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RATO User Manual

1 Introduction

Resource Annotation and Outline Creation Tool (RAT-O) is a client/server software tool aimed at creation of conceptual annotations of electronic resources yielding their simplified later retrieval. It is one of the main CIPHER tools dedicated to collecting and organising multimedia resources as an important phase of the whole process of exploring and presenting cultural heritage by means of IST. RATO supports mainly descriptions of web pages and images - in general, of any resource accessible through Internet. The following keywords are crucial for RATO:

- *Annotation* is a concise description of an article, book, musical piece or some other masterpiece or, in general, an information resource. It includes important aspects of content not evident in the title. In contrast to summaries, annotations are made with respect to possible later retrieval of the individual resources.
- *Keywords* represent another type of secondary information, which enables us to identify the resources of our interest. Currently, there are plenty of advanced systems, namely digital libraries utilising secondary information to store, process and retrieve information of interest. In current terminology, intelligent approaches in this area can be viewed as knowledge management methods.
- *Ontology* is a structure of concepts. Ontology-based support for annotations gives much more powerful descriptive formalism than simple keywords, where computers may perform more focused and optimal search through a database of annotated resources giving fast response times and more appropriate results.
- *Outline* is a sketch of a narrative utilising the collected resources and making links to them. It is expected that the user will enrich this outline by adding text paragraphs and/or pictures. At the end, the outline represents a structured definition of a full narrative rather than just its plot. The user can generate the *html* presentation of the narrative based on the content of the respective outline object.

Once the database of resource annotations from a specific area is available, one may wish to write a document summarising the information from an area of interest with the help of these resources. If additional information is found, it can be later included. This is a typical kind of research work, for example when writing an article with referencing a number of documents or other information resources. Therefore a software annotation tool was extended by a functionality of a document outline editor, which makes it possible to define the document outline and later enrich it by hanging relevant text paragraphs, resource references, and/or pictures to appropriate nodes of the tree representing the outline of the document.

Even the naive users may use the RAT-O tool. Moreover, the tool may be used in various areas. For example, the RAT-O tool was used to create document outlines containing the typology of chapels prepared by National Monument Institute in Southern Bohemia. In this case, chapel pictures annotated with help of specialised ontology of chapels illustrate the chapel types described in the created document outline.

2 Technical Background

The Resource Annotation and Outline Creation Tool (RAT-O) is a web application, consisting of a thin client communicating with two Java servers. Figure 1 illustrates the RAT-O architecture.

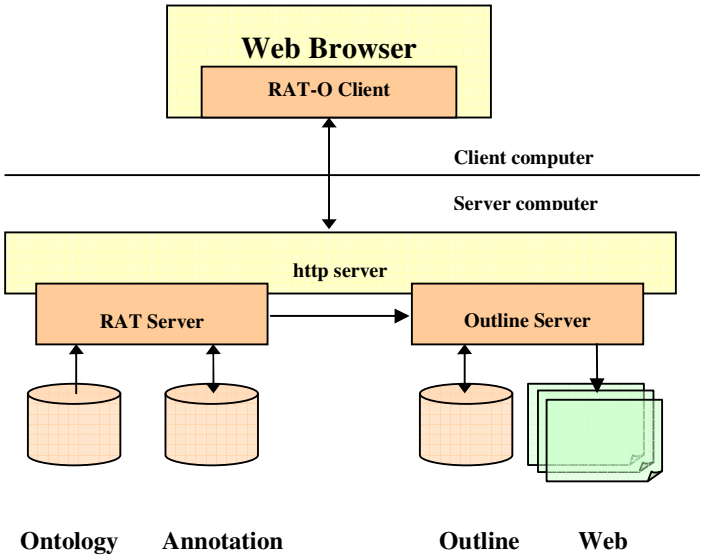

Figure 1 - RAT-O architecture

The tool is aimed at annotating resources identified by Uniform Resource Identifiers (URI) using structured annotation elements. Each of them can be either a simple keyword in a form of a character string, or a keyword associated with a concept expressing the meaning of the keyword. In principle, the annotation is a mapping of the resource to a tuple of keywords. The value added by the RAT-O tool is the ability to process not only conventional (simple) keywords in the form of character strings, but in addition, RAT-O makes it possible to assign a meaning to a keyword by assigning a concept defined by classes of appropriate ontologies. It means that resources are annotated by attaching concepts rather than simple textual keywords, although such an approach is allowed, too.

Annotations are kept in a database, which can be later searched for given keywords or concepts. From annotated resources, document outlines can be created. The outline can be easily converted to an html presentation. A preview of the html presentation is displayed in an Internet browser and final version of the presentation can be published by means of Outline server. RAT-O itself does not support creating and editing of domain ontologies. For this purpose we use the *ApolloCH* ontology editor.

3 RAT-O home page

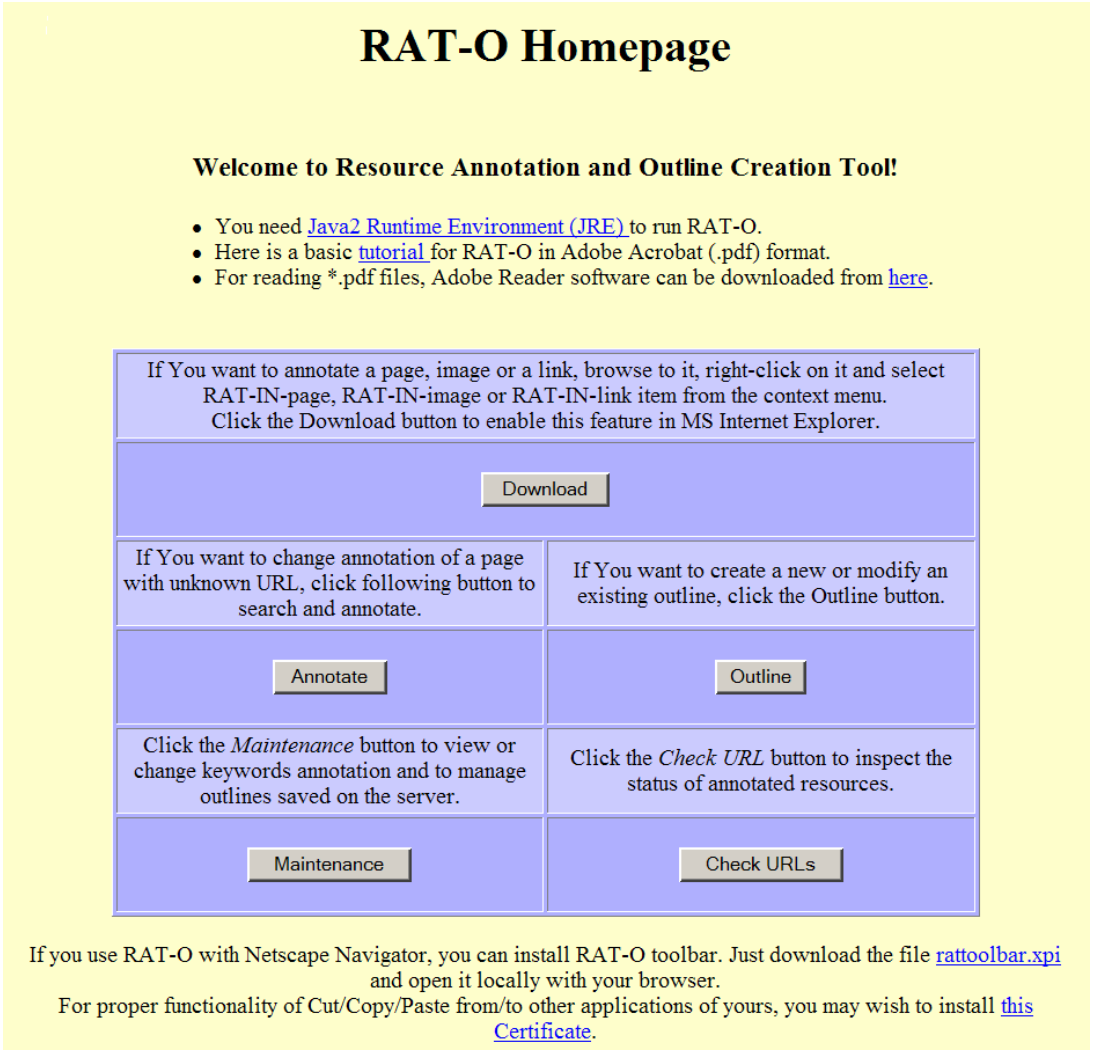

Figure 2 - RAT-O home page

To start working with the RAT-O tool, go to the RAT-O home page shown in Figure 2. This page navigates the user in order to:

- allow him to make his computer ready to run RAT-O,
- start annotating resources,
- start editing outlines,
- run the maintenance applet, and
- check the validity of annotated URIs.

Download

As it has been described above already, RAT-O has so called “thin-client” architecture; i.e. a small part of its functionality is done on the client, whereas the majority of business logic is concentrated on the server side. The potential user does not need to install any specialised

software applications on his computer. The only software he needs is any Internet browser (preferably the Microsoft® Internet Explorer or the Netscape Navigator)*.

The *Download* push button on RAT-O main page (see Figure 2) makes possible to configure properly user's MS Internet Explorer in order to achieve a higher level of its integration with RAT-O. In particular, the MS Windows registry file will be downloaded, which contains the following three registry entries:

```
[HKEY_CURRENT_USER\Software\Microsoft\Internet Explorer\MenuExt\RAT-in]
@="http://krizik.felk.cvut.cz/Rato/IExplorerMenu/ratscriptin_default.htm"
"Contexts"=dword:00000001

[HKEY_CURRENT_USER\Software\Microsoft\Internet Explorer\MenuExt\RAT-in-image]
@="http://krizik.felk.cvut.cz/Rato/IExplorerMenu/ratscriptin_image.htm"
"Contexts"=dword:00000002

[HKEY_CURRENT_USER\Software\Microsoft\Internet Explorer\MenuExt\RAT-in-link]
@="http://krizik.felk.cvut.cz/Rato/IExplorerMenu/ratscriptin_link.htm"
"Contexts"=dword:00000020
```

By double clicking on the downloaded file, the entries will be added to the registry of user's computer. As a result, three new items will appear in the context menu of user's MS Internet Explorer:

- **RAT-in**: By selecting this menu item, the annotation of the current html page will start.
- **RAT-in-image:** Applicable, if the mouse cursor is located on a picture. By selecting this menu item, the annotation of that picture will start rather than that of the whole html page.
- **RAT-in-link:** Applicable, if the mouse cursor is located on an HTML link. By selecting this menu item, the annotation of the referenced resource will start rather that of the current html page.

Annotate

Enables the user to start annotation of a resource. For details see chapter 5.

Outline

Enables the user to start editing an annotation. For details see chapter 6.

Maintenance

The functionality under the *Maintenance* push button allows the user to maintain his own workspace and/or provide his colleagues with his own content. For details see sections 8.1 - 8.4.

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* For these two Internet browsers, a configuration has been developed within the CIPHER project, which provides users with a higher level of comfort. Nevertheless, any Internet browsers are suitable for running RAT-O.

Check URLs

The functionality under the *Check URLs* push button makes the user able to test if the URLs annotated in the past are still valid (they still exist) and/or whether they have been modified since last time or not. For details see section 8.5.

4 Login

Before the user can do any action, he has to login to the server. There is none explicit command for invoking the login dialog. It appears automatically when the user requires carrying out an action, but RAT-O does not know his credentials yet.

