LMU LUDWIG-MAXIMILIANS UNIVERSITÄT MÜNCHEN
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INSTITUT FÜR MEDIZINISCHE INFORMATIONSVERARBEITUNG
BIOMETRIE UND EPIDEMIOLOGIE
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Electronic Data Capture - MACRO

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ELN European LeukemiaNet

Agenda

- Purpose of Electronic Data Capture (EDC)
- Regulatory Requirements
- EDC-System „MACRO”
- Clinical Trial Support for ELN by WP 3 (CICS)
- Costs

ELN European LeukemiaNet

Purpose of Electronic Data Capture

- Obtain trial data in electronic form for subsequent analysis
- Replace paper-based case report forms by electronic ones (e-CRFs)
- Quality assurance:
  - Perform data validation (“edit checks”) during data entry
  - Provide assistance for generating and processing queries

Regulatory Requirements

- Directive 2001/20/EC of the European Parliament and of the Council (“Clinical Trials Directive”)
- National law
- Good Clinical Practice (GCP-ICH)
- 21 CFR Part 11 (Electronic Records)
- [EU-GMP Annex 11]

ICH-GCP – Consolidated Guideline

5.5.3 ... the sponsor should:

(a) Ensure and document that the electronic data processing system(s) conforms to the sponsor's established requirements for **completeness, accuracy, reliability**, and consistent intended performance (i.e., **validation**).

(b) Maintain **SOPs** for using these systems.

(c) Ensure that the systems are designed to permit data changes in such a way that the **data changes are documented** and that there is no deletion of entered data (i.e., maintain an audit trail, data trail, edit trail).

(d) Maintain a security system that prevents unauthorized access to the data.

...

21 CFR Part 11

- Electronic Records
  - Authenticity
  - Integrity
  - Confidentiality
  - Non-Repudiability
- Electronic Signatures
  - Identification codes & passwords

