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Digital Library Interoperability,
Best Practices and Modelling Foundations

User Domain in the DL Reference Model

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User Session Timetable

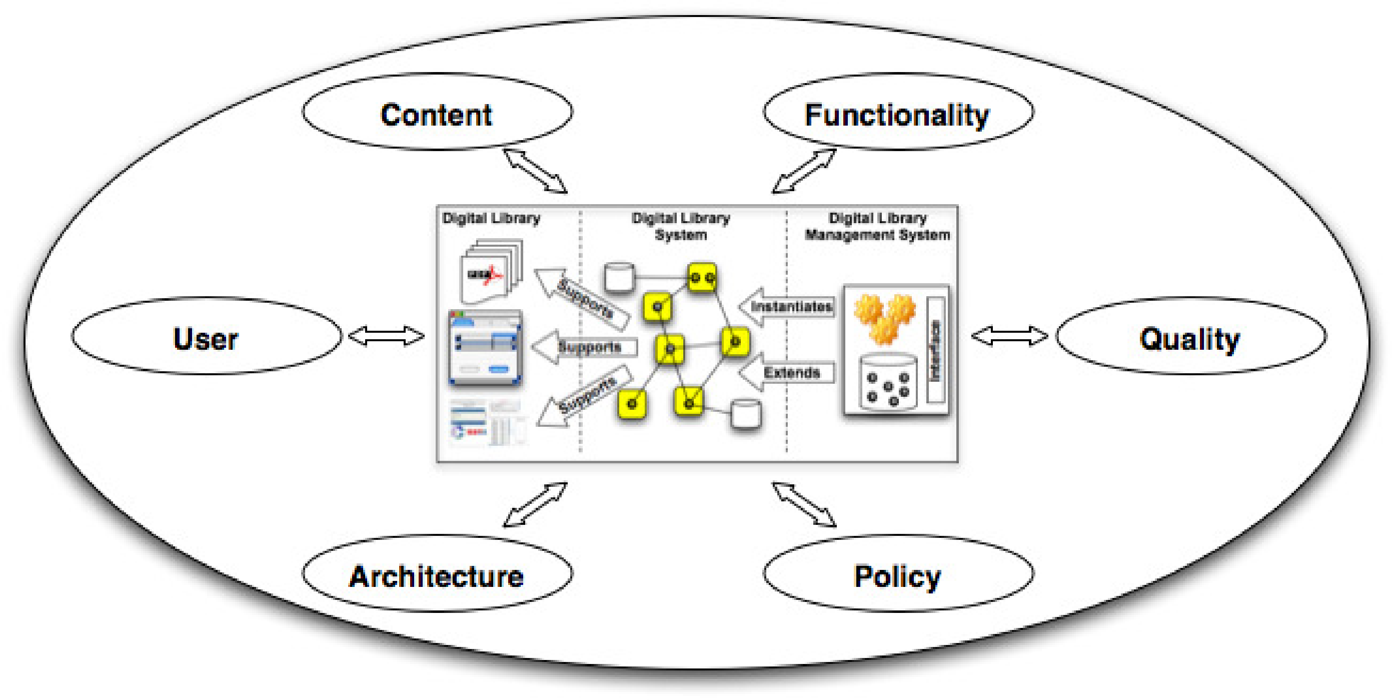
9:00 - 9:50	User Domain in the DL Reference Model (Yannis Ioannidis)
9:50 - 10:40	User Interoperability (Akrivi Katifori)
10:40 - 11:10	Coffee break
11:10 - 11:20	Exercise Presentation
11:20 – 11:40	4 groups work on the exercise
11:40 – 12:10	Presentation of the results
12:10 – 12:30	Groups are paired by 2 in order for them to discuss how to make their different user models interoperable
12:30 – 12:45	Discussion and presentation of the results

