PS Software Engineering 1 (WS2001/02)
Group 2 - Infowarrior

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January 16, 2002

Contents

1 Introduction **5**

2 CRC Session **5**
- 2.1 Info Collection . . . 5
- 2.2 Maintainance . . . 5
- 2.3 XML . . . 6
- 2.4 Database . . . 6
- 2.5 Information Representation . . . 6
- 2.6 Information Delivery (Push) . . . 7
- 2.7 Authentification . . . 7
- 2.8 Web Server (Pop) . . . 8
- 2.9 Information . . . 8
- 2.10 Person . . . 8
- 2.11 Web Browser . . . 9
- 2.12 Billing Validation Center . . . 9

3 User Role Map **9**

4 Use Cases **10**
- 4.1 Client Sends Information . . . 10
- 4.2 User Requests Public Information . . . 10
- 4.3 User Requests Restricted Information . . . 13
- 4.4 system administration . . . 15
  - 4.4.1 Sign In (Register) . . . 15
  - 4.4.2 Register other System . . . 15
  - 4.4.3 User Requests Login . . . 18
  - 4.4.4 Delete user (User request) . . . 18
  - 4.4.5 Set user values . . . 18

5 Essential User Interface **20**
- 5.1 Public User Interface . . . 20
- 5.2 Login Interface . . . 21
- 5.3 User Interface After Login . . . 21
- 5.4 Sign In Interface 1 . . . 21
- 5.5 Sign In Interface 2 . . . 23
- 5.6 Sign Out Interface . . . 23
- 5.7 EUI Flow Diagram . . . 25

6 Class Diagrams **25**

7 Sequence Diagrams **25**

8 Activity Diagrams **25**

9 Design Class Diagram **25**

10 Component Diagram **25**

A Protocols **32**
A.1 Protocol of 2001.10.31 . . . 32
A.1.1 Participants . . . 32
A.1.2 Topics . . . 32
A.2 Protocol of 2001.11.07 . . . 34
A.2.1 Participants . . . 34
A.2.2 Topics . . . 34
A.3 Protocol of 2001.11.14 . . . 35
A.3.1 Participants . . . 35
A.3.2 Topics . . . 35
A.4 Protocol of 2001.11.21 . . . 36
A.4.1 Participants . . . 36
A.4.2 Topics . . . 36
A.5 Protocol of 2001.12.05 . . . 37
A.5.1 Participants . . . 37
A.5.2 HTML-Interface Presentation . . . 37
A.5.3 WML-Interface . . . 37
A.5.4 Flow Diagrams . . . 37
A.5.5 Exercises for 12.12.2001 . . . 37
A.6 Protocol of 2001.12.12 . . . 38
A.6.1 Participants . . . 38
A.6.2 Topics . . . 38

B Other Sutff **39**
B.1 CRC Cutout Cards . . . 39
B.2 Class Diagram - Big . . . 40

List of Figures

1 User Role Map 9
2 Use Case: Client Sends Information (section 4.1) 11
3 Use Case: User Requests Public Information (section 4.2) 12
4 Use Case: User Requests Restricted Information (section 4.3) 13
5 Use Case: Other System Requests Restricted Information (section 4.3) . . 14
6 Use Case: Sign In (section 4.4.1) 16
7 Use Case: User Requests Login (section 4.4.3) 17
8 Use Case: Other System Requests Login (section 4.4.3) 18
9 Use Case: Deleter User (User Request) (section 4.4.4) 19
10 Public User Interface 20
11 Login Interface 21
12 User Interface After Login 22
13 Sign In Interface 1 22
14 Sign In Interface 2 23
15 Sign Out Interface 24
16 Essential User Interface Flow Diagram 24
17 Diagram of classes 25
18 Sequence Diagram: User Reqests Restricted Information 26
19 Sequence Diagram: Send Information 27
20 Sequence Diagram: User Sign In 28
21 Activity Diagram: User System Interface 29
22 Design Class Diagram 30
23 Design Class Diagram 31

1 Introduction

software engineering The computer science discipline concerned with developing large applications. Software engineering covers not only the technical aspects of building software systems, but also management issues, such as directing programming teams, scheduling, and budgeting.[1]

And that's just what this PS is all about, we are to devolop a large program called "Infowarrior" that represents and relays incoming news. The development process ends just before implementation.

2 CRC Session

2.1 Info Collection

InfoCollector	
Superclasses:	
Subclasses: all form classes	
Responsibility: Collection of information	
Responsibilities	*Collaborators*
Receive Information(type, infoobject)	External(various)
	Database
	InfoDelivery
	Authentification
	WebServer

2.2 Maintainance

Maintainance	
Superclasses:	
Subclasses:	
Responsibility: Provides tool for administrators	
Responsibilities	*Collaborators*
Set Options	InfoDelivery
Get Options	Authentification
Set Scheduler	InfoRepresentation
Set Output Format	WebServer
Set Output Template	
Delete User	
Add User	
Change Userinfo	

[1] taken from www.webopedia.com

2.3 XML

Not relevant, because we intend to use freely available class collections (e.g.: JDOM).

XML	
Superclasses:	
Subclasses:	
Responsibility: XML tool collection	
Responsibilities	*Collaborators*

2.4 Database

Database	
Superclasses:	
Subclasses:	
Responsibility: Stores news items	
Responsibilities	*Collaborators*
Not relevant, because we intend to use	InfoCollector
freely available software (e.g.: mySql).	InfoDelivery
	WebServer

Of interest however are the dataobjects to be stored in the database (in respect to database design).
Of interest is the format of the "special form" in which news are stored (c.f.: Prot.1 page 32

2.5 Information Representation

InfoRepresentation	
Superclasses:	
Subclasses:	
Responsibility: Formats information for viewers	
Responsibilities	*Collaborators*
Format(type, InfoObject)	InfoDelivery
SetFormat(type, template)	Maintainance
SetStandardFormatMail(template)	WebServer
SetStandardFormatHTTP(template)	
SetStandardFormatDBT(template)	

2.6 Information Delivery (Push)

Only timed transfer or request handling?
timeframe is from 0-25 (0 realtime, rest is in hourframe of digest).

InfoDelivery (Push)	
Superclasses:	
Subclasses:	
Responsibility: Forwards information and handles requests	
Responsibilities	*Collaborators*
SendDigest(time)	Authentification
SetRecp(adr, type, time, what)	Maintainance
SendRT(InfoObject)	InfoCollector
ChangeRecpFrame(adr, time)	Database
ChangeRecpType(adr, type)	InfoRepresentation
ChangeRecpWhat(adr, what)	External(various)
ShowRecentHTTP(time)	

2.7 Authentification

Authentification	
Superclasses:	
Subclasses:	
Responsibility: Forwards information and handles requests	
Responsibilities	*Collaborators*
Login(user, pwd)	Maintainance
Logout(user)	InfoCollector
GetPermissions(user)	WebSever
SetPermission(user, permission)	InfoDelivery
GetDecryptionKey(adr)	
SetDecryptionKey(adr, key)	
GetEncryptionKey(adr)	
SetEncryptionKey(adr, key)	

2.8 Web Server (Pop)

WebServer	
Superclasses:	
Subclasses:	
Responsibility: HTTP GUI	
Responsibilities	*Collaborators*
	Datebase
	Maintainance
	InfoCollection
	Authentification
	InfoRepresentation
	External(User)

2.9 Information

Info	
Superclasses:	
Subclasses:	
Responsibility: Repesentation of the abstract concept of information	
Responsibilities	*Collaborators*

2.10 Person

Person	
Superclasses:	
Subclasses:	
Responsibility: artificial or real person	
Responsibilities	*Collaborators*
	InfoDelivery
	WebServer
	InfoCollection

2.11 Web Browser

WebBrowser	
Superclasses:	
Subclasses:	
Responsibility: A webbrowser with graphical capability	
Responsibilities	*Collaborators*
	Person
	WebServer

2.12 Billing Validation Center

ValidationCenter	
Superclasses:	
Subclasses:	
Responsibility: validates billing information	
Responsibilities	*Collaborators*
	Authetification

3 User Role Map

The arrows represent the flow of information. Super- or subscripts on the arrows designate the means of transfer (e.g. webbrowser between UP and WS).
Means of transfer as lower case, and roles are all caps.

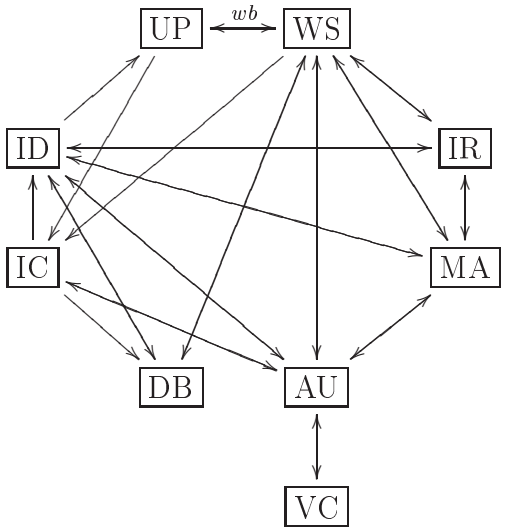

Figure 1: User Role Map

Explanation:
AU... Authentification
DB... Database
IC... Information Collection
ID... Information Delivery
IR... Information Represenation
MA... Maintainance
UP... User/Person
WS... Web Server
VC... Validation Center

wb... WebBrowser

4 Use Cases

The use cases in this section are simple textual representation of happenings in the system brought into cronological order. The start of use cases in this section is not necessarily an action outside of the system (e.g.: a user action), but an action specified by the customer requirement specification.

