Libraries Forum 2015

JULAC
香港特別行政區大學圖書館長聯席會
Joint University Librarians Advisory Committee

Held at The Hong Kong Institute of Education
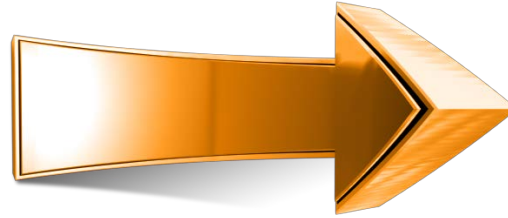**24 April 2015**

Future Trends of ILS

K.T. Lam

The Hong Kong University of Science and Technology Library
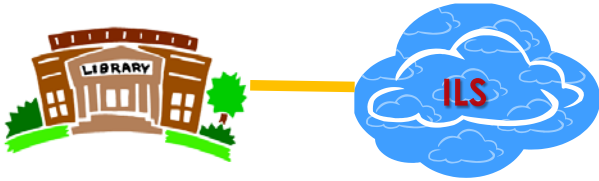
lblkt@ust.hk, orcid.org/0000-0003-2625-9419

Library automation
- Circulation
- Cataloging
- Acquisitions
- Serials control
- ERM (electronic resource management
- OPAC (online public access catalog)

Next-Generation

Cloud-based, SaaS, Multi-tenant

- **Cloud-based**
  - ILS software hosted remotely at vendor's data centers
  - Server virtualization
  - No more headache of locally hosted system

- **Software as a service**
  - ILS vendor provides the "service"
  - Subscription based
  - Software update processes simplified
  - →Library Service Platform
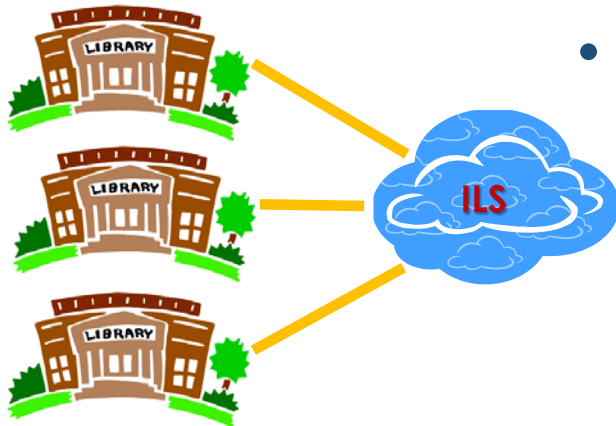
- **Multi-tenant**
  - Single ILS software instance
  - Used by multiple number of libraries
  - Each library can have its own settings and data
  - Allow sharing of content