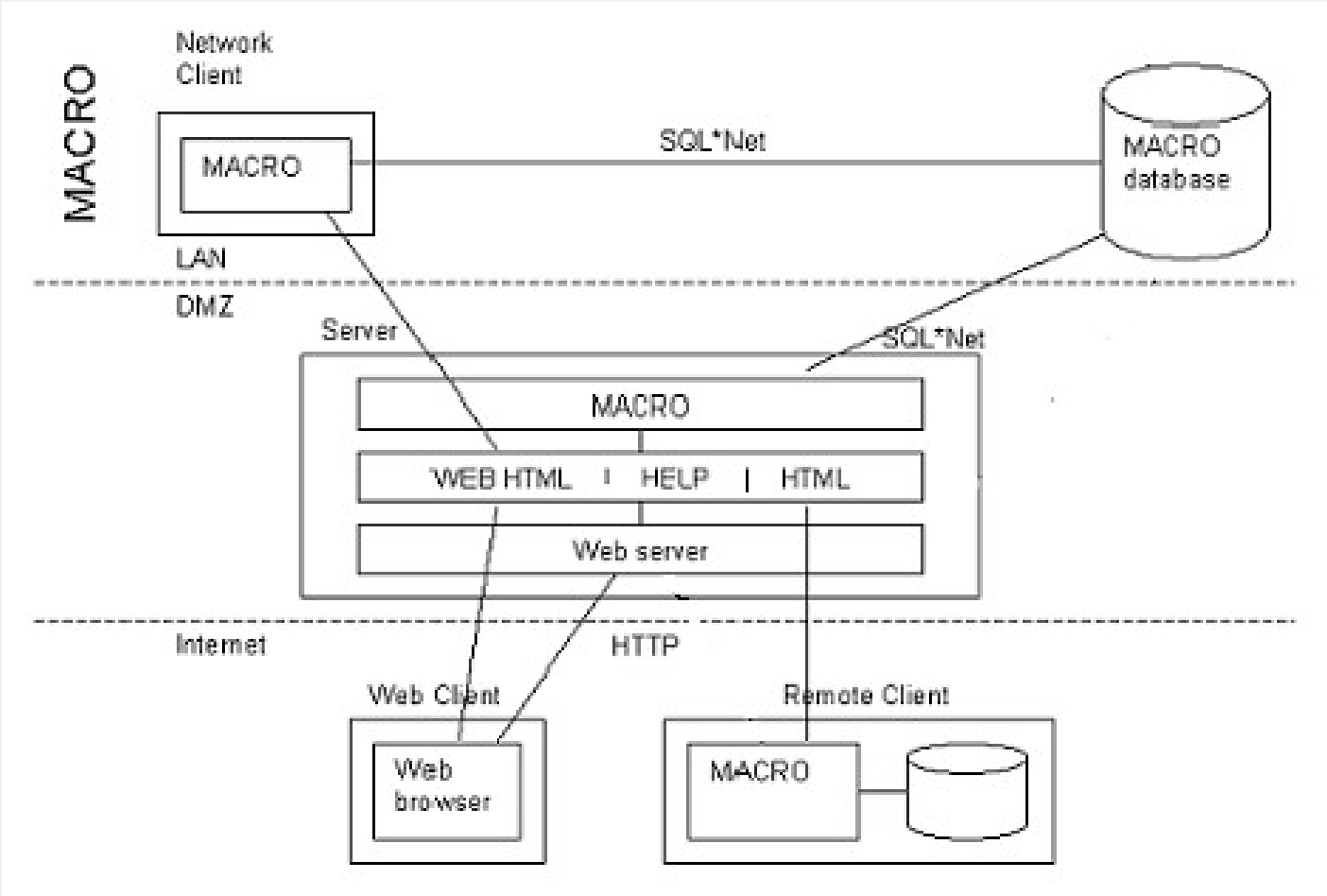
Requirements for Use in Clinical Trials

- GCP-conformant system
- Vendor using validated software development process
- Validated installation
- Implementation and validation of electronic CRFs
- Registration of authorized users
- User training

MACRO

- Vendor: InferMed Ltd, London
  - www.infermed.com
- Architecture: Client/Server
  - “Network client”
    - Trial design, data entry, monitoring
    - System and user administration
  - “Web client”
    - Data entry, monitoring
  - “Remote client”
    - Data entry, monitoring
    - Trial design