4.1 Client Sends Information

1. client sends information to InfoCollector in realtime mode
2. autentification of informationmaterial and sender
3. information will be transfered originally to database
4. information will be transfered originally to InfoDelivery (push)
5. information will be transfered to InfoRepresentation
6. information will be transformated into the specified format
7. information will be retransfered from InfoRep to InfoDelivery

4.2 User Requests Public Information

1. user requests information contacting user interface (GUI)
2. user may select between various forms of information representation
3. information will be fetched from database
4. information will be transfered to InfoRepresentation
5. information will be transformated into the specified format

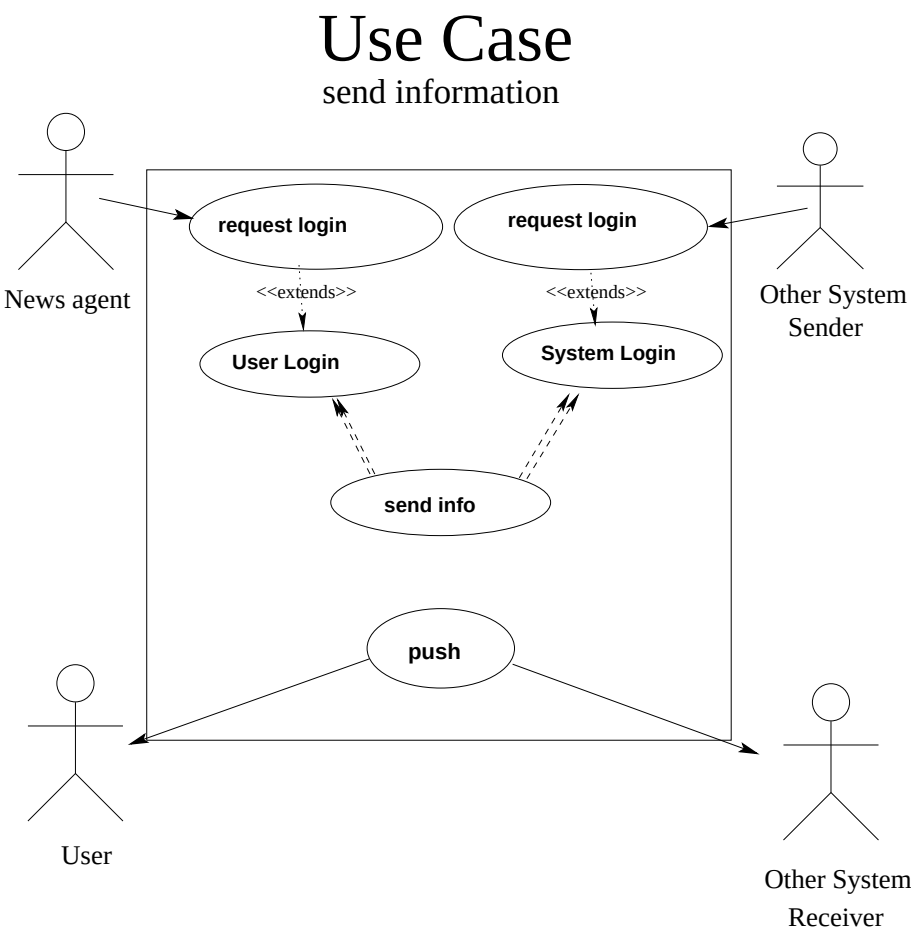

Figure 2: Use Case: Client Sends Information (section 4.1)

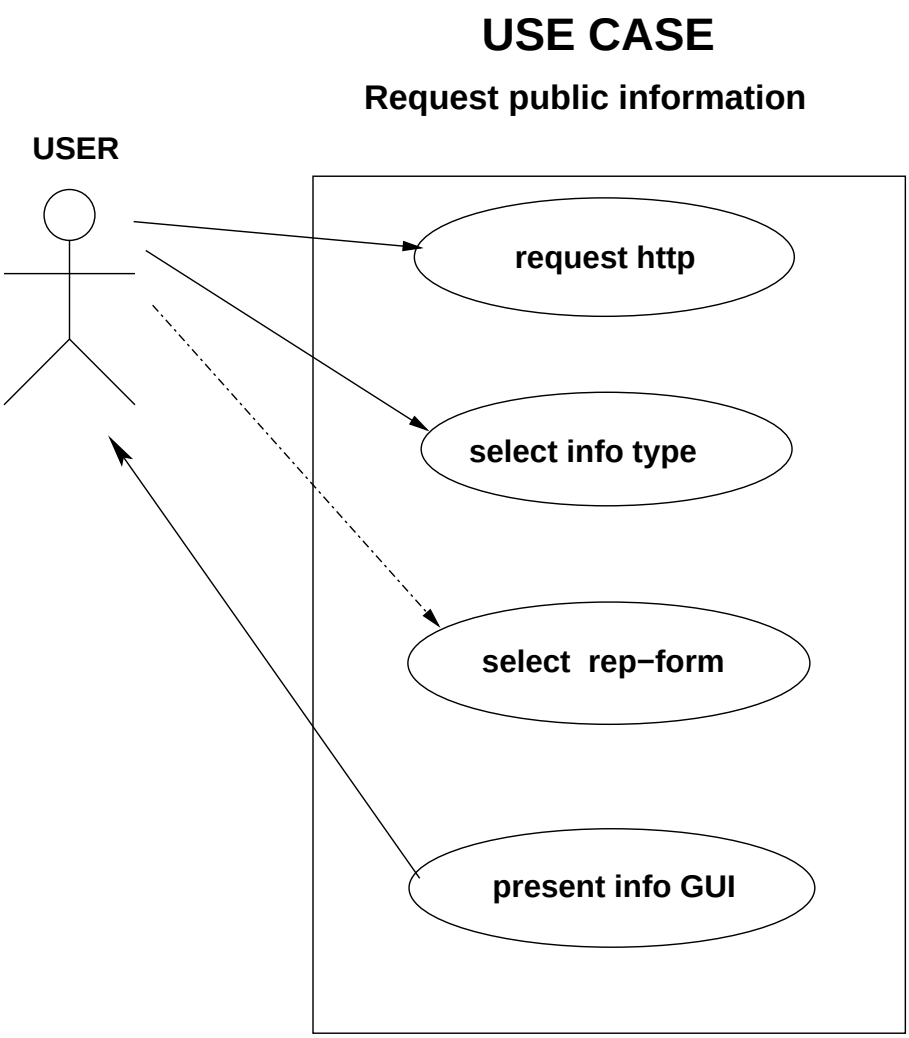

Figure 3: Use Case: User Requests Public Information (section 4.2)

6. information will be retransfered to WebServer
7. html presentation

4.3 User Requests Restricted Information

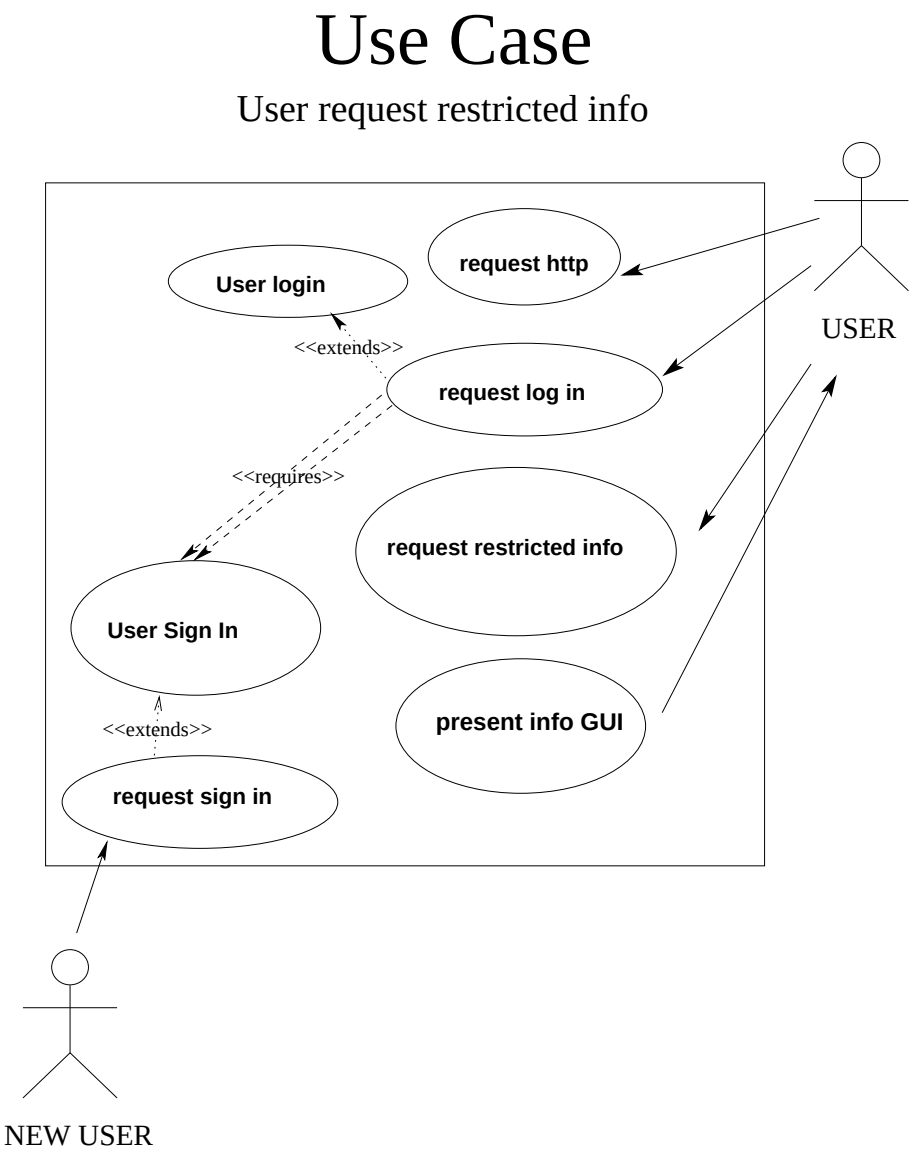

Figure 4: Use Case: User Requests Restricted Information (section 4.3)