Unified management of resource types

Traditional ILS → Acquisitions module

Serials module

ERM module

Unified workflow and management
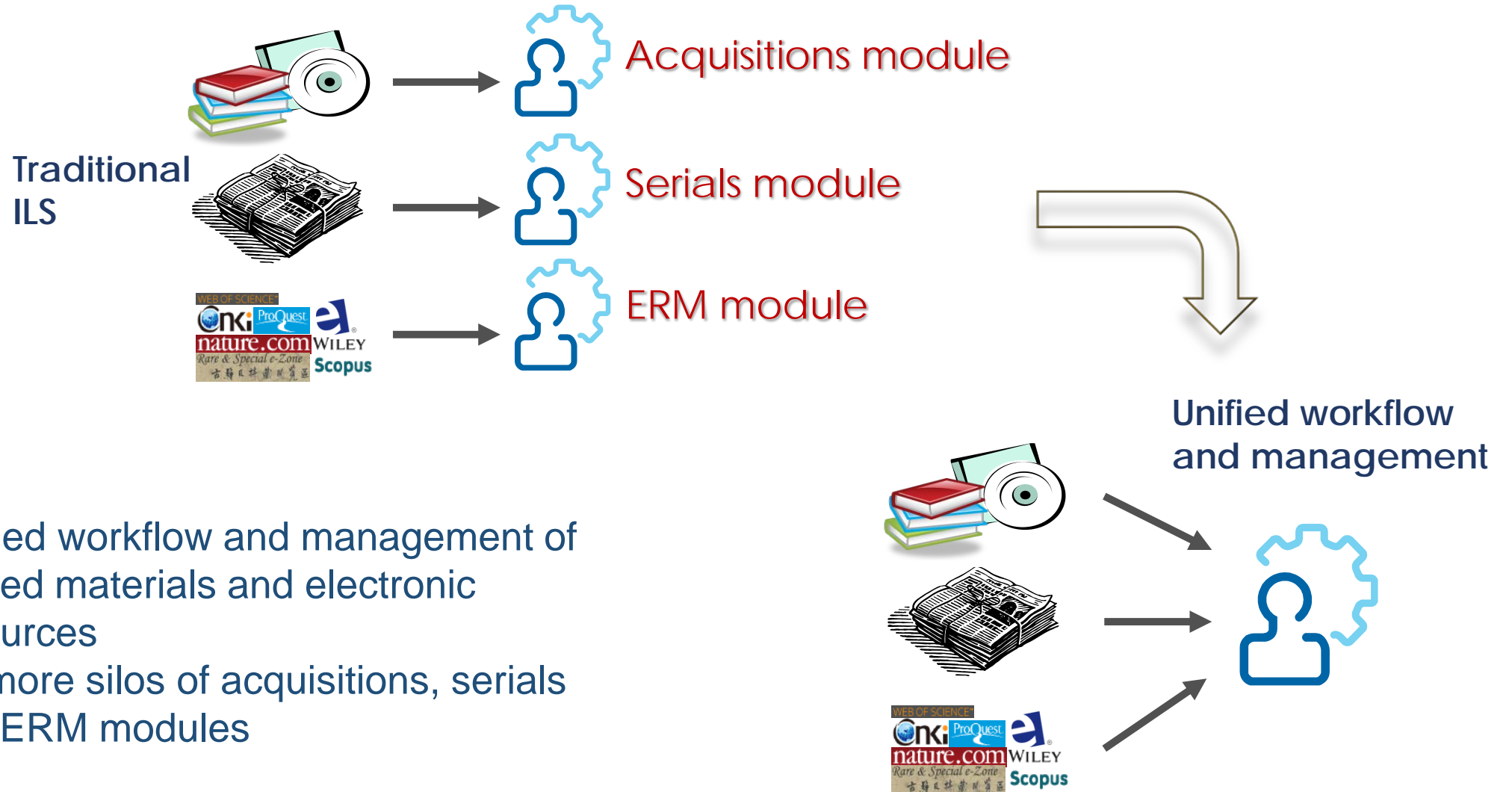
- Unified workflow and management of printed materials and electronic resources
- No more silos of acquisitions, serials and ERM modules

Integrated with information discovery platform

- One stop searching

- Seamless access to the discovered objects
  - Subscribed electronic resources: full-text of journal articles, conference papers, e-books, news, etc.
  - Free web resources
  - Library held electronic items and digitized objects
  - Library held physical items

- The goal is to use the discovered objects, not their metadata

- Open architecture to
  - Direct users to external content
  - Bring in external content (e.g. enrichments such as cover arts, table of contents, summary, cover art, reviews, etc.)
  - Incorporate social media features

From circulation to fulfillment

- Traditional access service focuses on
  - Circulation
  - Interlibrary loan
  - Document delivery

- Next generation access service emphases on
  - Fulfillment

- Seamless access and request via Information Discovery Platform

Fulfillment means:
- Access to physical items held in library
  - Circulation – for items held in library
  - User initiated borrowing – for items held elsewhere
- Access to information objects available online
  - Online reading – for library subscribed / accessible resources
  - Delivery to desktop – for resources requiring request permission or purchases
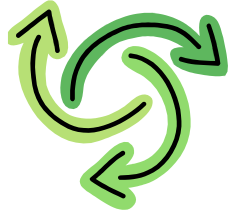
Build-in knowledge base

Knowledge Base

✓ Knowledge of E-journal packages
  ✓ Profiles
  ✓ Coverages

✓ Knowledge to link to full-text of articles and e-books

✓ Authority control metadata
  ✓ Names
  ✓ Subjects
  ✓ Places

Seamless linking to third party system

Link / Harvest

- ✓ Finance system

- ✓ Student/staff records

- ✓ Book vendors, aggregators

- ✓ Bibliographic utilities

- ✓ Authority databases
  - ✓ OCLC's VIAF
  - ✓ LC Linked Data Service

- ✓ Enrichments
  - ✓ Cover images
  - ✓ Reviews
  - ✓ Table of contents
  - ✓ Online attentions
  - ✓ Linked data