MACRO Architecture



MACRO Features

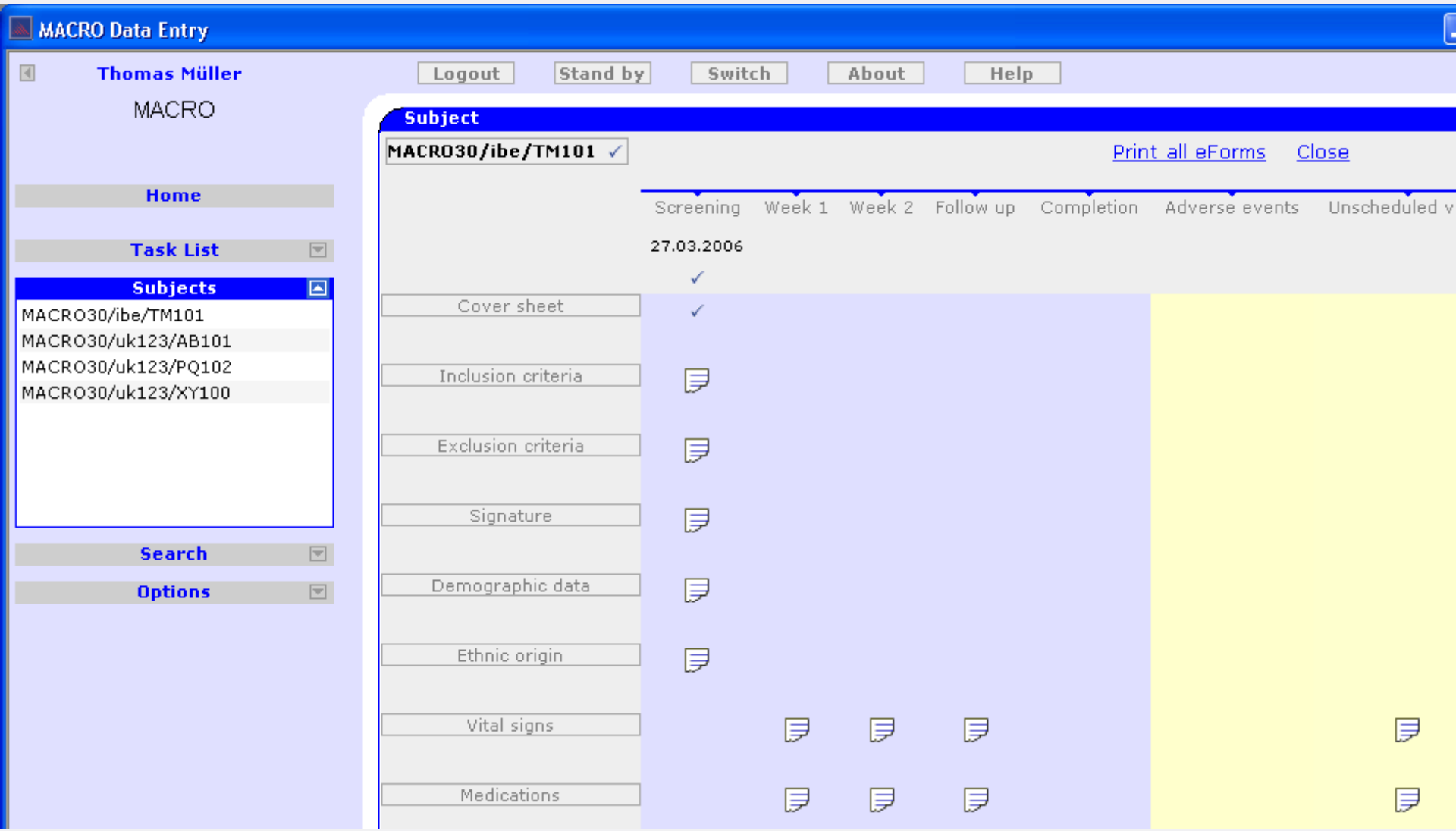
- GCP-conformant (e.g., audit trail)
- Support for multicentre trials
- Role-based authorization scheme
- Data validation
- Reporting
  - Data management
  - Monitoring
  - Custom
- Trial design tools

