Journal of Universal Computer Science, vol. 14, no. 10 (2008), 1695-1716
submitted: 25/3/08, accepted: 26/5/08, appeared: 28/5/08 © J.UCS

Applications of Mash-ups for a Digital Journal

Muhammad Salman Khan
(Institute for Information Systems and Computer Media
Graz University of Technology, Graz, Austria
skhan@iicm.edu)

Narayanan Kulathuramaiyer
(Faculty of Computer Science and Information Technology
University of Malaysia Sarawak, Samarahan, Malaysia
nara@fit.unimas.my)

Hermann Maurer
(Institute for Information Systems and Computer Media
Graz University of Technology, Graz, Austria
hmaurer@iicm.edu)

Abstract: The WWW is currently experiencing a revolutionary growth due to numerous emerging tools, techniques and concepts. Digital journals thus need to transform themselves to cope with this evolution of the web. With their growing information size and access, conventional techniques for managing a journal and supporting authors and readers are becoming insufficient. Journals of the future need to provide innovative administrative tools in helping its managers to ensure quality. They also need to provide better facilities for assisting authors and readers in making decisions regarding their submission of papers and in providing novel navigational features for finding relevant publications and collaborators in particular areas of interest. In this paper, we explore an innovative solution to address these problems by using an emerging Web 2.0 technology. We explore the application of mash-ups for J.UCS - the Journal of Universal Computer Science and encourage readers and authors to try out the applications (see section 11 Conclusions). J.UCS can then serve as a model for contemporary electronic journals.

Keywords: mash-up, annotations, Web 2.0, metadata, decision making, scholarly network
Categories: H.3.3, H.3.4, H.3.5, H.3.7, H.4.3, H.5.1

1 Introduction

The Journal of Universal Computer Science (J.UCS) is an open access, high quality, peer reviewed electronic journal having more than 1000 publications since 1994. J.UCS has been published in volumes (one per year) with at least 12 yearly issues. It has more than 300 highly profiled editors across the world enabling a broad coverage of all aspects of Computer Science [J.UCS 2007]. At the end of each year, a volume of J.UCS is published as a printed copy and archived [Maurer and Schmaranz 1994], [Calude et al. 1994]. This printed version exactly matches the electronic version with the same pagination as the online edition. The electronic versions are thus static documents, frozen over time. This practice of having print equivalent for an electronic journal has also been suggested by McElroy [McElroy 2002].

Since its beginning, J.UCS has introduced and incorporated a number of novel ideas to support its readers, authors, editors and administration e.g. the annotation feature. An annotation refers to a note or comment about an existing publication informing readers about new research results or errors. Annotations in J.UCS are applied subject to an evaluation based on a refereeing process and are only added if deemed appropriate. Verified annotations make it possible to insert only objective comments and prevent the misuse of annotations for personal disputes. Other features of J.UCS include full-text search of its contents, fast access to published papers, distribution of contents over a wide range of servers and a better content management using Hyperwave [Maurer and Schmaranz 1994]. Furthermore many new features and ideas are being explored to be incorporated into J.UCS, such as mash-ups [Kulathuramaiyer 2007] and links to the future. The original idea of links to the future and its design via the application of annotations together with other novel ideas were specified in [Maurer 2001]. Additional ideas about links to the future were then discussed in [Krottmaier 2003] and [Afzal et al. 2007]. The "links to the future" ability maintains the static nature of papers while dynamically accumulating related works via annotations [Afzal et al. 2007].

Mash-ups are becoming an important application development paradigm for emerging Web applications. Their ability to integrate data from multiple sources into a single web environment has tremendous potential. In our continued efforts to enhance the quality of the journal we explore the development of a social network for a scholarly community. This paper reviews the ability in supporting such facilities. Furthermore, for expanding the coverage and impact of the journal, the internal administration of the journal (which includes the editorial strength) needs to be expanded as well, supported by emerging technologies. This paper will also serve as a guide to users of the journal as it highlights the newly available functions.

2 Related Work

Electronic journals have been continuously upgrading their services based on technological developments. Efforts have been made in providing high level access options to the users of e-collections using 2D or 3D maps involving semantic analysis and visualization of relevant topics, topics map, citations map, clustering, keywords in context, concept space, and concept analysis [McKiernan 2003]. Some journals also provide translation services, personalization, embedded multimedia within text of articles, concurrent searching of other information sources, multiple accesses/ search to other journals and a citation index (links in the references to the cited article in the same journal or other journals) [Liew and Foo 2001]. Some important aspects of modern digital libraries like intelligent search, visualization of search results, conceptual searching, white lists, adaptive interfaces have been discussed in [Maurer et al. 2006].

Research has also been focussed on content analysis of publications to analyze patterns over time, geographical distribution of publications, hot research areas, experts in a field, co-authorship, citations, co-citations, research fronts, institutions participations etc. either statistically [White and McCain 1998], [Tutarel 2002], [Menz 2001], [Hawkins 2001], [Beattie and Goodacre 2004] or via interactive visualizations [Lee et al. 2005], [Synnestvedt et al. 2005], [Kang et al. 2007]. In

addressing the same issue, this paper explores the exploitation of emerging technologies for supporting the discovery and visualisation of intrinsic patterns and the provision of interactive user friendly facilities for the administration and readership of journals.

With its growing information size, readership, authors and editors, the management of J.UCS has experienced some administrative and users concerns in the ensuring of its long-term sustainability. The following section describes these concerns.

3 Major Concerns Addressed by this Paper

The major concerns addressed with regards to the users of the journal include concerns of management with respect to effective administration as well as potential concerns of authors and readers. We will first discuss the management concerns which emphasize the importance of employing mash-ups to support administrative tasks.

3.1 Management Concerns

3.1.1 Geographical Distribution of Papers

In expanding the publications of J.UCS it is necessary to gain insights and information about the current state of readership and accessibility of the journal. For example, there is a need to determine which locations (cities and institutes) are contributing less, more and which has stopped contributing. Such information can be extremely useful for a number of reasons. For instance, it allows the determination of coverage patterns and popularity of certain topics. It can also show places from where papers have never been submitted or places from where papers were coming in the past but the stream of submissions from these locations has turned into a trickle.

Furthermore, the administration of J.UCS also wants to know the trends of publications in a particular research area or in a particular location. It could also help the management in the analysis and review of proposals for special issues of J.UCS.

3.1.2 Geographical Distribution and Coverage of Editors

In principal the administration of J.UCS would like to have an even distribution of editors across the world with a balanced distribution across topics in order to sustain the journal's claim of being a truly universal and international publication instrument. In particular, there are potential intrinsic distributions patterns that need to be uncovered, in enhancing the image of journal. To illustrate this point we consider the following scenario; where all editors in a particular research area had come from a specific region could lead to the perception about the journal being too restricted or even been seen to be biased (especially if there are political or personal differences with respect to this region). The management thus needs to find out about such patterns and to ensure the balanced representation of editors across the globe in each research area.

3.1.3 Determining Groups of Authors and Editors

J.UCS adopts a unique approach regarding the review process of submitted papers. When a submission is received, it is forwarded to all the members of the J.UCS editorial board. If at least three editors sign up for a review of the paper, the submission is accepted and the review process is initiated for the paper. If the required number of editors is not adequate to review it, the paper is forwarded again for the second time to all the editors. If still there are not enough editors signed up for its review the managing editor then asks the author of the paper to nominate six editors (possibly outside of J.UCS). The managing editor then selects 2-3 editors from the nominated list of editors and asks them to proceed with reviews. The managing editor may also further request these specialists to become members of the editorial board of J.UCS: all editors have to be at least tenured Associate Professors or equivalent, and have to have a substantial publications record in reviewed journals. This approach distinctly differs from the approach employed in other journals which usually follow a different procedure: papers submitted are sent for reviews directly to selected editors, based on their area of expertise.