1. User request login (as per 4.4.3)
2. User request information (similar to 4.2
3. User logs out

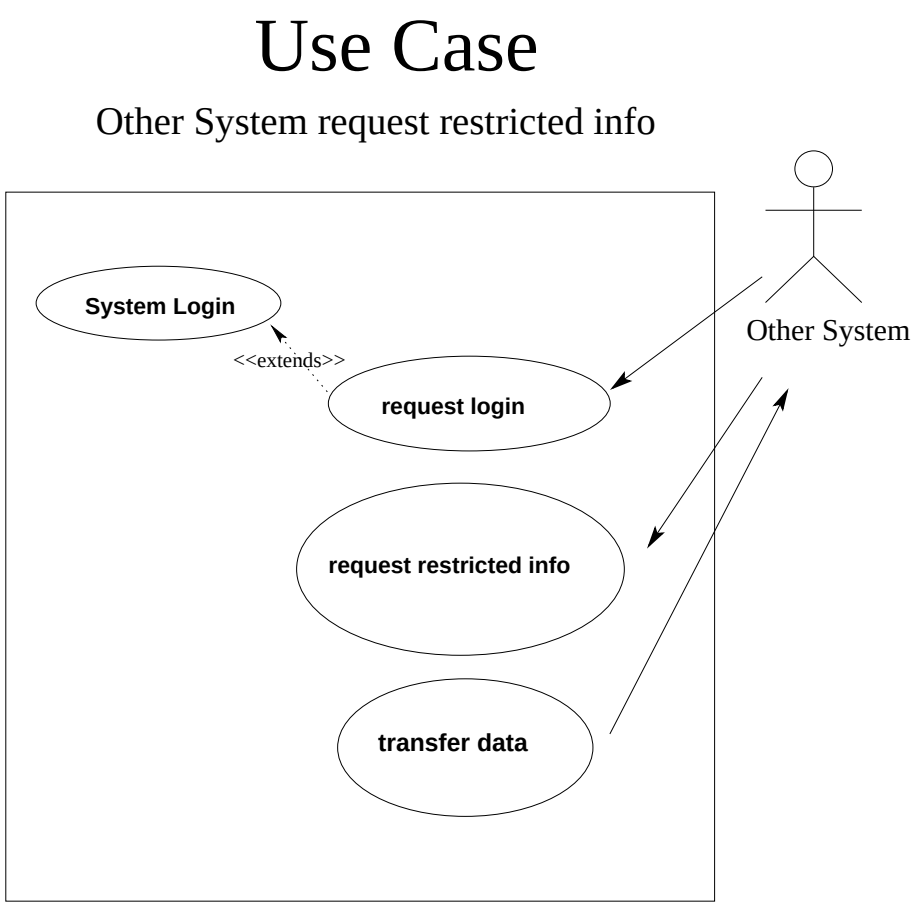

Figure 5: Use Case: Other System Requests Restricted Information (section 4.3)

4.4 system administration

Various use cases apear in the field of user and system management. We tried to extract and discuss the most important and freqqently used.

4.4.1 Sign In (Register)

1. User request account (through webserver)
2. Webserver creates secure connection (https)
3. User enters data (loginname, password, emailaddress, desired auth level, payment info)
4. Webserver request User creation through Maintainance
5. Maintainance requests information data from Authentification
6. Authentification requests ok from Validationcenter
7. Authentification returns success or failure statement
8. Maintainance returns success or failure statement
9. If successfull the user is forwarded to 4.4.5 else the user is returned to point 3.

4.4.2 Register other System

1. Admin requests access (through webserver)
2. Websever creates secure connection (https)
3. Admin enters data (loginname, password)
4. Webserver requests authetification
5. On failure the User is returned to point 1.
6. On success the admin is given an maintainance menu.
7. Admin chooses register System.
8. Admin enters the releveant data (login, password, security data, email, payment info)
9. Webserver requests system creation through Maintainance.
10. Maintainance requests ok from Authentification.
11. Maintainance returns success of failure statement.
12. The foreign systems is informed of the account via email.

Use Case

User Sign In

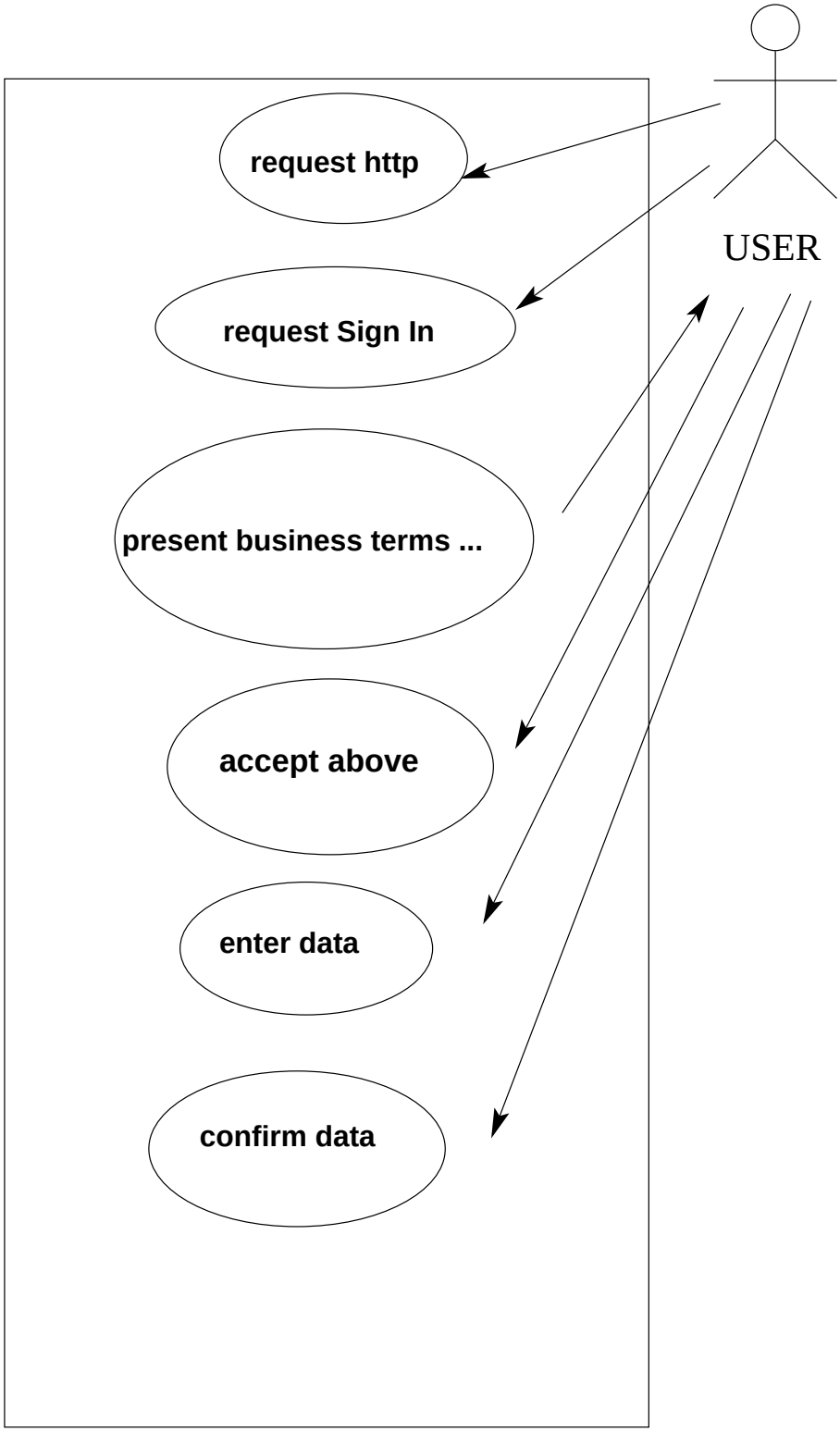

Figure 6: Use Case: Sign In (section 4.4.1)

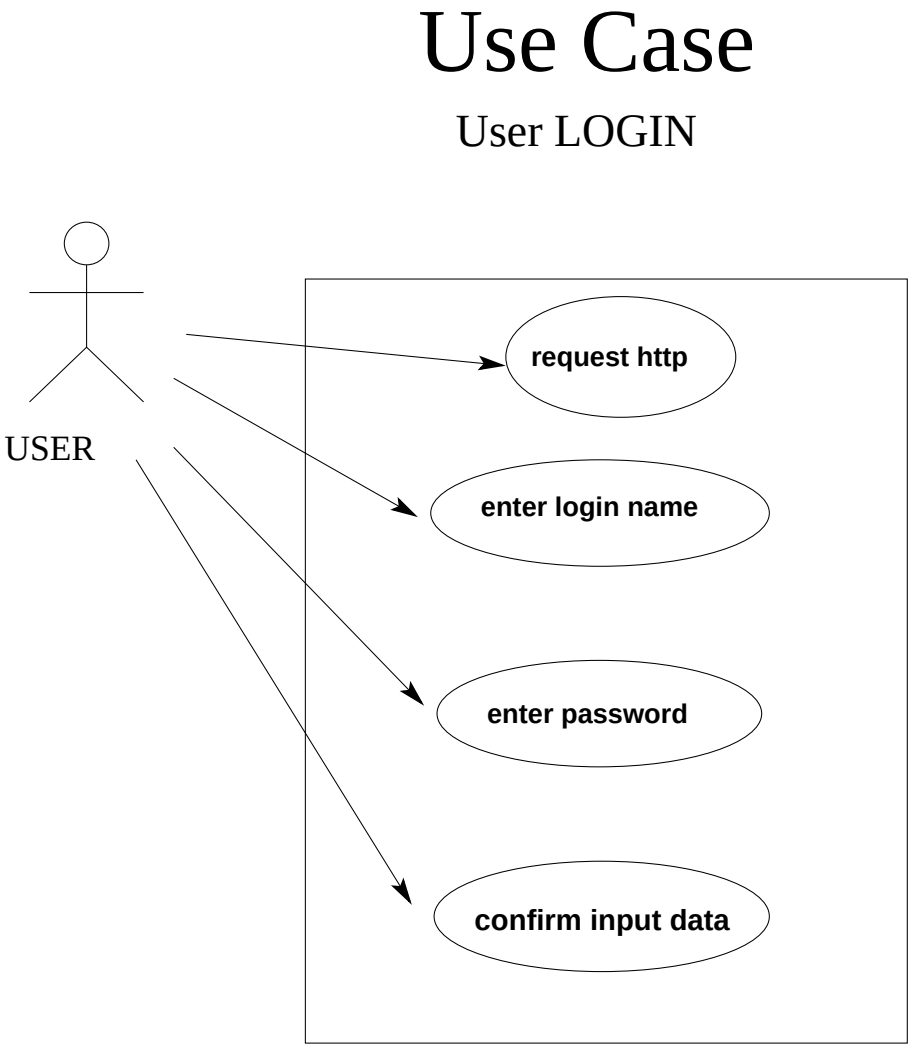

Figure 7: Use Case: User Requests Login (section 4.4.3)

