



Incorporation of diverse ILL Systems through an Intelligent Middleware Platform – A step forward to the one-stop Library Service

George Veranis*

Dimitris Kouis**

Foteini Efthymiou**

*Library of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Thessaloniki, Greece

**Union Catalogue Department, Hellenic Academic Libraries Link, National Technical University of Athens, Greece

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Presentation layout

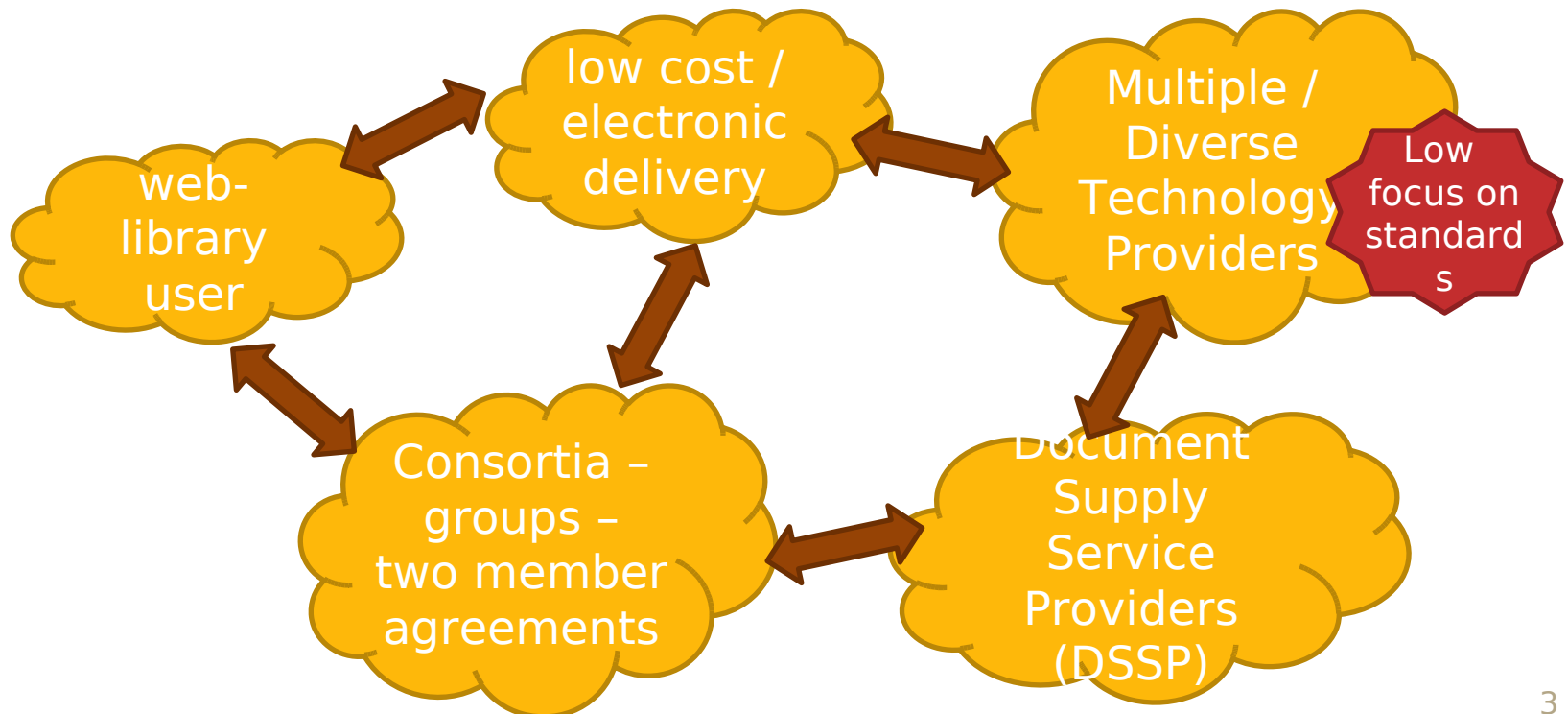
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Introduction - Current Status

- Interlibrary Loan Service staff



- “the unexpected is our routine”



