

# iPad

## *Semantic Laboratory Notebook*



# **1. Addressed Needs**

2. Solution: iPad

3. Case Study

# Business Case: R&D productivity

"The time for discovery and development of a new molecular entity (NME) has gone from approximately 4 years in the early 1960s to over 14 years today."

"A one month delay in a blockbuster drug's approval can yield \$41.7 million (U.S.) in lost revenue."

"The pitfalls of paper are estimated to cost the drug industry over \$1 billion annually in lost opportunities and duplicated research."

"If pharma companies are to survive, let alone remain competitive, they will need to find ways to coordinate and consolidate information."

"R&D productivity - not R&D investment - is the real challenge for global innovation."

Source: Atrium research, Rockley bulletin, Nature, First Consulting Group, Financial Times

# KM needs in bioresearch

**Collective data management (29)** *share only what you want with whomever you want whenever you want, clarity, structure-based search ...*

**Data integration (21)** *across applications, groups, organizations, business process, domains ...*

**Data storage (21)** *all data, electronic, open and standard formats, i.p. protection ...*

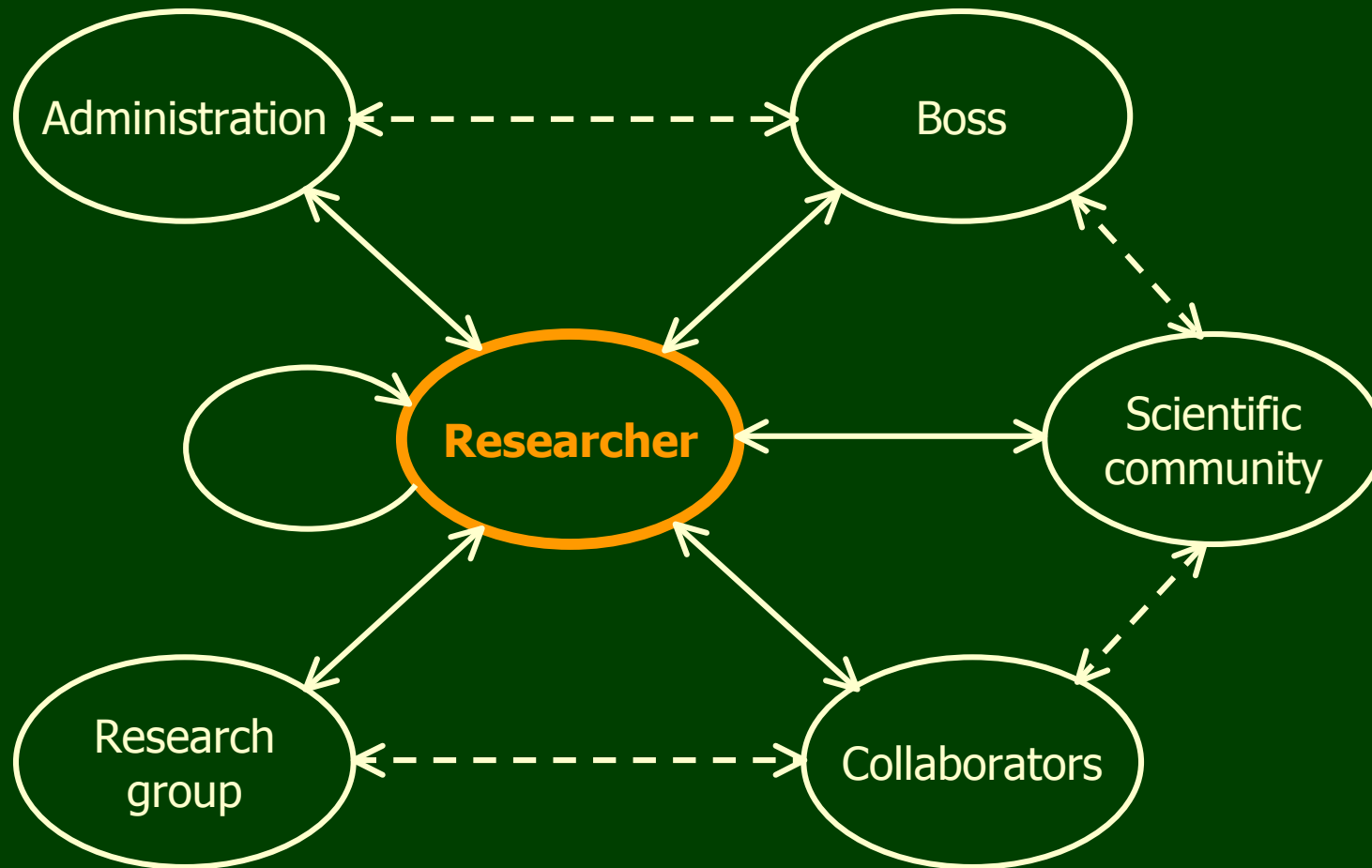
**Personal data management (18)** *effective data entry (simple, mobile, flexible, structured), useful perspectives, structure-based search ...*