Outline

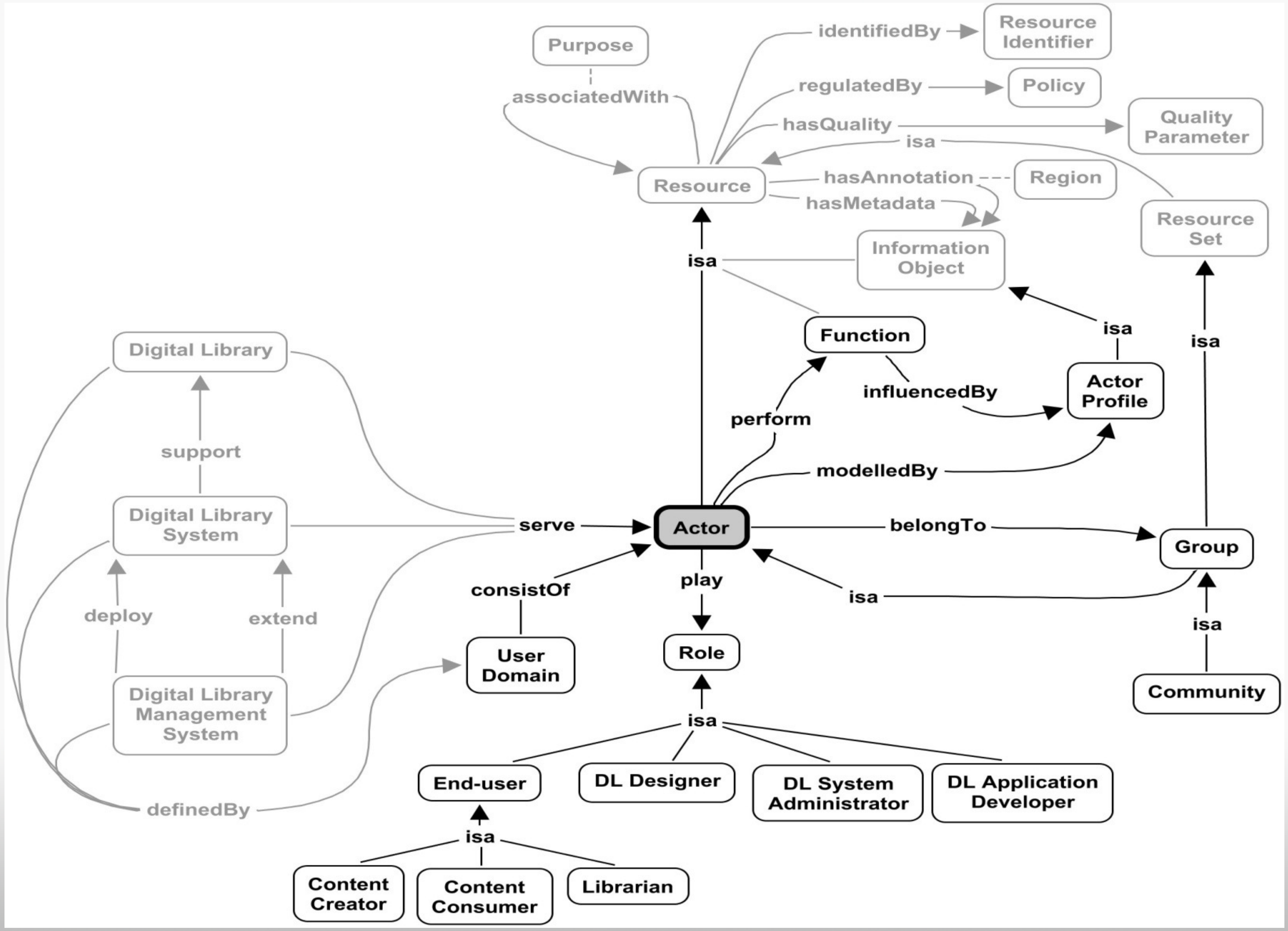
- The Model
- User Domain Concept Map
- User Domain
- Actor
- Actor Profile
- Group
- Role

The Model

Concepts and relationships that represent the significant aspects of the different type of DL "systems"