Introduction - Current Status

- Libraries



Multiple
ILL
interfaces

Member
in more
than one
consortia
- groups

Serve
more
than one
DSPP

Demandin
g web-
users

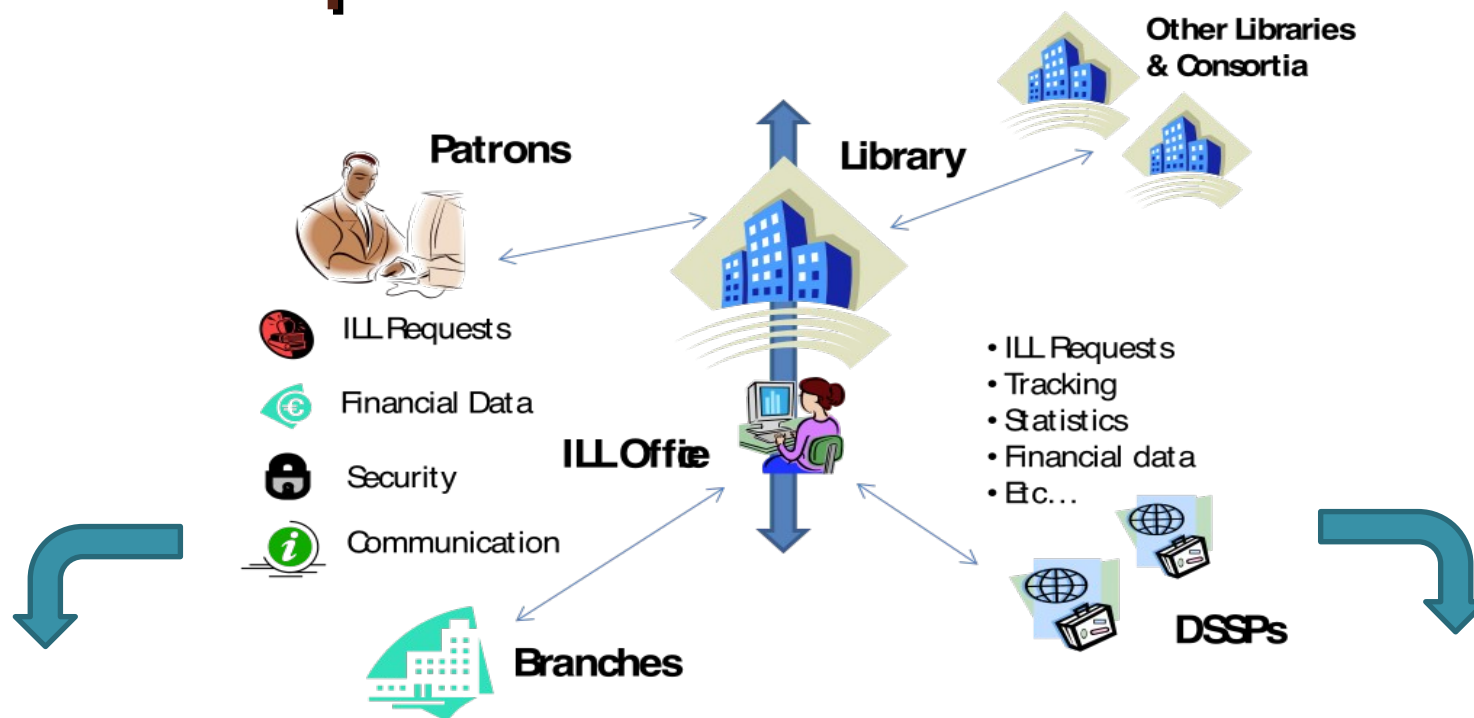
ILL
software
Vendors
often
changes

Low focus
on
standards

Increased
complexit
y

Towards
“one-stop
library
service”

Composite ILL Architecture



<u>Inner space (left side)</u>	<u>Middle space</u>	<u>Outer space (right side)</u>
<ul style="list-style-type: none"> • Users • different branches and library buildings • Financial data • Security • Statistics 	<ul style="list-style-type: none"> • ILL practitioners • Library Staff • Financial Staff 	<ul style="list-style-type: none"> • library consortia • client to Document Supply Service Providers • provider itself