**Project management (12)** *collaborative document editing, keeping up-to-date, task management ...*

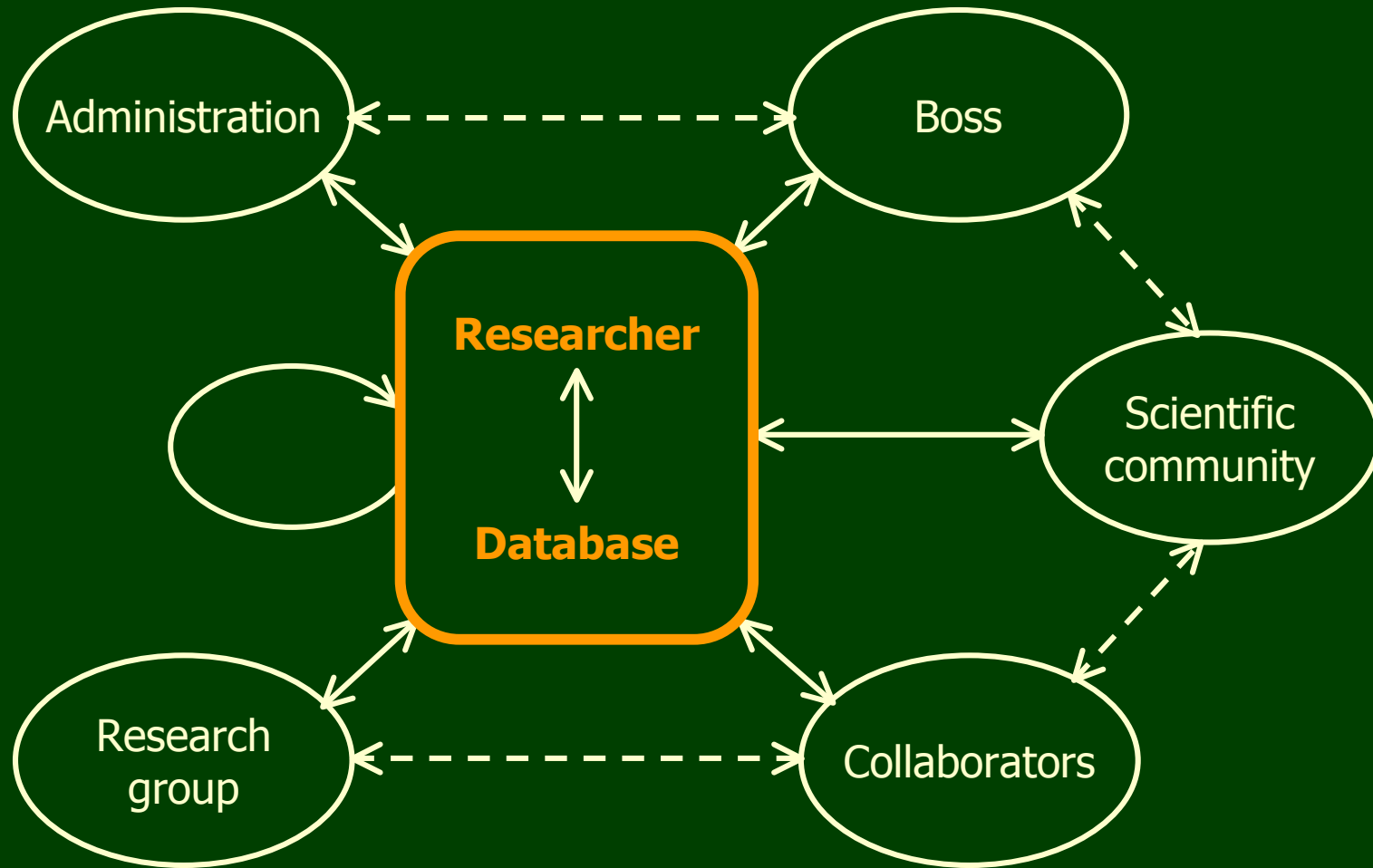
**Analysis (12)** *inference, validation, discovery, consistency, autocompletion*