MACRO Minimum Client Requirements

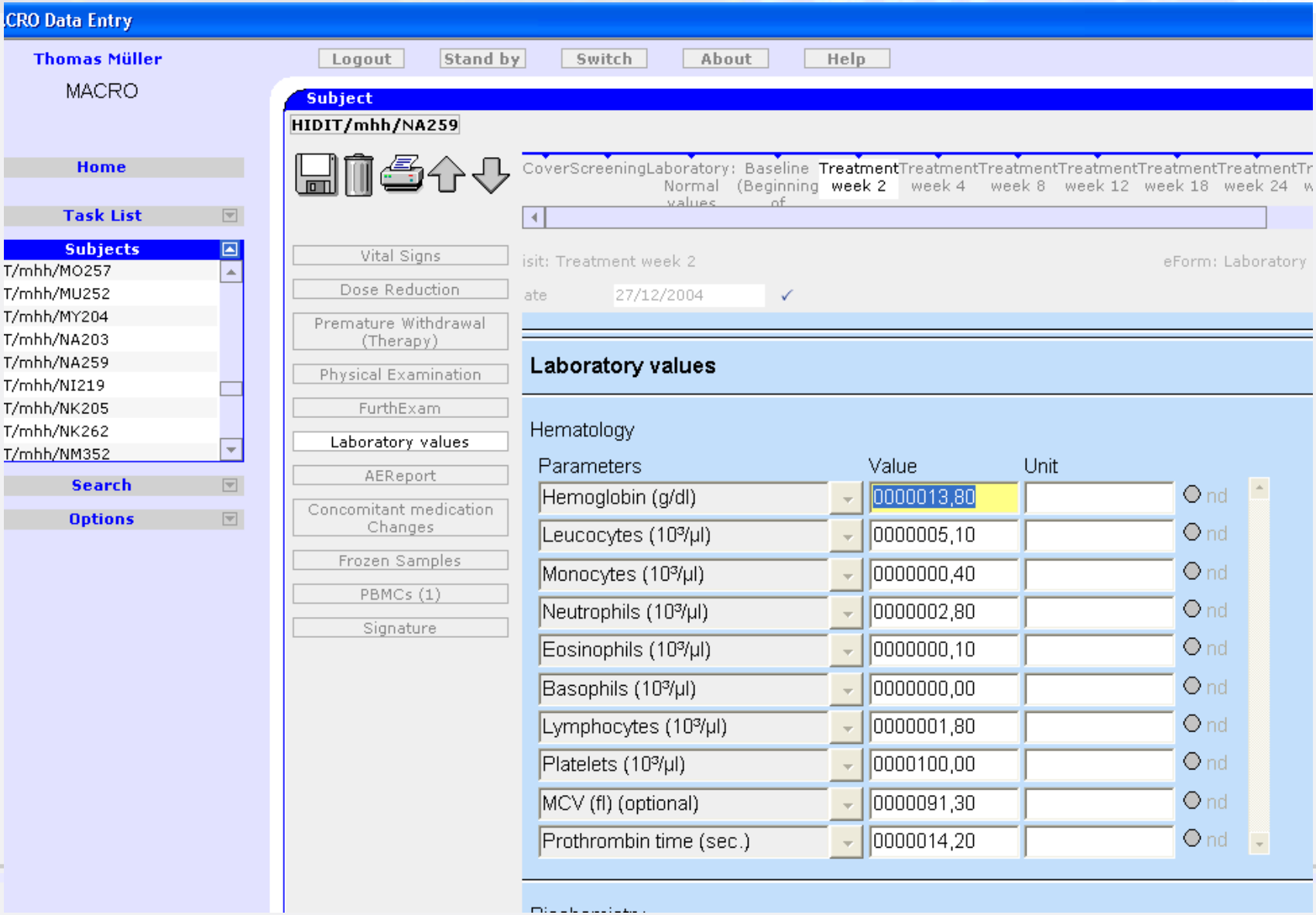
- 450 MHz Pentium II with 128 MB RAM and 500 MB free hard disk space
- Windows 2000 Professional or XP Professional
- Screen resolution of 1024 x 768
- Web client:
  - Internet Explorer (IE) 5.5 or 6.0 with high (128-bit) encryption pack
- Remote client:
  - Local database: MSDE 2000 or SQL Server 2000

