



Best Information through Regional Outcomes

The BIRO System

Valentina Baglioni
University of Perugia

“A Shared Information System for Diabetes in Europe:
final results of the B.I.R.O. Project”
Dessau Conference Room
Perugia, 25th May 2009



Directorate-General for
Health & Consumers

Perugia, 25th May 2009



Best Information through Regional Outcomes

The BIRO system

- BIRO system aims to be a viable solution towards the construction of a **common infrastructure for standardized information exchange in diabetes care** at the lowest cost through the active involvement of regional networks
- The BIRO architecture consists of two different modules: Local BIRO System and Central BIRO System
- The **Local BIRO System** should be implemented by each participating centre and allows standardized processing of local data and production of a comparable statistical reports for selected BIRO indicators
- The **Central BIRO System** collects and compiles data sent by local modules to derive an overall statistical report



Directorate-General for
Health & Consumers

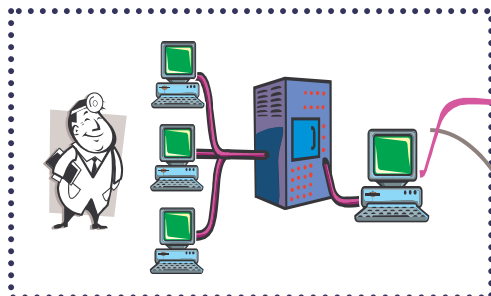
Perugia, 25th May 2009



Best Information through Regional Outcomes

BIRO architecture

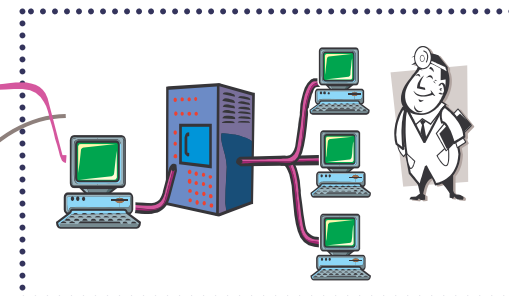
Region 1: Umbria, Italy



Local BIRO System

Local Report 1

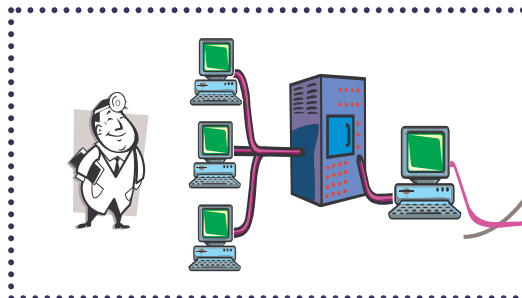
Region 2: Tayside, Scotland



Local BIRO System

Local Report 2

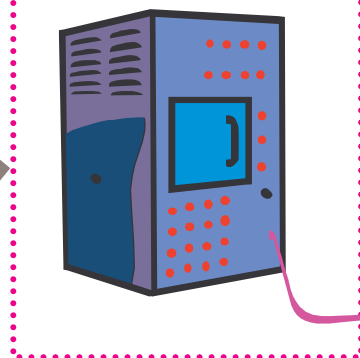
Region 3: Cyprus



Local BIRO System

Local Report 3

Central BIRO System



Global Report

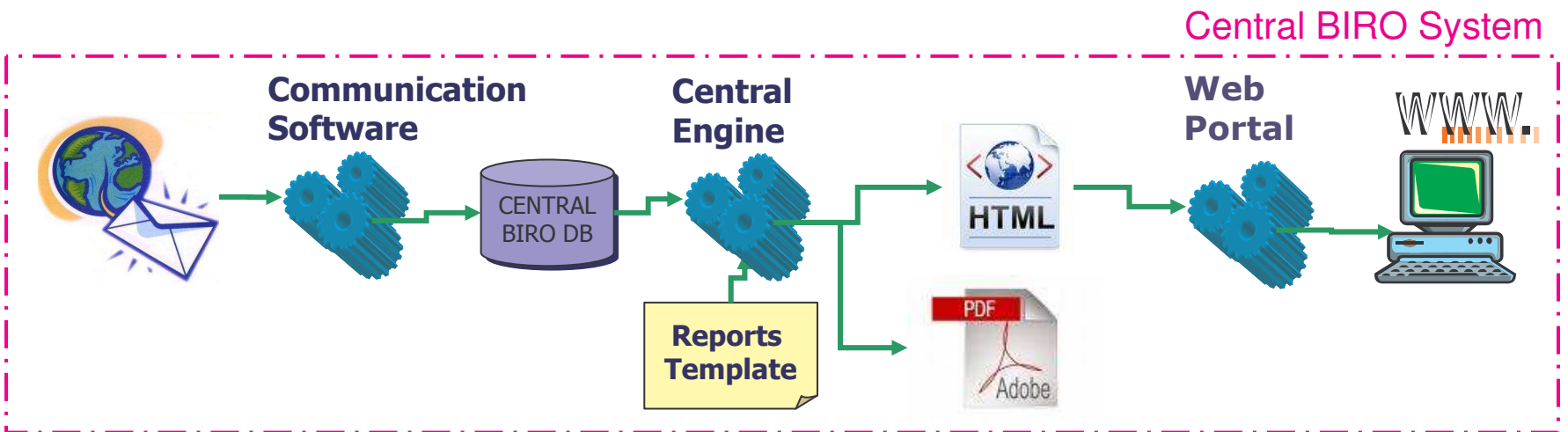
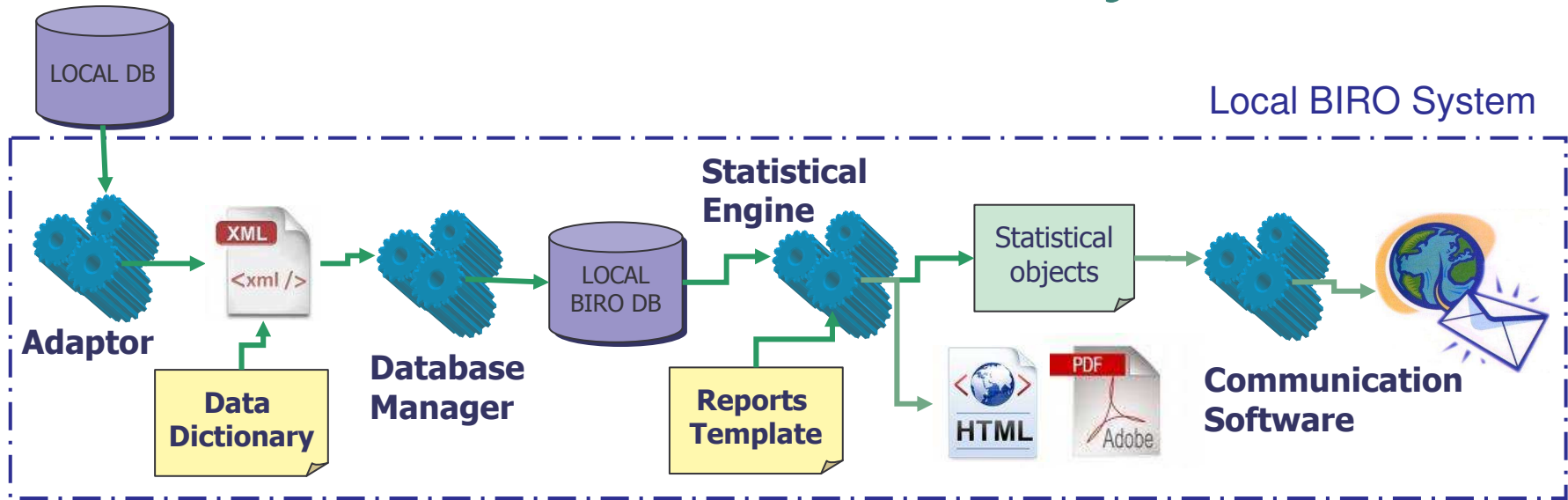
BIRO Web Portal





