

*Towards a WWW-accessible Knowledge-Base
on Breast Cancer Prognosis and Therapy*

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What's DIST?

DIST is the **Department of Informatics Systems and Telematics** of the University of Genova.

Long experience in national and international research projects in the fields of **Computer Science, Biomedical Engineering Communications and Robotics**.

Several EC projects: **ESPRIT, AIM, BRITE, TIDE...**

The Bioengineering Group of DIST is involved in:

- the **EPIC (European Prototype for Integrated Care)** of the **AIM** scheme
- the **AC:TION** project of the last **Telematics Application** call (with IST from Genoa and INT from Milan), specifically with the **CONQUEST** proposal for the **quality aspects of cancer assistance**, and with the **ECOLE/GRIP** proposal for **cancer guidelines aspects**.

The Bioengineering Group has developed **BREASTCAN**, a **knowledge based system for breast cancer diagnosis and cancer patient management**.

The problem to be faced

Which **factors** determine the proper **prognosis** for breast cancer?

The main prognostic factor is the **lymph node status**

«Rough» criterion often used:

If positive (i.e. lymph nodes have been found during operation)

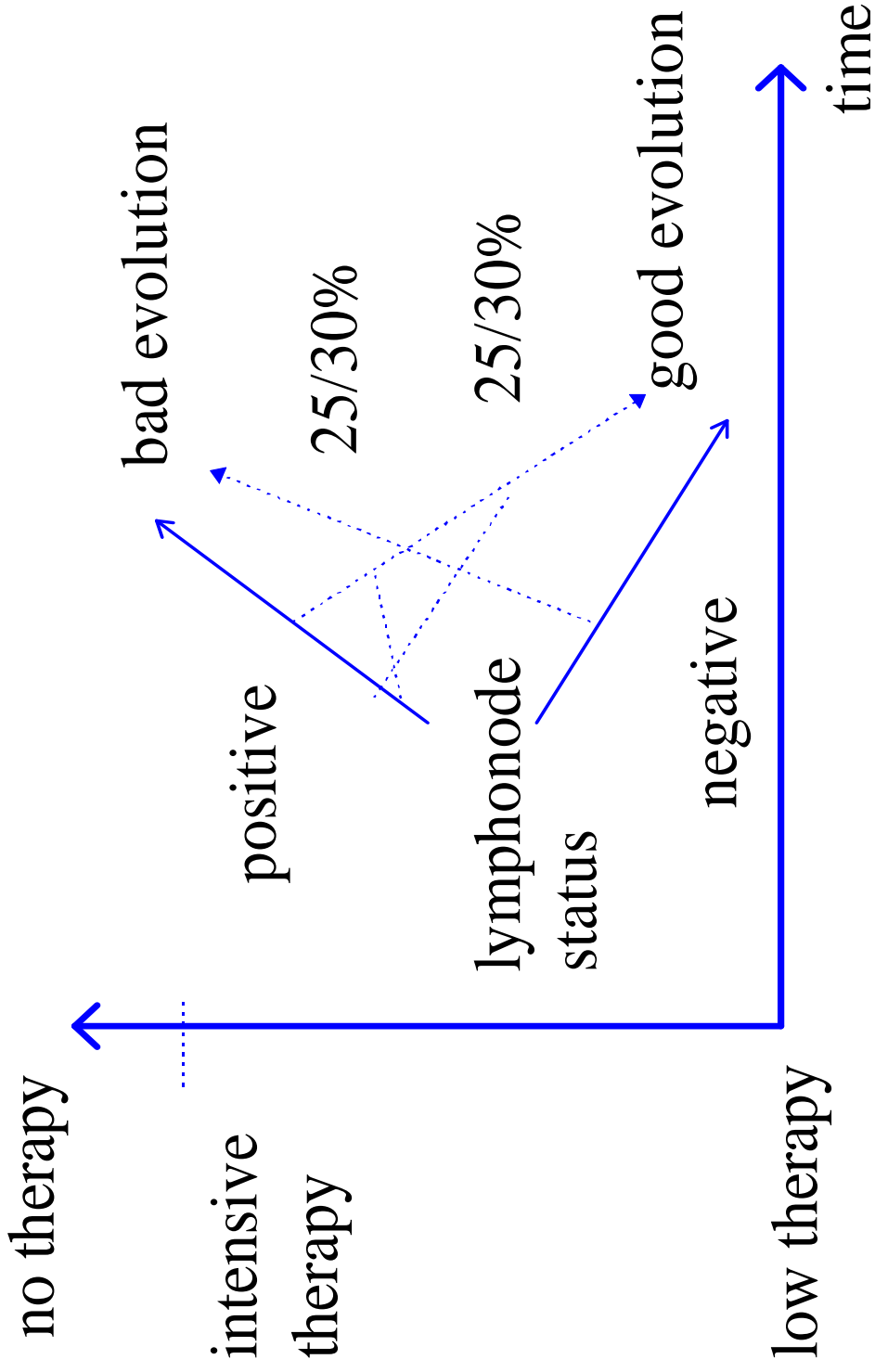
=> bad prognosis

If negative

=> good prognosis

but all possible variability may be found depending on **other prognostic factors** which are continuously updated by **cancer researchers**.

Evolution of the disease



Users' needs to be addressed

Intended user =

- student in oncology
- or researcher specializing in oncology
- or practitioner giving treatments on breast cancer

Needs:

- access to updated knowledge on breast cancer diagnosis, prognosis and therapy
- training

Our objectives

A knowledge base which should:

- be able to connect **different guidelines used in different cancer research centres** (i.e. Genoa-IST, Nice-Lacassagne... and to join different points of view
- be able to be **updated with knowledge coming from newly published research** (specifically those on **biological** aspects)
- be conceptual in the sense that it may be understood and even hand-used by experts.

