



KALABIE II Project – Workflow integration and "going fully electronic"

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Agenda

Kalabie Phase I

Kalabie Phase II

- **Scope and Functionality**
- **Integration**
- **SAFE-Biopharma Digital Signatures**
 - How to get a certificate
 - How to apply a digital signature
- **Architecture**

Kalabie Phase III



Situation in 2005

- ELAN was used as ELN by Chemical Development (CD) in R&D and Process Development (PD) in IA at various sites
 - Vendor: MDL
 - Technologie: Winword + Macros, Oracle, ISISDirect
- Kalabie ELN had already been implemented for Synthesis Chemists in PD at the Sisteron and Aramon sites
 - Vendor KLEE
 - Technology: Java, XML, Oracle
- A decision was taken
 - to implement KALABIE as ELN in CD and PD globally
 - Start as a first step with all the sites, which had no ELN at that time (→ Move from paper to electronic)



Kalabie Phase I - Achievements

- Deployed for 280 Chemists on Kalabie ELN Core v2.2
- Using Standard Synthesis Activity profile customized for Sanofi-Aventis
- Scope
 - CD: Porcheville, Montpellier and Budapest
 - PD: Neuville and Budapest
- In 3 languages: English, Hungarian and French
- Interfaced to Molecule Sources: ChemBase + MDL ACD
- Including an Enterprise Automatic Printing Service
- In Production since July 2007



Kalabie - Standard Functionality

- Flexible Experiment Editor
 - Configurable Layout based on experiment type
 - **Activity Profile**
 - Experiment specific templates and phrases
 - Drop down lists with predefined values
 - Attachment of Images + annotation
 - Attachment of objects
- Search engine accross all experiments and management of favorites lists
- Administration
 - User and profiles
 - Management of list values (down to lab level)
 - Confidential projects



Kalabie Phase II – Project scope

- Deployment for 250 additional users
- 4 new sites:
 - CD: Vitry, Frankfurt and Bridgewater
 - ICMS: Chilly and Frankfurt
- 1 additional language: German
- 3 new Scientific Activities:
 - Crystallization
 - Isotope Chemistry Metabolic Synthesis (ICMS)
 - Safety Activity Labs
 - Analytics
- HS&E (Health, Safety & Environment) safety rules support
 - Notification and email alert when using CMR Hazard Products



Kalabie Phase II – Project scope

- Further interfacing to Sanofi-Aventis Information Systems including:
 - Corporate Compound Database for registration and as molecule source
 - Analytical LIMS and Analysis Request Support
 - Labs/R LIMS in CD and PD Automation Labs
 - ARLA Multireactor Automation Software
 - PDI – Workflow to synchronize Batch-/Compound IDs between Foundation systems
- Use of electronic records to protect IP
 - Implementation of SAFE Biopharma digital signatures
 - Audit Trail (requirement of the Patent department)



Kalabie Phase II – New Functionality

- Kalabie Molecule ID substitution function by Corporate Code
- Better Management of Molecule Ids (Codes, Names, Nickname, etc...)
- Radio Isotope labeled compound support
- Better Management of molecules in Kalabie database
- Use of SAFE Digital signatures
- Idea Capture Standard Activity Profile
- Support of stand-alone molecules in reaction (e.g.: for purification purpose)
- Mandatory printing function for attached documents
- Yields display on Reaction Scheme, reposition of intermediates
- Unchangeable timestamp and « History Review » function on « Protocol » section
- Favorites Compounds list
- Multi reactor management (Variation of experiment parameters)
- Implementation of General Analysis Module



Digital Signature - Position paper from Patent department

- **Not included in Original scope** – Intention was to continue to continue to use the existing hybrid mode with biweekly automatic printouts, manual signature process (author + witness) and paper archiving
- **Conclusion**, October 30, The Patent Department issued a “position paper on acceptability of electronic record keeping of research activities :
- **Can go ahead** with electronic signatures and witnessing provided:
 - Authorship of the information is clearly ascertainable and ascribable to a specific party;
 - Witnessing of the information is clearly ascertainable and ascribable to a specific party having no inventive contribution in the information; and
 - Authorship and witnessing entries are collected in a timely and unalterable form.