New requirements

- **Support of various standard types for ILL data exchange (ILL ISO, email, SIP, telnet etc.) - Easy to add and support new forms of data exchange:** While focusing on standards remains a major aim, an integrated ILL platform should encompass, in the form of plug-ins, various technologies and communication protocols, in order to be able to add a new ILL Supplier, almost with no new development.
- **All-in-one simple, single interface for all users' categories (librarians, users etc.):** Librarians and users should experience a simple, single interface, while any change at the lower levels should be transparent to them. All requirements set by (Gaffney, 2009) should apply in all development stages.
- **Lower complexity, more automated procedures, real-time track options:** Any attempt to create systems with more complexity or less options that users experience through other content providers (e.g. Amazon, Google, etc.) will lead to low satisfaction. Also, necessary training should be minimum or zero.
- **Support of the complete ILL chain (search, order, deliver, track, financial, copyright protection, etc.):** ILL standard states and workflow should be supported and maintained in order to achieve maximum interoperability with foreign systems.

Background information

- smILLe system emerged in the beginning of September 2006.
- Development took place in order to fulfill the ILL needs of the Central Library of University of Macedonia, Greece.
- The system's development took into consideration the academic library's needs, as well as ILL international standards.
- smILLe is the first system, in Pan-Hellenic level, that has been developed according to ISO ILL standards.
- Currently, more than five libraries in Greece and Cyprus have adopted smILLe as their ILL core system, while Hellenic Academic Libraries Link is planning to establish a centralized form of the system, serving all its members.

Technologies

Open source / free software

- PHP
- Perl
- MySQL
- Ajax

Technologies – Techniques

- Intelligent Agents
- Data mining

Application environment

- best hosted on Linux environment, without excluding other operational systems.

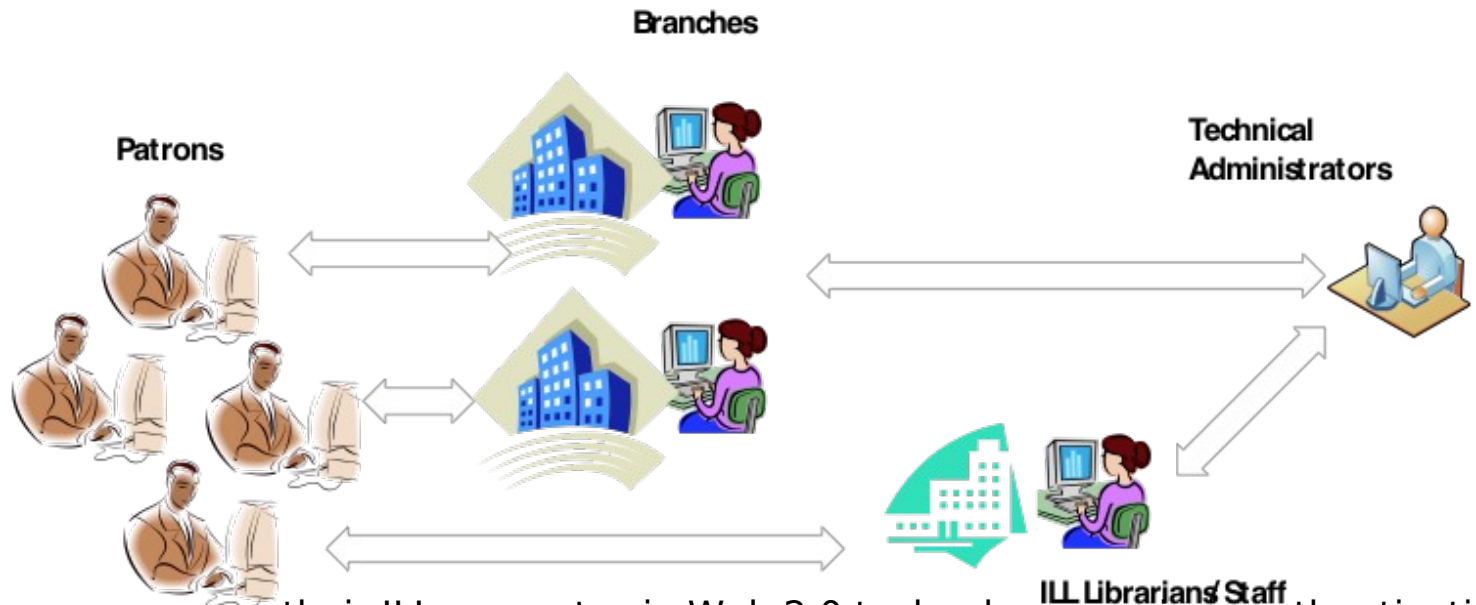
Concerning copyright issues

- first versions were issued under the “Academic Free License”
- Currently smILLe is under GPL v3