**Communication (7)** *open channels, clarity, report & publication draft generation, multi-channel ...*

# Flow of research information: at present



# Flow of research information: proposed



# Key technological issues

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- 1. Simplicity & flexibility of structured data entry**  
*multi-media, without form constraints, inter-object relationships*

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*browsing & search, sharing, communication, integration ...*



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- 1. Simplicity & flexibility of structured data entry**  
*multi-media, without form constraints, inter-object relationships*
- 2. Sufficient user benefits**  
*browsing & search, sharing, communication, integration ...*
- 3. Protection of intellectual property**  
*proof of date and authorship in an electronic environment*

# Business Case: Semantic Web

"Gartner says the explosion of unstructured data is negatively affecting the productivity of individuals and the overall competitiveness of enterprises."

"A semantic model can have a profound affect on how research data can be organized in meaningful bundles."

"Semantic Web technologies will create opportunities for improvements in discovery, development, and safety. Companies should move aggressively to pilot the use of semantic technologies in these areas."

"Life scientists in particular, Berners-Lee insisted, could find the Semantic Web a valuable tool and "provide leadership to lots of other fields" in implementing this next-generation Web technology."

"The Semantic Web will likely profoundly change the very nature of how scientific knowledge is produced and shared."

Source: First Consulting Group, Science, Bio-IT World, Nature

1. Addressed Needs


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# iPad Components

The screenshot displays the iPad Editor application window. The interface includes a menu bar (File, Edit, Insert, Format, View, Search, Favorites, Tools, Help), a toolbar, and a document titled "pharmac.xml". The document content is structured as follows:

- comment:**
  - data
  - intellectual property
  - reference
  - task
- Document browser:**
  - search notes
    - PROJECT: "Detection of pharma"
      - Participant: Virginia Jan
      - Funding source: "SI"
      - Central questions of the c
      - Strategy
      - Equipment: "Detection of"
        - Method: "Zymographic"
          - Protocol: "Detectio"
            - Results
              - Data
            - Interpretation
          - Protocol: "Detectio"
            - Results
              - Data
            - Interpretation
        - Method: "Determinatio"
          - Protocol: "Method"
            - Results
              - Data
            - Interpretation

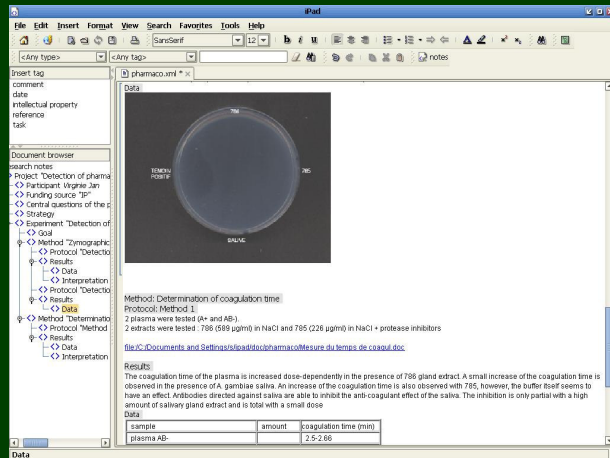
- Main Content:**
- Data:** 
- Method: Determination of coagulation time**
  - Protocol: Method 1:
    - 2 plasma were tested (A- and AB).
    - 2 extracts were tested: 705 (589 µg/ml) in NaCl and 705 (226 µg/ml) + protease inhibitors
    - [file:///C:/Documents%20and%20Settings/raouad/leche/Pharmacologie/ure%20du%20tempe%20de%20coagula.doc](#)
  - Results:**