Digital Signature

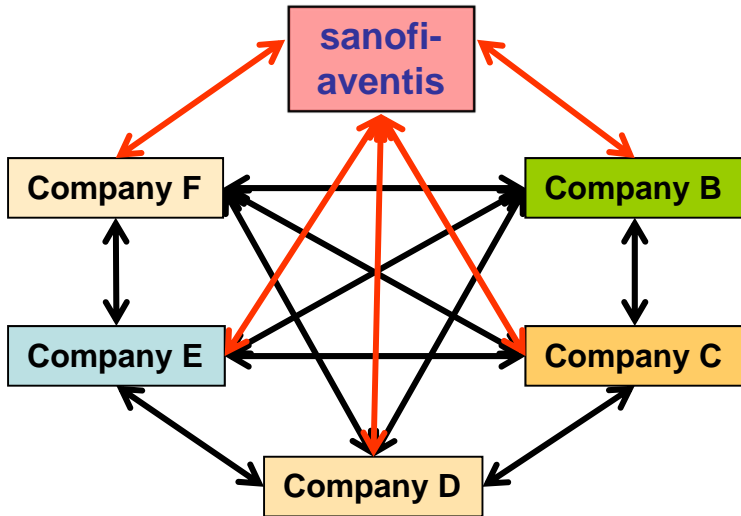
- Chosen solution is from SAFE-BioPharma and based on a digital certificate provided by Certificate authority System (CAS) and stored on a special USB device (eToken).
- SAFE-BioPharma is a non-profit association that manages its digital identity and signature standard for the pharma+healthcare industrie
- Aligned to IS strategy – Kalabie is a pilot project
 - Sanofi-Aventis is a SAFE-BioPharma member and represented in the board and in several working groups
- To apply a digital signature, two things are needed
 - eToken
 - PIN
- Time stamp will be provided by an external service (TC-Trustcenter)



