



INSTITUTE
OF BIOSTATISTICS
AND ANALYSES
Masaryk University

A Pilot Interactive Data Viewer for Cancer Screening

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Masaryk University, Faculty of Medicine
Institute of Biostatistics and Analyses

Presentation's content

- Cancon and CCCN introduction
- Interactive Data Viewer
 - Used data-mining methodology
 - Data warehousing
 - Implementation
 - Demo
- Conclusion
- Future vision



CanCon

Cancer Control Joint Action

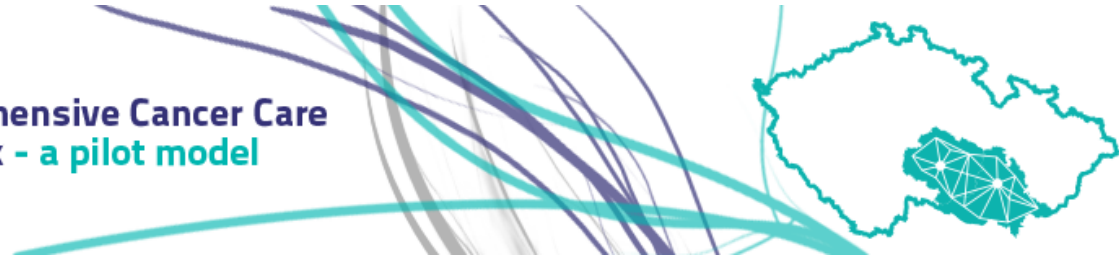
”

Altogether there were involved in Cancon hundreds of cancer experts, working in 25 countries and 126 partner organisations in Europe.

“



Comprehensive Cancer Care
Network - a pilot model



”

Our pilot model of CCCN involves eight hospitals, namely one highly specialised national comprehensive cancer centre, three regional cancer centres and four general hospitals.

“

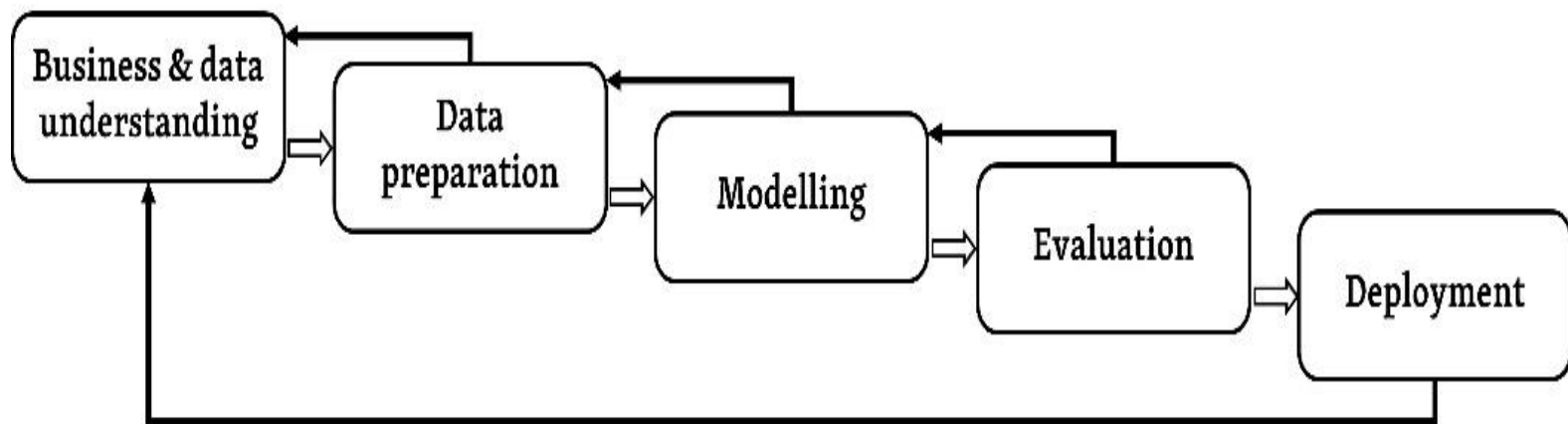
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The pilot model covers all components of cancer care.

“

The Data Viewer creation process

- Cross Industry Standard Process for Data Mining (CRISP-DM)