The coagulation time of the plasma is increased dose-dependently in the presence of 705 gland extract. A small increase of the coagulation time is observed in the presence of a, gambian saliva. An increase of the coagulation time is also observed with 705, however, the latter fruit seems to have an effect. Antibodies directed against saliva are able to inhibit the anti-coagulant effect of the saliva. The inhibition is only partial with a high amount of salivary gland extract and is total with a small dose
  - Data:**

sample	amount	coagulation time (min)
plasma AB		2.5-2.66

iPad Editor

# iPad Components

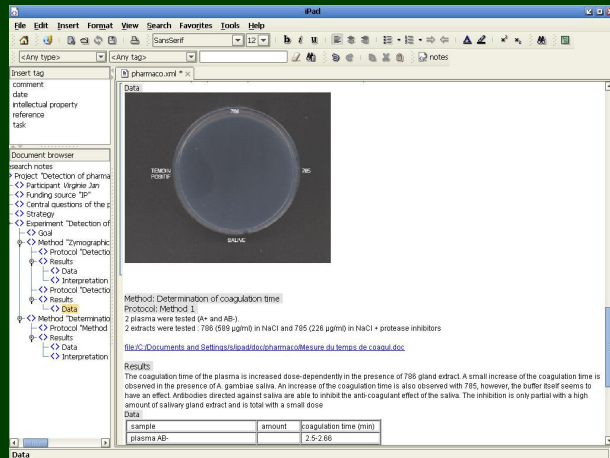


iPad Editor

iPad middle-layer  
server

Database

# iPad Components



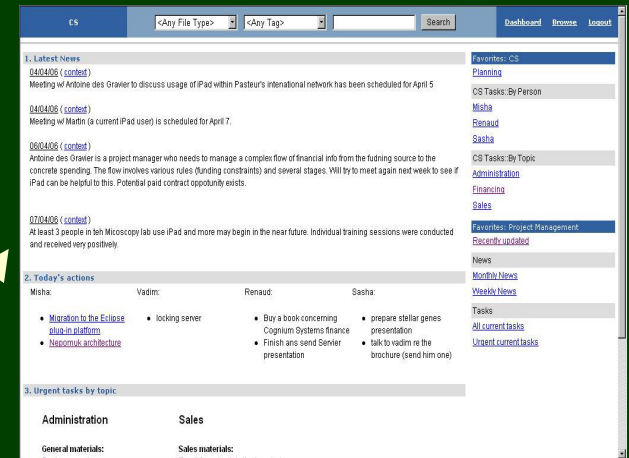
iPad Editor



iPad middle-layer  
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Database



iPad Web Portal

# iPad: functionality checklist

- ✓ **Collective data management** *share only what you want with whomever you want whenever you want, clarity, structure-based search ...*
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- ✓ **Data storage** *all data, electronic, open and standard formats, i.p. protection ...*
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# iPad: key issue checklist

- ✓ **Simplicity & flexibility of structured data entry**  
*multi-media, without form constraints, inter-object relationships*
- ✓ **Sufficient user benefits**  
*browsing & search, sharing, communication, integration ...*
- ✓ **Protection of intellectual property**  
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# Major Benefits

## Monetary savings

- + Less lost work
- + Resource optimization

## Time savings

- + Faster search and assembly
- + Faster communication and formatting
- + Less lost work

## Increase in the quality and quantity of research

- + Useful perspectives
- + Improved collaboration
- + Improved project management
- + More information available to the organization
- + More information given to the scientific community (in the future)
- + A tool to structure scientific data (in the near future)

# Drawbacks

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- Learning new software (rather simple)
- Changing habits (will go away over time, gradual adoption)

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# Case Study at Institut Pasteur

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- Over 1 year continuous use
- Formal evaluation is planned within NEPOMUK
- Positive user feedback so far
- Feedback confirms our hypotheses
- Interest from pharma industry