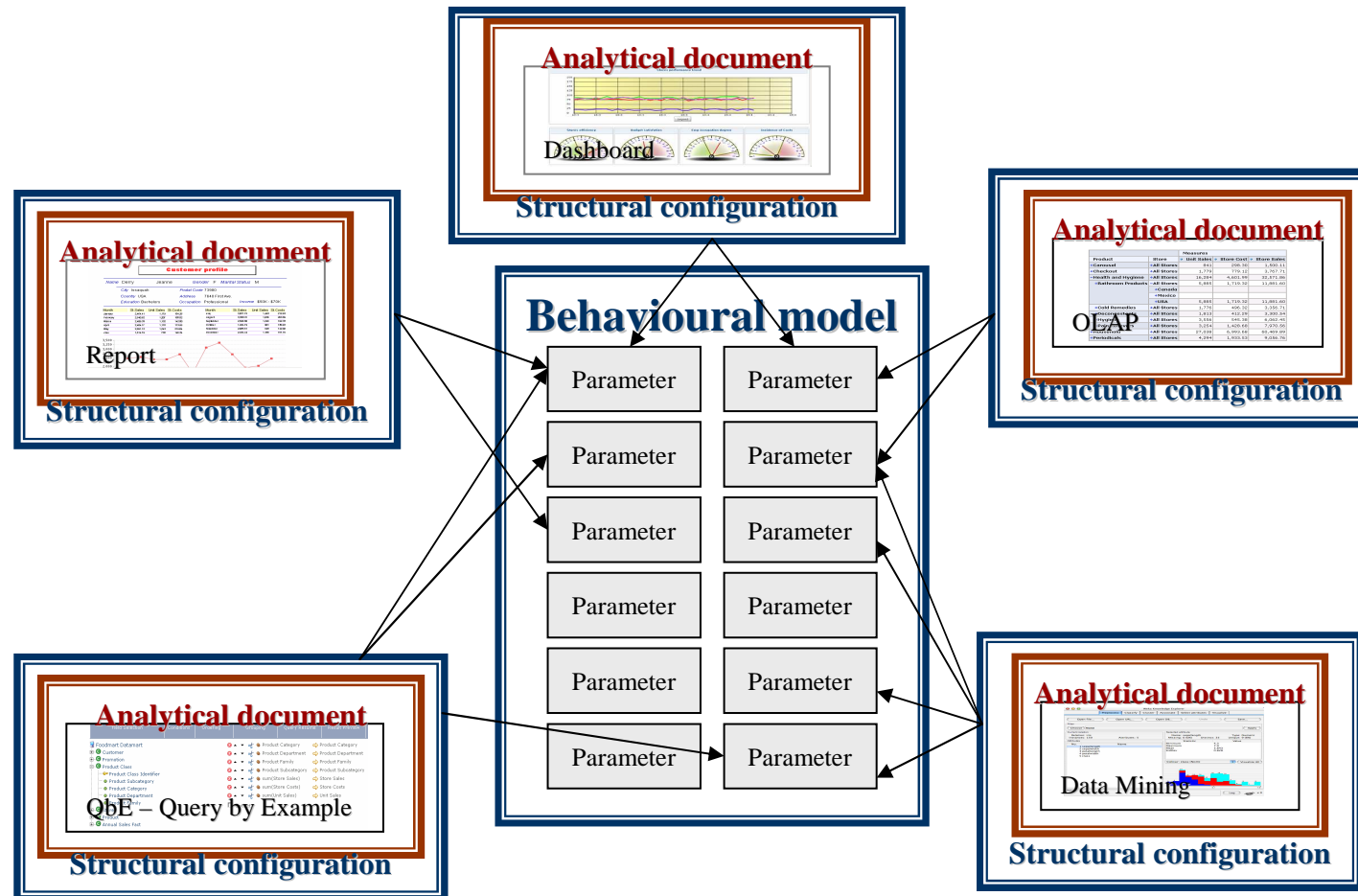
Integration Platform vs Product

- **SpagoBI is a integration platform:**
 - Not a product platform, with a predefined set of tools
 - Open to many products for the same/different analytical area, both open source and proprietary
 - It allows the composition of one's own platform time for time in the best way
 - No binding dependences from products and tools
 - Open standards adoption
 - It allows to give the right answers to an analytical questions by means of different products
 - It is not the lite OS version of an enterprise commercial version