Figure 3 - RAT-O login dialog

Three data items are to be entered in the login dialog shown in Figure 3:

- user's **name**, i.e. the username under which the user is registered within the RAT-O server.
- user's **password**
- name of the **working area**, which the user wants to access. This field may remain empty. In this case the user assumes by default that the user wants to access his private working area and takes the name of the working area equal to the username entered in the first field. Thus, repeating the username in the name of the working area as shown in Figure 3 is not necessary.

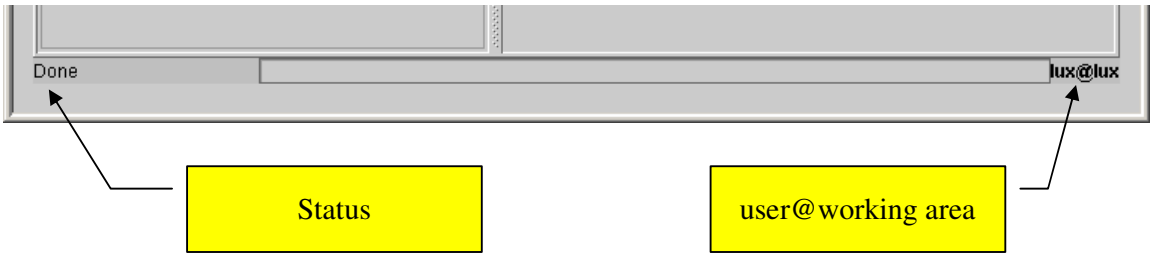


Figure 4 - RAT-O window status bar

After pressing the OK button, user's credentials are sent to the server. The server checks user's authentication (i.e. matching his name and password) and his authorisation to the specified working area.

If the authentication or the authorisation fails, a warning message appears on user's screen and no action will be carried out. If both the authentication and the authorisation succeed, the window relevant to the required action will appear. All RAT-O windows have status bar at the bottom as shown in Figure 4. There is a status of the recent action shown in the left part. In the right part, there is shown the indication of the user (his username) logged-in and the name of the working area the user is logged-in to.

5 Resource annotation

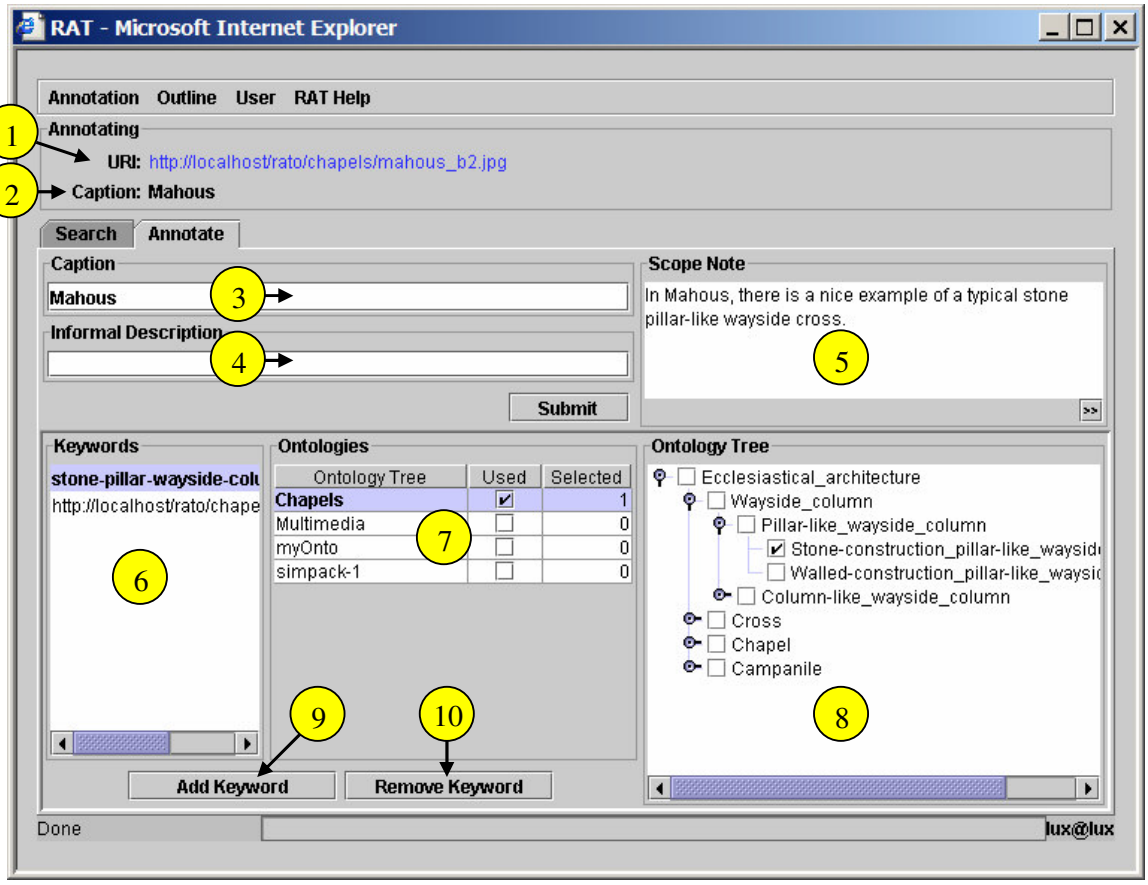


Figure 5 - Resource annotation window

Figure 5 shows the *Resource annotation window* of RAT-O. The window consists of the following items:

1 **URI** of the annotated resource. As the URI is a unique identifier of any resource, RAT-O uses the URI as an identifier of the annotation. URI is a read-only field. It is assigned once to the annotation when it has been created and then it can not be modified.

2 **Caption** is a read-only copy of the field (3). The reason, why it is duplicated is that the user needs to see it in read-only form also when he activates the *Search* tab of the window and field (3) is not visible.

3 Editable field **Caption** is aimed at defining the caption of the annotation. Together with the *Scope Note* (5) is *Caption* copied to the outline, if the resource annotation has been included to an outline (see Figure 25). Text present in the *Caption* is also subject to text-based search (see 5.3.1). *Caption* should be a very short and apt description of the resource.

4 Editable field **Informal Annotation** is aimed at keeping annotator's private remarks. On including the annotated resource to an outline, this text will not be copied to the

outline (see Figure 25). This field takes part in text-based search (see 5.3.1). This field may be used for tagging annotations, which need a subsequent review, etc.

5 Editable field **Scope Note** is aimed at official and formal description of the content represented by the annotated resource. On including the annotated resource to an outline, this text will be copied to the outline (see Figure 25). This field takes part in text-based search (see 5.3.1).

For comfortable editing large scope notes, the >> button offers a bigger text area in a separate.

6 The field **Keywords** represents a list of all keywords associated with the annotated resource. Button (9) makes possible to add a new keyword to the list. Button (10) allows removing keywords from the list.

The keyword is a text string, which takes part in the text-based search (see 5.3.1). However, the user can assign a meaning to it. In such a case the keyword takes part also in the semantic (formal) search (see 5.3.2). The meaning can be assigned to a keyword by selecting one or more concepts from one or more ontologies.

7 The **Ontologies** field (7) lists all available ontologies. On selecting any keyword in (6), the set of checked checkboxes in (7) define, which ontologies take part in providing the selected keyword with a meaning.

The selected ontology is shown in bold in (7).

8 The **Ontology Tree** field displays the hierarchy of concepts in the ontology selected (bolded) in (7). Each node of the tree represents a concept. Concepts on lower levels are specialisations of those on upper levels. There is a checkbox assigned to each tree node. The user can assign a concept to the keyword selected in (6) by checking a checkbox of the respective concept.

If at least one concept has been assigned to the keyword selected in (6), the checkbox belonging to the selected (bold) ontology in (7) is checked. Figure 6 shows an example, when the *wall_cracks* concept (belonging to ontology *Damage*) has been assigned to the keyword selected in (6).

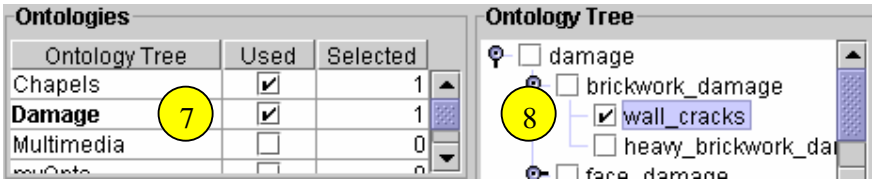


Figure 6 – Example: *wall_cracks* concept from ontology *Damage* has been assigned to the keyword selected in (6)

If a checked checkbox assigned to a node is grey, then it means that not the node, but some its specialisation in the collapsed sub-tree below the checked node has been assigned to the selected keyword. For example, the *Spatial_chapel* in Figure 7 has a greyed checkbox. It means that some specialisation of *Spatial_chapel* has been assigned to the keyword selected in (6).

Important: In order to avoid non-necessary data transfer between the client and the server, the ontology is loaded on its first usage. That is why the field (8) may be empty, when opening the *Annotation window* for annotating a new resource.

Figure 7 - Greyed checkbox in ontology tree

9 The **Add keyword** push button allows adding new keywords to the list (6). It opens the *Add keyword* dialog, which makes possible to add a brand new keyword or to use an existing one.

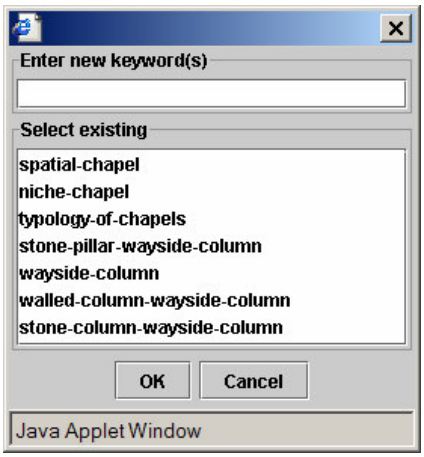


Figure 8 - *Add keyword* dialog

10 The **Remove keyword** push button allows removing the selected keyword from the list (6).

Remark: Only the membership of the keyword to the particular annotation will be deleted. The keyword itself will remain defined. It will appear among existing keywords in the *Add keyword* dialog next time. Use the maintenance applet (see *Maintenance* button in Figure 2) to delete the keyword completely.

5.1 Creating a new resource annotation or editing an existing one

There are three ways how to start annotation of a resource:

- The **first** way: Press the *Annotate* button in the RAT-O home page (see Figure 2). In this case, the URI will not be assigned. The upper part of the *Resource annotation window* will appear like Figure 9 rather than Figure 5.