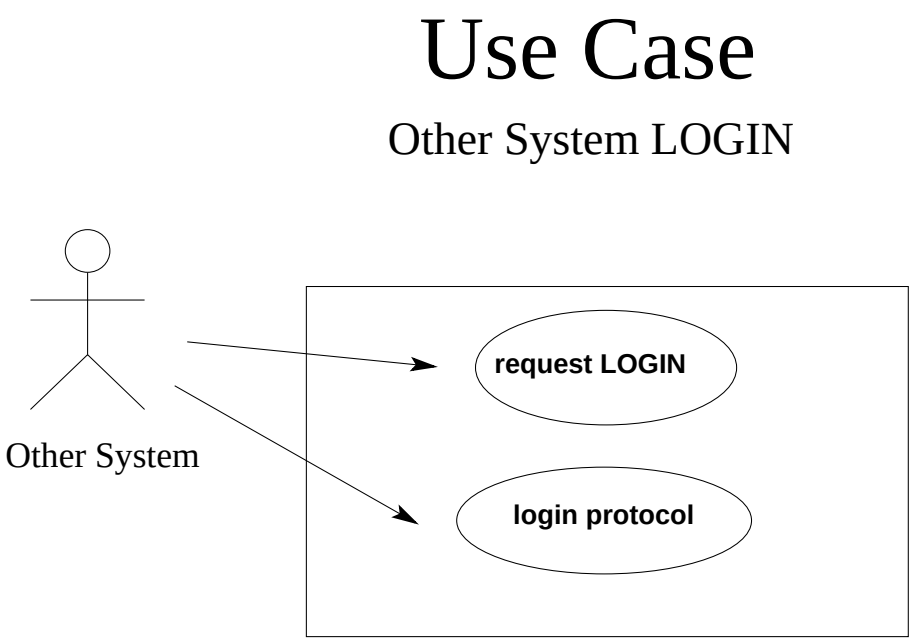

Figure 8: Use Case: Other System Requests Login (section 4.4.3)

4.4.3 User Requests Login

1. User requests login (through webserver)
2. Webserver creates secure connection (https)
3. User enter data (loginname, password)
4. Webserver requests User authentification (through Authentification)
5. Authenficication either grants (continue) or denies access (return to 4.4.3).

4.4.4 Delete user (User request)

1. User requests login (as per 4.4.3)
2. User confirms deletion
3. If confirmation positive, maintainance is contacted with user deletion request.
4. Maintainance deletes all userinfo from Information Delivery
5. Maintainance deletes all userinfo from Authentification
6. User is forwarded to 4.4.3

4.4.5 Set user values

1. User requests login (as per 4.4.3)
2. Webserver request user settings from Maintainance

Use Case

User Sign Out

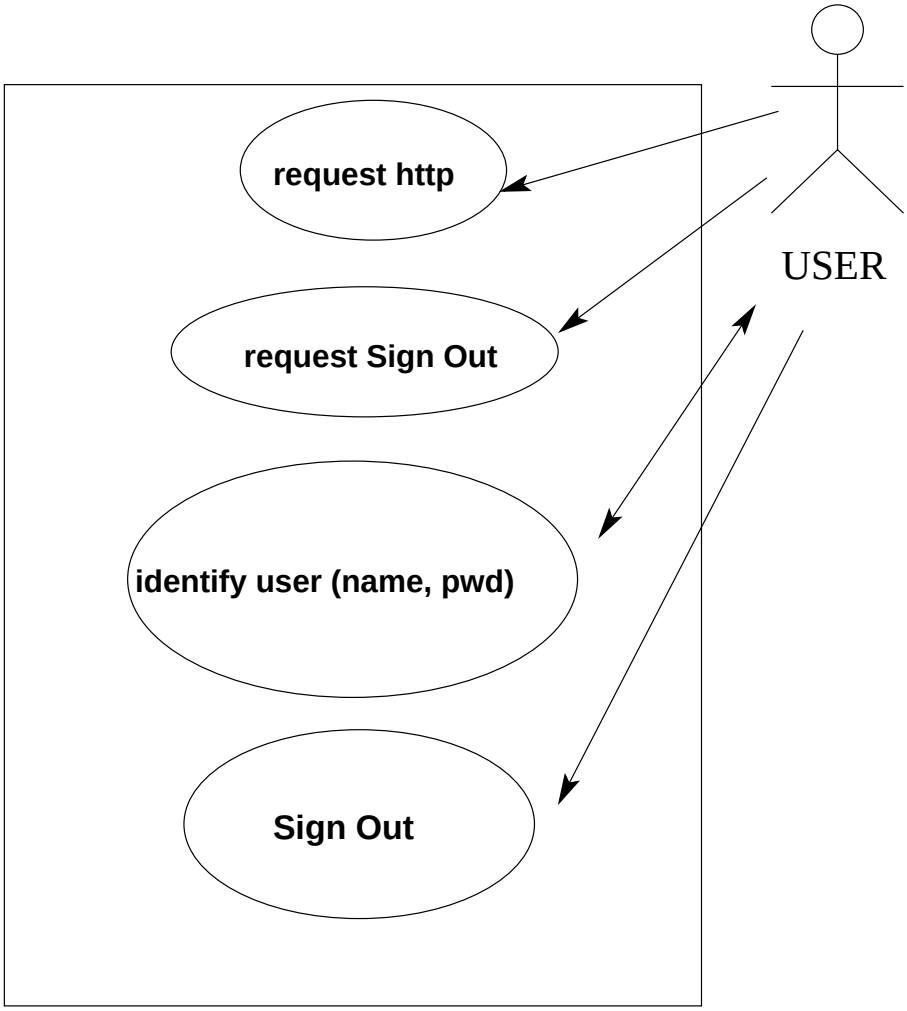

Figure 9: Use Case: Deleter User (User Request) (section 4.4.4)

3. Maintainance requests userinfo from InfoDelivery
4. Maintainance requests userinfo from Authetification
5. Maintainance returns user changable settings [2]
6. Webserver presents settings and awaits user changes
7. User enters changes
8. Webserver request setting change from Maintainance
9. Maintainance validates settitings
10. If successfull changes are forwarded to InfoDelivery and Authentification
11. Report of changes is sent to Webserver (including new settings if changes where made)
12. user continues with repeated setting change or logout.

5 Essential User Interface

5.1 Public User Interface

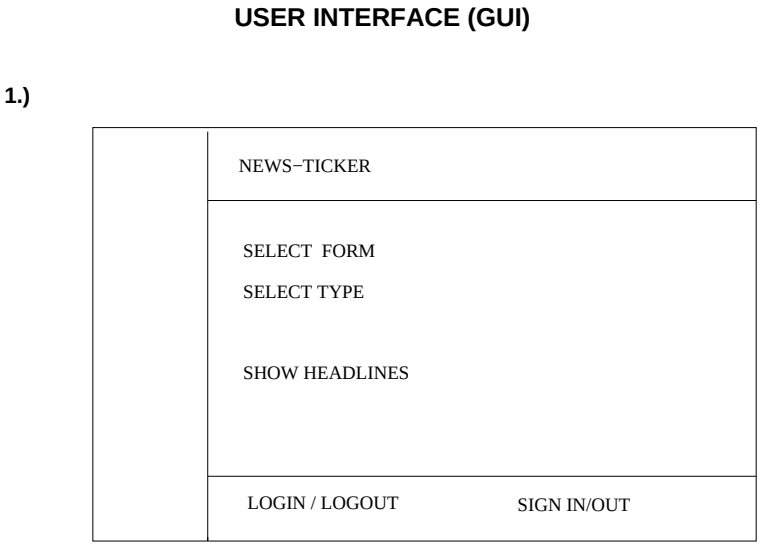

Figure 10: Public User Interface

- **News-Ticker** incoming public news (visualized in a frame, means always visible) .
- **Dropdown menu select form** if download is wanted, specify format type(e.g. ps , doc, pdf, html , gz , etc).

[2] this exludes for example system settings, login name, ...

- **Dropdown menu select info type** User may specify desired information by region, topic, date, etc. . If selected change to new site.
- **headlines** actual headlines are shown on the start site.
- **Login / Logout** (visualized in a frame, means always visible).
  In case of a login request the user gets to the **Login Shell (2)**. In case of a logout the **User Interface (1)** is presented.
- **Sign in / Sign out** (visualized in a frame, means always visible)
  If sign in is selected, change to new site **Sign In Interface (4)**.
  If sign out is selected change to new site **Sign Out Interface (6)**.

5.2 Login Interface

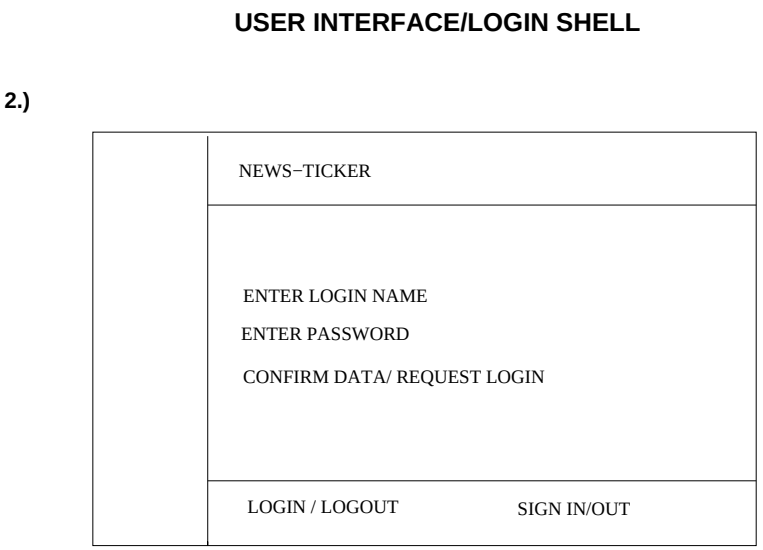

Figure 11: Login Interface

User can enter his login name and password to get access to restricted info. After this he has to confirm this data and depending on the correctness of it, change to **User Interface After Login (3)** or start again **Login Interface**

5.3 User Interface After Login

The Dropdown menu is updated according to the user level and Change Settings (Drop down menu of user options) is added.

5.4 Sign In Interface 1

- General Terms of Business including user level and payment info.
- Accept , go to **Sign In Interface 2**.
- Don't accept, go back to **Public User Interface**.

USER INTERFACE AFTER LOGIN

3.)