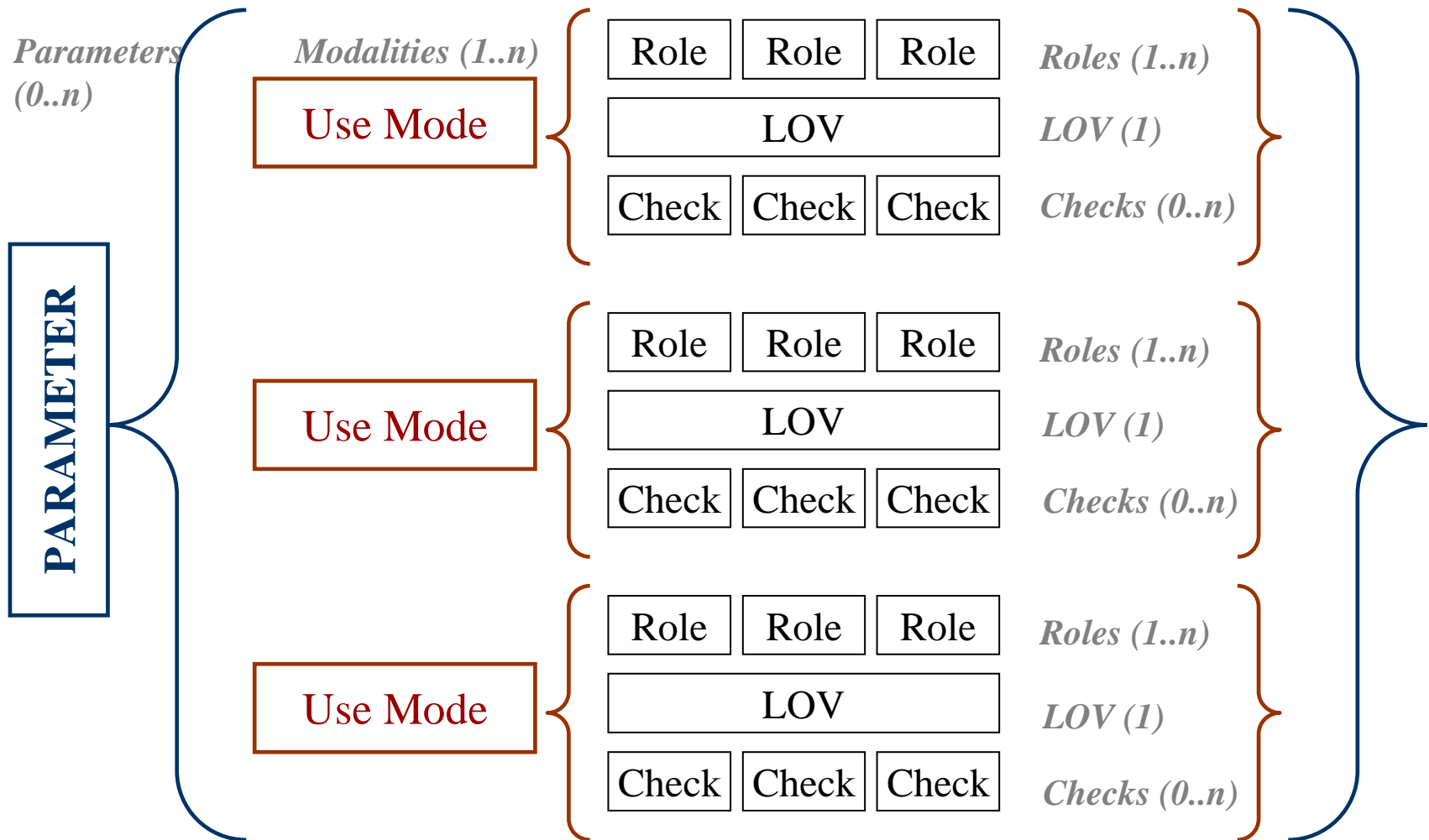
SpagoBI keystones

- **Two models, shared across every integrated engine**
 - **Behavioural model**
 - It represents the rules of the user's behaviour in relation to its responsibility with the company
 - It enhances the relevant criterias and describes how they are showed and checked according to the end-users' roles
 - Unique representation of every relevant concept
 - **Analytical model**
 - The right document type and template for the right user, need and ability
 - Moving more and more towards a META-MODEL which describes all the analytical area in an abstract way