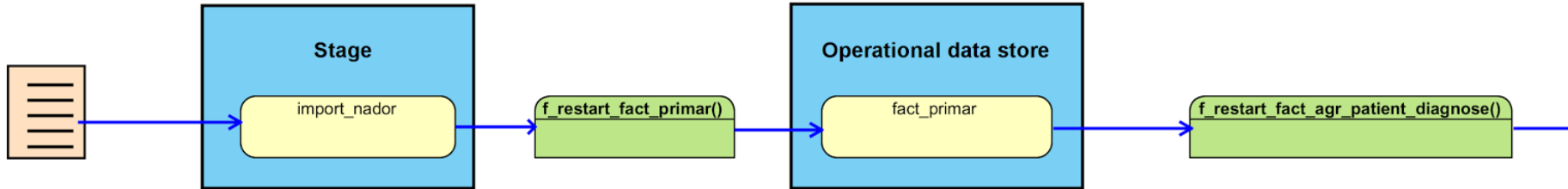


The data source

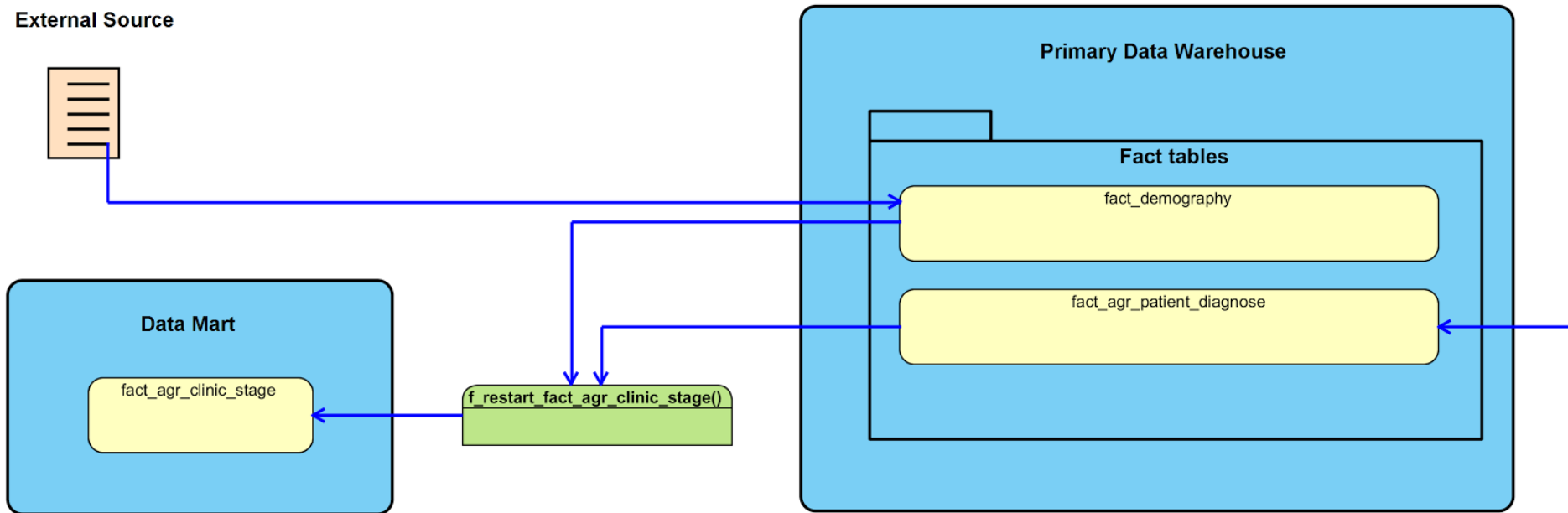
- The only data source is **The Czech Cancer Registry (CNCR)**.
- The purpose of the CNCR is registration of cases of oncological diseases and periodic monitoring of their further evolution.
- Includes information about patients with disease in following groups:
 - malignant neoplasms (C00 - C97),
 - neoplasms in situ (D00 - D09),
 - neoplasms of uncertain or unknown behavior (D37 - D48) and
 - other specified diseases with participation of lymphoreticular tissue and reticulohistiocytic system (D76.0).