Although J.UCS has this unique refereeing process with its own benefits (fast review process, reduced management burden for manager editorial), this approach may be subject to abuse or may lead to the grouping of editors and authors. Such a grouping may then affect the quality of the journal.

Although we do not believe that such situations are currently happening, we highlight here the importance of dealing with this issue. As the journal expands it will become even more difficult to ensure that such phenomena do not happen. This issue will also need to be taken into consideration by other journals even employing alternative reviewing procedures.

3.1.4 Selection of Special Issues

In order to expand its coverage and focus on upcoming issues, J.UCS also publishes special issues periodically. J.UCS maintains a well defined guideline for special issues to become accepted and become published. For example, to ensure a high international standing, special issues with a large number of papers coming from the same country are in principle not considered.

3.2 Authors and Readers Concerns

3.2.1 Determining Collaborators

As in any particular discipline the scientific research depends on extensive social interactions or scientific collaborations [Kraut et al. 1988], the readers or potential authors may then be interested to know the affiliations of other authors in a particular research area in order to potentially collaborate with them.

3.2.2 Determining Distribution, Coverage and Expertise of Editors

The authors and readers may also be interested to know whether particular research areas have indeed high quality referees with an even geographical distribution. If editors distribution in a field are seen to be local or having an ethnic, religious or

other forms of bias, potential authors may consider it better off to submit papers elsewhere. This is exactly why the composition and distribution of the editorial team is one of the main concerns of the administration of J.UCS as mentioned earlier.

3.2.3 Navigation through Digital Publications

Navigating an electronic journal's contents is typically performed by browsing publications either via a directory listing of journal papers, searching facility (by author, keywords, title, full text etc.) for related papers, articles by topic, articles by authors, co-authors or other papers from the same authors etc. Alternatively, readers or authors may require a visual representation of the publications for a particular region or a particular research area. A visual display enables a quick overview with minimal efforts.

In an effort to address these issues in making J.UCS more manageable and to enable it to become a still more user centred digital journal, we explore a variety of solutions. In this paper we describe the use of mash-ups as a novel tool to harness the power of community dynamics in expanding J.UCS.

The following section and subsections describe the power of mash-ups in answering the concerns of both management and authors as described in the above sections.

4 Web Mash-ups: An Emerging Web 2.0 Paradigm

The term Web 2.0 was coined by Tim O'Reilly [O'Reilly, T. 2007] to describe the revolutionary growth of the web, which has now become a powerful platform for social networking. This new social computing paradigm has produced enormous contributions to the web with its socially generated contents. By engaging millions of users on the web, massive collaborative projects have been achieved e.g. YouTube [YouTube 2007], Flickr [Flickr 2007], Wikipedia [Wikipedia 2007], and many others.

A mash-up is an emerging Web 2.0 paradigm that allows anyone to combine pre-existing data or information which is accessible through a public interface or API from sources like Amazon, Google, Yahoo, eBay, etc. in innovative ways, enabling people to access customized information that matters to them in a meaningful way.

Programmableweb [Programmableweb 2007] serves as an important resource for the categorisation of information and the analysis of an evolving collection of interesting and useful mash-ups. According to this site, more than 3.45 mash-ups appear everyday. [Kulathuramaiyer 2007] has described the presence of mapping mash-ups, timeline mash-ups, meta-search mash-ups, image-based organisation mash-ups etc.

According to Programmableweb, about 50% of the total mash-ups are geographic (map based) mash-ups. Mibazar.com [Mibazaar 2007] illustrates the variety of Google-map based mash-ups that provide information on education, history, top celebrities, shopping, events and many others.

One example of such a mash-up is used by the New York City Coalition against Hunger. It is an organization which is engaged in solving the hunger problem of the New York city. By using a combination of Google Maps' free application programming interface, geographic information from ArcWeb, and its own

information about the locations of city's soup kitchens, the organization was able to build an online map of the city's charitable food providers' locations along with their contact information. As a result, the soup kitchens in the city have a fast and easy way to find each other, in order to coordinate work to solve a common problem [TechSoup 2007].

In this paper we explore the development of a mash-up for J.UCS by combining the J.UCS digital repository with Google Map APIs, to provide customized information for decision making.

In the next section we describe the mechanism we adopted in extracting the J.UCS metadata about publications, and the techniques adopted to refine and resolve the location related information of authors.

5 Information Extraction

J.UCS documents collections (papers) and their metadata about documents are stored and managed using the Hyperwave system [Hyperwave 2007], [Maurer 1996]. The Hyperwave system is an information management system that allows organization of knowledge and information in a sophisticated way. Publications in J.UCS have a corresponding metadata (XML) file (one for each paper) that contains all the information about that paper such as title, authors, institutions, cities, countries, keywords used in paper, area of research, date of publication, volume and issue number etc. In the development of the mash-ups, metadata about papers published was captured from the Hyperwave server using Hyperwave APIs and was represented in a relational database.

Preliminary experiments revealed that the location information of a large number of the authors was found to be missing, incorrect or not compliant to the standard form. In the next section we will discuss the approach employed to extract the correct location information.

5.1 Variations in Representation of Locations

The location data of authors first needed to be cleaned, as the data contained spelling mistakes (e.g. Unted Kingdom), variations in forms of data which includes abbreviations (e.g. US, U.S., USA, U.S.A, United States, United States of America; Zuerich, Zürich.)

In order to rectify and standardise the names of the countries and the cities, we employed the GeoBytes database [GeoBytes 2007] (containing the cities and countries information from around the world) to verify the city and country information of authors. Locations that did not have any match in the GeoBytes database were then identified. We manually constructed a database of mismatched words and associated them with the intended city and country names. As this information should have actually been verified at the point of data entry, the mash-up system developed could then serve as a tool for verifying data acquisition in the future. This derived geo-data names database will be applied to verify non-standard or incorrect information of locations entered in the J.UCS repository.

5.2 Determining Unknown Location Information of Authors

The difficulty in ascertaining the exact city-location of institutions has been described in [Kulathuramaiyer 2007]. The institution name and corresponding country information for all the authors were available in the metadata files. However, a large number of authors did not specify the corresponding city information (where their institution was located). Although it may seem a trivial task to automatically place an institution in its rightful city location, this had proved to be a challenge. Firstly, we were not able to acquire a comprehensive publicly available database to automate the task of matching institution names directly to their respective cities, Furthermore there are also numerous institutions having multiple campuses or localities e.g. University of California has campuses in different cities! Without the information about the city where an institution resides, it became a challenge to determine the geo-code for the institution (to place on a map).

We first tried to discover the location information by using Google MAP APIs and Search APIs. The information provided by Google MAP APIs was much too restrictive (even compared to the Google search APIs). The database associated with the MAP API tends to be a much smaller subset. Searching for the cities of the institutions through Google Search APIs was again complicated because it returned numerous results for a single query and it was also difficult to extract the name of the city from the HTML pages returned, because there are times when these pages did not contain the name of any city at all and there were other times when a result returned multiple city names.

An alternative way to identify the locations of authors was proposed in [Klerkx and Duval 2007] by using the domain names of authors' email addresses. They employed a domain name look up service, MaxMind [MaxMind 2007] having 128,000 domain names registered in their database. This approach was again problematic for a number of reasons: it only works for institution-specific email addresses. It will not work for hotmail or gmail addresses. The database is also limited in terms of its coverage of institutions. e.g. pwr.wroc.pl, domain of the Wroclaw University of Technology in Poland, was not found.

Additionally, location of authors belonging to an institution having multiple branches such as Microsoft, larger universities, virtual universities, could also not be located precisely. This in a way has justified the need to build our own internal institution-city database.