The middleware approach

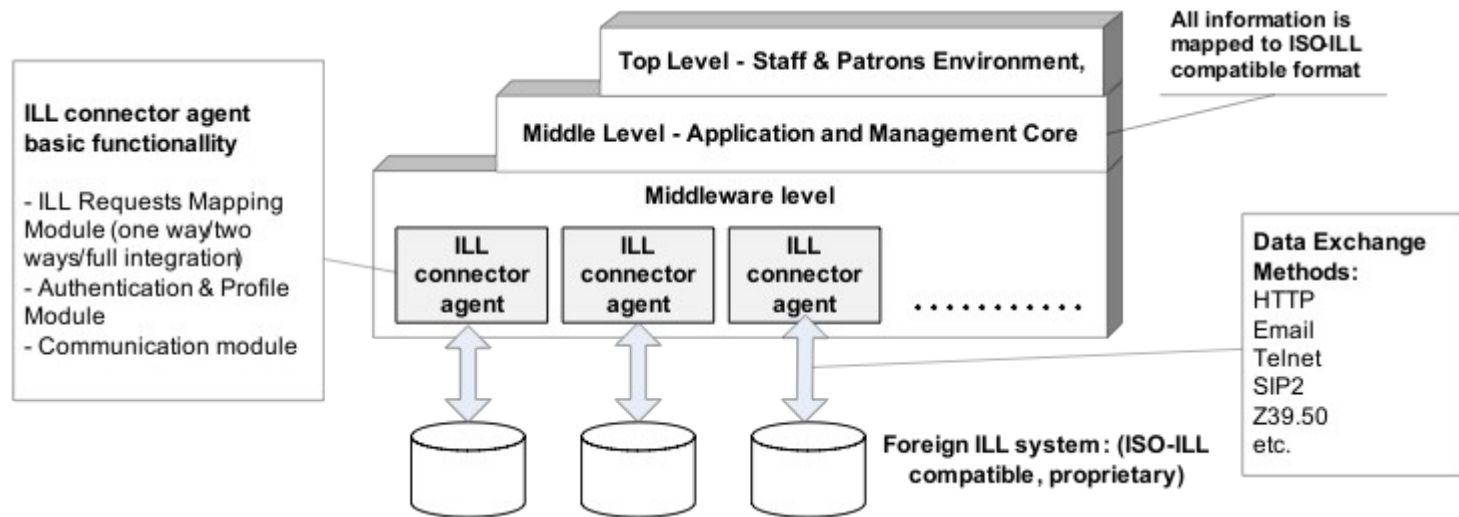
- Middleware approach is often exploited in the case where different components or foreign software applications need to exchange data, or interact, in order to perform complex operations.
- ILL composite environment urges for such an approach, due to the diversity of the systems.
- Middleware approach resembles the ideal solution in order to “isolate” user and library staff from frequent low level technology changes and additions or removals of DSSPs.
- This way substantial investment in users’ and librarians’ training and familiarization is avoided every time that a major change occurs.
- The more the ILL software vendors comply with standards during implementation, the less complexity the middleware software presents (or they are not necessary) and vice versa.

User roles



- **Users:** manage their ILL requests via Web 2.0 technology, various authentication schemes are supported depending on the technology infrastructure existing in the library environment.
- **Branch/departmental library staff:** Staff with this type of account enjoys limited rights in the system, sufficient to perform the basic set of the ILL workflow in a branch or departmental library (i.e. service of ILL requests concerning local material or requests by local patrons).
- **ILL Librarians/ staff:** Staff with this type of account enjoys expanded rights in the system's operation. They are allowed to carry out all functions concerned with the elaboration of library users and their ILL requests, including financial management and statistics reports.
- **Technical Administrators:** They are the supervisors of the system's function, as well as, the controllers of the workflows which are executed by ILL librarians/staff. Additionally, they supervise the normal operation of those modules that allow communication with other systems.