- ✓ Learning Management System
  - ✓ To ILS
    - ✓ Reading lists
    - ✓ Course materials objects
    - ✓ Put on reserve
  - ✓ From ILS
    - ✓ Discover information objects relevant to courses

Facilitate sharing and collaboration

- Sick of loading e-journal and e-book packages to catalog?
  - Duplication of effort
  - Load bibliographic metadata to a "shared" database
    - Individual libraries just add holdings to these records

- Collaborated cataloging
  - Sharing metadata
    - Long-standing concept
    - But, must be able to have seamless integration to workflow

- Collaborated collection development
  - Benchmarking, collection analysis
  - Consortial purchases

Decision support tools

- Traditional report generation
  - Static reports
  - Have to export tables and run analysis externally

- Build-in data analysis tools to support decision making
  - Real time access to data
  - Cross table/database tabulation
  - Drag and drop design
  - Filter and extract options

Open architecture

- Traditional ILS
  - Data is in black box – not openly accessible
  - Limited APIs to access data, usually require purchases
  - Impossible to develop external programs to extend functionalities

- Open architecture means
  - Non-proprietary databases and search engines
    - Oracle, MySQL, PostgreSQL, Solr, etc.
    - System staff know how to query them
  - Rich set of open APIs to access the data
    - Allow both viewing and updating
  - Full support of third party programming
    - Developer forums
    - Community repositories of source codes

Migrating from MARC to linked data

Linked Open Data on the Web

Source: http://lod-cloud.net/

Google Knowledge Graph
linked data in action

- Providing information of objects
- Connecting an object to other objects

Google Knowledge Graph responsive to what you search

Where are the libraries in the linked data arena?
When our users start a search on the web, is our data there?