We then devised a heuristic approach to extract the information of missing locations. The first effort was to construct an internal database in mapping of institution-city locations. This database is subsequently used in checking for city information of institutions whose location was not known. The proposed approach first parsed the institutions names to identify whether there was a city name found within the institution name. This could be done by looking for a string in the institution name that matches a city in either our internal database of cities or the database of cities and countries (including longitude and latitude) collected from GeoBytes. For example the institution name "Technical University of Graz" contains the name of the city in which it is situated i.e. Graz. In this approach the country name was applied to disambiguate the cities names existing in more than one country.

In the original database, only 47% of the authors specified exact location information where city and country data was known. By applying the above

mentioned approach, we were then able to map out the locations of 86% of the authors. Manual inspection revealed that the remaining 13% of the authors had stated country information but city information was still found missing and 1% of the authors had provided no information about both city and country.

Although the above mentioned approach had not solved our problem completely, the results have been satisfactory. It has to be noted that using techniques that employ pattern matching alone, it is difficult even for a human to be sure of the precise location of an author, e.g. Washington Business School of North Virginia is not in Washington but it is located in Vienna, Virginia. In order to create a platform for users to provide feedback and verify the locations, we decided to employ a mash-up. This mash-up visualizes the location of each author together with his or her name and institution name, in order to collect feedback about locations that are not confirmed or not precisely located. We have therefore resorted to a community centred approach to verify the contents of the journal.

6 Mash-up as a means of Community Assisted Content Management

The main interface for the mash-up with community feedback is shown in Figure 1. This mash-up allows users to view the distribution of authors or editors across the globe. The user also has the option to browse across volumes or topics. Each marker on the map represents the collection of either editors or authors from a particular location; its size represents the number of authors or editors. It has to be noted that the location information is based only on the institution from which an author published a paper (This will depend on the institutional information provided in published papers). Information of current affiliation of authors will however need to be maintained in a separate user profile database. Our future works will explore user profile mapping to support a community of users further. Figure 1 and Figure 2 illustrate the mash-up developed which also displays the statistics of authors or editors in each country.

To assist the users, we distinguish between known cities (whose locations are confirmed) and unknown cities (whose locations are not confirmed). The user can click on any marker to view the details of each person in an information window referred to by a marker as shown in Figure 3.

The community (which includes the original authors and editors) can assist the administration of J.UCS in correctly relocating and profiling the attributes of any author or editor. The mash-up provides editorial support for data updating as shown in Figure 4. As authors often tend to be in more than one location for example visiting scholars, job change, and there are some very large universities which span multiple locations (University of Arizona, Curtin University in Miri, Sydney as well as in Perth), in future we would like to enhance our annotation tool for the community to add new information about the profile of each author and reflect these emerging historical realities using our mash-up to the general public (on author's wish due to privacy reasons) and off course to the administration of the journal for various administrative tasks. The links that have been used to show the linking between co-

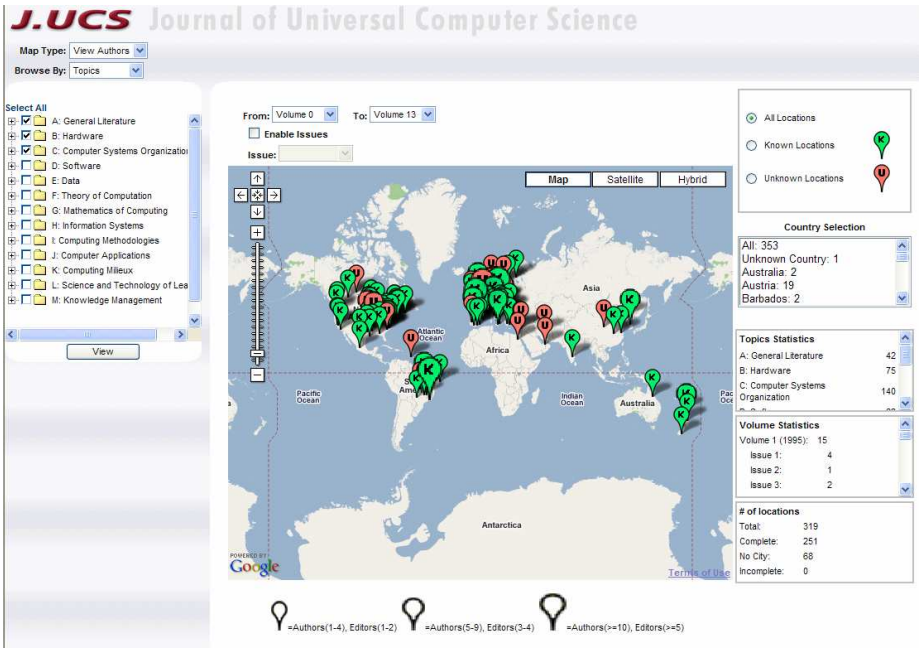

Figure 1: Main interface of the community feedback mash-up.

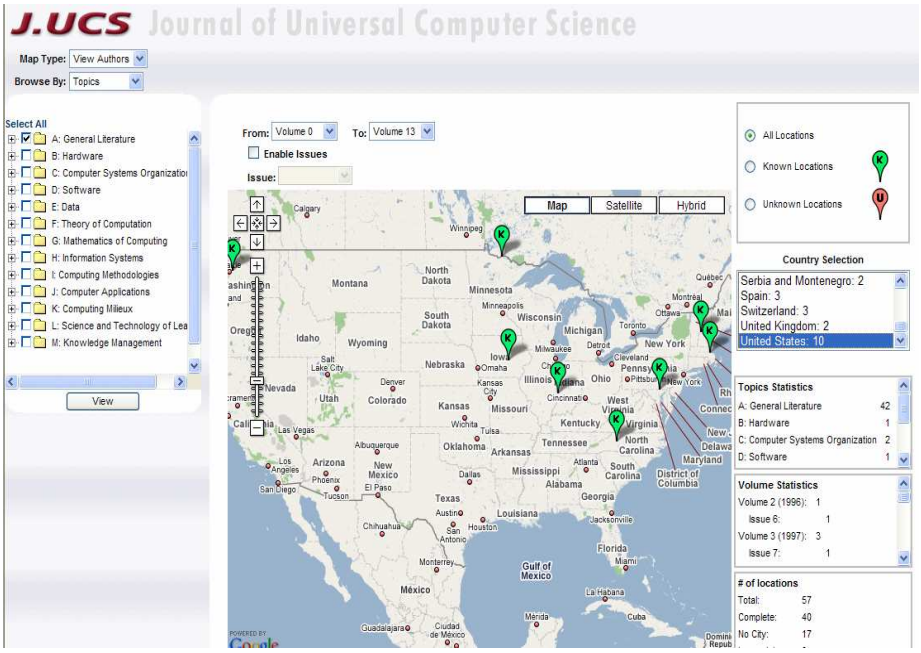

Figure 2: Distribution of authors filtered by country.