Architecture



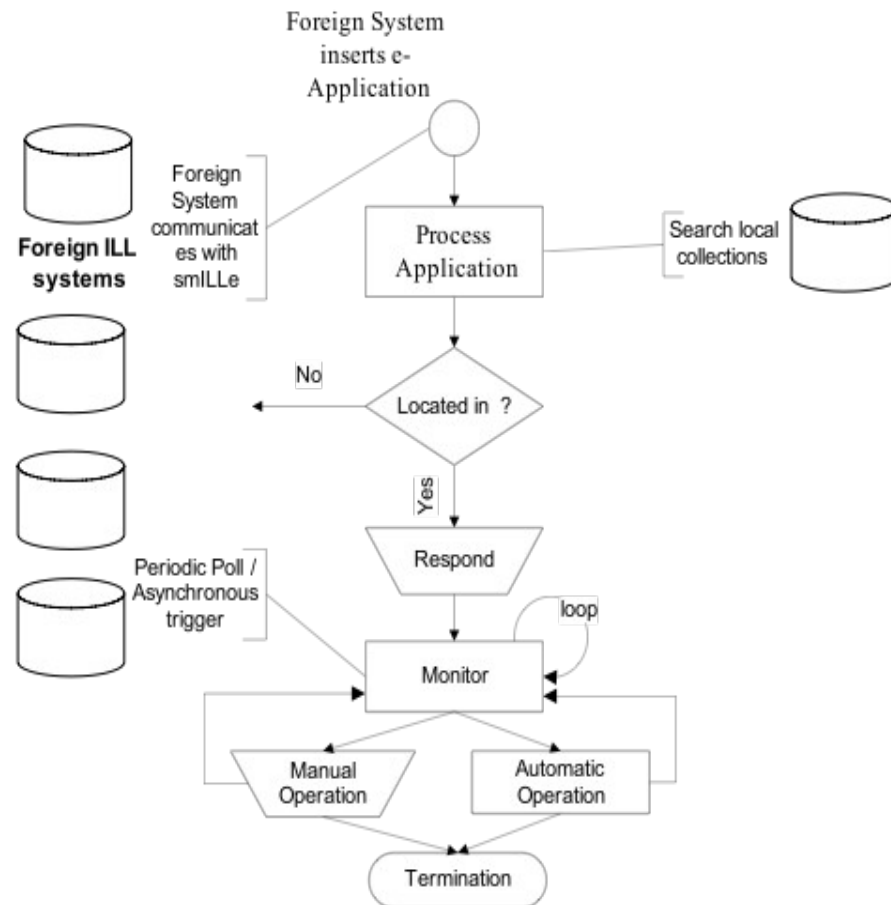
ILL Connector Agent:

- A synergy of technologies which have methods and characteristics that permit connection with each ILL system.
- The middleware recognizes the structure of the ILL system (structure and technology of message exchanged, e.g. web, telnet, email etc.) and by using the developed connectors, it is able to perform ILL commands, according to the demands that smILLe middleware sets.
- The connectors may be materialized both for systems which support ISO ILL standards or not; it is worth reminding that in the internal smILLe environment requests' management is based on ILL standards.

Connectors Status

Level of integration	VDX	Subito	NDCDS	British
One way (partial): communication between systems occurs only from one way (smILLe→foreign system or smile←foreign system), minimum tracking or order functions, login to the foreign system is necessary for almost all operations.				X
Two ways (partial): communication between systems occurs in both ways, basic tracking, order and ILL management functions are supported, login to the foreign system is necessary for advanced operations only.		X		
Full integration: all functionality of the foreign system can be supported through smILLe platform, advance tracking, order and management operations are supported, login to the foreign system is necessary only for debugging reasons.	X		X	