MARC
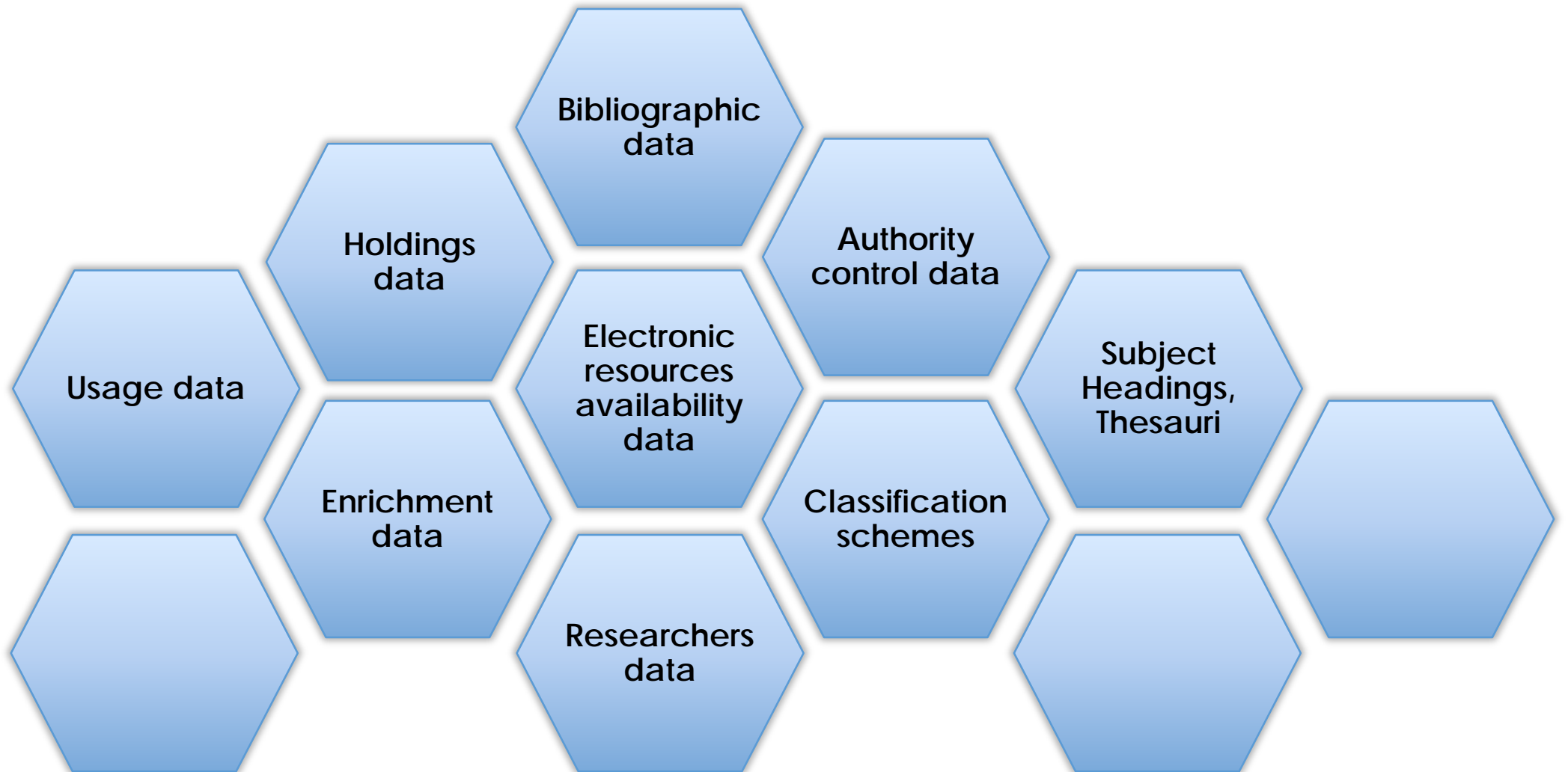
```
LEADER 00000nam  2200421Ia 4500
001     82362916
008     070208s2007     cc a            000 0 chi d
020     9789620763779
020     9620763777
035     (OCoLC)82362916
040     HNK|cHNK
049     HNKA
090     QB985|b.W6 2007
245 00 |6880-01|aWo men wei he zai ci?/|czuo zhe Huojin ... [et
       al.]
250     |6880-02|aDi 1 ban
260     |6880-03|aXianggang :|bXianggang ke ji da xue da xue fa
       zhan yu gong gong shi wu chu :|bShang wu yin shu guan
       (Xianggang) you xian gong si,|c2007
300     148 p. :|bill. (some col.) ;|c21 cm
440  0 |6880-04|aXianggang ke ji da xue gao deng yan jiu yuan jie
       chu jiang zuo xi lie
490 1  |6880-05|aKe da, Shang wu ke pu cong shu =|aPop science
       series ;|v1
500     |6880-06|aEssays from "Yu zhou qi yuan", held June 2006 at
       Xianggang ke ji da xue gao deng yan jiu yuan
500     Colophon title
600 10 Hawking, Stephen,|d1942-
650  0 Cosmology
700 1  Hawking, Stephen,|d1942-
830  0 |6880-07|aKe da, Shang wu ke pu cong shu ;|v1
880 00 |6245-01/$1|a我們為何在此？/|c作者霍金 ... [et al.]
880     |6250-02/$1|a第1版
880     |6260-03/$1|a香港 :|b香港科技大學大學發展與公共事務處 :
       |b商務印書館(香港)有限公司,|c2007
880  0 |6440-04/$1|a香港科技大學高等研究院傑出講座系列
880 1  |6490-05/$1|a科大‧商務科普叢書 =|aPop science series ;|v1
880     |6500-06/$1|aEssays from "宇宙起源", held June 2006 at
       香港科技大學高等研究院
880  0 |6830-07/$1|a科大‧商務科普叢書 ;|v1
910     do/dl
```