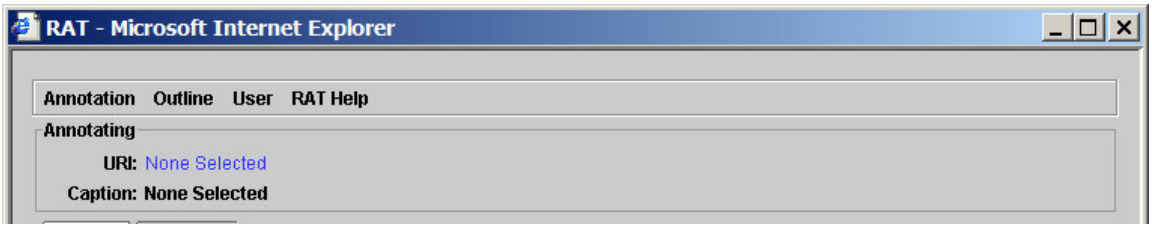


Figure 9 - Annotation window with non-assigned URI

The annotation can go on only after determining the URI of the annotated resource. To specify the URI, the user has to:

1. Press the *Annotate URL …* item of the main menu (see Figure 10).

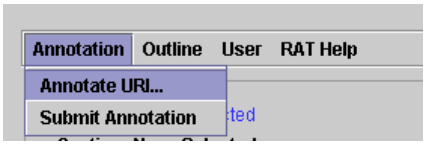


Figure 10 - *Annotate URL* menu item

2. Specify the URI in the *URI to Annotate* modal dialog and press OK.

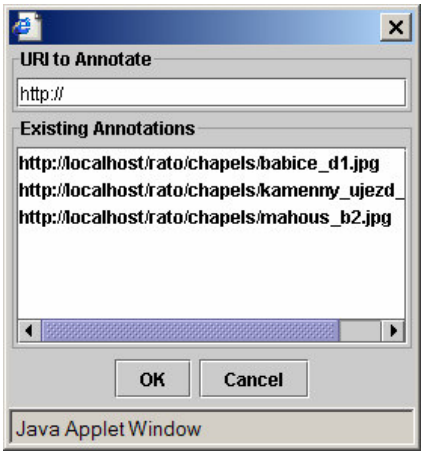


Figure 11 - *URI to Annotate* modal dialog

Remark: This way is applicable both to resources, which have not been annotated yet, and to those, which have been already annotated. In the later case, the recently stored annotation will be shown in the *Resource annotation window*.

- The **second** way of starting resource annotation assumes that the user uses the MS Internet Explorer and he updated the MS Windows registry of his computer as described in the *Download* paragraph of chapter 3. Then the user proceeds following the steps below:

  1) Open a web page containing the resource to be annotated in the MS Internet Explorer. Then carry out one of the steps 2) or 3) or 4) according to the type of the annotated resource.

  2) *If the annotated resource is the whole html page shown by the MS Internet Explorer*:

     (a) The mouse cursor shall be positioned anywhere on the page.

     (b) Click the right mouse button.

     (c) Select the *Rat-in* item of the context menu.

     (d) Click the left mouse button.

  3) *If the annotated resource is a picture shown in the current html page displayed by the MS Internet Explorer*:

     (a) Position the mouse cursor over the picture to be annotated.

     (b) Click the right mouse button.

(c) Select the *Rat-in-image* item of the context menu

(d) Click the left mouse button.

4) *If the user wishes to annotate a resource referenced by a link included in the current html page displayed by the MS Internet Explorer*:

(a) Position the mouse cursor over the link to the annotated resource.

(b) Click the right mouse button.

(c) Select the *Rat-in-link* item of the context menu

(d) Click the left mouse button.

Remark: This way is applicable both to resources, which have not been annotated yet, and to those, which have been already annotated. In the later case, the recently stored annotation will be shown in the *Resource annotation window*.

- The **third** way:

  When the user is working in the *Outline editing window* (see Figure 19), he can access the *Resource annotation window* directly from the *Outline window*:

  1) Search for a resource in the *Outline editing window* (see Figure 25).

  2) Select one of the resources enumerated in the list of all found resources (satisfying the search condition).

  3) Press the *Annotate Selected* menu item:

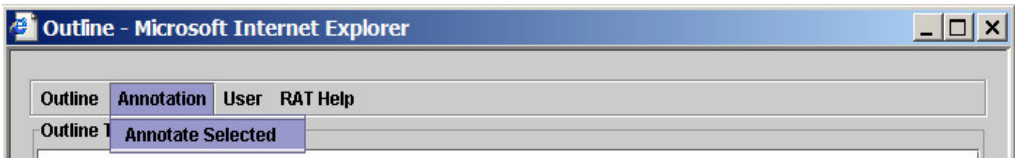


Figure 12 - Accessing *Annotation* window from the *Outline* window

  4) The *Resource annotation window* appears. It will be filled-in with the annotation data of the given resource.

  Remark: This way is applicable only to already annotated resources.

- The **fourth** way:

  When the user is working in the *Maintenance* applet (see Figure 38 or the *Maintenance* button in Figure 2), he can access the *Resource annotation window* by pressing the *Edit* button (see Figure 13), while any of the URIs in the list of available annotations has been selected.

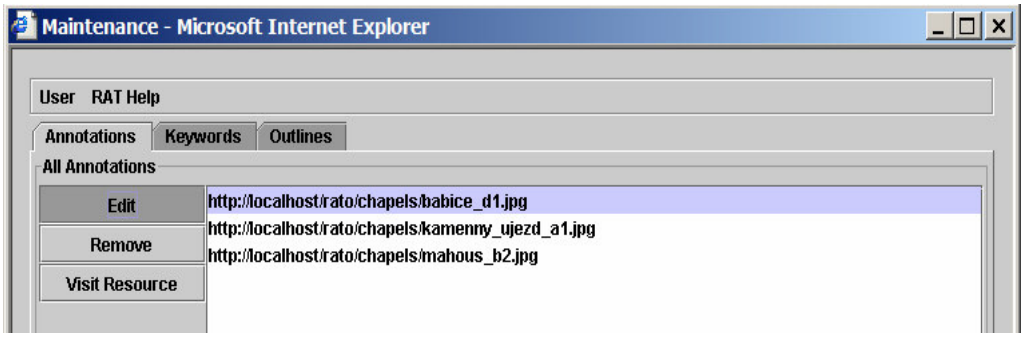


Figure 13 - Accessing *Annotation* window from the *Maintenance* applet

5.2 Saving an annotation to the server

Any modifications done in the *Resource annotation window* have been made only locally so far. The changes will be made persistent only on submitting the changes to the RAT-O server.

Remark: Changes non-submitted to the server can not be taken into account by the process searching for annotated resources whether using text-based or semantic search.

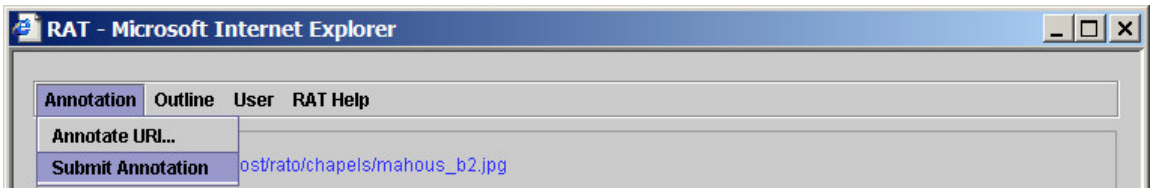


Figure 14 - Submitting an annotation to RAT-O server

The user is informed on successful submitting the annotation to RAT-server by a pop-up message shown in

Figure 15 - Successful submission to RAT-server

5.3 Search for resources

RAT-O provides the user with the search functionality, which allows him to fast find annotated resources, which fulfil the given search criteria.

RAT-O offers two ways of searching resources:

- **Text-based search** – see section 5.3.1, and
- **Semantic search** – see section 5.2.

5.3.1 Text-based search

Text based search is aimed at finding resources, whose annotation contain the specified fragment of text in any of the following slots (see Figure 5 for interpreting the slots):

- Caption,
- Scope Note,
- Informal Description,
- Keywords.

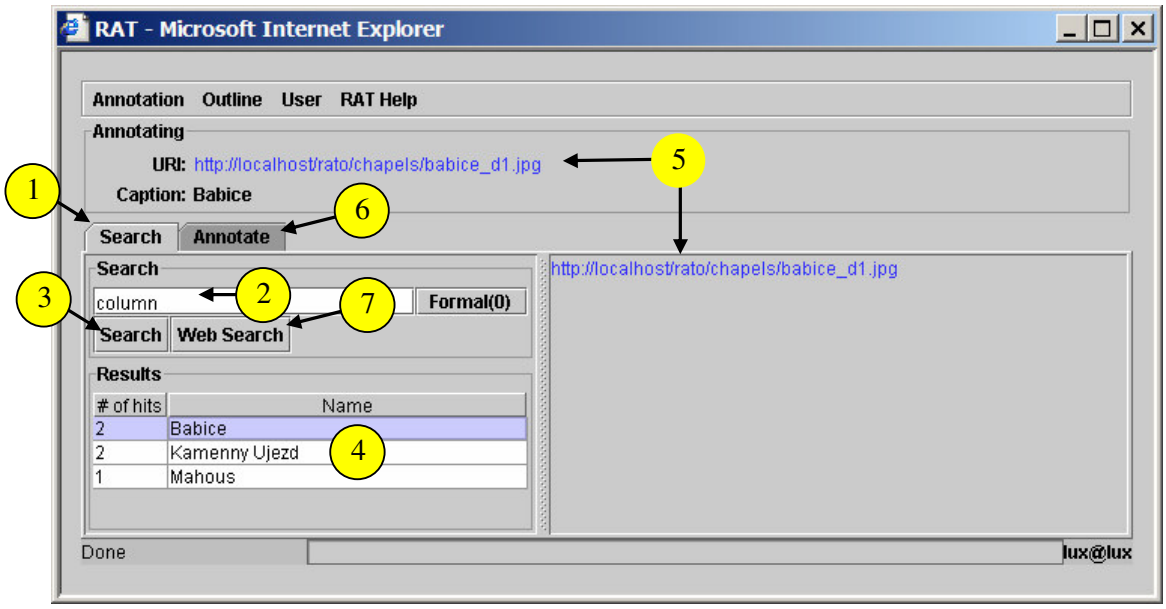


Figure 16 - Text-based search

To carry out the text-based search, the user shall follow the steps listed below. The numbering of these steps corresponds to the numbers in yellow tags shown in Figure 16:

1. Select the *Search* tab of the *Resource annotation window*.
2. Enter the search string to the text box labelled *Search* (Tag (2) in Figure 16).
3. Press the *Search* button.
4. Annotations, which have been found, are listed in (4). By clicking on any of them the resource becomes the **selected** one (blue stripe).
5. Number (5) tags the (clickable) hyperlink to the selected resource.
6. On selecting the *Annotate* tab, the full annotation of the selected resource will be shown (ready to be further modified) in *Resource annotation window*.
7. When clicking on the *Web Search* button, the Internet-wide search will be done. This step can be carried out any time after step (2).