User Domain Concept Map

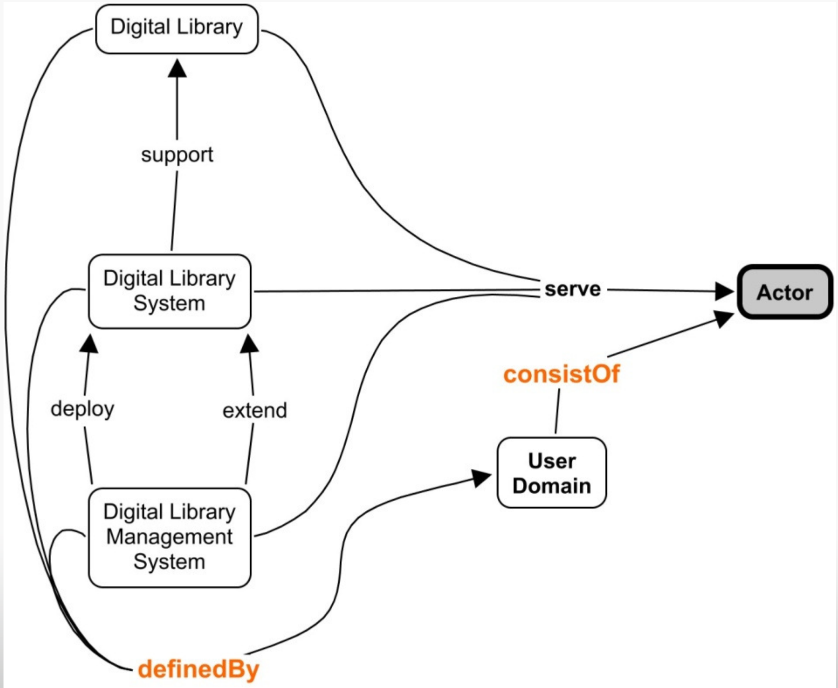


User Domain: Definition

- One of six main **concepts** characterising DL universe
- Umbrella concept representing all entities (**Actors**) interacting with DL to
  - connect them with Information Objects (IOs)
  - support them in consuming available IOs
  - produce new IOs (through Functions)

User Domain: Relationships

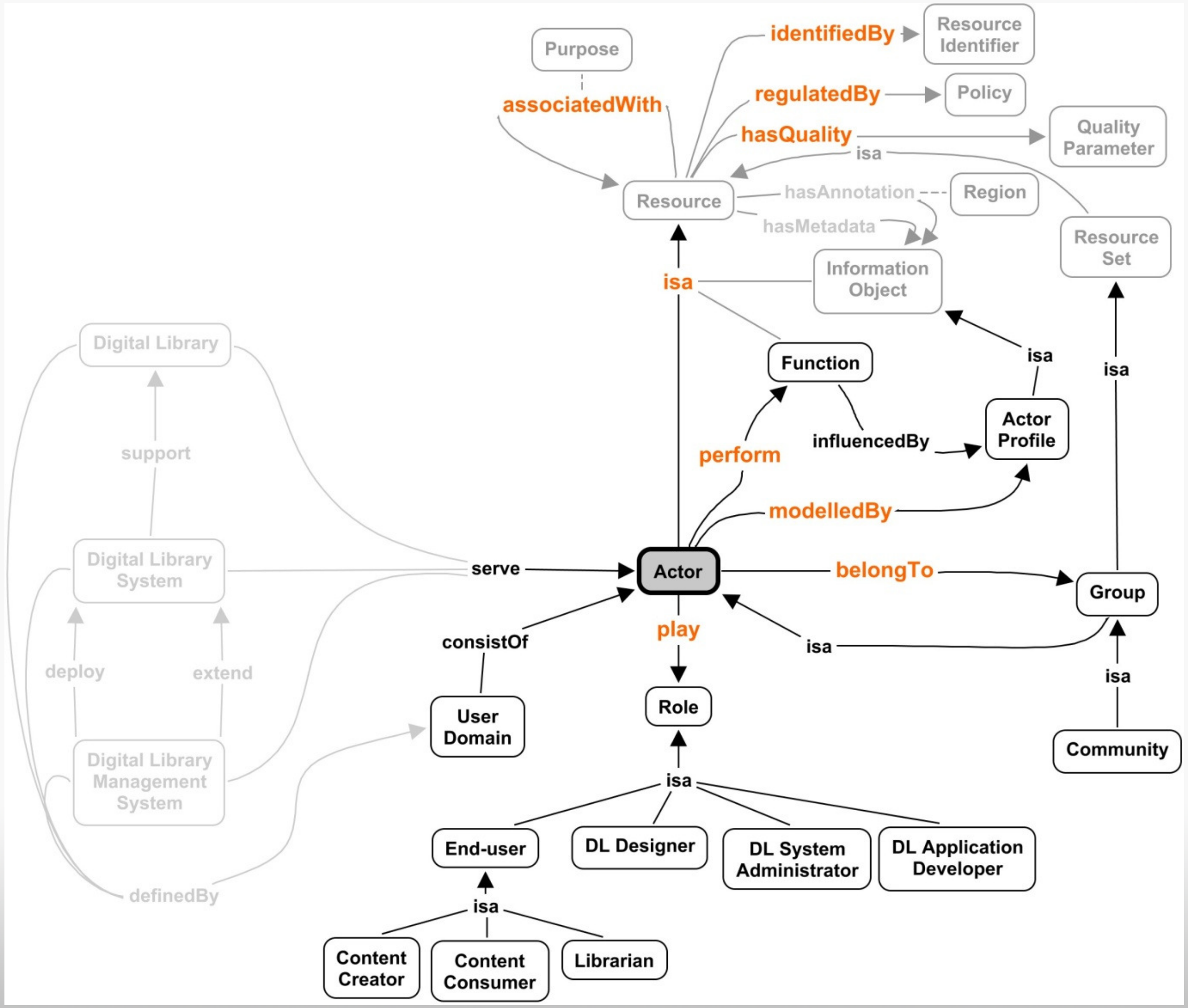
- Digital Library <*definedBy*> User Domain
- Digital Library System <*definedBy*> User Domain
- Digital Library Management System <*definedBy*> User Domain
- User Domain <*consistOf*> Actor