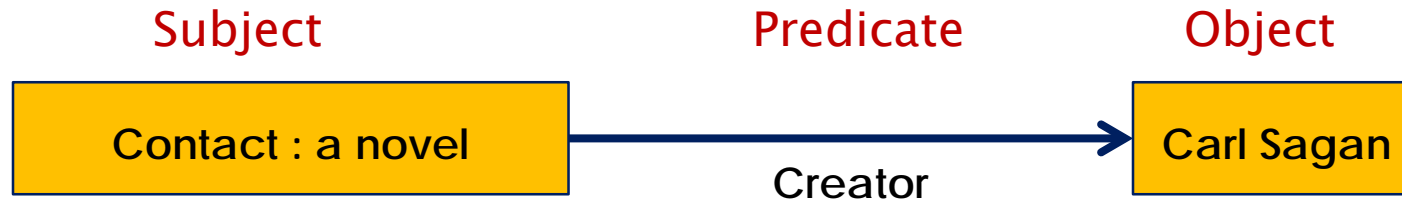- "**MA**chine **R**eadable" – defined in 1960s, in the sense of printing **C**atalog cards

- Not readable at all by machines in semantic web

- String-based; not entity-based; we need "things" not "strings"

- No linking capability, even among MARC records

Linked data

Directed Graph

Subject   Predicate   Object

| Contact : a novel | → Creator → | Carl Sagan |

Triple

`<http://catalog.ust.hk/bf/b111111>` —— bf:creator ——→ `<http://catalog.ust.hk/bf/b111111person1>`

RDF/XML

```xml
<?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF xmlns:bf="http://bibframe.org/vocab/" xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
    <rdf:Description rdf:about="http://catalog.ust.hk/b111111">
        <bf:creator rdf:resource="http://catalog.ust.hk/bf/b111111person1"/>
    </rdf:Description>
</rdf:RDF>
```
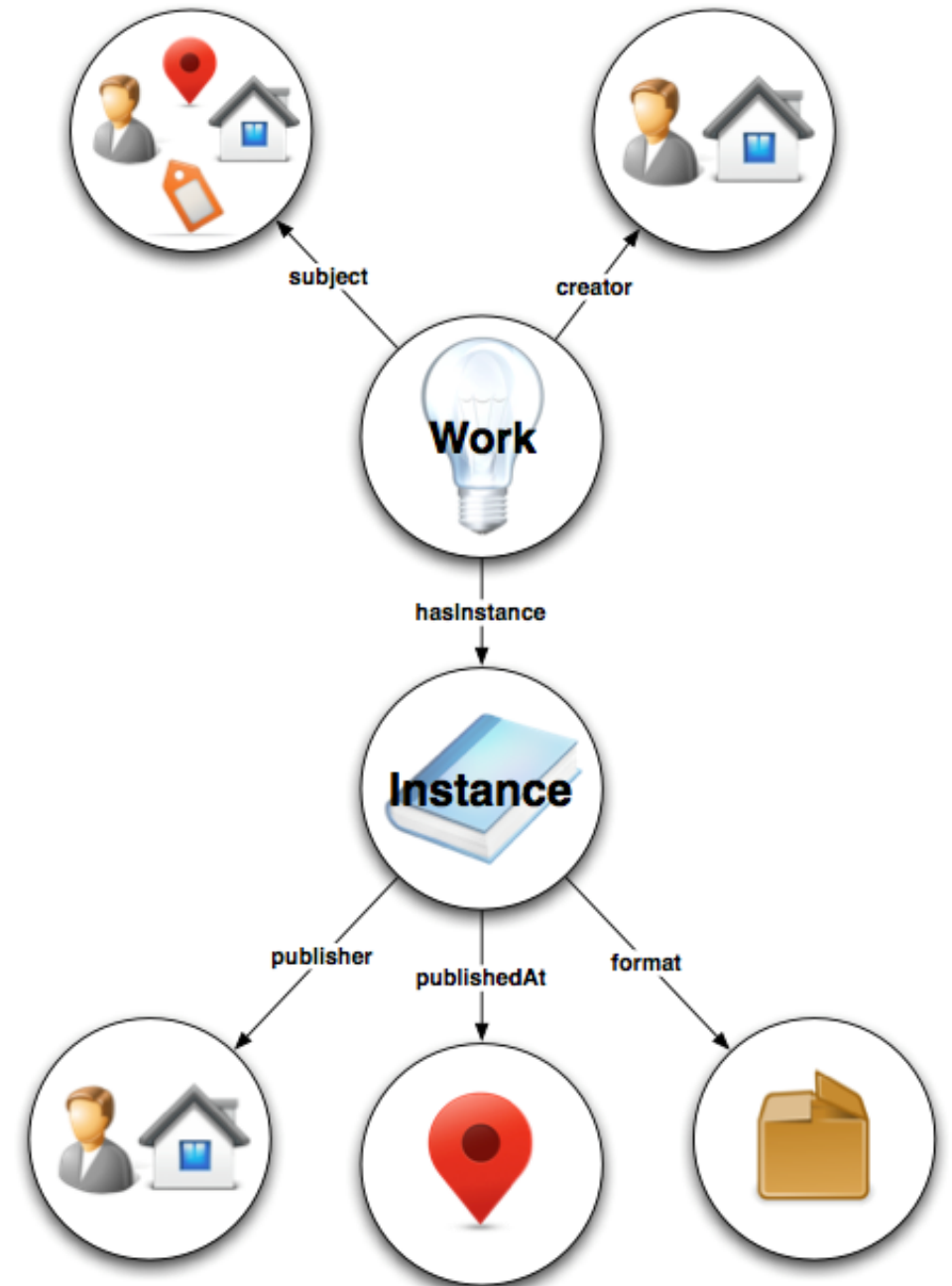
bf: BIBFRAME