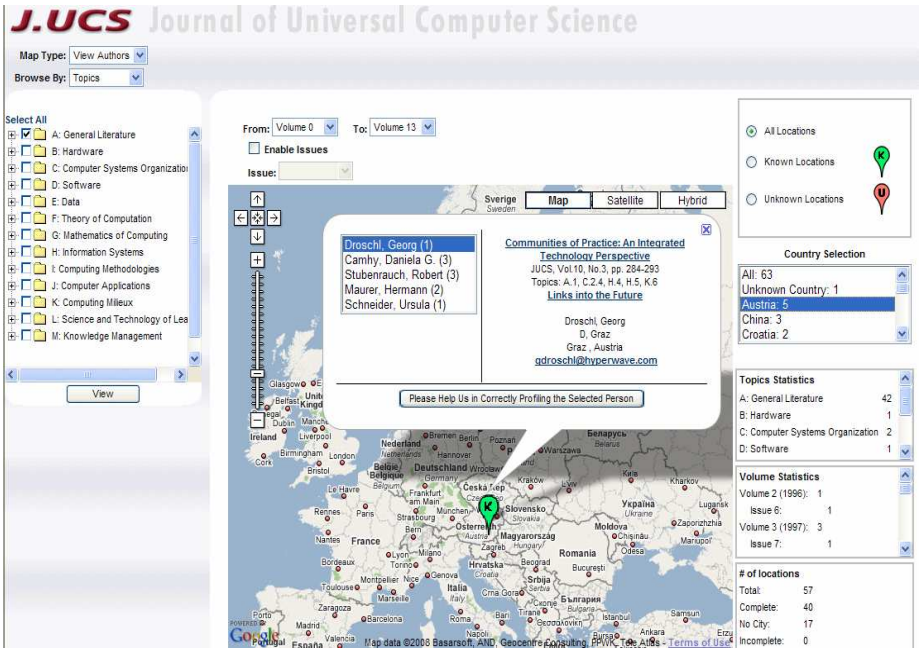

Figure 3: Information about authors.

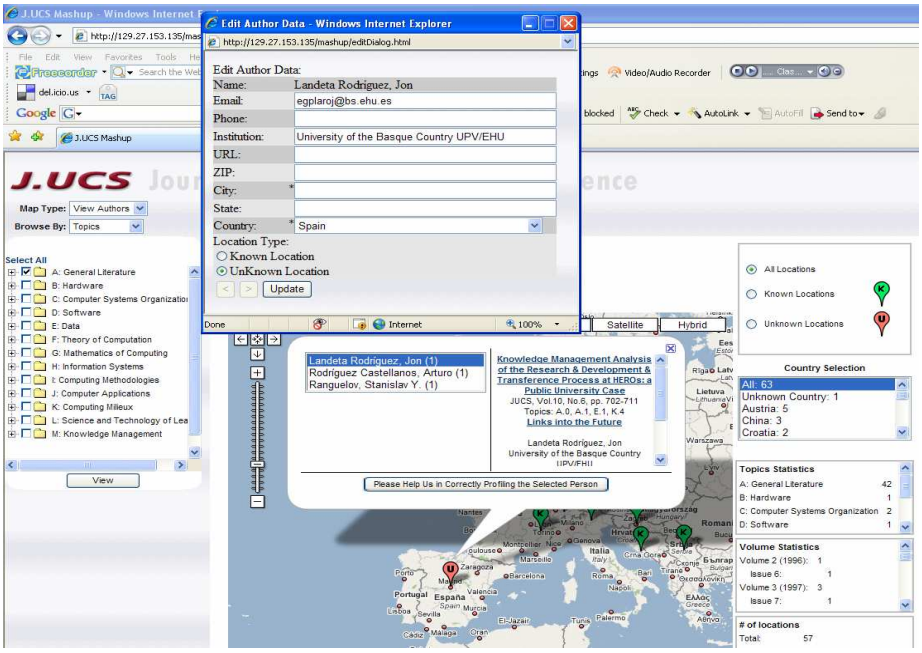

Figure 4: Updating of missing information.

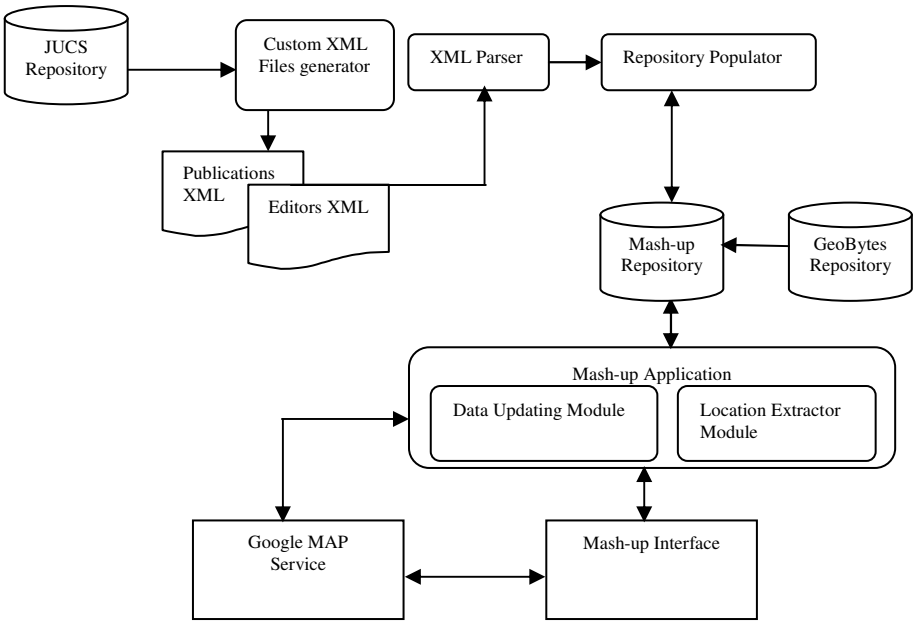

Figure 5: System Architecture.

authors as shown in Figure 8 can also be used to reflect the movement of any particular author over the time.

7 System Architecture

In this section we describe a detailed architecture of the mash-up application as shown in Figure 5.

The metadata information (XML files) about each publication in J.UCS is extracted by an application and a separate customized XML file was generated. The Repository Populator Application extracts the available information from the customized XML file with the help of XML parser to populate the mash-up repository. The GeoBytes database provides the name of the cities, countries and their longitude and latitude information. The Mash-up is responsible to accept requests from users, extract the information from the Mash-up Repository and display it with the help of Google Maps using Google Maps APIs. The location extractor module resolves the location of the authors (each time if there is a not-resolved location under the current selection of options) when the Mash-up application is requested to show the authors distribution across the globe under the current selection of options in the main interface of the mash-up. The Data Updating Module takes the location and data updating information from the user and stores it in the Mash-up Repository.

8 Overview of Administrative Mash-up

The experiments carried out have helped to prepare the necessary data to be used for the development of decision making mash-up. However the over-reliance on community feedback results in the risk of human error or misinformation. We have thus incorporated an automated email alert facility to notify the administrator of the mash-up whenever an update is effectively made by any user. We have also incorporated an administrative mash-up to help the administrator to either accept or undo the changes made by users as shown in Figure 6.

The administrator can also lock any information about any author or editor preventing users from updating information that is known to be correct.

Based on our initial experiments, we have enabled the first administrative mash-up for an electronic journal. The features built into this preliminary mash-up have also been incorporated into the Journal's website (http://www.jucs.org) for users to update their profiles and construct new profiles.

The next section and subsections describe the resulting mash-up that can be utilized to address administration and user concerns as highlighted in section 3.

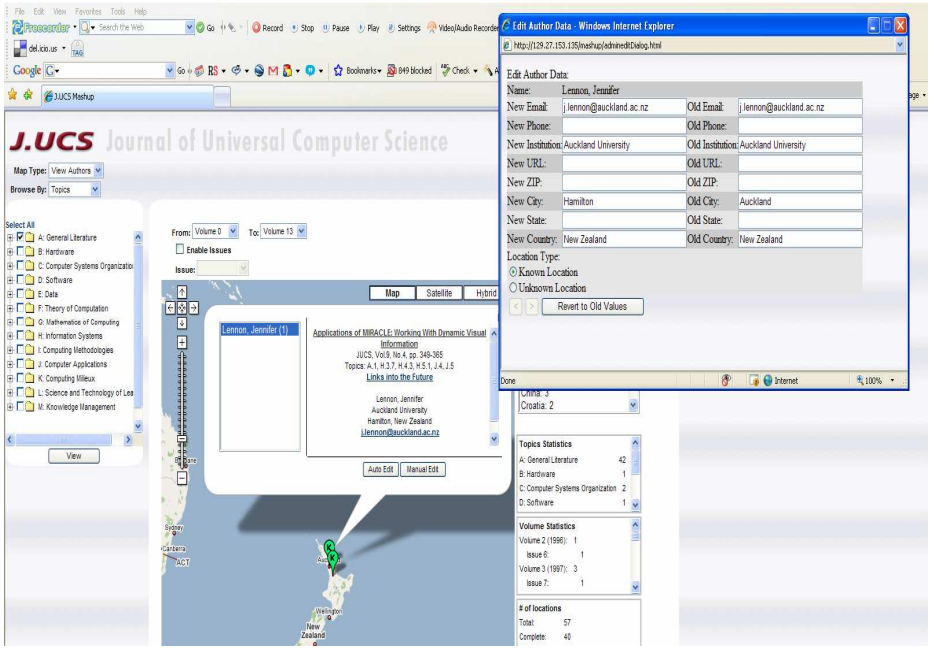

Figure 6: Undo of changes made by general user.