MACRO: CRF-Development

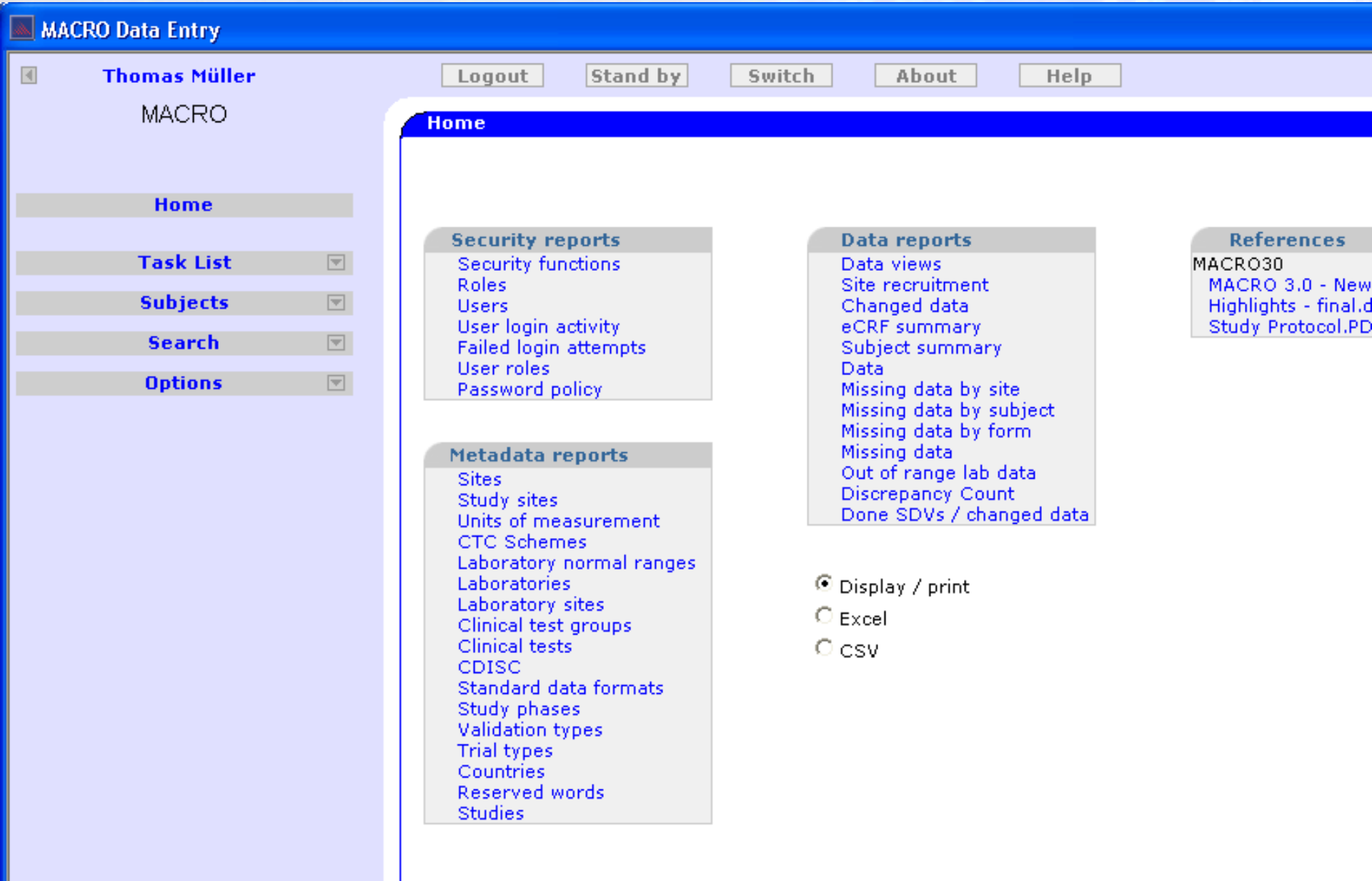
- e-CRFs mostly analogous to paper CRFs
  - visits
  - e-forms
- Data types and structures
  - text, date, integer, value + unit
  - repeats
  - special structures for laboratory data
- Programmable plausibility checks
- e-CRF library


MACRO Data Entry
Thomas Müller
MACRO
Logout
Stand by
Switch
About
Help
Home
Task List
Subjects
MACRO30/ibe/TM101
MACRO30/uk123/AB101
MACRO30/uk123/PQ102
MACRO30/uk123/XY100
Search
Options
Subject
MACRO30/ibe/TM101
Print all eForms
Close
Screening
Week 1
Week 2
Follow up
Completion
Adverse events
Unscheduled v
27.03.2006
Cover sheet
Inclusion criteria
Exclusion criteria
Signature
Demographic data
Ethnic origin
Vital signs
Medications