5.3.2 Semantic search

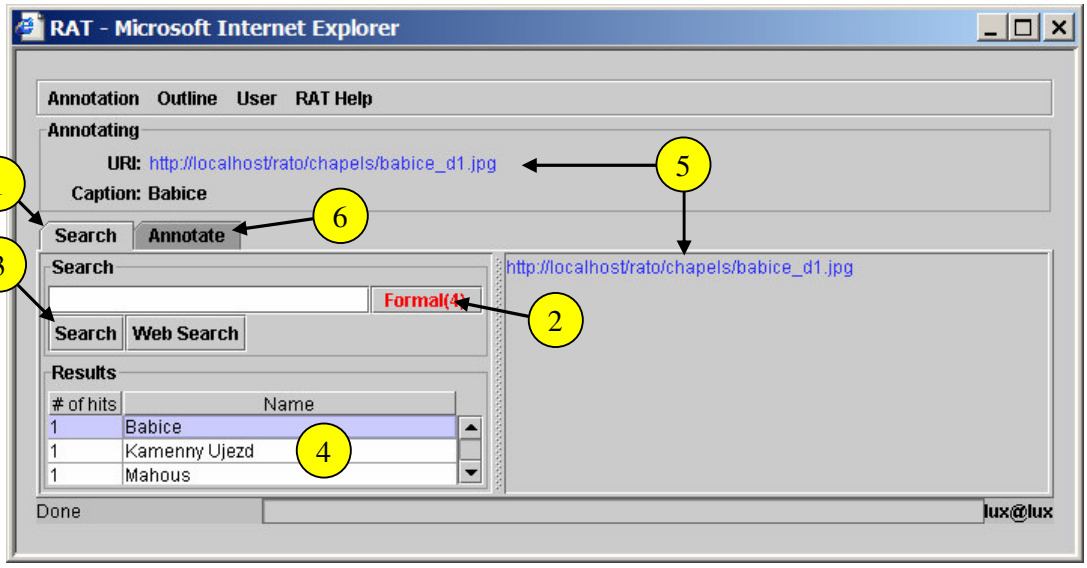


Figure 17 - *Semantic query definition* dialog

When carrying out the semantic search, the user proceeds similarly as in the case of text-based search, i.e.:

1. Select the *Search* tab of the *Resource annotation window*.
2. Press the *Formal* push button (Tag (2) in Figure 17) in order to define the semantic query. For defining the formal query follow the scenario illustrated in Figure 17. The label of the *Formal* push button becomes red after defining the semantic query. The number in the parenthesis specifies the number of concepts taking part in the semantic query.
3. Press the *Search* button.
4. Found annotations are listed in (4). By clicking on any of them the resource becomes the **selected** one (blue stripe).
5. Number (5) tags the (clickable) hyperlink to the selected resource.
6. When selecting the *Annotate* tab, the full annotation of the selected resource will be shown (ready to be further modified).

The scenario of **defining the semantic query** is illustrated in Figure 18. It starts by opening the semantic query definition dialog upon pressing the *Formal* push button (see tag 2 in Figure 17). The user selects zero or more concepts from zero or more available ontologies.

The semantic query requests the RAT-O server to find all annotations, in which some of the selected concepts (or their specialisation) has been assigned to some of the keywords taking part in the annotation.

The results are sorted according to the number of hits. It means that the annotations associated with the highest number of concepts belonging to the semantic query will be on the top of the result list.

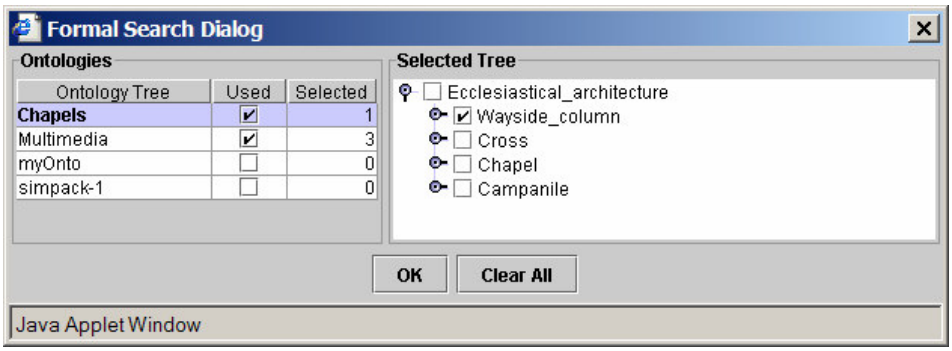


Figure 18 - Defining the semantic query

Remarks:

1. If both the search string and the semantic query have been defined at the same time, both text-based and semantic searches will be carried out. The results will contain annotations, which meets the text-based and/or semantic search conditions.
2. The semantic query remains defined while the *Formal* push button (see tag 2 in Figure 17) is red. The query can be re-defined after pressing the *Formal* push button again.

6 Authoring presentations

When the user wants to create a document with the help of annotated resources, he/she opens the *Outline editing window* of RAT-O (see Figure 19). For details on how to open the *Outline editing window* see section 5.1.

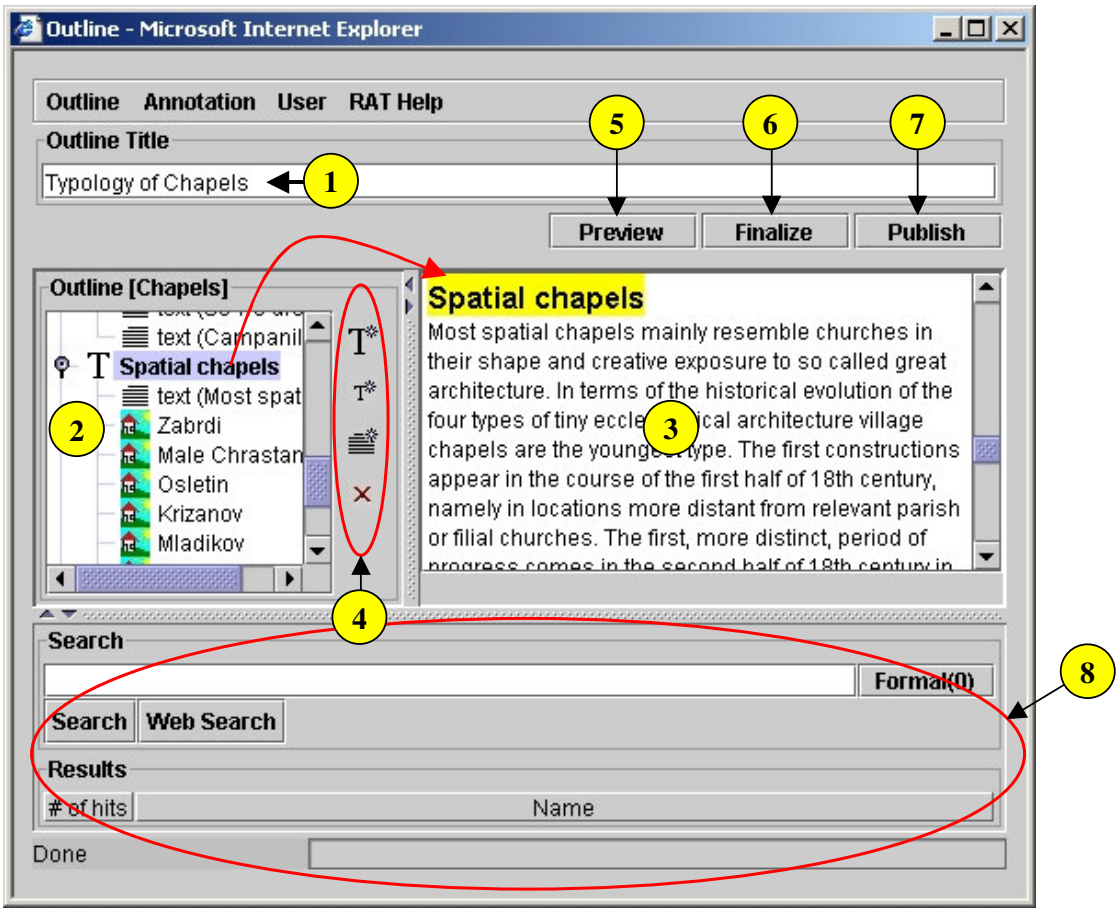


Figure 19 - ***Outline editing window***

There are the following (groups of) controls on the *Outline editing window*:

1 The editable text field **Outline Title** is aimed at defining the title of the outline. This is the title of the future presentation generated from the outline - see push buttons *Preview* (5), *Finalize* (6), and *Publish* (7). It is not the name of the file, to which the outline will be stored (see section 6.2) on RAT-O server.

2 The field (2) is aimed at defining the tree-like structure of the narrative, i.e. its outline (also known as plot). Individual non-leaf nodes of the tree represent individual sections or sub-sections of the outline, the leaf nodes represent individual text paragraphs or annotated resources (typically pictures) included to the outline.

The nodes of the tree are selectable. On selecting a node in the tree (2), the corresponding paragraph will be highlighted (its background will become yellow) in the area (3). If the selected node is a non-leaf node (it represents a (sub)section), the highlighted paragraph in (3) corresponds to the heading of that (sub)section. If the selected node is a leaf, the highlighted paragraph in (3) is the text paragraph attached to that leaf node.

Individual types of nodes are indicated by respective icons:

T This icon denotes a node, which is a *Topic*, i.e. a (sub)section of the plot. The heading of that (sub) section will represent this node in the narrative.

Note that the root node of the outline is represented by its *Outline Title* (1) in the narrative (3).

This icon denotes a node, which represents a textual paragraph in the narrative.

This icon denotes a node, which represents an annotated resource (typically a picture) included to the narrative. The node name (shown to the right to the icon) is the caption of the annotated resource.

Plot re-structuring: The outline can be easily re-structured simply by dragging a node and dropping it to the desired position in the tree. The respective paragraph in the area (3) will follow the node to the respective position within the narrative.

3 The area (3) represents a simple textual view of the narrative. It consists of a linearly ordered list of paragraphs, which correspond to individual nodes of the tree-like structure of the narrative – see (2).

When clicking on a paragraph, this paragraph becomes the current one.

The current paragraph is highlighted in (3). The tree node corresponding to that paragraph becomes selected in (2). The current paragraph is editable.

4 There are four push buttons located in the area (4), which are aimed at adding new nodes to the plot and/or removing the selected node from the plot. In particular, the following four push buttons are available:

Add a new *Topic* to the outline. *Topic* denotes a section of the first level (immediately one level under the root node).

Example:

Let the current paragraph is as shown in Figure 20.

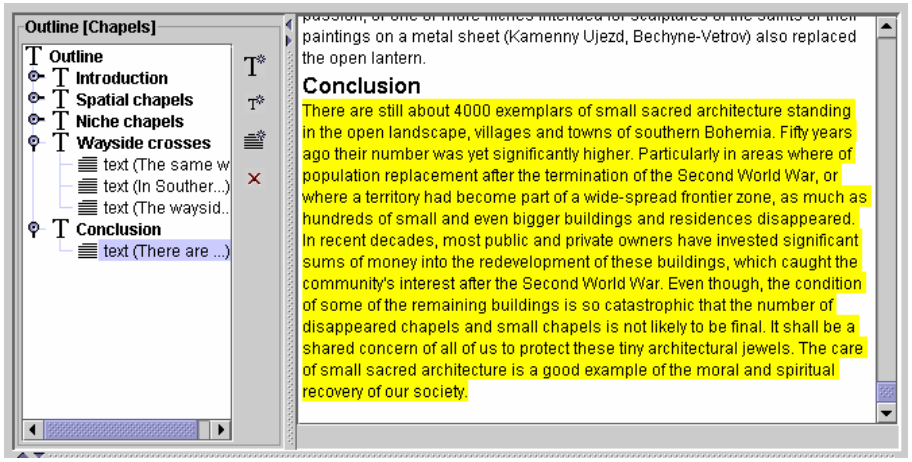


Figure 20 - Before adding a new topic

After adding a new *Topic*, a new level-one node will appear as shown in Figure 21.

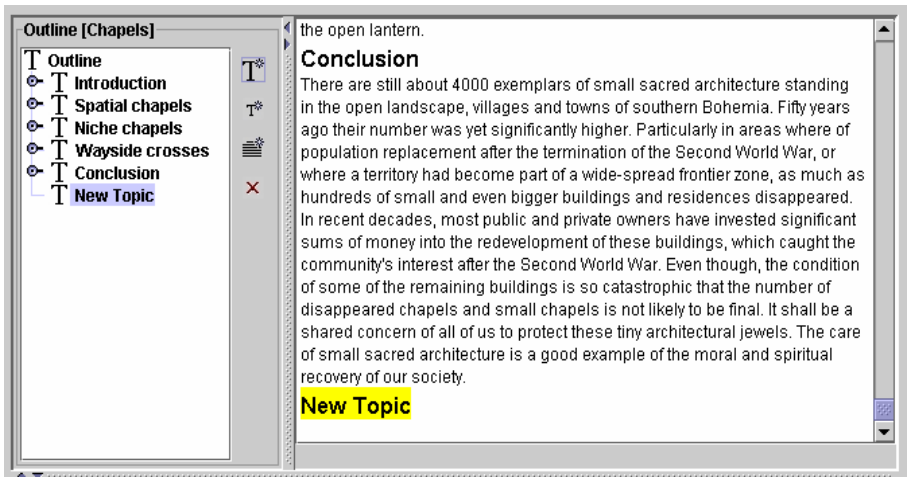


Figure 21 - After adding a new topic

Add a new *Sub-topic* to the outline. I.e. a narrative sub-section will be added within the current section.