The Galileo project

- *Collaboration between INRIA-Sophia-Antipolis, University of Genoa (DIST) and IST of Genoa (1996-1997) for :*
 - **Capitalization of expertise** on the breast cancer prognosis and therapy, from multiple expertise sources (practitioners, researchers, articles...).
 - Building a **multi-experts knowledge base** accessible on the Web, and linked to documentary expertise sources...

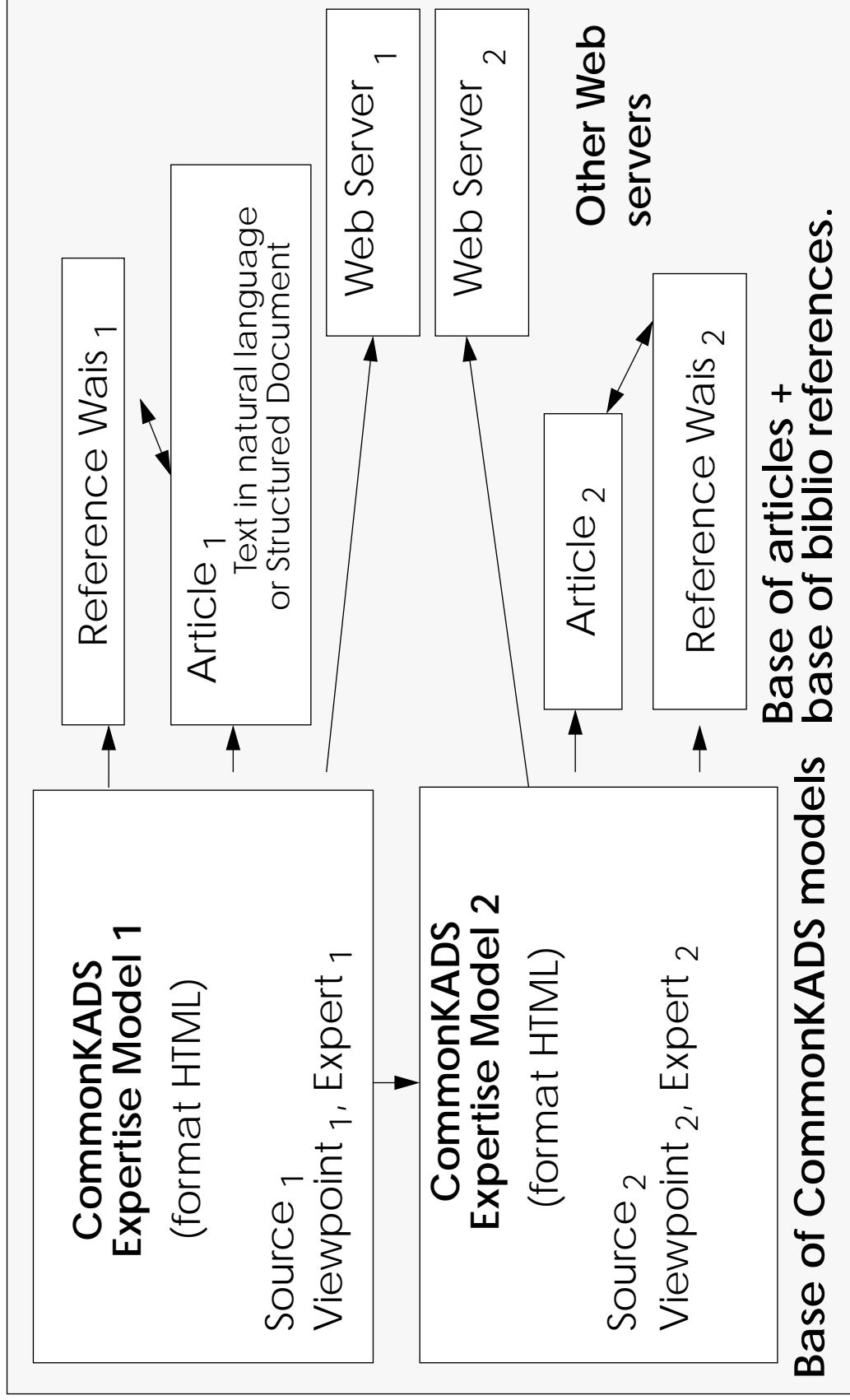
Present Results

- Interviews of an expert of IST + analysis of articles
 - ⇒ Construction of a **CommonKADS expertise model on breast cancer prognosis**.
- Use of the knowledge acquisition tool COKACE (that allows to **build and validate expertise models**) :
 - ⇒ Validation of the expertise model
 - + Model in **HTML format**, accessible through Web, with possible **access and interrogation of Wais bibliographic bases**, and possible **access to documents sources**.

Further Research

- Techniques of management of multiple CommonKADS expertise models :
 - * hypertext links between such expertise models corresponding to **different viewpoints**,
 - * hypertext links with the **articles**.
- **Elicitation and modelling** in CommonKADS of knowledge of several experts + analysis of several articles.
 - ⇒ Construction of **several expertise models on breast cancer prognosis and therapy**.
- Setting the base of models on the Web :
 - * Development of the **Web server** (cf. HTML interfaces) for the consultation of the base
 - * Exploitation of a **Wais server** to manage bibliographic references to filter the access to articles.

Multiple Expertise Models



Conclusions

- *Interest for Knowledge Acquisition:*
 - Knowledge Acquisition from documents
 - Knowledge Acquisition and multi-expertise
 - **Knowledge Acquisition and the Web**
- *Interest for Telemedicine:*
 - Knowledge base + Documentary Sources, available on the Web
 - Comparison of multiple methods or viewpoints on breast cancer prognosis and therapy (cf. training, research).