9 Mash-up as a Decision Making Tool

9.1 Distribution of Publications

This interface in Figure 7 depicts the distribution of publications in J.UCS over the years across the globe. The user can select any volume, issue, paper and any topic or

group of topics from the list of volumes and topics and is presented with a distribution of papers for a selection of volumes and topics.

The size of the marker indicates the number of publications at a particular location as opposed to the number of authors in user feed back mash-up (see section 6) where the main concern is to profile the attributes of authors. Moreover it is also useful to show the number of papers at a particular location specially while comparing it with editors (see section 9.3) instead of authors because the size of the markers representing the number of authors can not convey the number of papers written from a particular location and hence can not be used to accurately highlight the possibility of bias (see section 3.1.3).

In this application we have assigned markers for representing location information of all the co-authors of all publications. Assigning markers to the locations of only the first authors will not provide a true picture of the distribution of publications across the globe. The visual markers as used in the current implementation as such do not correspond directly to the exact number of publications. Summarized information about papers is however provided in tabular forms. In our current implementation, a link has been provided to visualize co-author linking as shown in Figure 8.

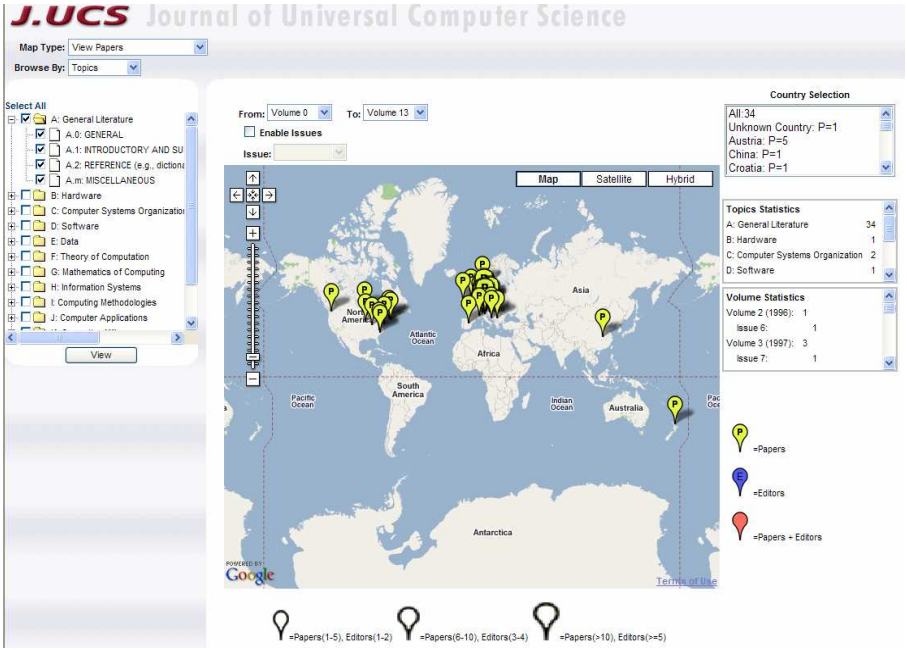

Figure 7: Interface for browsing by topics.

This mash-up will help the authors, readers and management to know that publications in any particular research areas came from certain locations over a period of time. It will help the readers or researchers to navigate in a novel manner. The mash-up thus provides an additional visual entry point to the document collection of J.UCS (based on geographical locations of authors of papers).

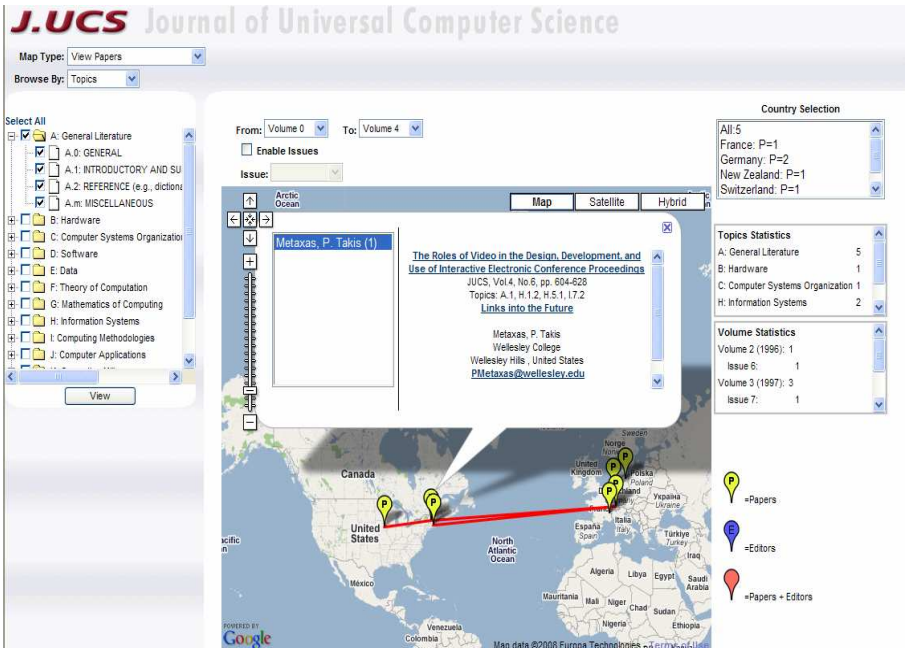

Figure 8: Co-Authors Linking.

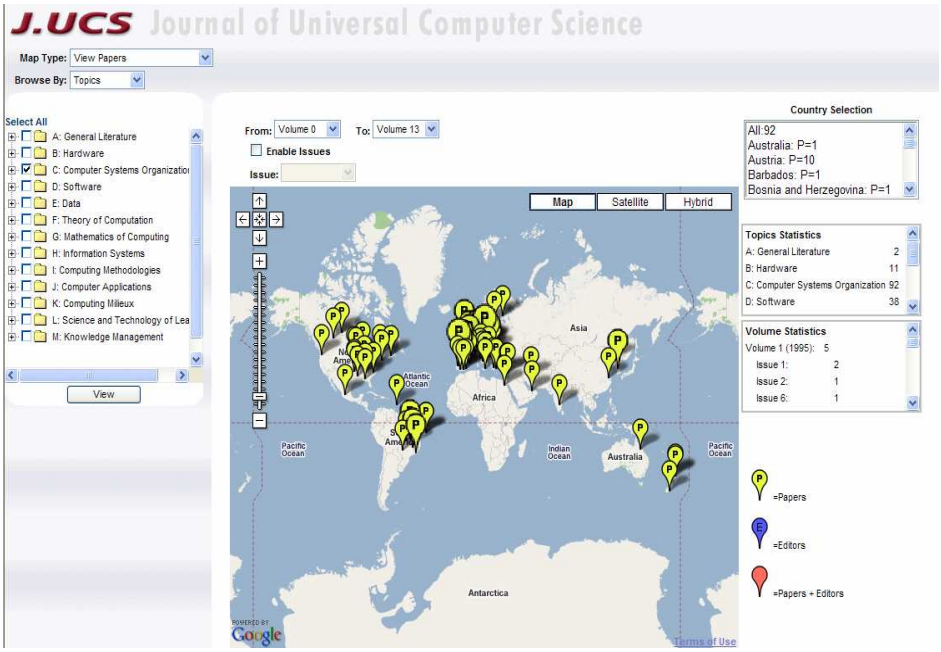

Figure 9: Distribution of publications for topic "Computer System Organization" (C) from volume 0 to volume 13.