Building the data warehouse 1/2

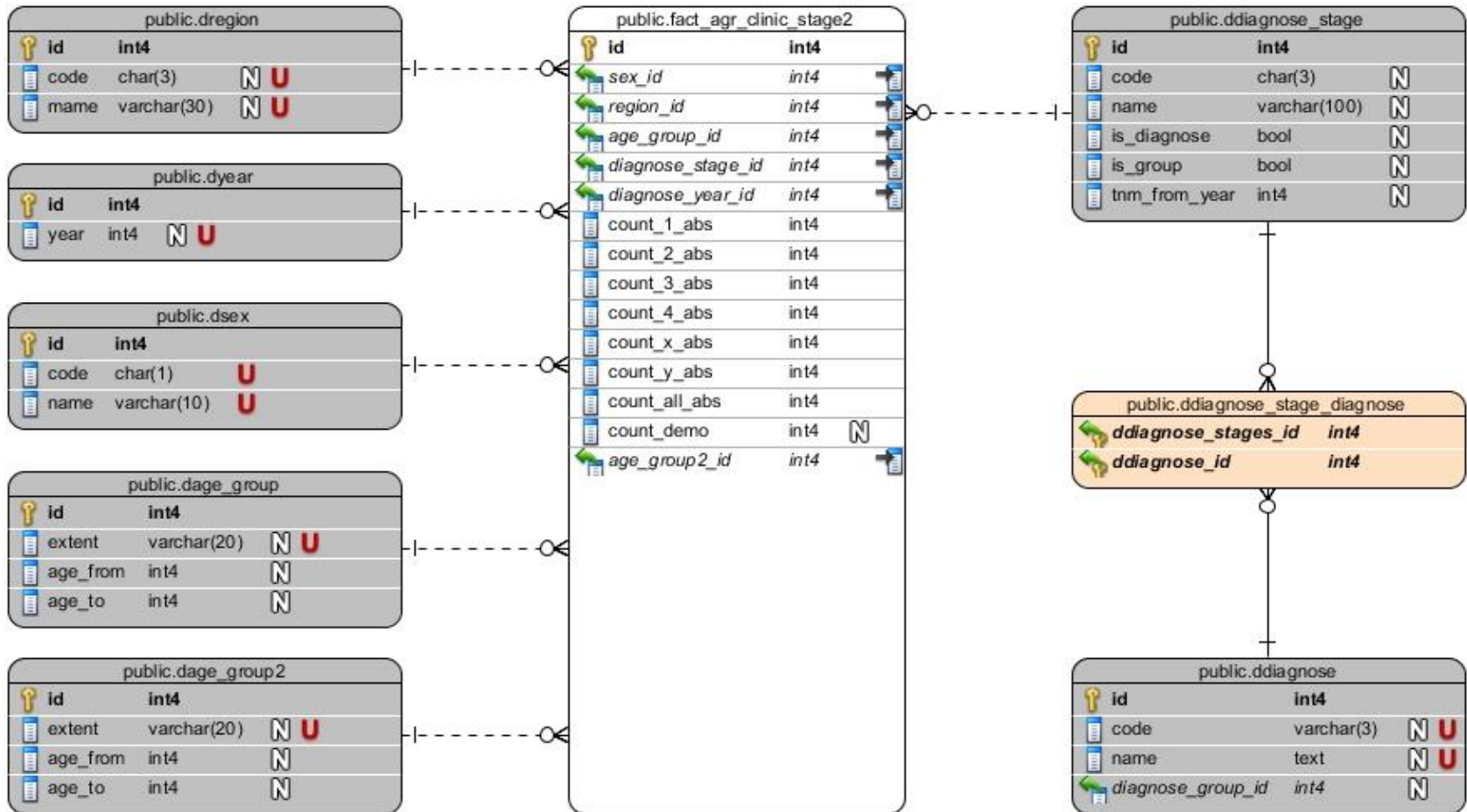
External Source



External Source



The table and its dimensions tables with data of clinical stages of patients



Building the application 1/2 – technologies

- Client-server network architecture
- Symfony 3 framework project
- PostgreSQL database
- HTML5
- D3.js library

Building the application 2/2 – techniques

- Model-View-Controller (MVC) application architecture
 - Isolated parts for development

- Reusable parts of code
 - AppBundle – core parts of application
 - VisualisationBundle – graphs, tables, filters functionality

- GIT system for versioning

- Automated acceptance testing



The user interface decomposition

Page header & main navigation

Analyses' menu

Graph

Filters
&
Settings

Data Table

Footer

□ AppBundle

■ VisualisationBundle



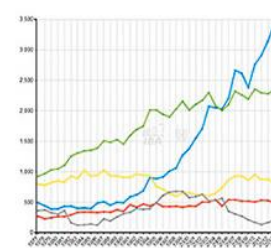
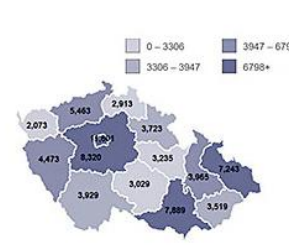
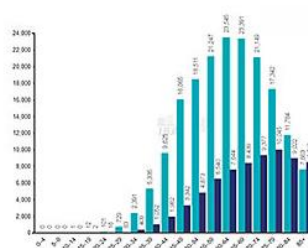
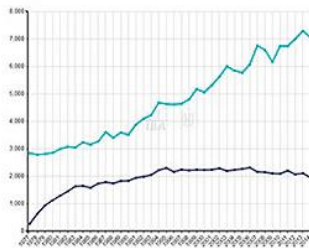
Cancer
epidemiology



Regional
benchmarking



Cancer diagnostics



A pilot model of Comprehensive Cancer Care Network (CCCN) has been set up in the Czech Republic, namely in the so-called South-West Moravia (SW Moravia) – an area consisting of two administrative regions: the Vysočina Region and the South Moravian Region. The structure, principles and other features of this model are described below.

Please continue to one of sections shown above.

Comprehensive Cancer Care Network – a pilot model [online].
Masaryk University, 2017 [cit. 06. 05. 2017]. Available from WWW: <http://cccn.onconet.cz/>.
2017 | created by IBA FM MU





Conclusion

- We have designed, developed and implemented a prototype of interactive viewer of data on cancer care and cancer epidemiology.
- It shows the contemporary analytical overview of
 - cancer incidence,
 - prevalence,
 - mortality,
 - regional benchmarking and
 - analysis of clinical stages.
- It includes the evidence on cancer care and cancer epidemiology in the CCCN pilot region and on the national level.

Future vision

- Extend the viewer in order to ensure regional and also international benchmarking analyses.

- Provide the PPTX export of analyses using the R language and the OpenCPU server.
 - The PowerPoint presentation download of the concrete graph.
 - The Modification options of output.
 - Usage in own slides.



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THANKS FOR YOUR ATTENTION!