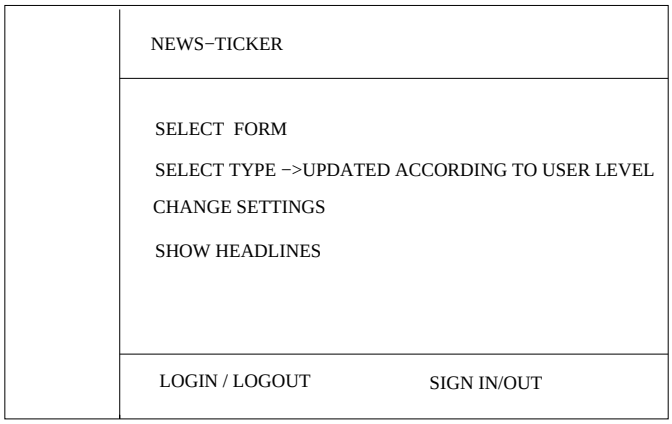

Figure 12: User Interface After Login

SIGN IN INTERFACE 1

4.)

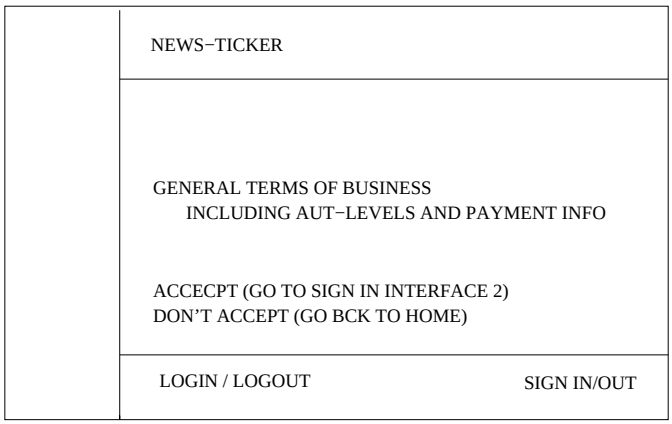

Figure 13: Sign In Interface 1

5.5 Sign In Interface 2

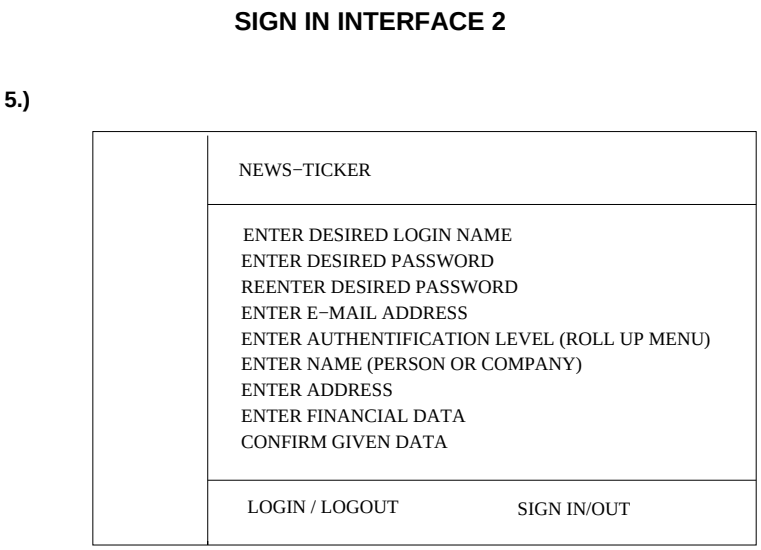

Figure 14: Sign In Interface 2

- enter desired login name
- enter desired password
- reenter desired password
- enter e-mail address
- select user/authentification level (roll up menu)
- name of person or company
- enter address
- enter financial data
- confirm given data, if data is
  - valid, go to **User Interface After Login**
  - invalid, repeat at **Sign In Interface 1**

5.6 Sign Out Interface

- enter login name
- enter password
- confirm sign out

SIGN OUT INTERFACE

6.)