Example: Let the outline be as shown in Figure 20 again. After adding a new sub-topic, the outline will look as shown in Figure 22.

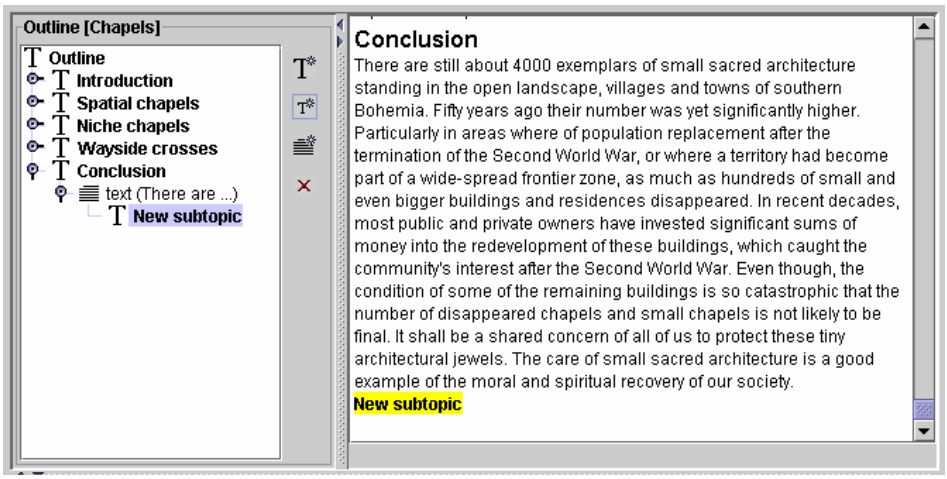


Figure 22 - After adding a new sub-topic

Add a new *text paragraph* to the outline. A new text paragraph will appear under the current one.

Example: Let the outline be as shown in Figure 20 again. After adding a new sub-topic, the outline will look as shown in Figure 23.

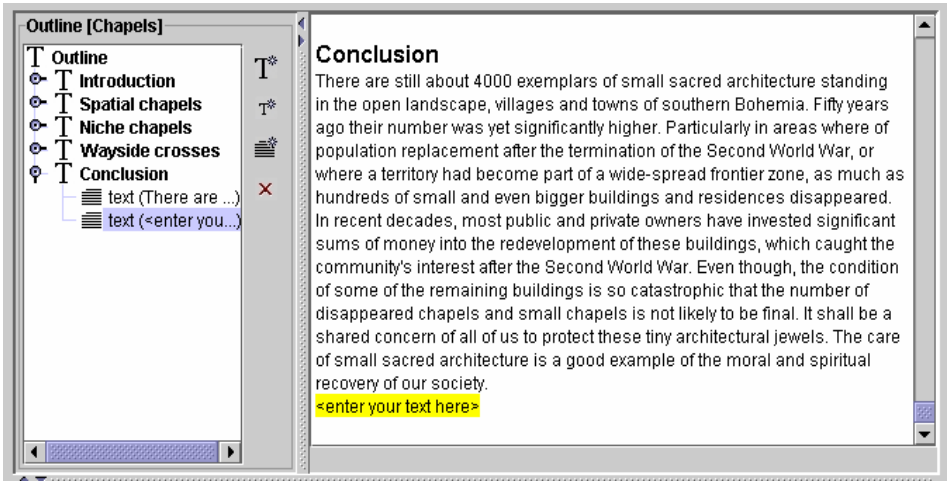


Figure 23 - After adding a new text paragraph

This push button removes the selected node from the outline.

5 The *Preview* push-button causes showing a preview of the final narrative without making the narrative persistent on RAT-server. Figure 24 shows an example of narrative preview.

Figure 24 – A *Preview* example

6 The *Finalize* push button causes generating the narrative in *html* format and saving it on RAT-O server without presenting it to the user.

7 The *Publish* push button causes generating the narrative in the CIPHER proprietary XML-based format and submits it for publishing on the community of interest portal[†].

[†] For details on publishing narratives on CH-Portal see chapters CH-Publisher and CH-Portal in CIPHER deliverable D15.

8 The bottom of *Outline editing window* contains a frame providing the search capabilities as described in 5.3. This makes possible to search for suitable resources directly on the *Outline editing window*.

After a set of resources meeting the search criterion has been found. The user can select one of them, drag it and drop it to the suitable position in the tree (2).

Example: An example is illustrated in Figure 25. Let the user searches for all resources, whose annotations contain the word *"column"*. The RAT-O search functionality (see section 5.3) returns a set of three resources (*Babice*, *Kamenny Ujezd*, and *Mahous*) in the list on the bottom of the *Outline editing window*. Let the user selects *Kamenny Ujezd* drags it over the node *Conclusion* in the tree (2) and drops it as indicated by the red arrow in Figure 25.

Figure 25 shows the result:

1. A new node has been added under the current node. Its name equals to the *Caption* of the respective resource annotation – i.e. *Kamenny Ujezd*.
2. A new text paragraph (the highlighted one) has appeared in the narrative presentation (3). Its text is a copy of the *Scope Note* of the respective resource annotation.

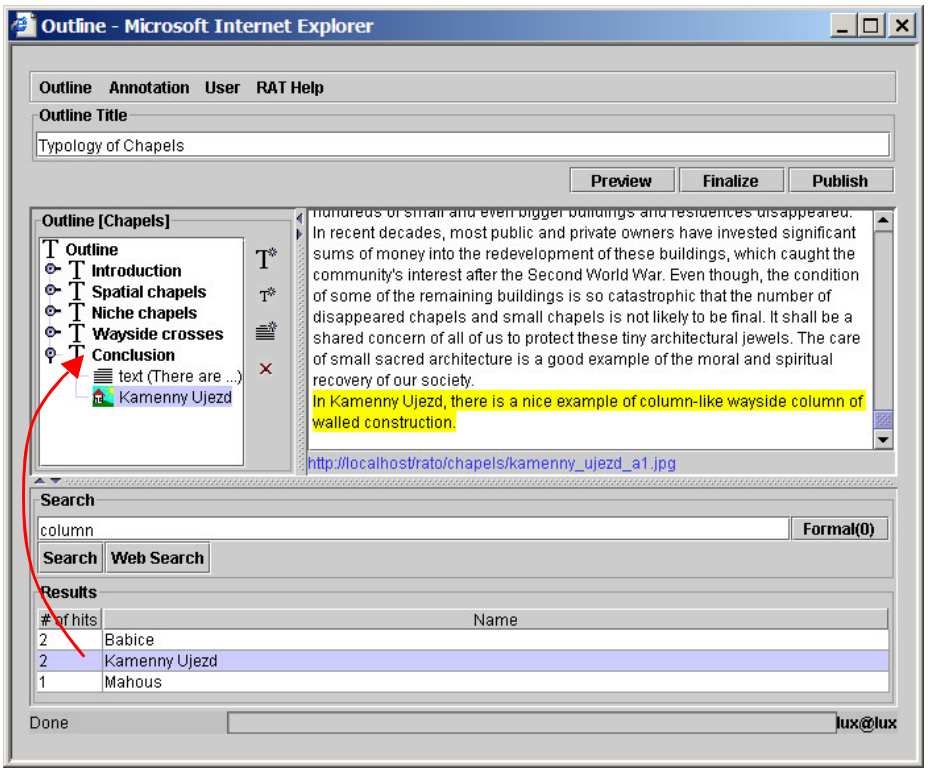


Figure 25 - After adding an annotated resource

6.1 Creating a new outline or editing an existing one

There are the following two ways how to access the *Outline editing window*:

- **The first way:**
  1. The user pushes the *Outline* button on the RAT-O home page (see Figure 2). Then the *Outline editing window* (see Figure 19) appears.
  2. For creating a **new outline** the user selects the *Outline→New* menu item in the main menu of the *Outline editing window* – see Figure 26.

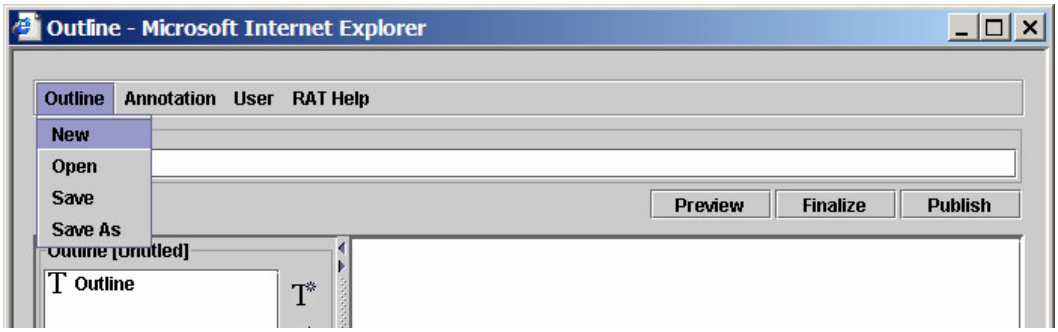


Figure 26 - Creating a new outline

  3. For editing **an existing outline** the user selects the *Outline→Open* menu item in the main menu of the *Outline editing window* - Figure 27.

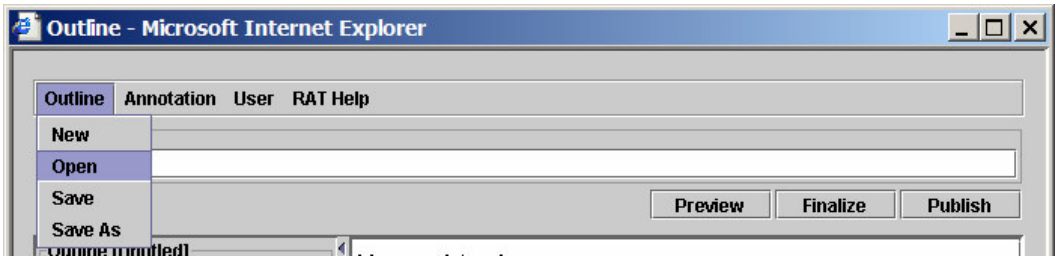


Figure 27 - Opening an existing outline

Then the user will be prompted to select the outline to be edited – see Figure 28.

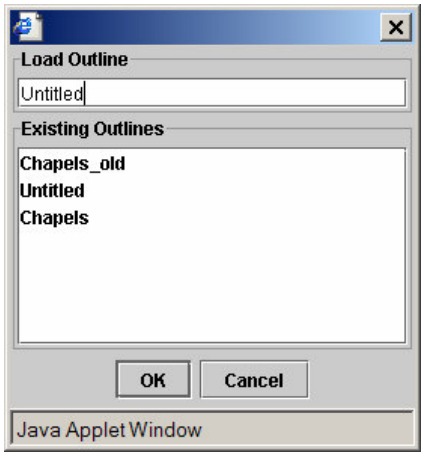


Figure 28 – *Load Outline* dialog

- **The second way:**

  In order to provide the user with the highest comfort, the *Resource annotation window* has the *Outline* item in its main menu. Thus, if the user has the *Resource annotation window* opened, he can immediately create a new outline (as specified above) without opening the RAT-O main window – see Figure 29.