- Announced in 2011 by Library of Congress
- To replace MARC
- Enabled for linked data
- Entity-based model
  - Creative work, Instance, Authority, Annotation
  - Person, organization, place, topic, etc.
- More real beginning this year
  - Testing, learning, pilot implementation by individual libraries and also at national level

bibframe project at HKUST Library
- Learning resource for librarians
- Test bed
- Platform for further studies

<http://catalog.ust.hk/bf>

Sample SmartCAT record
in bibframe data model
<http://catalog.ust.hk/bf/b995980>

```
Annotation (<hkust:b995980annotation17> [bf:annotates] <hkust:b995980>)
    [bf:label]: Biographical information on author
    [bf:annotationBody]: http://www.loc.gov/catdir/enhancements/fy0740/2007013725
    [rdf:type]: bf:Annotation

Aunnotation - Summary (<hkust:b995980summary16> [bf:summaryOf] <hkust:b995980>)
    [bf:label]: Publisher abstract
    [bf:review]: http://www.loc.gov/catdir/enhancements/fy0740/2007013725-d.html
    [rdf:type]: bf:Summary
```

```
Instance (<hkust:b995980instance14> [bf:instanceOf] <hkust:b995980>)
    [bf:title]: Quantum computing explained (cloth
    [bf:isbn10]: http://isbn.example.org/047009699
    [bf:isbn13]: http://isbn.example.org/978047009
    [bf:instanceTitle]:
        [bf:titleValue]: Quantum computing explain
        [rdf:type]: bf:Title
    [bf:publication]:
        [bf:providerName]:
            [rdf:type]: bf:Organization
            [bf:label]: Wiley-Interscience
        [bf:providerPlace]:
            [bf:label]: Hoboken, N.J.
            [rdf:type]: bf:Place
        [bf:copyrightDate]: c2008
        [rdf:type]: bf:Provider
    [bf:publication]:
        [bf:providerName]:
            [rdf:type]: bf:Organization
            [bf:label]: IEEE Computer Society
        [bf:copyrightDate]: c2008
        [rdf:type]: bf:Provider
    [bf:modeOfIssuance]: single unit
    [bf:dimensions]: 25 cm
    [bf:illustrationNote]: ill. ;
    [bf:titleStatement]: Quantum computing explain
    [bf:providerStatement]: Hoboken, N.J. : Wiley-
    [bf:supplementaryContentNote]: Includes biblio
    [bf:lccn]:
        [rdf:type]: bf:Identifier
        [bf:identifierValue]: 2007013725
        [bf:identifierScheme]: id:vocabulary/ident
    [rdf:type]: bf:Instance
    [rdf:type]: bf:Monograph
```

```
Work (<hkust:b995980>)
    [rdf:type]: bf:Text
    [bf:workTitle]:
        [bf:titleValue]: Quantum computing explained
        [rdf:type]: bf:Title
    [bf:creator]:
        [bf:label]: McMahon, David (David M.)
        [bf:authorizedAccessPoint]: McMahon, David (David M.)
        [bf:hasAuthority]:
            [rdf:type]: madsrdf:Authority
            [madsrdf:authoritativeLabel]: McMahon, David (David M.)
        [rdf:type]: bf:Person
        [bf:hasAuthority]: http://viaf.org/viaf/78186500
        [bf:hasAuthority]: http://id.loc.gov/authorities/names/n2005041076
    [bf:subject]:
        [bf:authorizedAccessPoint]: Quantum computers
        [bf:label]: Quantum computers
        [bf:hasAuthority]:
            [rdf:type]: madsrdf:Authority
            [madsrdf:authoritativeLabel]: Quantum computers
            [madsrdf:isMemberOfMADSScheme]: id:authorities/subjects
            [rdf:type]: madsrdf:Topic
        [rdf:type]: bf:Topic
        [bf:hasAuthority]: http://id.loc.gov/authorities/subjects/sh98002795
    [rdf:type]: bf:Work
    [bf:authorizedAccessPoint]: McMahon, David (David M.) Quantum computing explained
    [bf:language]: id:vocabulary/languages/eng
    [bf:classificationLcc]: id:authorities/classification/QA76.889
    [bf:classification]:
        [rdf:type]: bf:Classification
        [bf:classificationScheme]: id:authorities/classSchemes/ddc
        [bf:classificationNumber]: 004.1
        [bf:label]: 004.1
        [bf:classificationEdition]: full
        [bf:classificationEdition]: 22
    [bf:authorizedAccessPoint]: mcmahondaviddavidmquantumcomputingexplainedengworktext
```