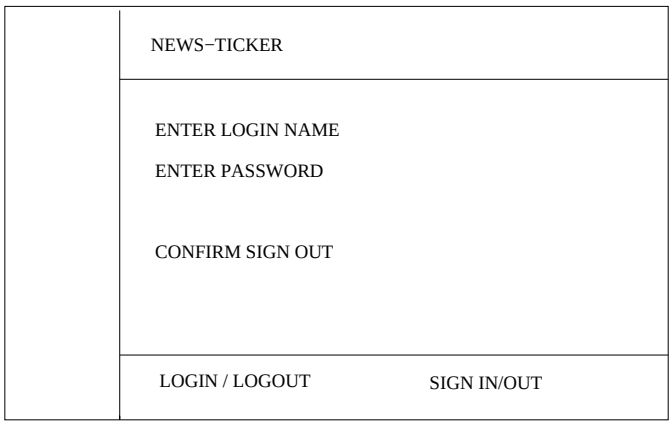

Figure 15: Sign Out Interface

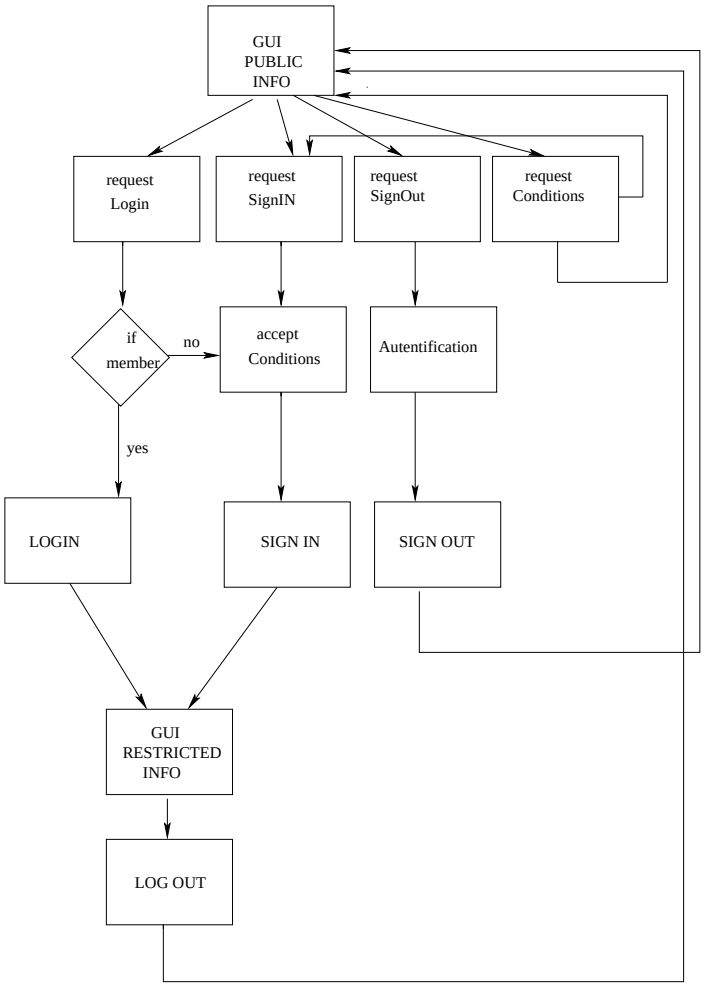

Figure 16: Essential User Interface Flow Diagram

5.7 EUI Flow Diagram

6 Class Diagrams

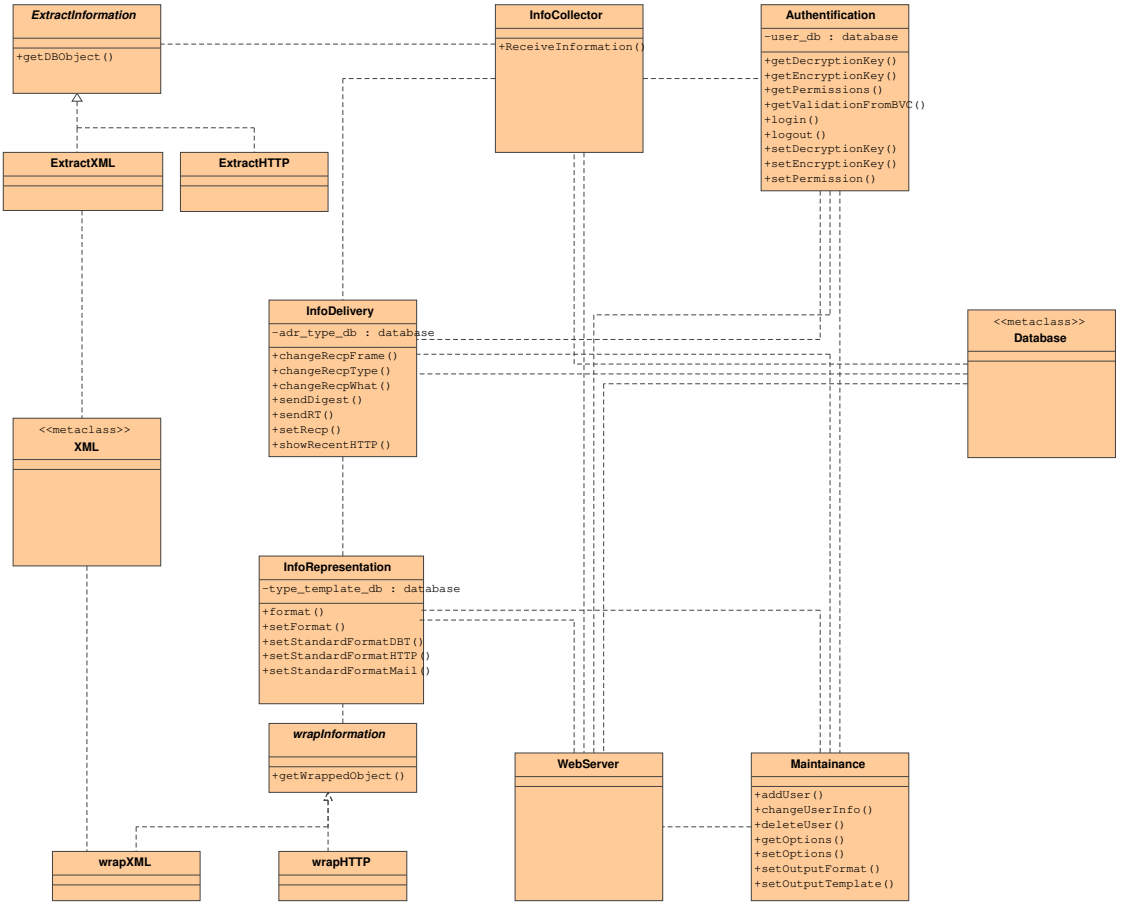

Figure 17: Diagram of classes

7 Sequence Diagrams

8 Activity Diagrams

9 Design Class Diagram

10 Component Diagram

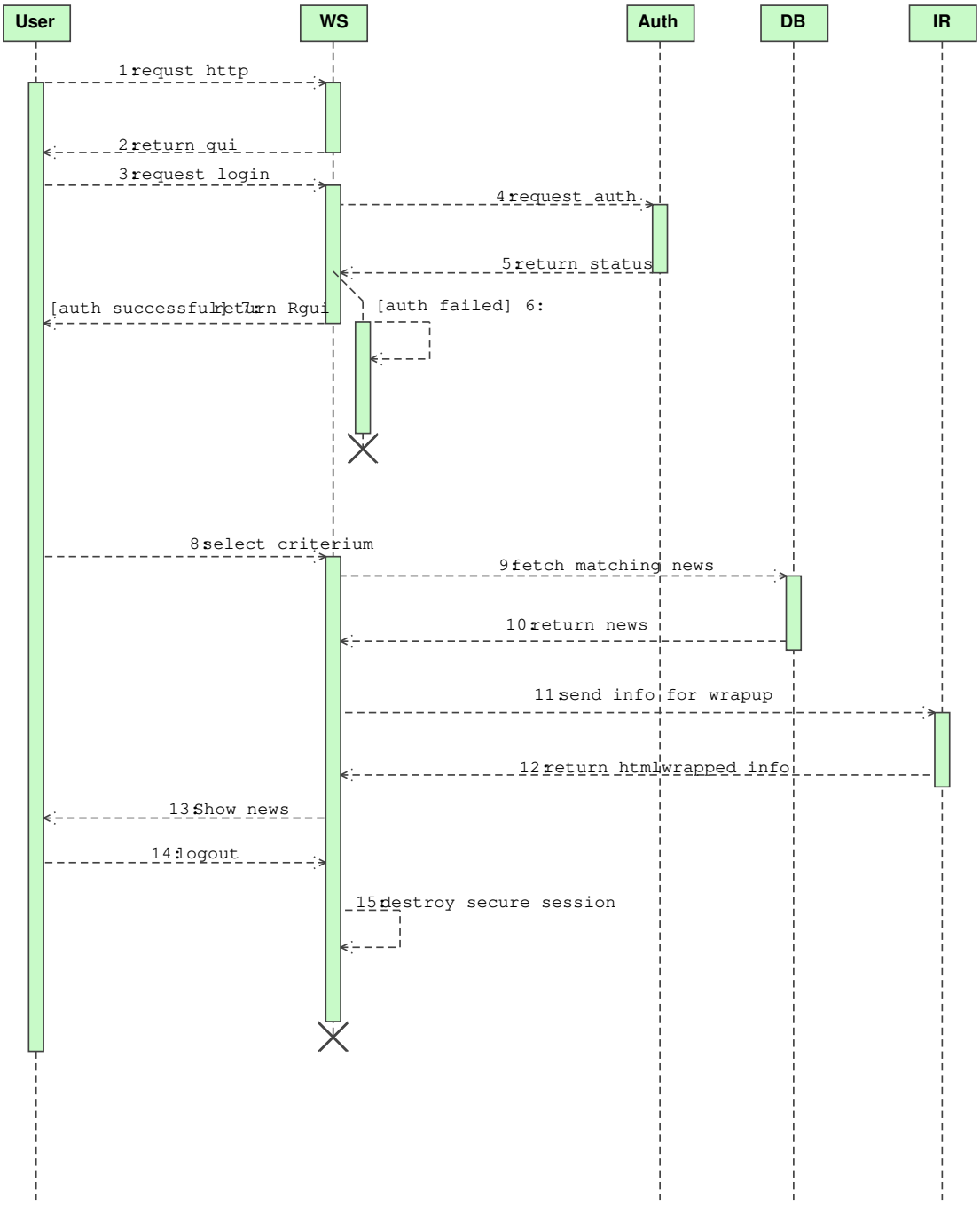

Figure 18: Sequence Diagram: User Reqests Restricted Information

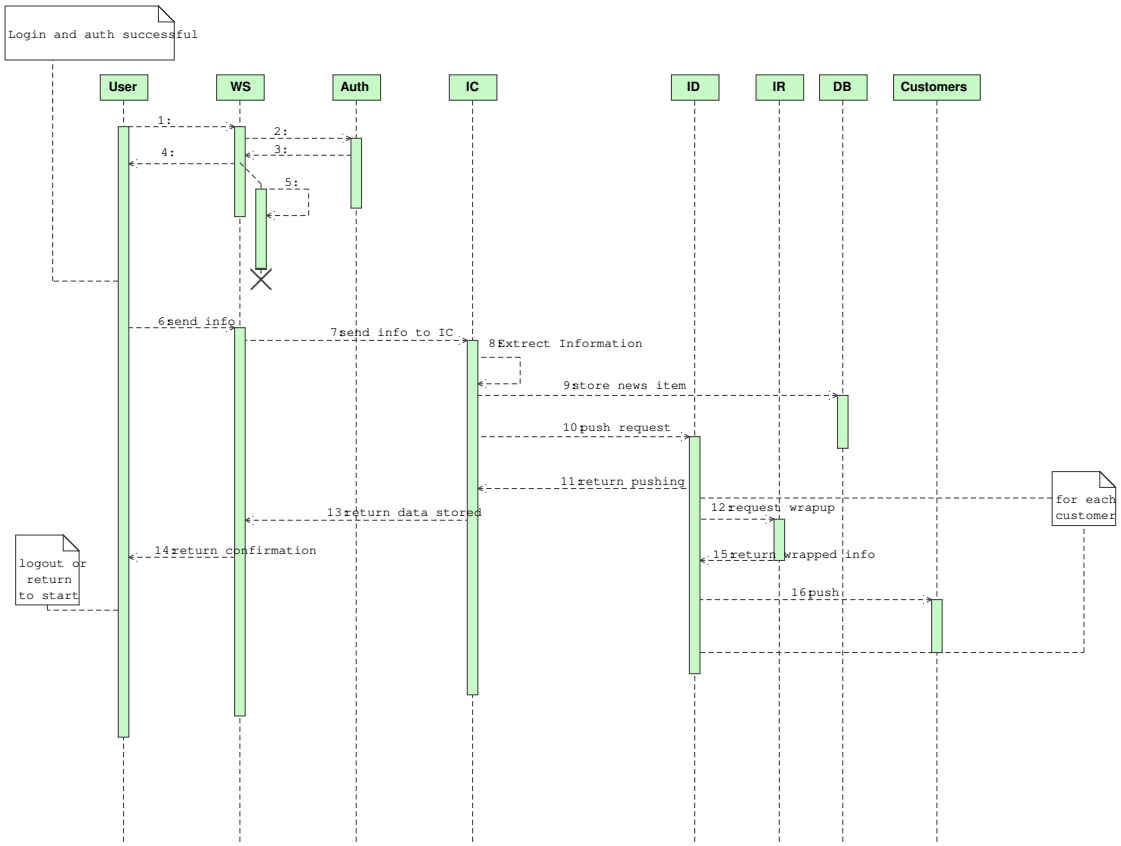

Figure 19: Sequence Diagram: Send Information