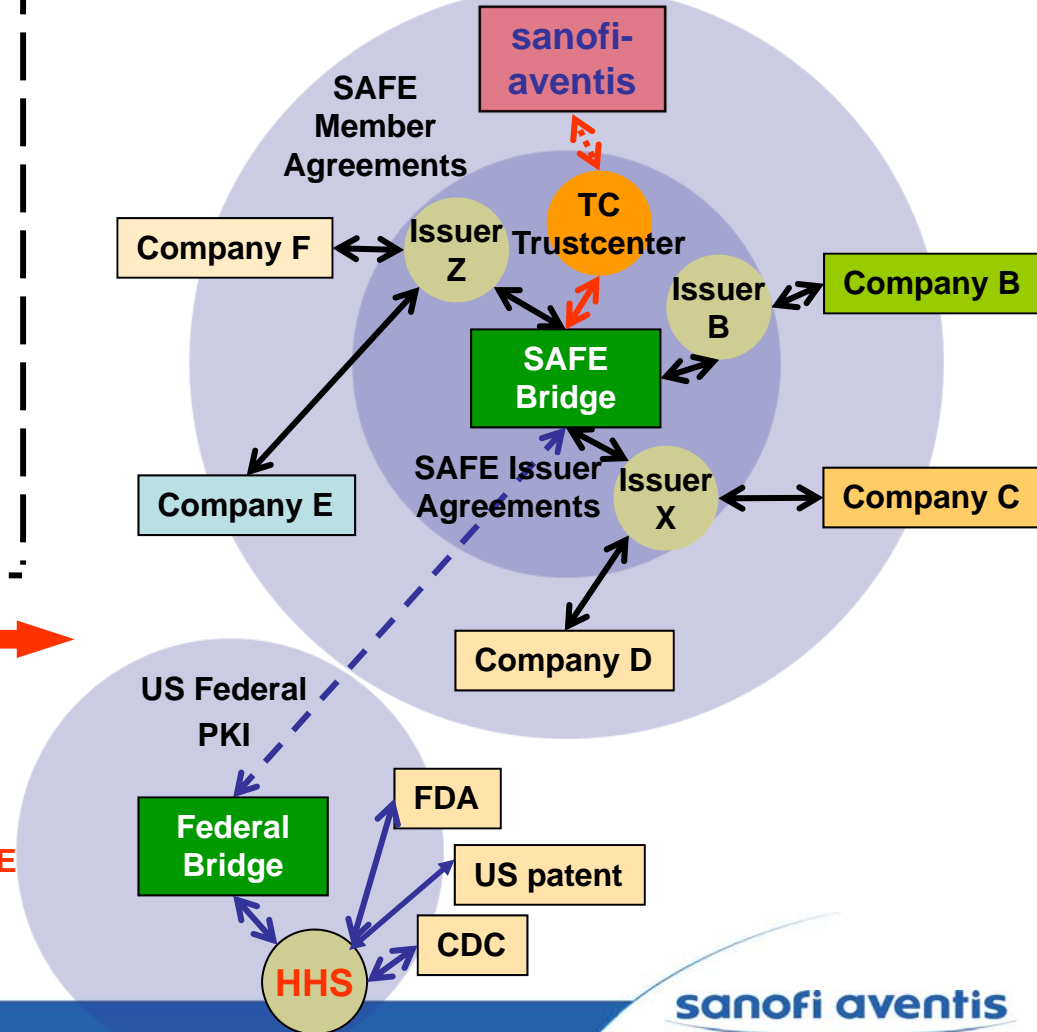
Kalabie Phase II – Digital Signatures

Why SAFE ?

One way of establishing trust → create & maintain multiple individual agreements



SAFE-BioPharma provides alternate model → single agreement framework plus global identity standard



SAFE is value-adding:

- Provides legally viable framework for shared trust (SAFE Member Agreement)
- Reduces cost & complexity
- Provides governance structure
- Provides technical means for shared trust (SAFE Bridge & SAFE Issuer Agreement)
- Continues to extend its trust model