Actor: Definition

- Actor
  - is a **Resource** (<*isa*>) representing any entity that interacts with a DL ‘system’, i.e., humans and inanimate entities
  - is identified by a **Resource Identifier** (<*identifiedBy*>)
  - may have one (at least) **Actor Profile** (<*modelledBy*>)
  - may play a different **Role** at different times (<*play*>)
  - may belong to one or more **Groups** (<*belongTo*>)
  - may be regulated by a set of **Policies** (<*regulatedBy*>), e.g., set of permissible Functions
  - may perform **Functions** (<*perform*>)
  - may be characterised by **Quality Parameters** (<*hasQuality*>),e.g., software agent may be characterised by its Robustness
  - may be **linked** to other Actors (<*associatedWith*>)

Actor: Relationships



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Actor: Examples

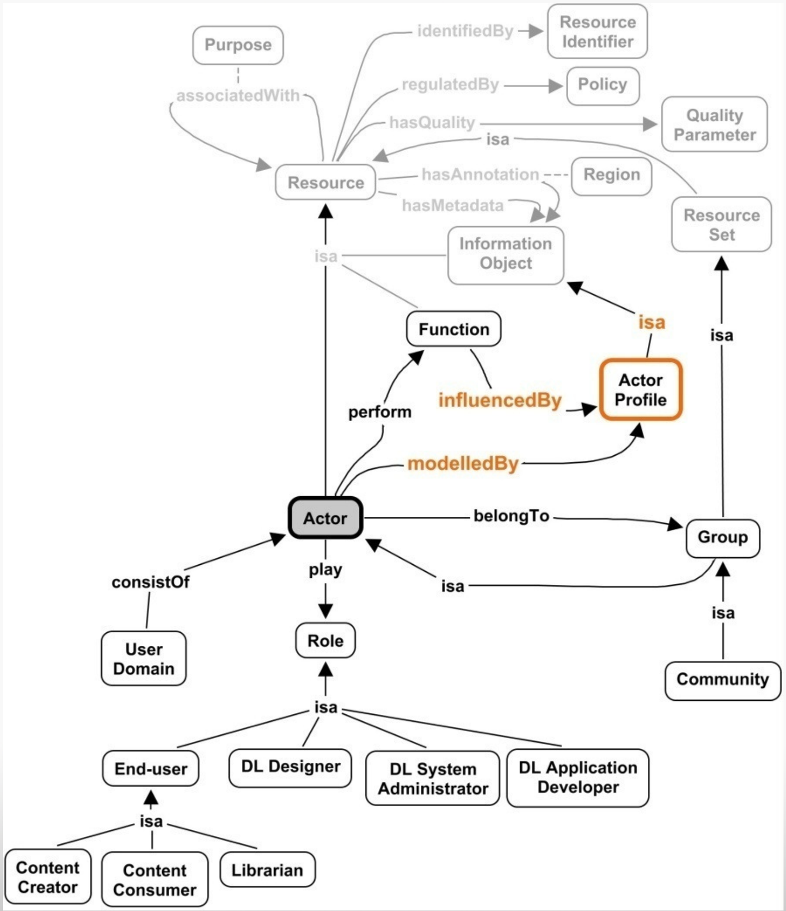
- John
- A Web Service harvesting the set of Information Objects forming a Collection in a Digital Library System
- …