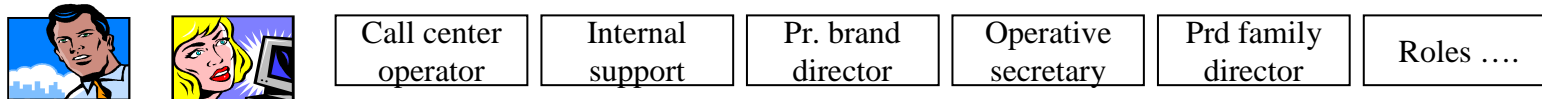
Behavioural model set up



Behavioural model set up



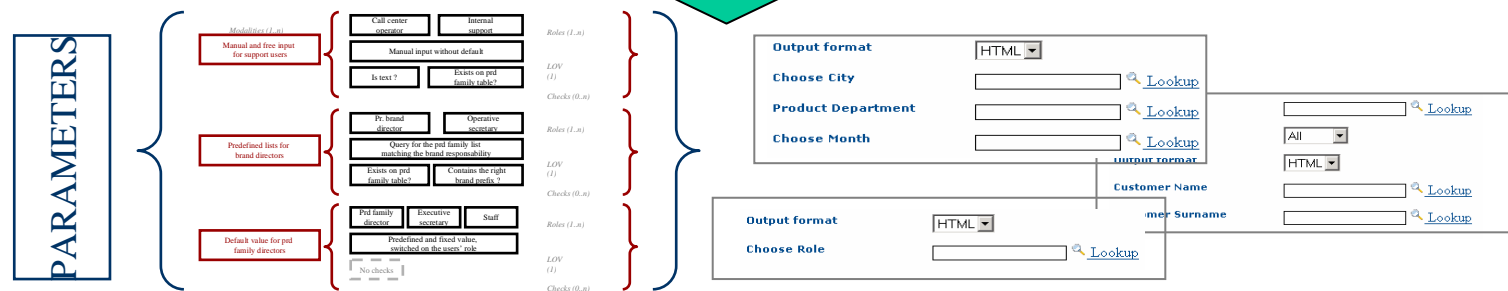
Behavioural model at work



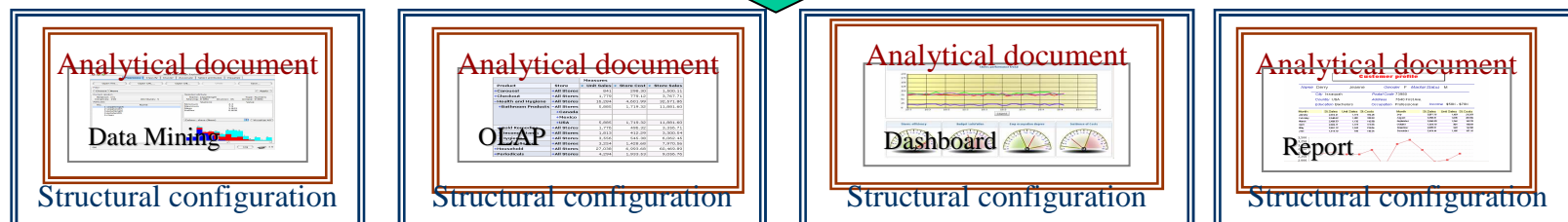
An authenticated user chooses the analytical document to be executed



The executive configuration of the analytical document is read and a page is produced for the input of the parameters according to the user's roles



The input values for the parameters are checked according to the user's roles and the final document is come back to the end-user



Analytical Meta-model: Abstraction

- **Concepts abstraction**
 - Report → analytical document
 - OLAP → analytical document
 - Parameter → contextElement
 - Filter → contextElement
 - Reached point of view → contextElement
 - JasperReport → Engine
 - Mondrian → Engine
 - ...
- **Behaviours abstraction**
 - Report execution → documentStart
 - Switch between OLAP → documentGo
 - Switch from report to OLAP → documentGo
 - Drill-down → documentNavigate
 - Drill-across → documentNavigate
 - Parameter passing value → documentSetContext
 - Drilled field sets → documentSetContext
 - ...