Secondly it will also help the management to know from which region or institution the publications have never come or stopped coming over the years. As it can be seen in Figure 9, for the topic "Computer System and Organization" no papers have ever been submitted from South Africa or Japan. There has only been one publication received from Australia so far.

Figure 10 shows that for the topic "Software" the journal has published a single paper from Wollongong, Australia up till volume 3 but has not accepted any newer publications.

In the near future we will also incorporate information about submission of papers to contrast with acceptance patterns as described in [Taylor 2001]. The inclusion of information of submission together with timeline data may be used to indicate the efficiency of an established journal in its review process. The mash-up can also be applied in the selection of special issues to be published in the journal. As it can be seen in Figure 11, more than 90% of the publications in the special issue 9 of volume 12 came from a single country. In such a situation the managing editor is responsible to explicitly scrutinize the papers to ascertain the international standing of the papers.

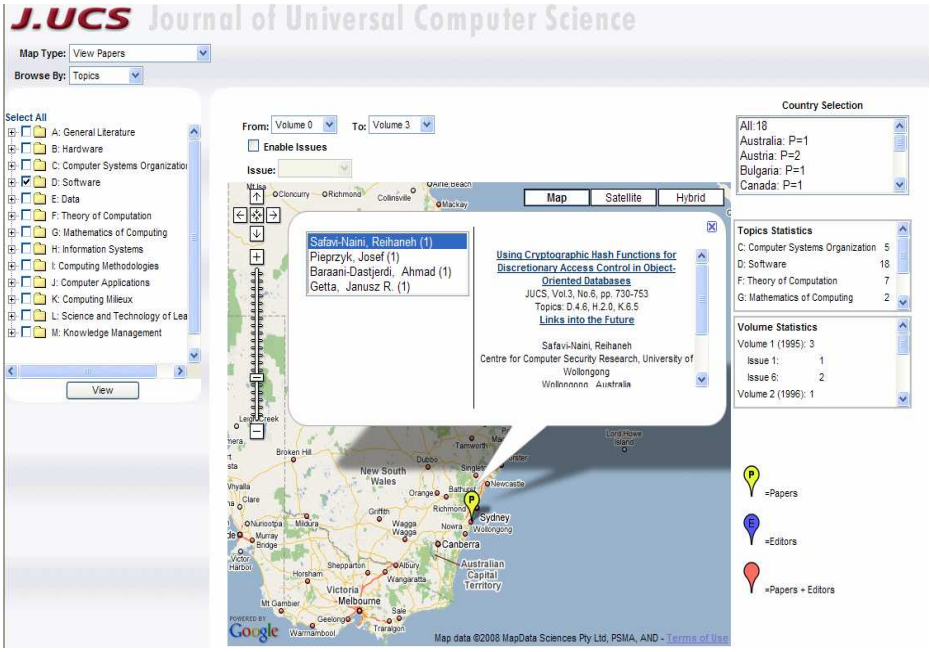

Figure 10: Sole publication from Wollongong, Australia for the topic "Software" (D) up till volume 3.

As can be seen in Figure 7, by viewing the map at an abstract level some of the markers tend to overlap with each other, some locations are hidden behind the markers and some countries are too small to be visible in just a single view of the globe e.g. European countries. To overcome this problem the users can zoom in to an appropriate level using the zooming and panning facility provided to get a more detailed view of the distribution of papers as shown in Figure 12.

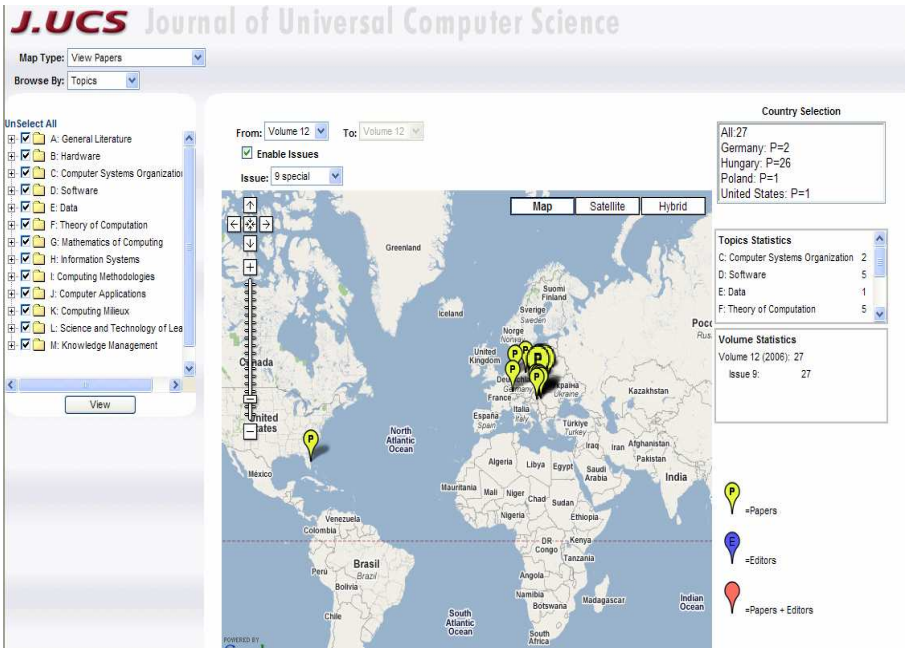

Figure 11: Distribution of all publications in special issue 9 of volume 12.

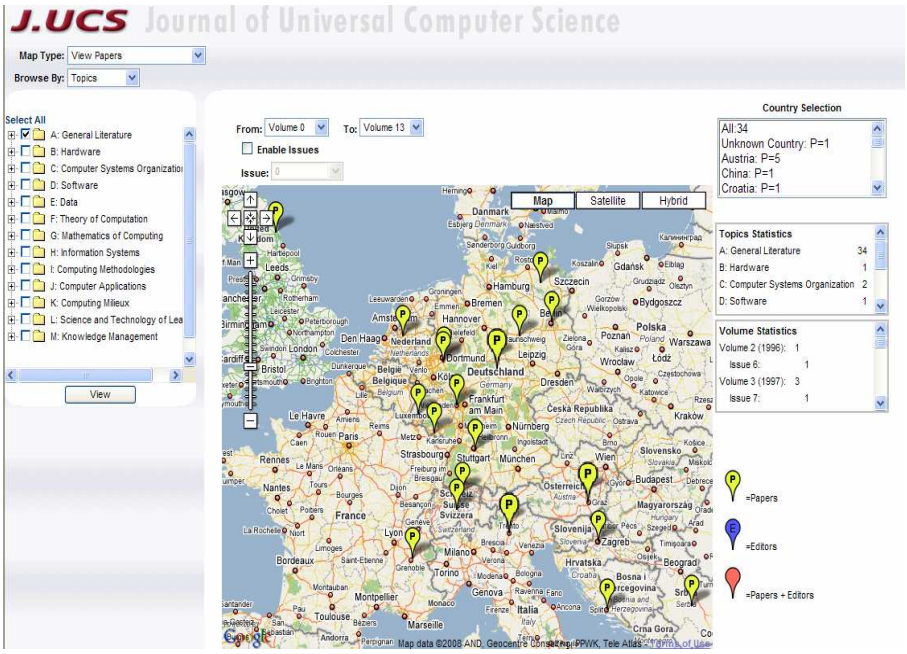

Figure 12: Distribution of papers across the globe at appropriate zoom level.