Actor Profile: Definition

- Actor Profile
  - is **Information Object** (<*isa*>)
  - models an **Actor** by capturing a variety of Actor's characteristics (<***modelledBy***>)
  - may model **more than one Actor**, i.e., a Group or a Community
  - captures **Policies** and **Roles** that govern what Functions an Actor is entitled to perform
  - influences **Functions** (<*influencedBy*>)

Actor Profile: Relationships

- Actor Profile <*isa*> Information Object
- Actor *is* <*modelledBy*> Actor Profile
- Function *is* <*influencedBy*> Actor Profile



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Actor Profile: Characteristics

- Characteristics vary depending on the type of Actor, i.e., human or nonhuman
- May include
  - **identity information**, e.g., age, residence or location for humans and operating system, web server edition for software components
  - **educational information**, e.g., highest degree achieved, field of study – only for humans
  - **preferences**, e.g., topics of interest, pertinent for both human and software Actors interacting with DL
  - …

Actor Profile: Examples

- **Group Profile**, i.e., the Actor profile capturing characteristics of a Group as a single entity
- **Community Profile**, i.e., the Actor profile capturing characteristics of a Community as a single entity
- **Mary is an Actor** interacting with a Music DL having a Profile capturing characteristics, e.g.,
  - full name
  - date of birth
  - address
  - musical preferences