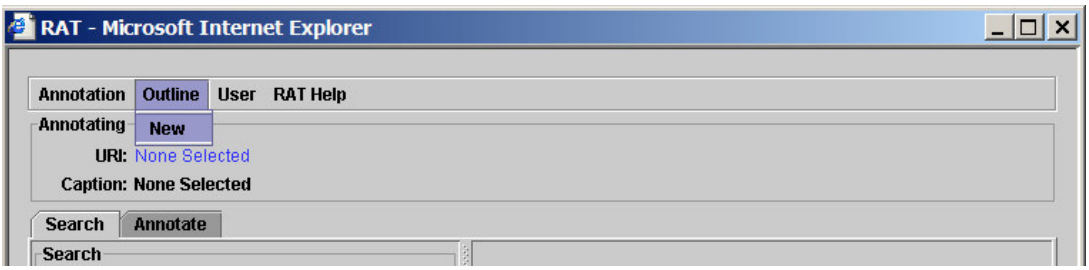


Figure 29 – Creating a new outline from the *Resource annotation window*

- **The third way:**

  Also the *Maintenance* applet provides the user with the possibility to create new outlines or edit existing outlines without having to open the RAT-O home page (see Figure 2):

  1. Select the *Outlines* tab of the *Maintenance window*.
  2. For creating a **new outline** press the *New* push button – see Figure 30.

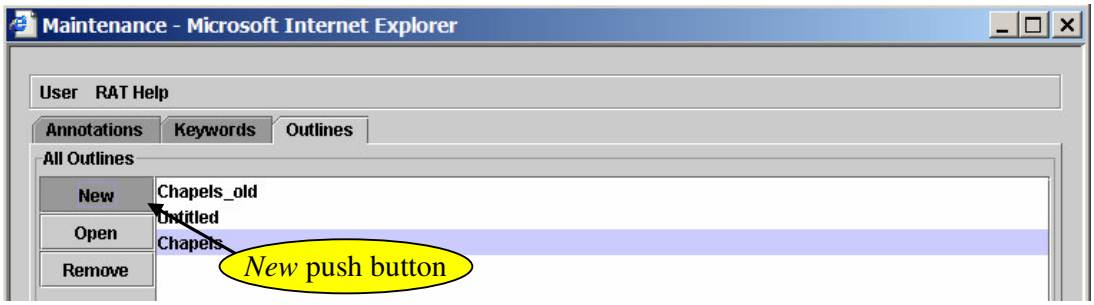


Figure 30 – Creating a new outline from the *Maintenance window*

  3. For editing **an existing outline** select the respective outline in the list and then press the *Open* push button – see Figure 31.

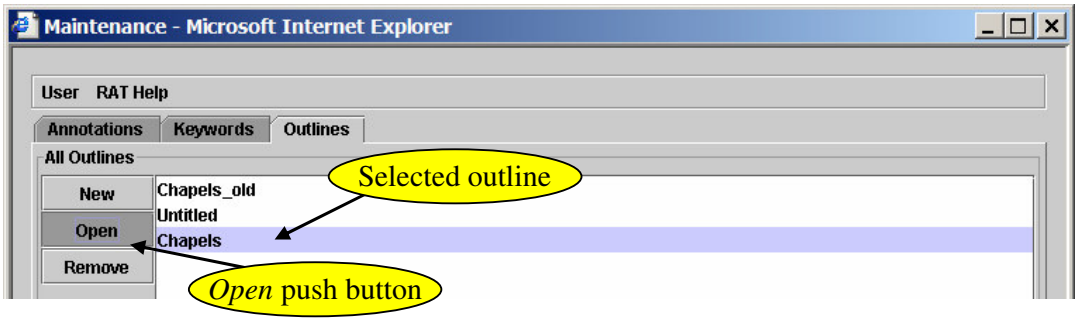


Figure 31 – Opening an existing outline from the *Maintenance window*

6.2 Saving an outline to the server

Note that all changes made to an outline have been made locally until the outline is saved to RAT-O sever. The actions invoked by *Preview*, *Finalize*, and/or *Publish* buttons are made on the content kept on the server. It means that an outline has to be saved to RAT-O server before making a narrative preview if the preview shall take recent changes into account.

Saving the outline can be achieved by selecting the ***Outline → Save*** item of the *Outline editing window* main menu as indicated in Figure 32.

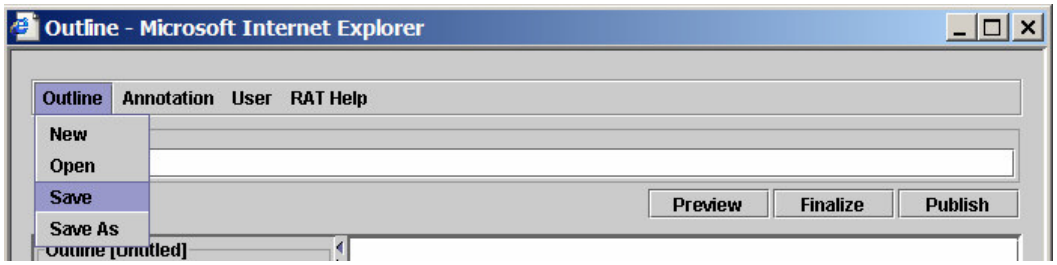


Figure 32 – Opening an existing outline from the *Maintenance window*

If the old content of the preview needs to be kept, it is possible to save the current status of the outline under another name. This can be achieved by:

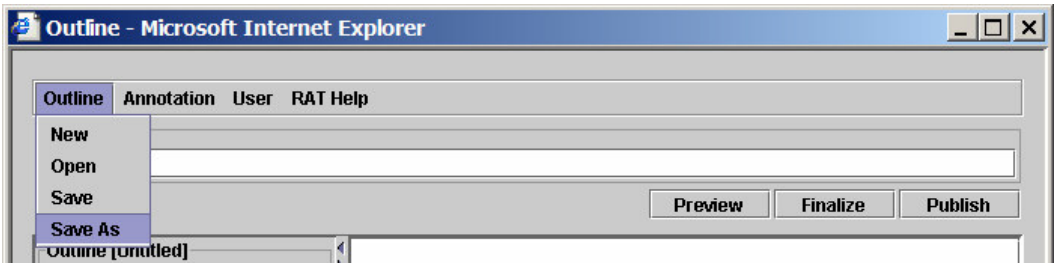


Figure 33 – Opening an existing outline from the *Maintenance window* under another name

1. Selecting the ***Outline → Save As*** item of the *Outline editing window* main menu as indicated in Figure 33.

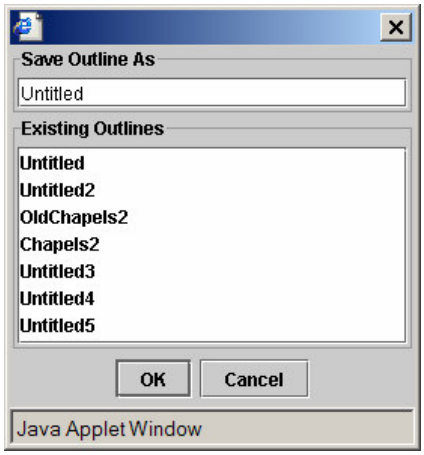


Figure 34 – *Outline Save* dialog

2. Specifying the name of the new outline by mans of the *Outline Save dialog* shown in Figure 34.

7 Collaboration

In order to enable user co-operation on annotations and creation of narrative outlines, RAT-O tool was extended. Currently it supports investigation of heritage resources by communities of interest. Technically speaking, new RAT-O functionality introduces annotation, outline and keyword versioning, working areas and user profiles.

7.1.1 Document Versioning

In a collaborative environment, where different authors may contribute to the shared content by submitting their individual documents and different authors may review and modify these documents, a problem of a loosing document consistency/integrity can easily appear. This phenomenon is well known in the IT community and is solved by special-purpose systems.

7.1.2 Version Conflicts

If RAT-O server was not equipped with appropriate algorithms, the following problem could arise. When a user saved an annotation or an outline, which had been modified meanwhile by another user, the recent modification would be lost without notifying any of the authors, who took part on its modification. This particular case is well known as *lost update* in concurrency management.

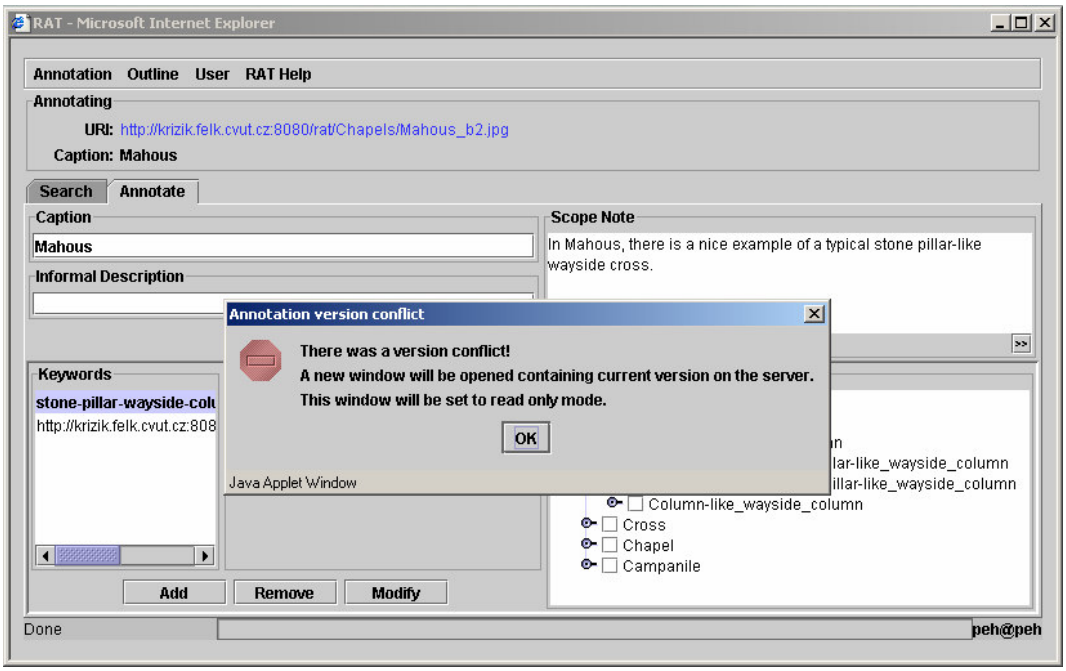


Figure 35 - Version conflict message

RAT-O server does not allow lost updates to arise. RAT-O server keeps track of document version numbers and when a version conflict is detected, it rejects storing the new version of the document, which is in conflict with the recently stored version, and warns the user, who is trying to save his modifications. The user is informed of this situation by a warning message (see the next figure).

After the user has closed the warning message pop-up window, a new RAT-O window will appear. It will display the annotation/outline with current version of annotation/outline. The originally edited window becomes read only. This is visually indicated by a violet banner *"read only mode"*. Now, the user can see his modifications in the read-only window and can manually transfer them to the newly opened window and update the current status of the document in a consistent way. In order to provide him with a higher level of comfort, RAT-O client has been equipped with the "drag and drop" functionality. Thus, the user can drag the relevant information from the read-only window and drop it to the read-write window.