Best Information through Regional Outcomes

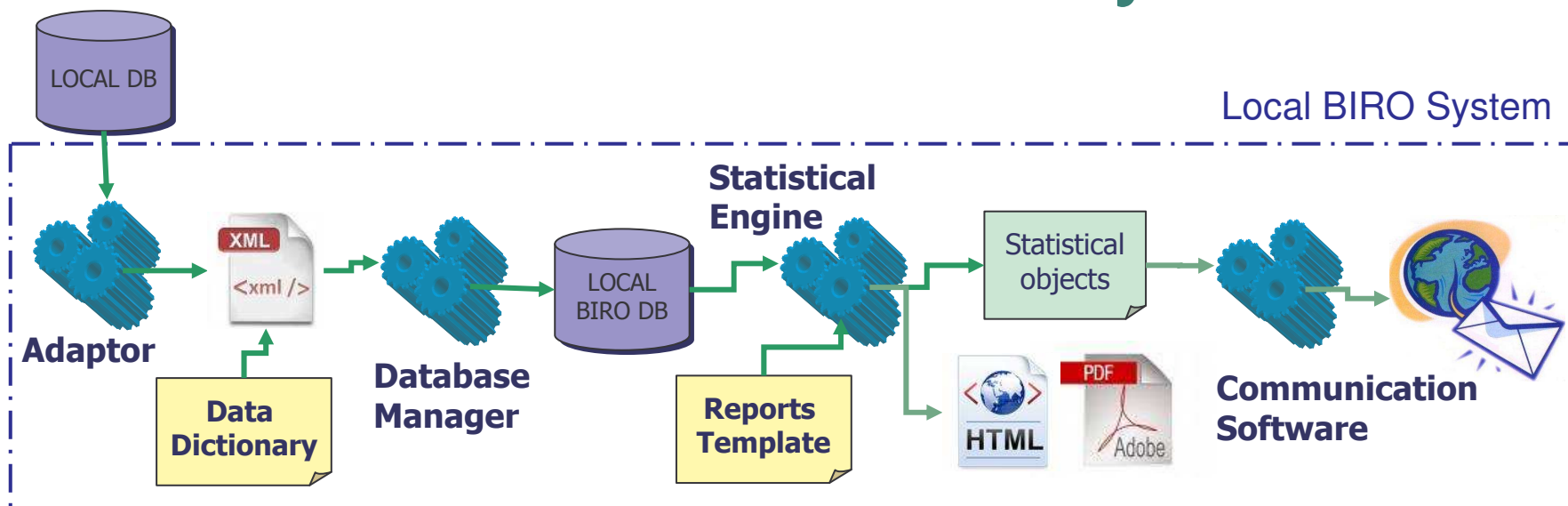
Local BIRO System



Directorate-General for Health & Consumers

Perugia, 25th May 2009

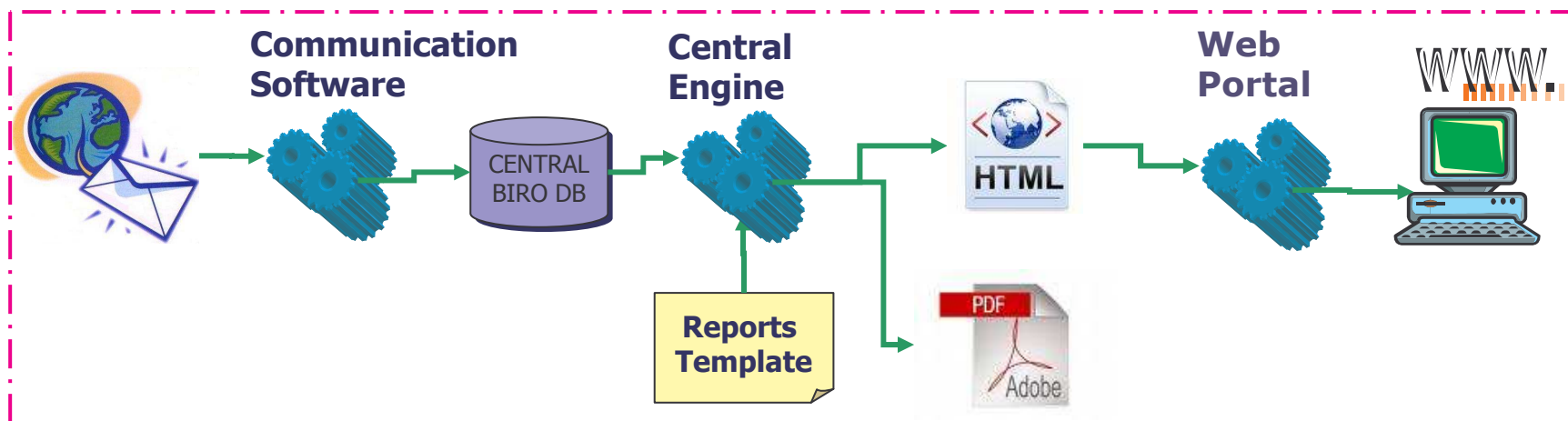
Local BIRO System



- **Adaptor** establishes a connection with local data source, extracts data and maps them according to the Data Dictionary. The output is a set of XML files containing patient data in BIRO format.
- Extracted data are stored into a BIRO Local DB through the **Database Manager** in order to provide the following statistical routines with a standard data structure
- **Statistical Engine** produces PDF and HTML local reports formatted according Report Template and a set of Statistical Objects to be sent to the Central System.
- **Communication Software** sends statistical objects over a secure network which ensures confidentiality, data integrity, authentication