9.2 Distribution of Editors

Figure 13 depicts the topic wise distribution of editors across the globe. The user can select any topic or group of topics and is presented by the system, the distribution of editors across the globe under the current selection.

This interface helps the authors in making decisions regarding their submissions to J.UCS. The authors can view information about the editors in their area of research and their affiliation before deciding to submit a paper to J.UCS.

This interface can also help the management to ensure the even distribution of editors across topics over the world. Figure 14 illustrates that, for the topic "Social Issues" (K.4.2) there are three editors from Germany and there is one editor from Australia. The management will then need to take appropriate action to expand the number of editors in such topic and thereby ensuring a uniform representation of editors across the globe in each research area.

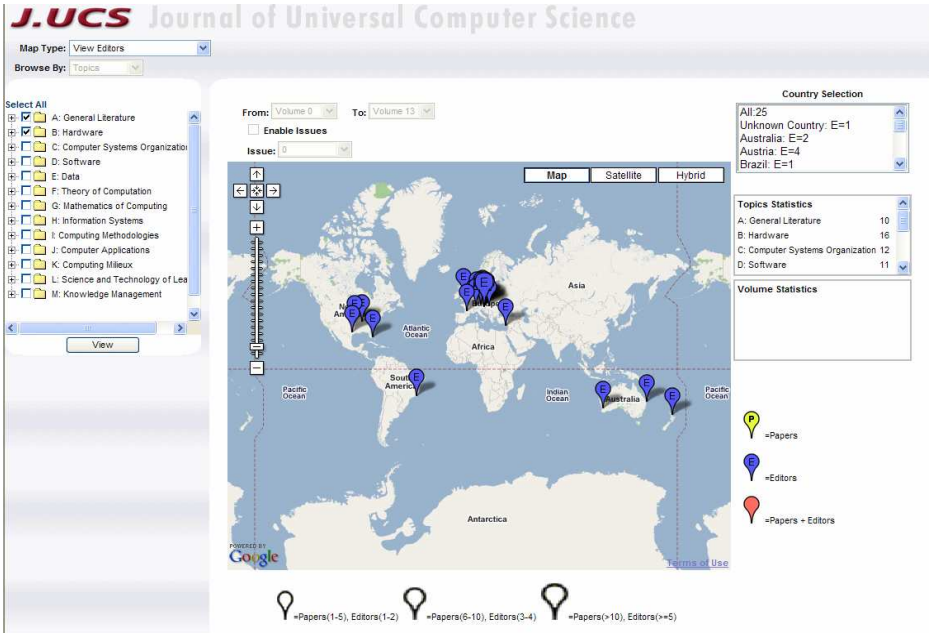

Figure 13: Distribution of editors across the globe for topics "General Literature" (A) and "Hardware" (B).

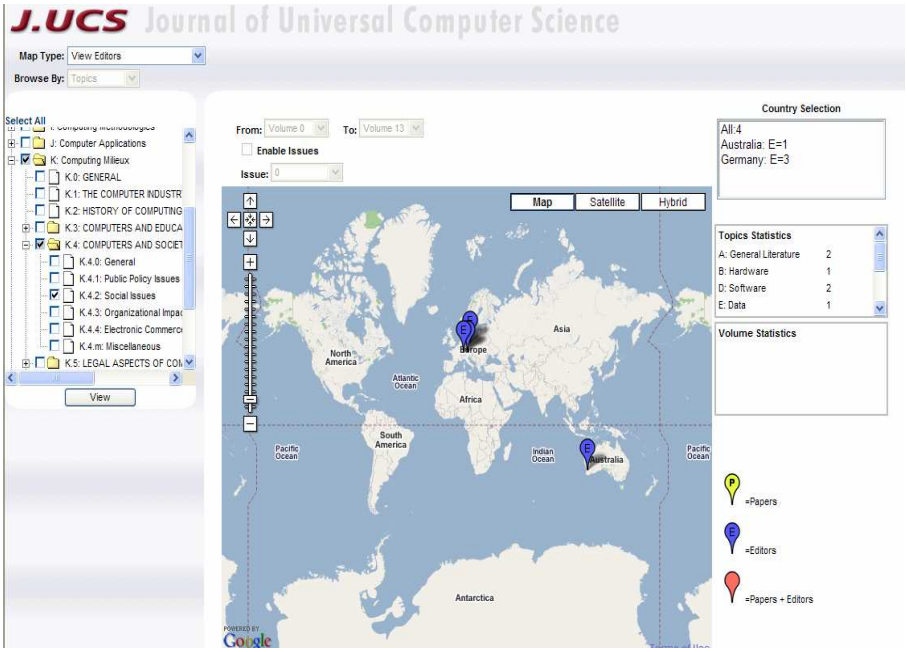

Figure 14: Editors distribution for topic "Social Issues" (K.4.2).

9.3 Distribution of Papers versus Editors

A comparative analysis of the distribution of authors and editors can also be visualized. The user can select any range of volumes and topics and is presented by the system the distribution of papers versus editors across the globe as shown in Figure 15. A blank marker without any letter (P or E) represents the location where there are both editor and papers. The size of the blank marker represents the number of papers from that location.

This tool has effectively enabled the administration to become aware of a possible bias in the process of reviews and thus minimizing the situations in which too many papers come from a particular research area or from the same location.

This interface can also help the administration in making decision on expanding the coverage of the journal. As shown in Figure 16, for topic "General Literature" (A), there are two editors from Australia but there is no publication from Australia under this topic. These editors could then be asked to assist in promoting the journal to their colleagues.

Moreover, places in which multiple authors come from can serve as a basis for selection of new editors. This will also allow for a more even distribution of editors geographically.

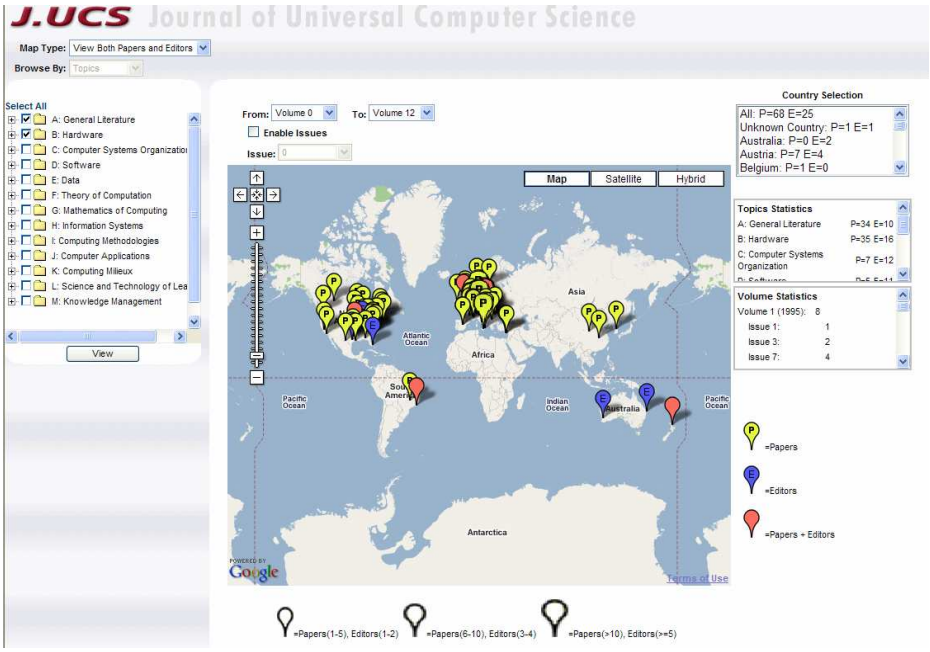

Figure 15: Distribution of authors vs. editors across the globe for the topics "General Literature" (A) and "Hardware" (B) from volume 0 to volume 12.