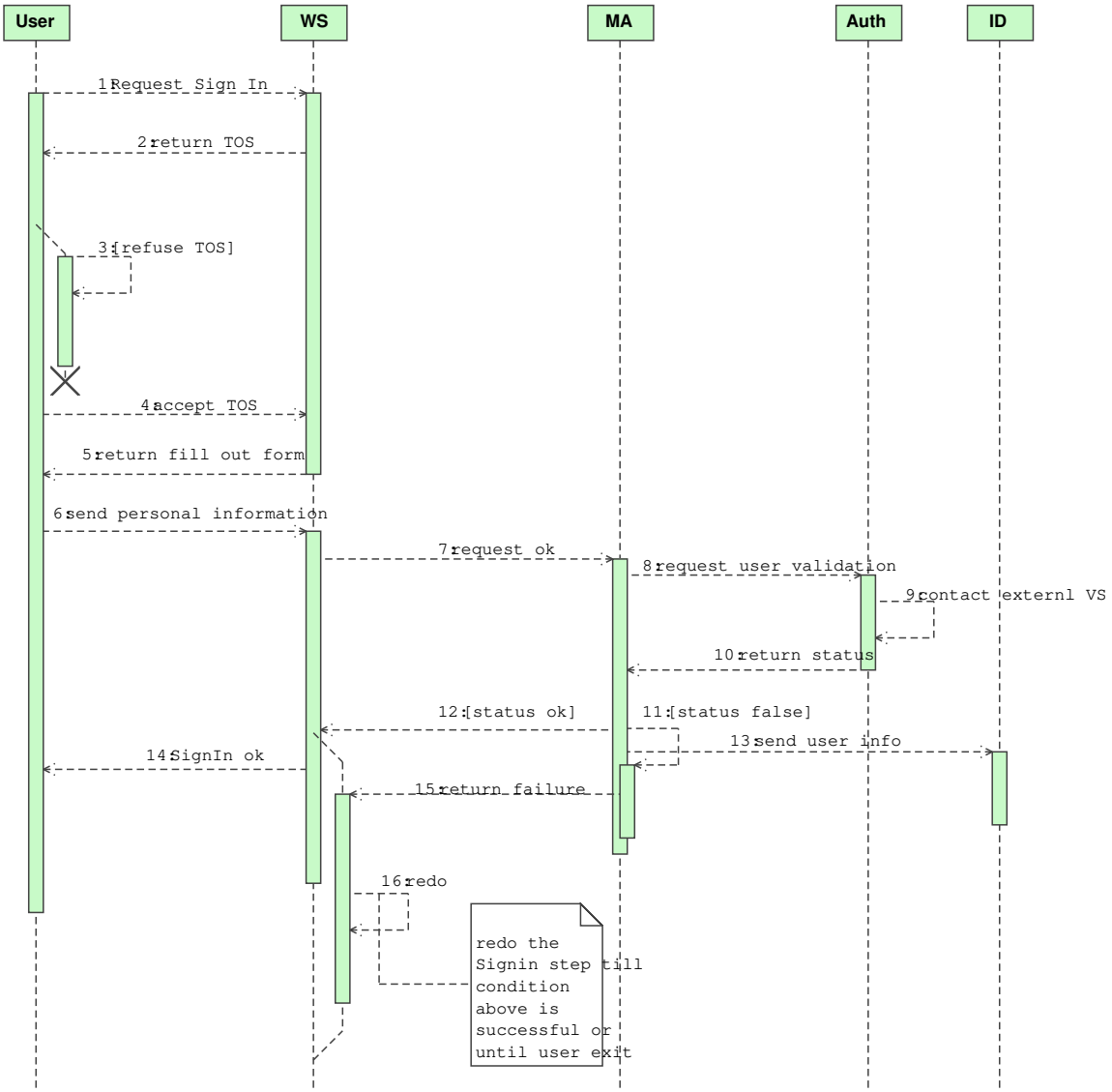

Figure 20: Sequence Diagram: User Sign In

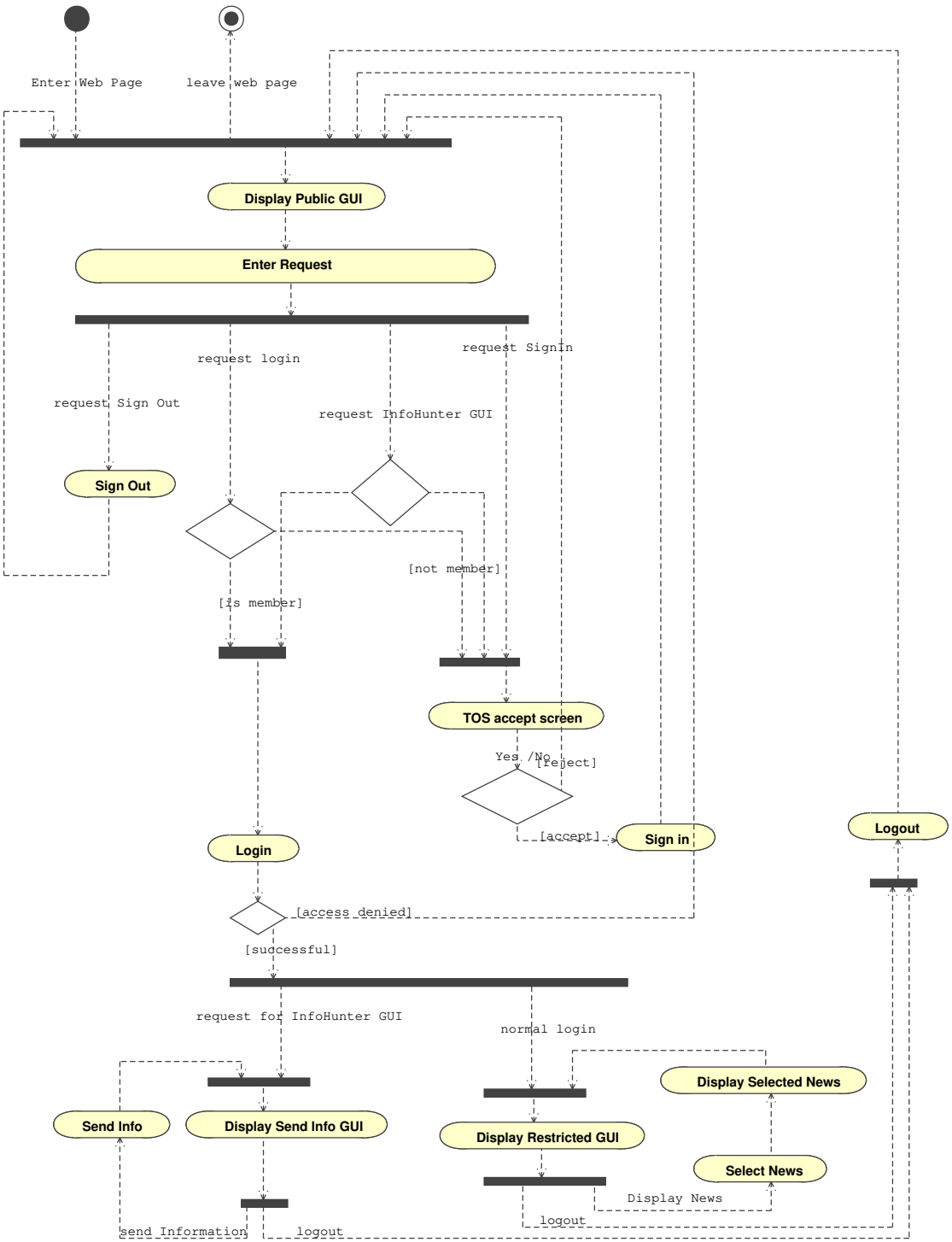

Figure 21: Activity Diagram: User System Interface

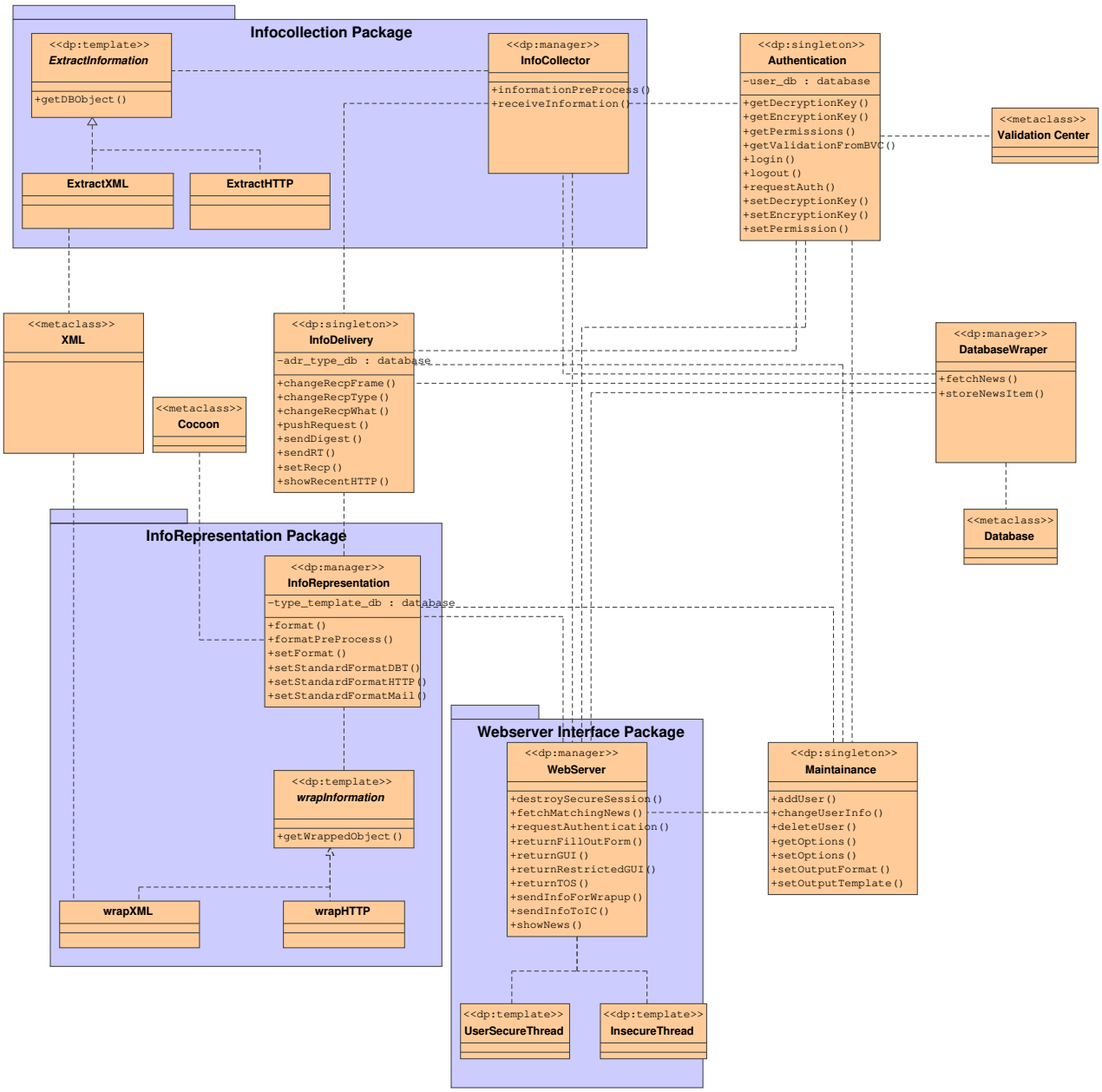

Figure 22: Design Class Diagram

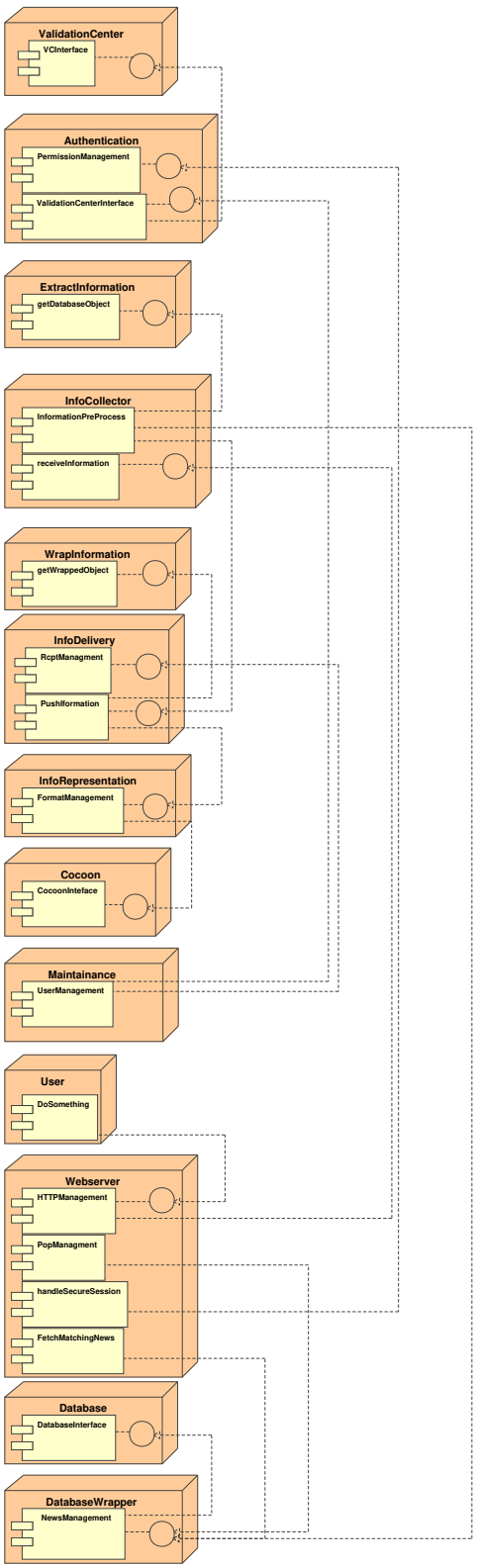

Figure 23: Design Class Diagram

A Protocols

A.1 Protocol of 2001.10.31

A.1.1 Participants

Dabrowski, Roman

Fettahoglu, Mustafa

- Hofbauer, Heinz

◦ Schneider, Michael

Schwaiger, Roland

Stütz, Thomas

The • designates this weeks leader.
The ◦ designates this weeks protocol writer.