Lender Workflow



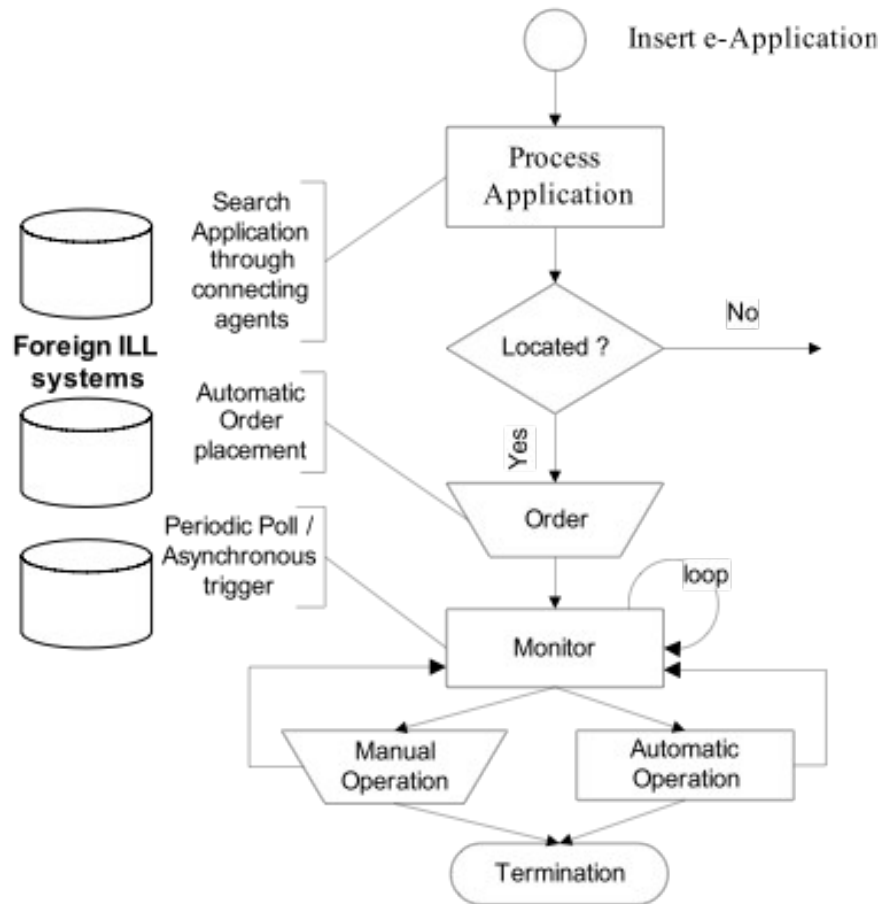
Step1. The system accepts requests from other systems; communication among smILLe and these systems is successful via the interoperability that the connectors' modules support.

Step2. The administrator starts the request's process, by searching the requested item in her/his library resources via the expanded search function that smILLe incorporates.

Step3. She/he changes the request's ILL status accordingly.

Step4. The chosen ILL request's status triggers the required actions, which are based on the module's interconnection map with the system that the request came from. All necessary parameters are examined so as every action that takes place is safe and consistent with the relevant standard.

Borrower Workflow



Step1. Fill in and submit of the electronic ILL application/request.

Step2. Search for requested material in suppliers' databases connected to the system (automatic/one click operation performed by the librarian).

Step3. Automatic order to supplier's system, if there is a connection to this system. The mechanic actions that take place during an automatic order resemble the actions that a librarian would perform if the connecting agent did not exist. In the case of no connection there is the option of manual process.

Step4. Requests' update and audit. The system gets information from the suppliers' systems and in parallel it updates the request's administrator for its progress.

Step5. The administrator decides about her/his next action according to the information she/he gets. She/he changes the request's ILL status accordingly and the inter-operational modules proceed to the adequate update actions in the systems they communicate with.

Demo

Demo Example: Serving an ILL request via smILLe to VDX .

<http://labsrv.lib.ntua.gr/smILLe/admin/login.php>

Conclusions

- Technology advances and information over-production and diffusion has caused the emergence of multiple library systems that often are unable to communicate with each other and entail even more difficulties to the already overloaded and complex e-working environment of both library staff and users.
- One-stop library service is suggested as one of the best ways to alleviate the library workflow burden and to make library service more attractive, as well as to leave space for more valuable contribution in the information and knowledge society.
- Setting out from smILLe paradigm, which is a mere implementation of the concept of one-stop ILL library service, libraries could start experimenting more systematically with the concept of one-stop library service.

The smILLe team welcomes libraries and software developers that wish to cooperate.

Thank for your attention !