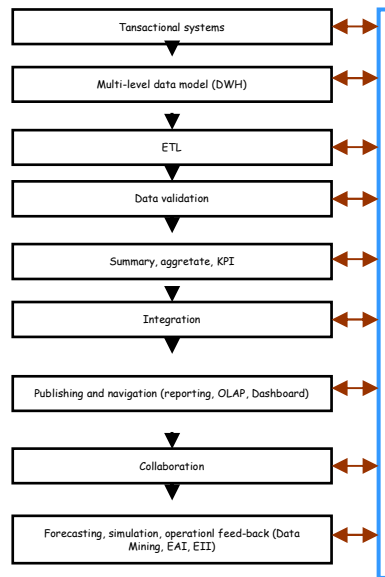
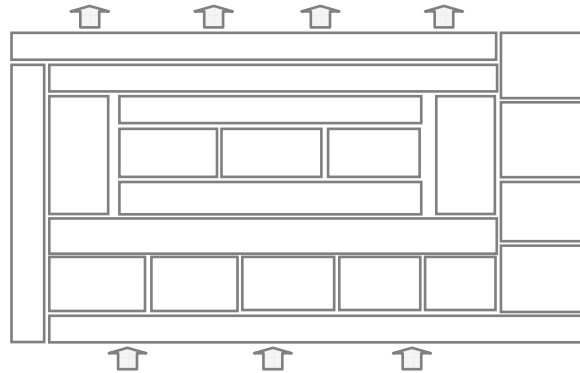
**Abstract
Model**

Analytical Meta-model: Reduction

- **Break up the abstract model into elementary abstract unit**
 - Analytical document
 - ...
- **Identify the useful context levels**
 - DocumentContext
 - NavigationContext
 - UserContext
 - SpagoBIContext
 - ...
- **Formal description of every abstract unit**
 - Analytical document
 - Dimension, Attribute, Measure, Hierarchy, ...
 - ...

SpagoBI – global references

SpagoBI, the Business Intelligence Free Platform



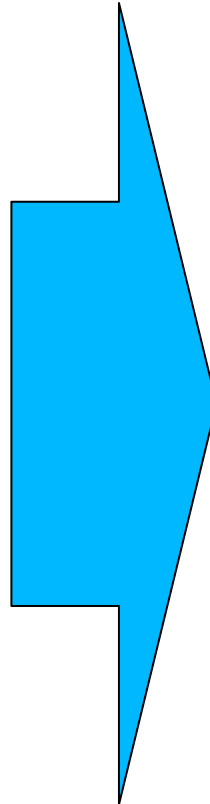
- Agile and evolutionary developments
- Modular approach
- Enterprise level envision
- Starting with a low dimension, thinking bigger
- Referring to global design (architectural, methodological, process development)
- First results quickly
- Light insertion in pre-existing environments, increasing the value of existing tools
- Project oriented: balancing the weights in the BI domain:
Solution=Product+Project

Architectural choices

Methodological lines

- Agile methodologies and evolutionary developments
- Modular approach (not always all the modules)
- Reference to global design (architectural, methodological and of process)
- Make in "little" (right dimension) but thinking bigger
- First results quickly
- Increase the value of the tools already used
- Light insertion in pre-existing environments
- OS proposable for the companies
- Enables a "experimentation" policy, widen the target of users for the BI, increase cultural level in BI
- Space for the project, moving the weights in the *BI*

Solution=Product+Project
formula



Architectural choices

- Modular architecture, services oriented
- Integration platform and not product platform
- Different engines for the same analytical area, in an alternative or parallel way
- Mix of FOSS and proprietary engines
- Independent Behavioural model shared by all the engines, independently from their nature
- Increase value of products already used and recovery of the past
- Portal environment
- Coexistence of different environments and tools
- Many and different db connections
- Open standards adoption (JSR 168, JSR 170, JSR 208, JSR 94)
- FOSS development, up to the end!

SpagoBI in a nutshell

SpagoBI, the Business Intelligence Free Platform

Done

Reporting
OLAP
Dashboard
QbE
CMS
Document Management
Behavioural model
Administrative support
User's roles handling
Approval cycle with fixed states;
Adaptive behaviour based on the end-user roles

Modular architecture
Portal JSR 168
CMS JSR 170
Pure Java Code
J2EE Framework in MVC model
Mixed platforms support : (AS)
Tomcat, JBoss, JOnAS; (Portals) eXo
Portal, WebSphere; (Analytical engines) JasperReport, Mondrian, Business Objects, BIRT
RDBMS independent
Unit test and stress test
Security layer
Basic metadata layer

Functional key

Technical key

Data Mining
What-if
Collaboration
Geo-references

Meta-data model for analytical layer
SOA architecture
Increase engine integrated and supported

Work in progress



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References

- <http://spagobi.eng.it> (home)
- <http://spagobi.eng.it/sbiportal> (demo)
- <http://spagobi.objectweb.org> (home ObjectWeb)
- http://forge.objectweb.org/project/showfiles.php?group_id=204 (download)
- http://forge.objectweb.org/mail/?group_id=204 (mailing list)



/* the Business Intelligence Free Platform */



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