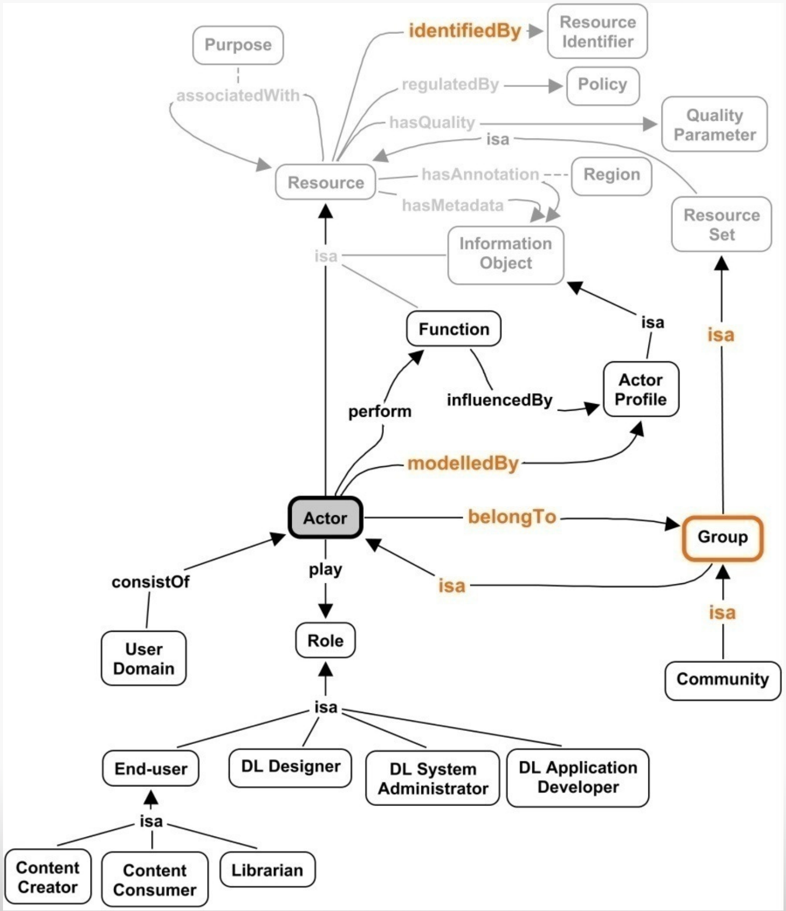
Group: Definition

- Group
  - is a **Resource Set** (<*isa*>) modeling a set of entities with common characteristics, i.e., Actor population that exhibits cohesiveness and can be considered as an Actor with its own profile and identifier
  - is an **Actor** (<*isa*>)
  - is identified by a **Resource Identifier** (<*identifiedBy*>)
  - is modelled by an **Actor Profile** *(<**modelledBy**>)* specifying group members explicitly (through enumeration) or implicitly (through set of desired characteristics)

- An Actor
  - may belong to a Group (<***belongTo***>)
  - inherit (part of) the characteristics from the Group but may have additional characteristics as described in its individual Profile

Group: Relationships

- **Group** <*isa*> **Resource Set**
- **Group** <*isa*> **Actor**
- **Group** is <***identifiedBy***> **Resource Identifier** (inherited from Resource)
- **Group** is <***modelledBy***> **Actor Profile** (inherited from Actor)
- **Actor** <***belongTo***> **Group**
- **Community** <*isa*> **Group**



Group: Example

- Group constituted by Actors John, Mary, and Paul
  - entitled to curate Leonardo da Vinci Collection disseminated through their University DL
  - has a Profile specifying that John, Mary, and Paul have the Role of Librarian as Actors of the Group

Community: Definition and Examples

- A particular **subclass of Group** referring to a social group of **humans** with shared interests

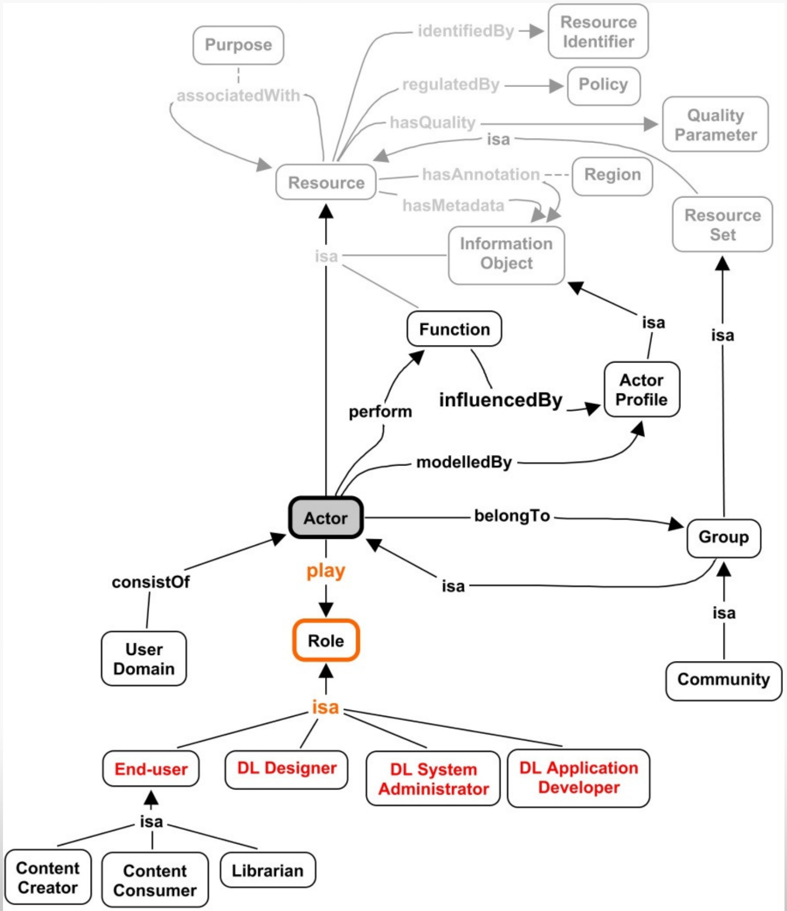
- Examples of Community
  - in an international Music DL may be
    - a Community of people interested in Rock music
    - a Community of people interested in Reggae music
    - …