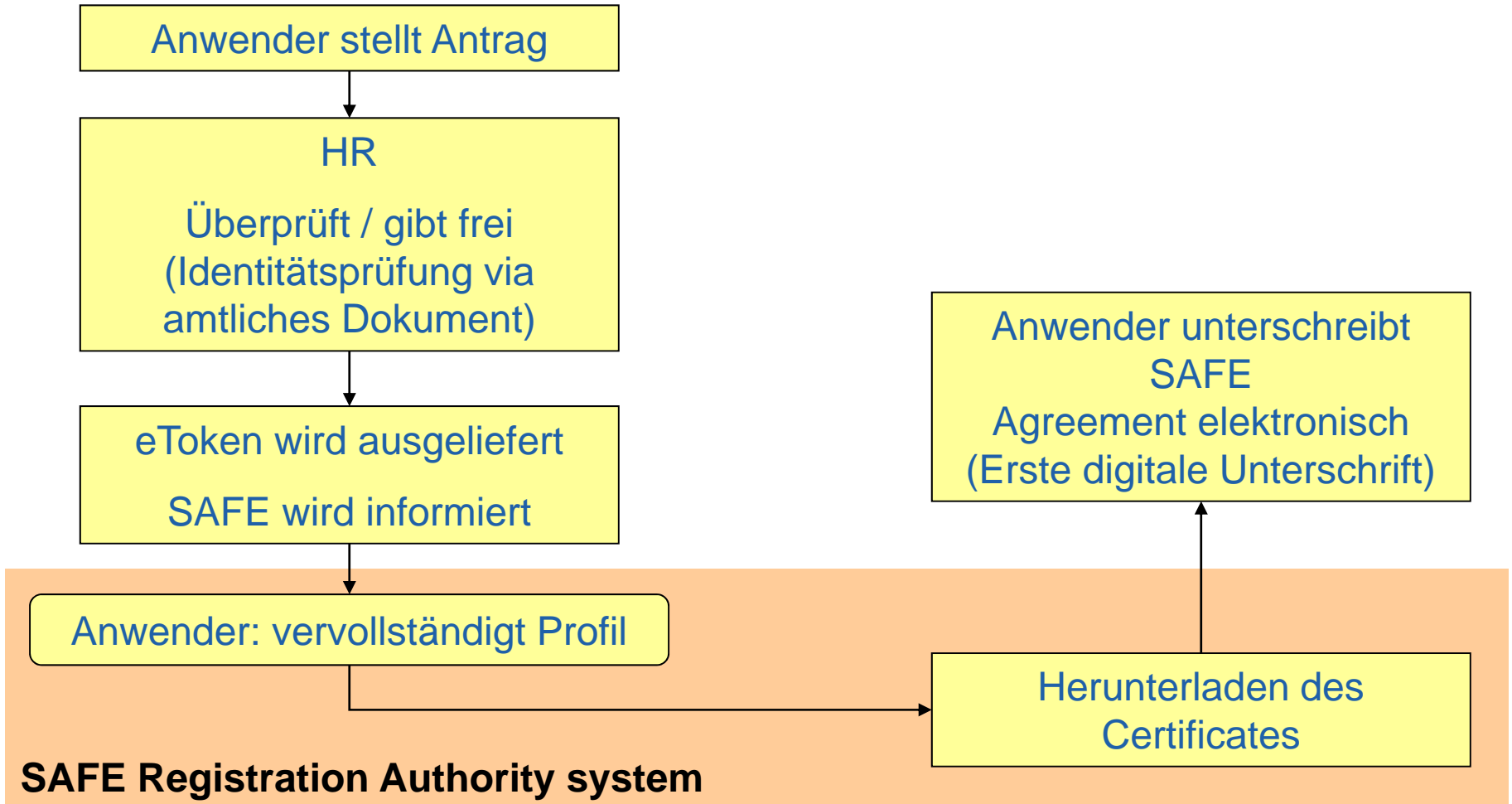


Rechtssituation für das Zertifikat

- Die Zertifizierung (bzw. Empfehlung) der SAFE Bridge stellt die internationale Akzeptanz bei relevanten Stakeholdern (FDA, US Patent, EMEA, Partnerfirmen, ...) sicher.
 - Verpflichtung der Partnerfirmen und Behörden die Unterschriften gegenseitig anzuerkennen
- Die Zertifizierung von TC Trust Center durch die Bundesnetzagentur stellt zusätzlich die rechtliche Akzeptanz der Zertifikate (Public / private key) in Deutschland (und damit letztlich auch Europa) sicher



How to get a certificate





Signature Workflow

- **1st Signature: Person, who executes the experiment will sign as author.**
- **2nd Signature: chosen witness (the drop-down list of possible witnesses is configurable)**
- **Witness will be informed via email, that he has to sign an experiment**



Signature Workflow in Kalabie I

Dokumenten Workflow [X]

Workflowfortschritt

1

Aktion auswählen*

Unterzeichnen [v]

Dokumenten Validierer*

BERNSMANN heiko (Wahl des Benutzers)

Anmerkungen

Bitte noch heute unterzeichnen. Danke!

OK Abbrechen

Experiment Signature [X]

PDF preview of experiment ADMC-01.8

2

Please fill out the following form. [Highlight Fields]

Frankfurt Scale-Up FFC.1.5
Mit Kalabie ELN bearbeitet
Erstellt: 13-NOV-2009 GMT+01:00

CSM

GOAL

Gather all requirements by using the Serena Tools

This document is ready to be signed under your agreement. Please review it before signing.

SAFE Signature

I intend this signature to be legally binding per my executed SAFE user agreement.

Reason *

I'm the Author of the Document.

SAFE Certificate *

Mathias Wolf (Trans Sped SAFE CA 1) [Refresh]

Continue Cancel



Signature Workflow in Kalabie II

Unterzeichnetes Experiment

Navigation toolbar with icons for print, save, back, forward, zoom, and search. A yellow circle with the number 4 is overlaid on the left side of the toolbar.

This document was certified by Mathias Wolf <mathias.wolf@sanofi-aventis.com>, Sanofi Aventis with certificate issued by Trans Sped SAFE CA I.

Signature page details for Mathias Wolf. Includes a blue ribbon icon, the name "Mathias Wolf", a "SAFE" logo, and technical details like DN, Grund, Anmerkung, and Datum.

Signaturseite

Autor

 **Mathias Wolf**



DN: CN=Mathias Wolf, OU=f613107121609ed674e6ec60ff74b3f43fff10ea,
Grund: Ich bin der Verfasser des Dokuments.
Anmerkung: Bitte noch heute unterzeichnen. Danke!
Diese Signatur soll gemäß meiner SAFE-Benutzervereinbarung rechtlich bind
Datum: 2009.11.13 14:04:58 +0100

Log on: RAS_500339

3 Log on to eToken eToken

Enter eToken password

eToken Name: RAS_500339

Password: *****

Current Language: DE

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Summary | Document | Signer | Date/Time | Legal

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Reason: Ich bin der Verfasser des Dokuments. Diese Signatur soll gemäß meiner SAFE-Benutzervere

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Validity Summary

-  The Document has not been modified since it was certified.
-  The document is signed by the current user.
-  Signature is timestamped.