# ILS and bibframe

- Expect to see vendors' native support of bibframe in the next-next-generation of ILS

- Provision of linking capabilities to external linked data stores
  - Bibliographic description repositories (e.g. LC, OCLC, etc.)
    - Possibly, publishers would contribute metadata directly to these bibliographic utilities – not libraries
  - Names and subjects authority control (e.g. VIAF, LC, etc.)
    - No more loading authority records to ILS, just linking persons, organizations, places, topics, etc. to external stores

[Cataloging would become a professional work of linking and annotation]

- Provision of auto-discovery of enrichment and availability information (thanks to linked data and semantic web)
  - Table of contents, summary, cover art, reviews, etc.
  - Linking to the actual online resources
- Enabling library data for discovery by machines, thus increasing the library visibility

Library
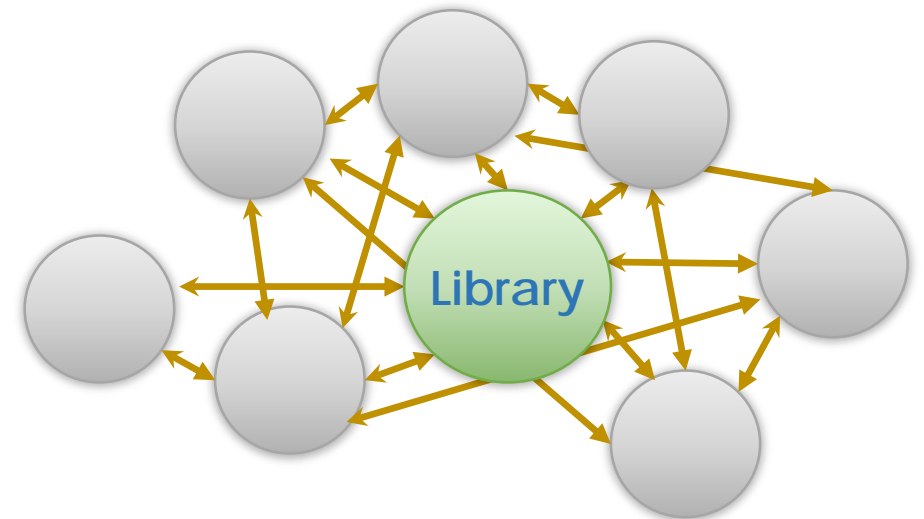
# Summary

- Discussed trends in next-generation ILS
  - Cloud-based, SasS, Multi-tenant
  - Unified resource management
  - Broadening of information discovery, access services, sharing and collaboration
  - Provision of knowledge base and seamless linking to external systems
  - Decision support tools
  - Open architecture

- Highlighted the linked data need to make libraries sustainable in the semantic web
  - Replacing MARC with BIBFRAME
  - Will see this happening in the **NEXT-NEXT GENERATION ILS**

# Thank You!