The mechanism described above prevents lost updates and thus loosing information without user's control.

Figure 36 shows a snapshot of user's screen after detecting a version conflict.

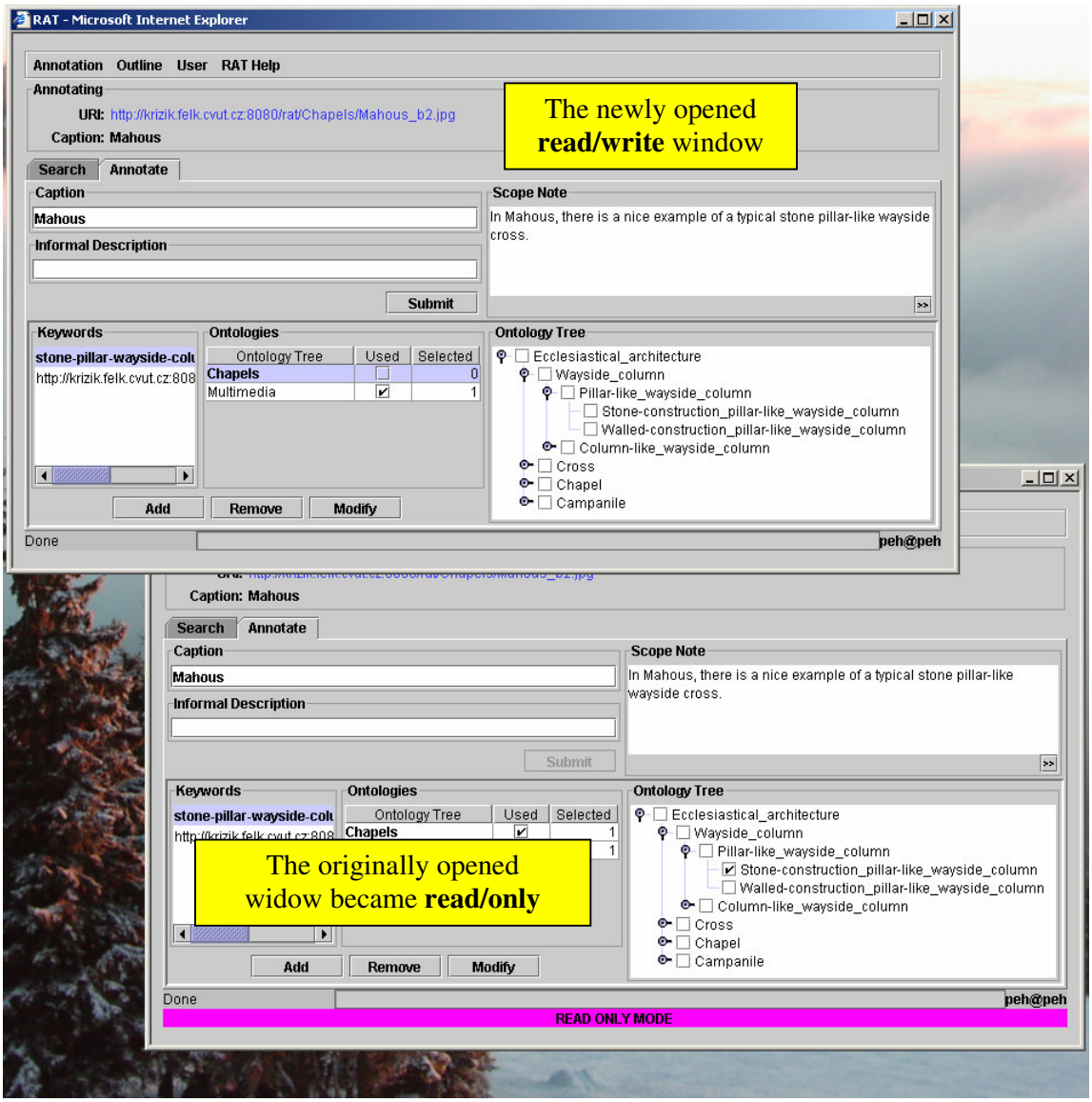


Figure 36 - The read/write window automatically opened when a version conflict has been detected

As soon as the user brought the document (annotation/outline) to a required status in the read/write window, he can save it normally to the server[‡].

7.2 Working areas and User Profiles

RAT-O document repository is organised into three categories of *working areas.*

- *Private* working area is a private repository, where a regular user can store and manage his/her own annotations and developed outlines.
- *Project* working area is intended as a collaborative "cooking pot", where the user community can build annotations and documents in common. In the target situation, there should be common consensus on the structured contents of the working area.
- *Project* working area is a repository of final annotations and document outlines, which are publicly available for each member of the user community.

Authors are given their privileges in RAT-O based on three distinguished user profiles: *User* (default profile), *Public*, and *Project.*

Table 1 gives an overview of access rights to various types of working areas by users of different user profiles.

	User Profile		
	User	**Project (Any Group Member)**	**Public (Editor)**
Owned Private Area	Read / Write	N / A	N / A
Other Private Areas	None	None	None
Public Area	Read-only	Read-only	Read / Write
Project Areas	Read / Write	Read / Write	Read / Write

Table 1 - Access rights of different user profiles[§]

The profile *User* is intended for typical users, who develop and maintain their own resource annotations and outlines as well as access the shared working areas.

Public profile is assigned only to a (usually one) person, who is responsible for maintaining the public annotations and outlines for the whole user community in the *Public* working area.

When a new project working area is to be set up, a user with *Project* profile is authorised to create and maintain it.

[‡] Note that in an unfortunate case another user may have saved the document meanwhile our resolving the conflict. Naturally, in such a case a series of version conflicts may happen.

[§] For read-only access, the RAT-client window gets the violet bar at the bottom indicating the read-only restriction – see Figure 36.

Moreover, if a user wishes to change the current working area during the work with RAT-O, specification of the only area name is sufficient via a menu action and he/she need not log in once more.

8 Maintenance

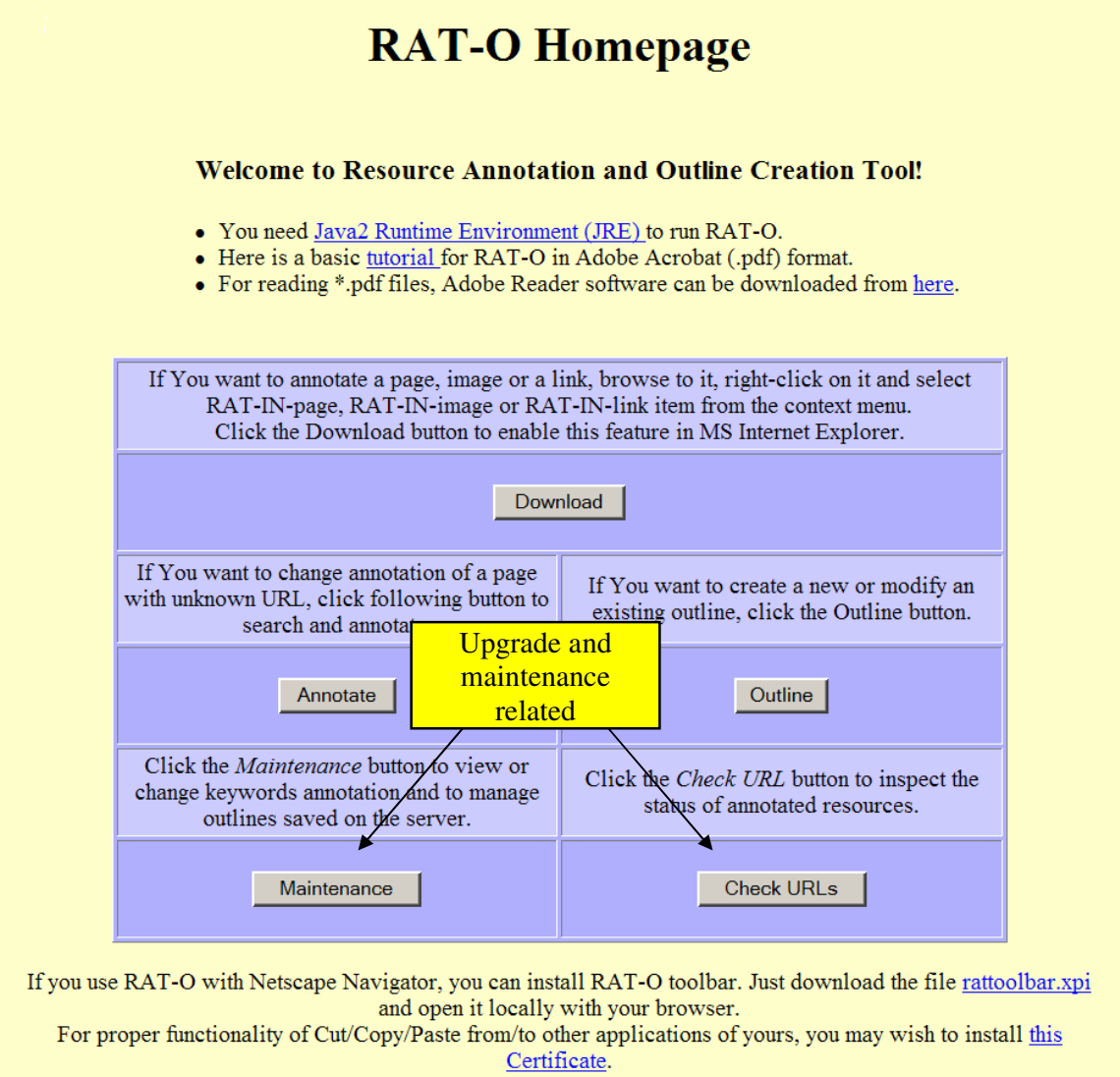


Figure 37 - Accessing the RAT-O maintenance functionality from RAT-O home page

In order to enable the user to maintain/upgrade the content of his/her own workspace of annotated resources or a workspace shared with others, development activities within CIPHER project have been focused on developing RAT-O maintenance modules in final stages of the CIPHER project.

The annotation tool has three tabs (see e.g. Figure 38), which are devoted to separate areas of maintenance and are described in the following sections.

8.1 Maintaining Annotations

On opening the maintenance applet, the Annotations tab is to be opened. The applet has to load all annotations from the given workspace. However, it must provide RAT server with user's credentials if the user has not been logged-in at the moment.

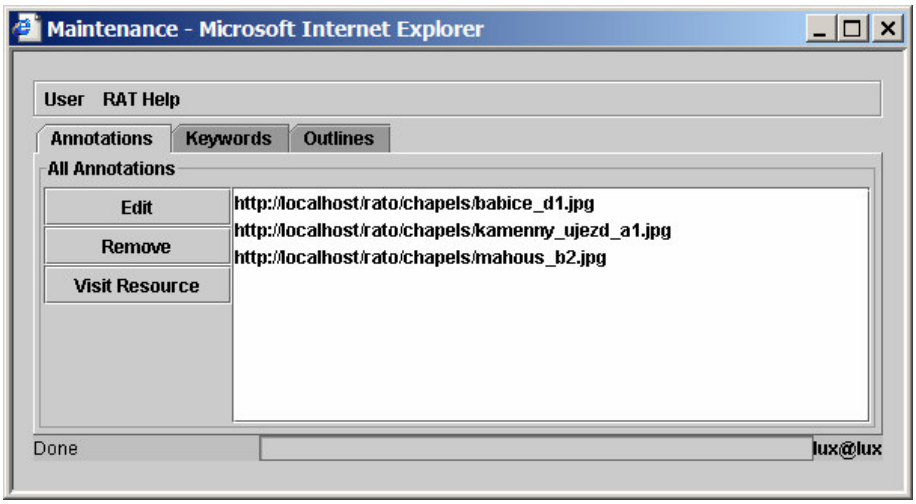


Figure 38 - Maintaining annotations

There are the following push buttons on the *Annotations* tab of the *Maintenance* applet:

- **Edit**: On pressing the button, a new RAT-O window will be open in order to allow the user to modify the selected annotation.
- **Visit resource:** On pressing the button, a new Internet browser window will be open and will show the respective resource, which is subject of the selected annotation.
- **Remove**: On pressing the button, the selected annotation will be removed from the given workspace. At the end of the *Remove annotation* scenario, the list of all available annotations will be reloaded.