A.1.2 Topics

- **CRC cards**
  Discussion of the use of CRC cards. Some examples were given, and discussed.
  Some new CRC cards were found during the example and added to the collection, but since we decided to redo the CRC session during the next meeting, we will not give any details.

- **Customer - Developer interaction**
  Clarification of Customer whishes through questions and general discussion of the scope of the project (e.g.: what media to take into account, i.e.: text, picture, movies, etc.).
  Important facts extracted from the customer during this phase:

  Incoming News:

  - Incoming news are realtime.
  - Outside sources deliver news.
  - News are delivered in a standard form [3].

  Outgoing News:

  - Realtime or digest
  - Active or passive (push - pop technology)
  - Customizable look (through maintainance tools).
  - Possible media: sms, xml, email, html, wap.

[3] This "standard form" is an established standard in the news community, but till now we know nothing of the actual form.

Database:

- Remaintime in fast DB is four weeks.
- After four weeks the news are moved to a slower repository.

Authentification:

- Incoming news must be authentified.
- Outgoing news may be encrypted.
- Passive access requires authentifiction for news which are not for the general public.

Monetarian Considerations:

- No budget restrictions!

A.2 Protocol of 2001.11.07

A.2.1 Participants

Hofbauer, Heinz

- Schneider, Michael

Schwaiger, Roland

◦ Stütz, Thomas

The • designates this weeks leader.
The ◦ designates this weeks protocol writer.

A.2.2 Topics

- **Organisation of the Project**
  We informed Mr. Schwaiger, that one member of the group (Mustafa Fettahoglu) had deciced to leave the group and quit the course.
- **CRC card Presentation**
  New CRC cards and User Role Map were presented.
- **Use Cases**
  Special frequently used and important use cases were discussed and visualized through the CRC card modell.
  New requirements and spezifications were extracted:
  - Different levels of access from public available (0) to very restricted (5).
  - A trusted center is responsible for validating financial info.
  - Two interfaces are necessary for InfoCollection , one for human users and one for other news systems from other companies.
    Therefor we need the new use case **register other system**
- **Next Week**

  1. Describe use cases (e.g. concerning the web interface)
  2. Essential User Interface
  3. Overhead Projector Presentation

A.3 Protocol of 2001.11.14

A.3.1 Participants

- ○ Hofbauer, Heinz

  Schwaiger, Roland

- • Stütz, Thomas

The • designates this weeks leader.
The ○ designates the protocol writer.

A.3.2 Topics

- **Use Cases**
  A quick graphical presentation of some choosen use case diagrams. Followed by an explanation of what todo and what not todo in use cases:

  + Systems are drawn in the rectangle
  + Subsystem are drawn in outside rectangle
  - There should be not time information in the use case (no 'and then' kind of structure
  + Relationship between use cases should be inserted (do other use cases use this use case and vice versa)

- **Introduction**
  We should write up an introduction.

- **Essential User Interface (EUI)**
  The EUI is to bare bones, it should contain the other screens as well, and contain a bit more information about what is happening in each frame.

A.4 Protocol of 2001.11.21

A.4.1 Participants

- Hofbauer, Heinz
- ◦ Schneider, Michael

  Schwaiger, Roland

  Stütz, Thomas

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A.4.2 Topics

- **Use Case Diagrams**
  First of all we discussed our new Use Case Diagrams. There were some corrections to to. Concerning all Use Cases we had to change the extends-arrows into uses-arrows.
- **Essential User Interfaces**
  We presented our User Interfaces. The next work was to implement a HTML-Site-Prototype and a WAP-Site-Prototype based on these Interfaces.
- **Class Diagramm**
  We presented and discussed our Class Diagram. We should construct a Person-Class and put in all information which are stored in database.

A.5 Protocol of 2001.12.05

A.5.1 Participants

Hofbauer, Heinz

- Schneider, Michael

Schwaiger, Roland

Stütz, Thomas

The bullet (•) designates this weeks leader.
The circ (∘) designates the writer of tthe protocoll.

A.5.2 HTML-Interface Presentation

- **Newsticker**
  leads to new Use Case (select news for newsticker e.g.)
- **Retype Password**
  was missing.
- **Web Interface for InfoCollection**
  It turned out that the customer wants a public web interface for information hunters, in order to make it possible that everybody can become an information hunter (after registration). New Use Cases have to be made.

A.5.3 WML-Interface

- We presente our WML prototype.

A.5.4 Flow Diagrams

- **Presentation**
- **Extension**
  The Flow Diagrams have to be extended with InfoCollection Interface Flow Diagrams.

A.5.5 Exercises for 12.12.2001

- **Update the paper**
  according to the results in this meeting
- **Sequential Diagrams**
- **Activity Diagrams**
- **Overhead Presentation of the results**

A.6 Protocol of 2001.12.12

A.6.1 Participants

- ◦ Hofbauer, Heinz

  Schneider, Michael

  Schwaiger, Roland

- • Stütz, Thomas

The • designates this weeks leader.
The ◦ designates the protocol writer.

A.6.2 Topics

- **Sequence Diagrams**
  - Change the order of the sequence diagrams so that they are in detailed order.
  - Explicitly show DBes (even local).
  - The items should be named like this - NAME:CLASSNAME
  - Change WS-User to WS-Frontend-User
  - Change IR to Cocoon
  - Include VC as an actor (and its VC not VS)
- **Activity Diagrams**
  - Only one outgoing connection from each Activity.
  - Usually decisions are Activity-Decision.
  - Only one ingoing connection to each Activity.
  - Include send login screen as Activity.
  - Forks are for not parallel executions.

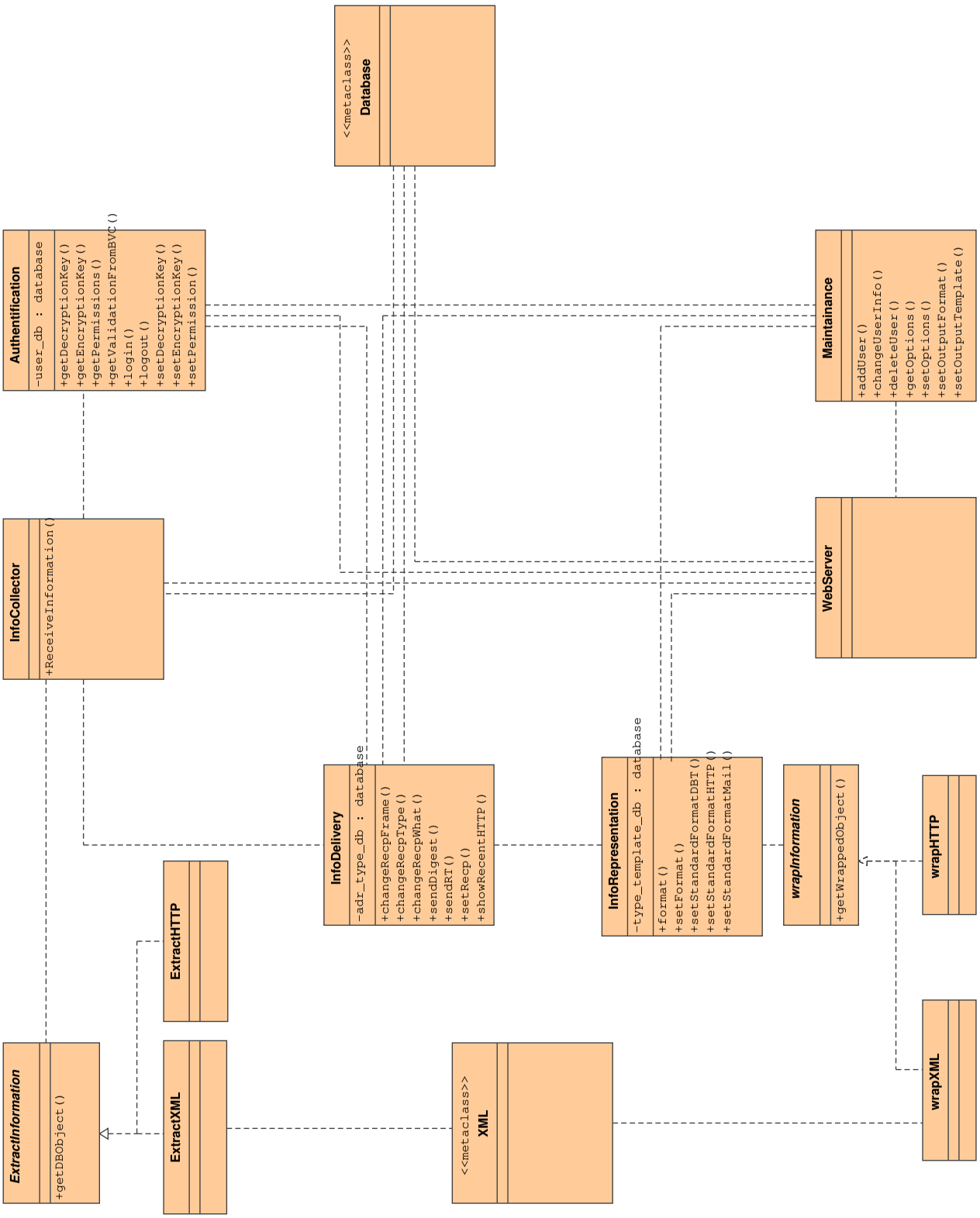
B Other Sutff

B.1 CRC Cutout Cards

Superclasses:
Subclasses:
Responsibility:

Responsibilities	*Collaborators*

Superclasses:
Subclasses:
Responsibility:

Responsibilities	*Collaborators*

B.2 Class Diagram - Big