Role: Definition

- Role
  - a kind of pre-packaged **generic profile** identifying the kind of Functions an Actor is eligible to perform
  - End-user (with sub-roles Content Consumer, Content Creator, and Librarian)
  - DL Designer
  - DL System Administrator
  - DL Application Developer
- An **Actor can play** different Roles at different times or more than one Role at the same time (<***play***>)
- Any DL could define **additional** roles

Role: Relationships

- Actor <*play*> Role
- End-User <*isa*> Role
- DL Designer <*isa*> Role
- DL System Administrator <*isa*> Role
- DL Application Developer <*isa*> Role



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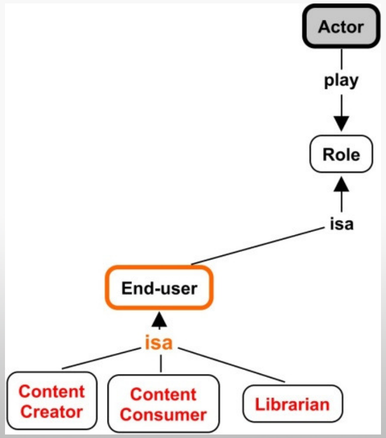
Role: Example

- Student is a typical Role in a University Digital Library being granted access to specific Collections and Functions
- …

End-user: Definition

- Role of Actor accessing DL to **exploit functionality** for providing, consuming, and managing DL Information Objects (IOs) and produce new

- A class of Actors subdivided into
  - *Content Creator*
  - *Content Consumer*
  - *Librarian*



End-user: Examples

- John is an End-user in a University DL accessing its **Collections** and **Functions** to prepare its examination
- Mary is another End-user accessing the same DL to complete its **doctoral thesis** and, once this thesis is discussed, publishes it for future use

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Content Consumer: Definition

- An End-user accessing DL for **consuming** IOs through Functions

- Instances of Content Consumer
  - a person who **searches** (Search function) contents of a digital collection
  - an external subscription service

Content Creator: Definition

- An End-user providing new IOs to **be stored** in DL or update existing IOs

- A Content Creator may be a human or a program, or another system, e.g.,
  - a person who creates and inserts documents in DL
  - a program that automatically converts artifacts to digital form and uploads them to DL

Content Creator: Example

- John
  - is an End-user of a scientific DL
  - uploads a new version of a working paper, reporting on the latest results of its experimentation, in a Collection shared with other colleagues working on a similar topic to prompt and ask for feedback

Librarian: Definition

- An End-user curating DL's Resources, namely Information Objects and End-users

- Distinguishing factor between **Digital Libraries** and the **Web**: the effort spent by Librarians to guarantee a quality of service

Librarian: Example

- Frank
  - is the Librarian of a University DL
  - is in charge to appropriately revise and classify scholarly works as to simplify the discovery by DL End-users