Production Server Architecture

- Kalabie deployed via Window Terminal Server Farm
 - Six WTS servers with 8 CPU's each (12 GB RAM)
 - Supports 150 simultaneous heavy users @ 256 MB/each
 - Installed software
 - IE, MS Office, Adobe Acrobat 8.1
 - Java Runtime, MDL Packages, Etoken Driver
- Load balanced application servers (SUN)
- Both WTS and application servers are connected to external servers to
 - verify the SAFE digital identity
 - obtain a certified time stamp from the Time Stamp Authority

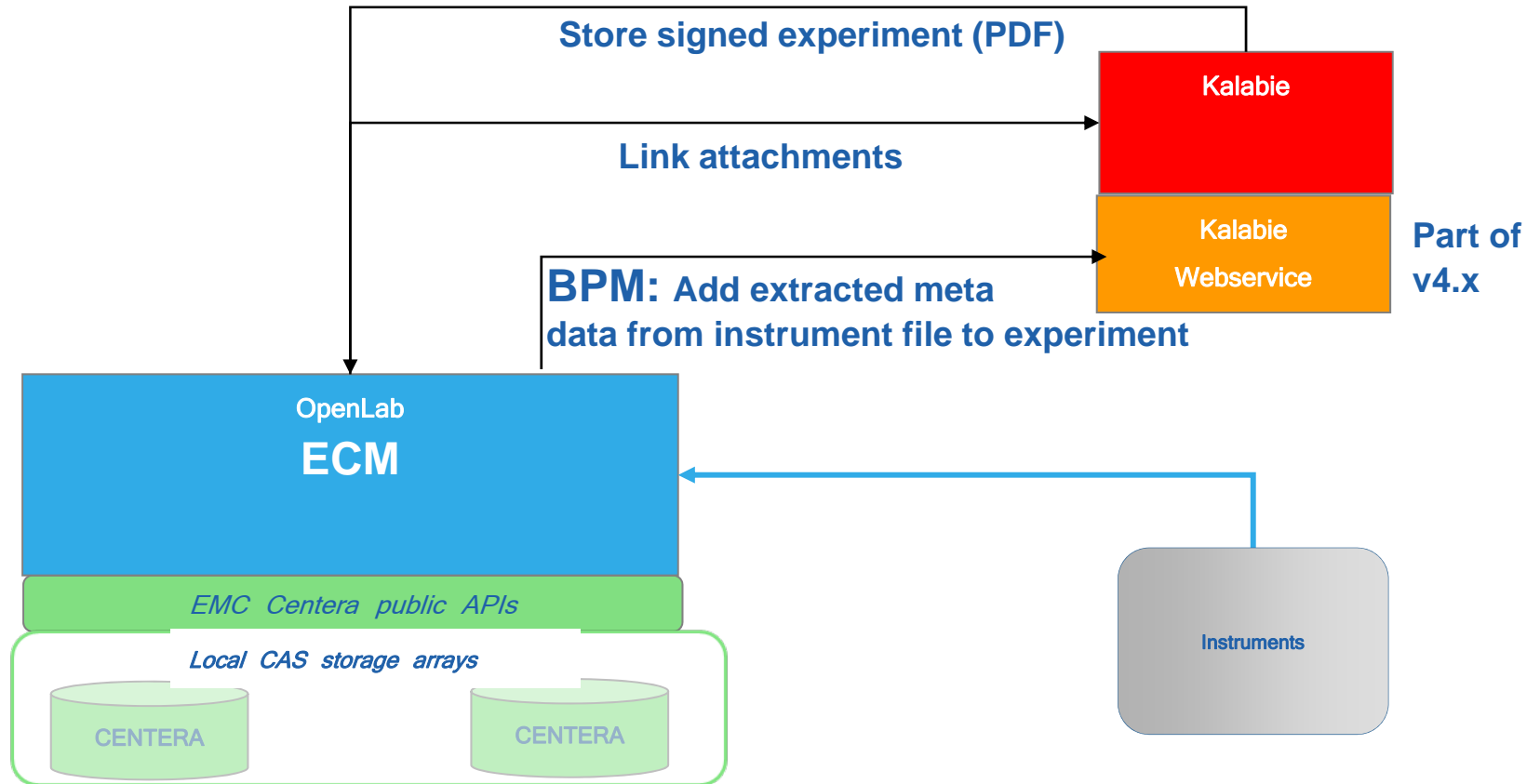


Kalabie Phase III – 2010/2011

- Deploy Kalabie to other units in Sanofi-Aventis
 - Based on Kalabie Core v4.1
- Make use of new functionality
 - Dynamic forms and fields (designer)
 - Save set of Dynamic forms as a new activity profile
 - Full text search engine across the whole experiment
 - Image annotation – fully searchable
 - Integration with OpenLab/ECM Storage system
 - Simple instrument integration (e.g balances)



Kalabie Phase III – Openlab/ECM



- Storage of all attachments in OpenLab
- Automatic archiving based on Rules