Central BIRO system

Central BIRO System



- At the central level **Communication Software** stores the Statistical Objects (CSV files) coming from multiple centres into Central BIRO Database
- The **Central Engine** has the same architecture of Statistical Engine but it is able to process aggregated data instead of individual data
- As output of the Central Engine we get an overall statistical PDF report following the Reports Template specification
- A set of html objects representing tables, maps, histograms etc. is also produced to be published on the BIRO **Web Portal**



Best Information through Regional Outcomes

BIRO system strenghts

- **secure** → according to PIA no sensitive individual data are transferred out of the boundaries of the local system but only aggregated data. Communication Software provides all fundamentals of information-security: confidentiality, integrity, authentication
- **inexpensive** → only open source tools, Java and R as a main programming languages have been chosen to produce a cost effective solution
- **non-invasive** → the use of the local BIRO System does not require any change in the way data are gathered locally
- **scalable** → it can be potentially used recursively to organize the network within countries and/or regions

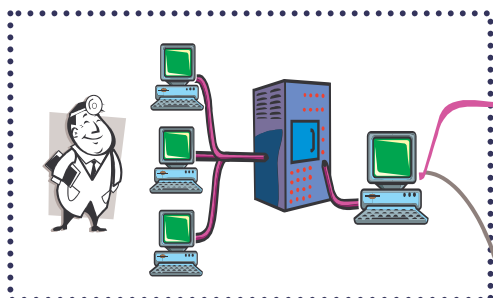


Directorate-General for
Health & Consumers

Perugia, 25th May 2009

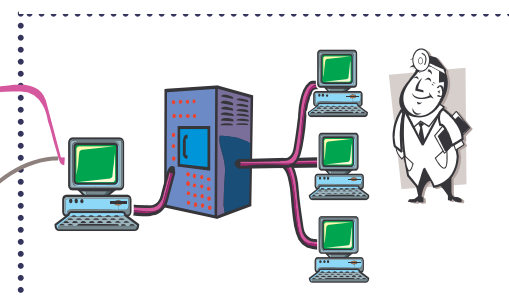
The local network

Centre 1: Perugia, diabetes centre



Local Report 1

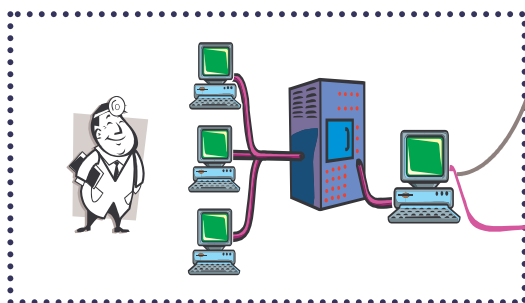
Centre 2: Orvieto, diabetes centre



Local Report 2

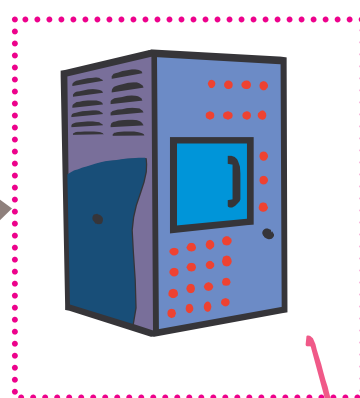
Local BIRO system

Centre 3: Terni, diabetes centre

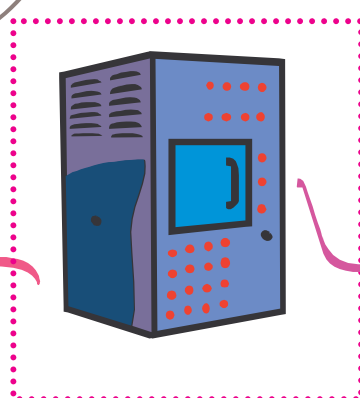


Local Report 3

Central BIRO System for Umbria



Central BIRO System for Europe



WWW



BIRO Web Portal



BIROBox

- BIROBox allows the user to configure and run all functions within the local BIRO System, from data extraction to the sending of statistical objects to the Central BIRO System