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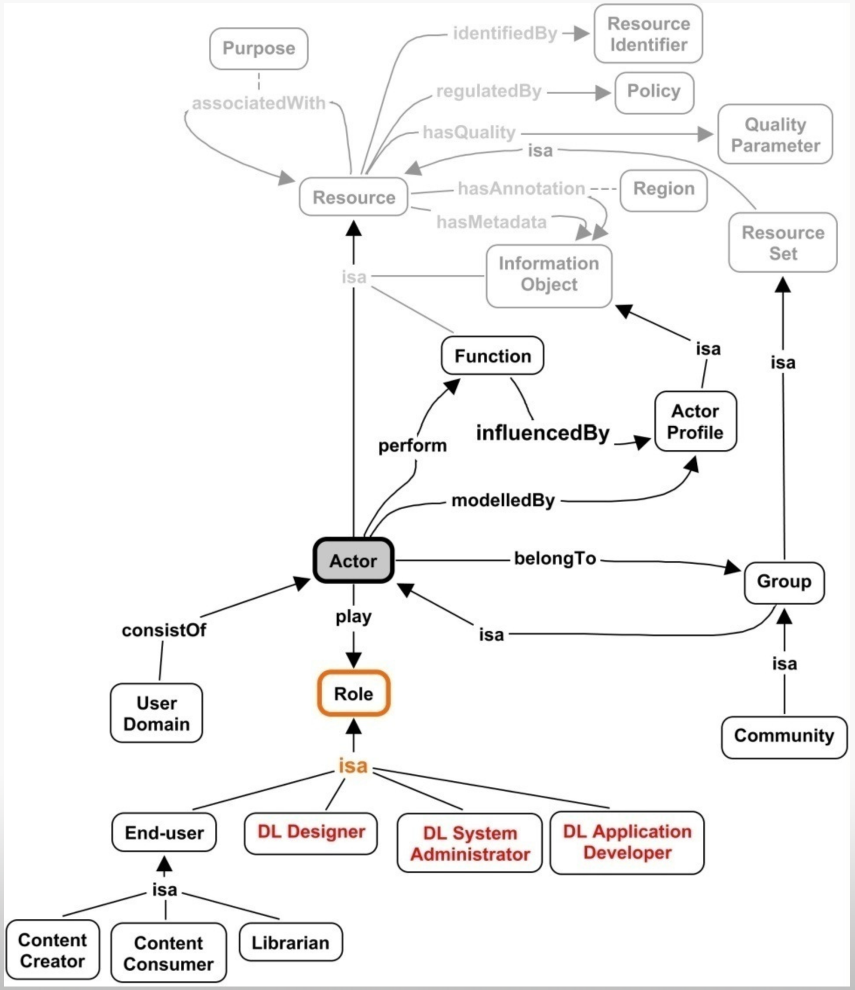
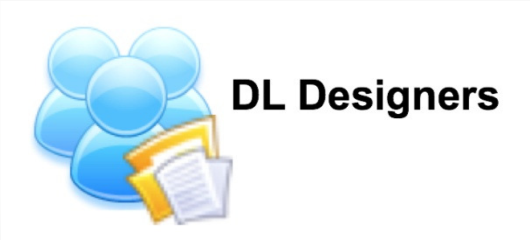
The 3 Other Roles



DL Designer

Exploit his knowledge of the application semantic domain to **define**, **customize**, and **maintain** the **Digital Library** so that it is aligned with the information and functional needs of its end-users. To perform this task, he interacts with the DLMS **providing functional and content configuration parameters**.

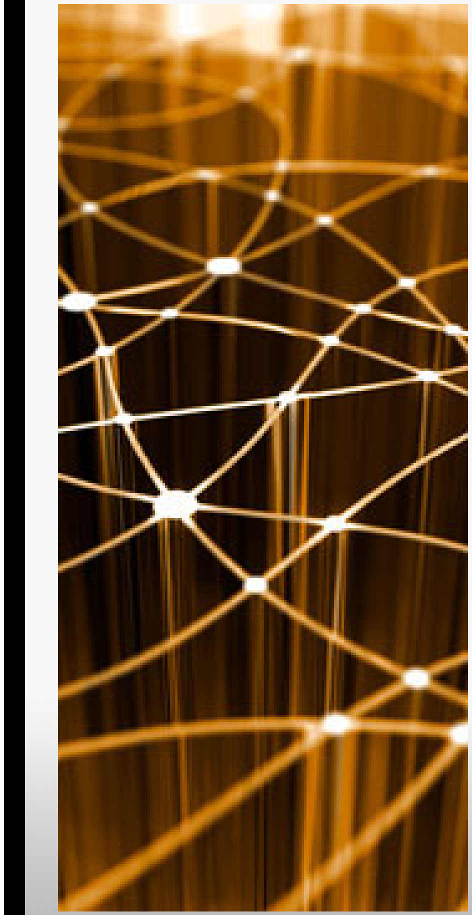


DL System Administrator

Select the **software components** necessary to **create** the **Digital Library System** needed to serve the required DL and decide where and how to deploy them. He interacts with the DLMS by **providing architectural configuration parameters**, such as the selected software components, the hosting nodes, and the components allocation.

DL Application Developer

These **develop** the **software components** of **DLMSs** and **DLSs**, realizing the necessary functionality



Thank you