Example e-CRF



Reports


MACRO Data Entry
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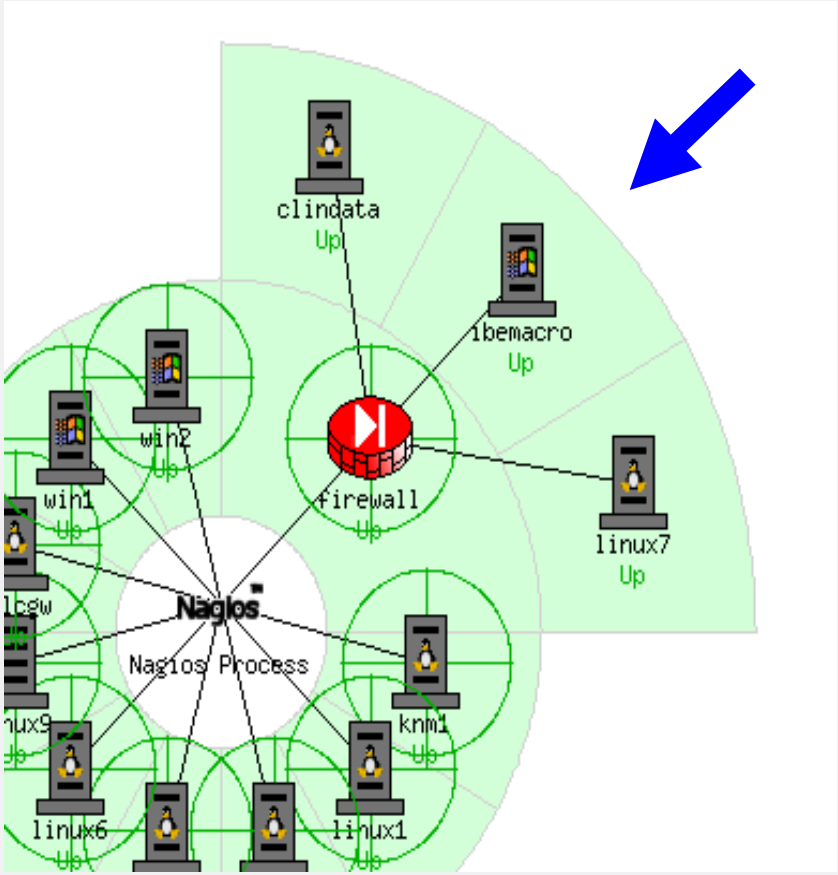
MACRO
Logout
Stand by
Switch
About
Help
Home
Task List
Subjects
Search
Options
Home
Security reports
Security functions
Roles
Users
User login activity
Failed login attempts
User roles
Password policy
Metadata reports
Sites
Study sites
Units of measurement
CTC Schemes
Laboratory normal ranges
Laboratories
Laboratory sites
Clinical test groups
Clinical tests
CDISC
Standard data formats
Study phases
Validation types
Trial types
Countries
Reserved words
Studies
Data reports
Data views
Site recruitment
Changed data
eCRF summary
Subject summary
Data
Missing data by site
Missing data by subject
Missing data by form
Missing data
Out of range lab data
Discrepancy Count
Done SDVs / changed data
Display / print
Excel
CSV
References
MACRO30
MACRO 3.0 - New
Highlights - final.d
Study Protocol.PD

Installation in Munich (LMU)

- Operational since April 2006
- Network security (firewall)
- Implemented trials: 3



Trial Implementation by WP 3

- WP 3 can provide:
  - CRF design consulting (in collaboration with WP 17), including specification of data dictionary
  - e-CRF implementation
  - e-CRF validation
  - User management
  - User training
  - Help desk
- WP 3 cannot provide:
  - data entry from paper forms on any relevant scale

Trial Implementation Procedure

Step	WP3/Sponsor
• Trial protocol finalized	Sponsor
• Specification of Data Dictionary	both
• Implementation of e-CRFs	WP3
• Review of e-CRFs	Sponsor
• Validation of e-CRFs	WP3
• Site and user registration	both
• User training (if necessary)	WP3
• Activation of trial data entry	WP3

Minimum Data Dictionary Content

- Patient identification
- For each visit:
  - Scheduled time (range)
  - Items (variables) to be documented
- For each item:
  - Data type (text, number, date, choice, selection...)
  - Coding used
  - For laboratory tests:
    - **Range of possible values**
    - **Range of likely (not frequent !) values**

Costs

- Additional costs to be bourne by the trial sponsor will arise from:
  - Named users: 600 € per user + 100 € per user and year
  - Training of system users
  - Trials related to drug registration or other commercial purposes (substantial amounts !)
- Additional costs may arise for implementation, validation and management of either numerous trials or extremely complex trials

Summary

- WP 3 operates a validated installation of the GCP-conformant data capture software MACRO
- The system is available for clinical trials conducted by the ELN
- WP 3 provides e-CRF design and validation
- Additional costs may arise, e.g. for user licenses

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