8.2 Keywords tab scenarios

The keywords tab is similar to the keyword part of a resource annotation. The functionality is the same.

- The **Add** button on the *Keywords* tab allows defining a new keyword. Before the new keyword is accepted, the client checks if its name is really unique.
- The **Delete** button removes the keyword.
- The **Rename** button opens a dialog aimed at entering the new name for the selected keyword.

The user can modify the definition of any keyword – namely its classification to ontology tree(s) – on the *Keywords* tab of the *Maintenance* applet. These modifications are not sent to the server immediately. Only on pressing the *Submit* push button, the changes of the selected keyword are sent to the server. The *Submit All* push button has a similar meaning – it starts a sequence of multiple *Submit keyword* scenarios with the goal to submit changes of all modified keywords to the server.

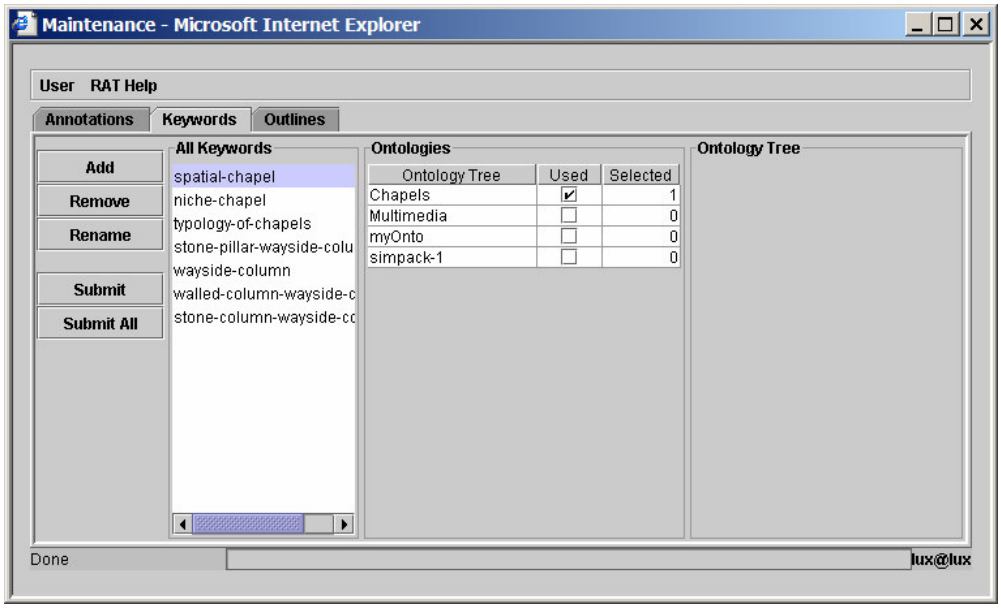
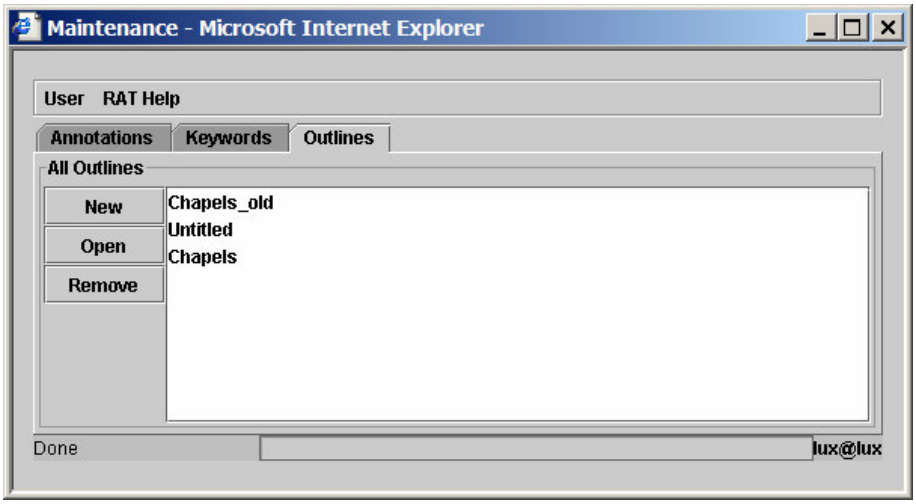


Figure 39 - Maintaining keywords

8.3 Outlines *tab scenarios*



There are the following push buttons on the *Annotations* tab of the *Maintenance* applet:

- **New**: On pressing the button, a new RAT-O window will be open in order to allow the user to create a new outline.
- **Edit:** On pressing the button, a new RAT-O window will be open in order to allow the user to modify the selected outline.
- **Remove**: On pressing the button, the selected outline will be removed from the given workspace. At the end of the remove, the list of all available annotations will be reloaded.

8.4 Workspace management

Every user registered at the RAT server has his private workspace at disposal. The workspace is identified by user's name. There is also the public workspace available to all users registered at the RAT server. In order to allow collaborative approach to organising resources, there exist project-related workspaces. Every user registered at the RAT server has assigned access rights to individual workspaces.

In order to allow exchange of content between users and/or projects, the design of RAT-O makes possible to open simultaneously separate RAT-O windows for different workspaces (i.e. also for different users) at the same computer. This generic approach is valid also for maintenance windows. Having several maintenance windows opened on various workspaces, user(s) can copy content between those workspaces simply by dragging and dropping individual content items (keywords, annotations, outlines) from one maintenance window to another one.

8.5 Checking annotations validity

If the user had annotated a resource located on a remote host, which is not under his control, it may happen that the resource was modified or deleted after some time by its owner. In such a case the collection of resource annotations created by the user may become inconsistent.

This may cause that some his presentations (outlines) may refer to non-existing or invalid resources. That is why a module for checking validity of resources has been developed.

For each annotation, RAT-O server keeps a timestamp when the particular resource was checked last time. The module implementing the *"Check URL"* functionality scans all resources referenced by all annotations of given workspace. For each of them the module sends a request (GET request applying the GETLASTMODIFIED attribute in terminology of http protocol) for providing it with the resource if it has been modified since the last check.

For each annotation do:

1. Select a URL.
2. Load the timestamp associated with the URL. If there is none, take 0.
3. Try to load the resource from its URL using the http GET command with the GETLASTMODIFIED attribute set to the URL's timestamp.
4. Parse the server answer without actually downloading the resource. If the server has sent the actual modification time of the resource, it is displayed for user information. Possible server replies are:
   - Error (resource not available, server not accessible etc.). It means that the resource is not accessible and thus it is not possible to resolve its change status.
   - 304 – NOT MODIFIED. The resource was not modified since the last check. The current time is saved to the xml file as the last check.
   - Other. Although the HTTP contains MODIFIED reply, not all http servers reply appropriately. All other replies are processed as modified.

The meaning of the table columns shown in Figure 40 is as follows:

Annotated URL: It is the URL of the particular annotation. By clicking on it, the user can inspect the resource visually.

Caption: Caption of the particular annotation entered by the user when annotating the resource.

Last Check: result of the last check of the particular URL.

Track Changes: It may happen that the respective resource is frequently reported to be modified, but its core content does not change significantly. This is the case of some dynamic html pages on some http servers or pages containing dynamic advertisements. In such a case the user may want to exclude this URL from the next check. He can do that simply by unchecking the checkbox in *Track Changes* column for the particular row.

Ignore last change: Normally, a timestamp of the last check associated with the URL would be replaced with the timestamp of the current check. However, the user may want to prevent this modification. This can happen if he believes that the "resource not available" result may be caused by a temporary failure of the target http server. By checking the *Ignore last change* checkbox the user prevents modification of the timestamp associated with the resource URL.

Values of all the checkboxes in *Track Changes* and *Ignore last change* columns will be taken into account on pressing the OK button.

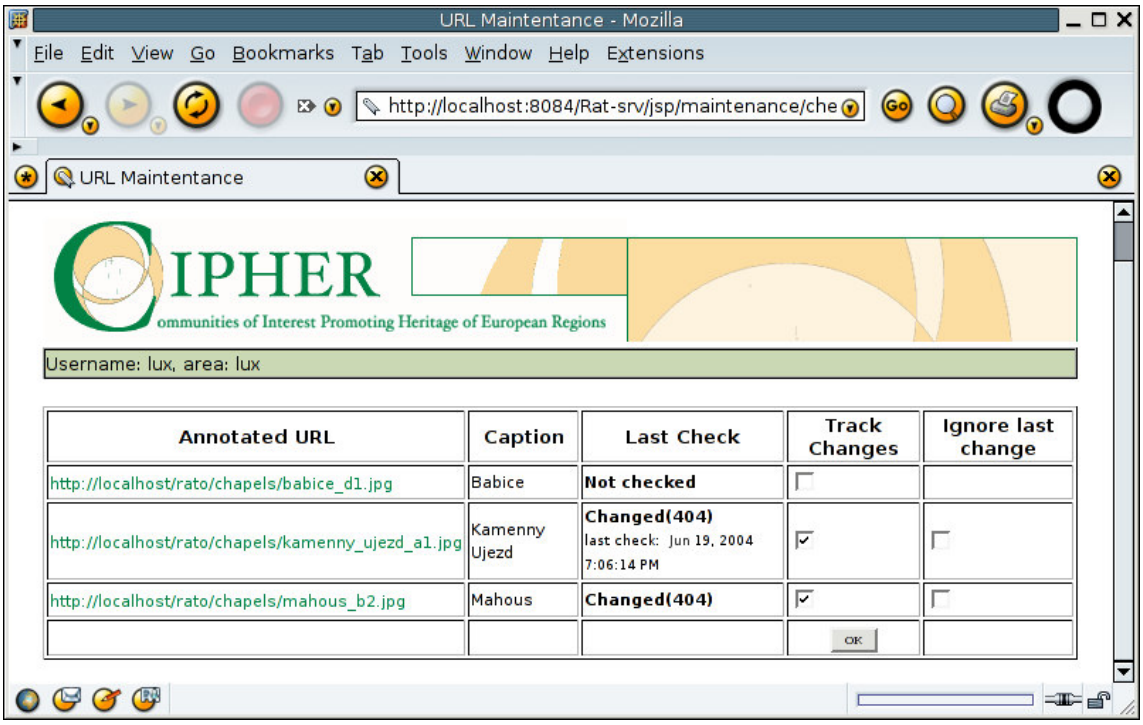


Figure 40 - *Check URLs* result page

9 Acknowledgement

RAT-O tool has been developed within the CIPHER project (Enabling Communities of Interest to Promote Heritage of European Regions) funded by the 5th Framework Programme of European Commission. For details on the project see http://www.cipherweb.org.

POWERED BY CIPHER