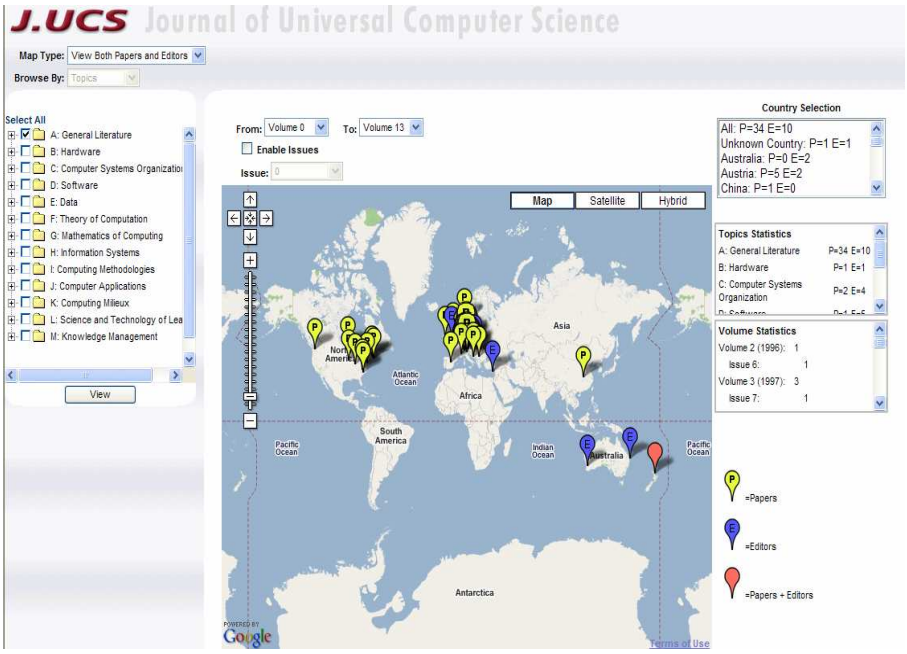

Figure 16: Distribution of authors vs. editors under the topic "General Literature" (A) for all volumes.

10 Future Work

A single feature mash-up was presented in this paper for effectively addressing the concerns of administration, readers and authors. The visualization of the distribution of papers, author and editors can provide insights into the quality of a journal. It can also be applied to indicate the lack of coverage, or even possibility of bias or discrepancies. This capability will be expanded as a part of our future work where we explore means to determine conflicts of interest between individual authors and editors. We will further enhance the ideas presented in this paper to develop multi-featured mash-ups by incorporating more publications and bibliographic data from different journals, publicly available digital repositories such as CiteSeer, DBLP and by searching publications using other publicly available search APIs such as Google, Yahoo and other search engines.

11 Conclusions

In this paper we highlighted the need of utilizing the new developments of the Web for expanding an electronic journal's readership, authorship and quality of its publications. In this context we explained some of the concerns faced by J.UCS management, its authors and readers. We demonstrated the employing a mash-up (an emerging web 2.0 paradigm) as a tool for decision-making. Our experimentations conclude that mash-ups are a powerful application development platform that enabled us to address the concerns mentioned earlier. It is our belief that mash-ups will serve as an important paradigm shift for an electronic journal's expansion.

We encourage all readers to try out the mash-up facilities available at J.UCS official web site i.e. www.jucs.org and help the J.UCS administration in profiling the attributes of potential authors.

References

[Afzal et al. 2007] Afzal, M.T., Kulathuramaiyer, N., Maurer, H.: "Creating Links to the Future"; J.UCS (Journal of Universal Computer Science), 13, 9 (2007), 1234-1245.

[Beattie and Goodacre 2004] Beattie, V., Goodacre, A.: "Publishing patterns within the UK accounting and finance academic community"; BAR (The British Accounting Review), 36, 1(2004), 7-44.

[Calude et al. 1994] Calude, C., Maurer, H., Salomaa, A.:"Journal of Universal Computer Science"; J.UCS (Journal of Universal Computer Science), 0, 0 (1994), 109-116.

[Flickr 2007] http://www.flickr.com/learn_more.gne

[GeoBytes 2007] http://www.geobytes.com/FreeServices.htm

[Hawkins 2001] Hawkins, D. T.: ""Bibliometrics of electronic journals in information science"; IR (Information Research), 7, 1 (2001), [Available at http://InformationR.net/ir/7-1/paper120.html]

[Hyperwave 2007] http://www.hyperwave.com/e/

[J.UCS 2007] Journal of Universal Computer Science, http//www.jucs.org.

[Kang et al. 2007] Kang, H., Plaisant, C., Lee, B., Bederson, B. B.: "NetLens: iterative exploration of content-actor network data"; IV (Information Visualization), 6, 1 (2007), 18-31.

[Klerkx and Duval 2007] Klerkx, J., Duval, E.: "GlobeMash: A Mashup for Accessing GLOBE "; Proc. 7th International conference on Knowledge Management (I-Know), Graz, Austria (2007), 392-399.

[Kraut et al. 1988] Kraut, R., Egido, C., Galegher, J.: "Patterns of Contact and Communication in Scientific Research Collaboration"; Proc. ACM Conference on Computer-Supported Cooperative Work, Portland, Oregon, USA (1988), 1-12.

[Krottmaier 2003] Krottmaier, H.: "Links to the Future"; JDIM (Journal of Digital Information Management), 1, 1 (2003), 3-8.

[Kulathuramaiyer 2007] Kulathuramaiyer, N.: "Mashups: Emerging Application Development Paradigm for a Digital Journal"; J.UCS (Journal of Universal Computer Science), 13, 4 (2007), 531-542.

[Lee et al. 2005] Lee, B., Czerwinski, M., Robertson, G., Bederson, B. B.: "Understanding Research Trends in Conferences using PaperLens"; Proc. Conference on Human Factors in Computing Systems (CHI-05), Portland, Oregon, USA, 1969-1972.

[Liew and Foo 2001] Liew, C. L., Foo, S.: "Electronic Documents: What Lies Ahead?"; Proc. 4th International Conference on Asian Digital Libraries (ICADL), Bangalore, India (2001), 88-105.

[Maurer 1996] Maurer, H.: "Hyperwave- The Next Generation Web Solution", Addison Wesley Longman Pub. Co. (1996).

[Maurer 2001] Maurer, H.: "Beyond Classical Digital Libraries"; Proc. of Conference on Global Digital Library Development (Ding-chi Chen, ed.), Tsinghua University Press, Beijing (2001), 165- 173.

[Maurer et al. 2006] Maurer, H., Krottmaier, H., Dreher, H.: "Important Aspects of Modern Digital Libraries"; Proc. International Conference on Digital Libraries (ICDL), New Dehli, India (2006), 843-855.

[Maurer and Schmaranz 1994] Maurer, H., Schmaranz, K.: "J.UCS - The Next Generation in Electronic Journal Publishing"; J.UCS (Journal of Universal Computer Science), 0, 0 (1994), 117-126.

[MaxMind 2007] http://www.maxmind.com/

[McElroy 2002] McElroy, E.: "Dos and don'ts for electronic journal management: some advice to publishers"; LP (Learned Publishing), 15, 2 (2002), 125-128.

[McKiernan 2003] McKiernan, G.: "New Age Navigation: Innovative Information Interfaces for Electronic Journals"; SL (The Serials Librarian), 45, 2(2003), 87-123.

[Menz 2001] Menz, H. B.: "The first ten year of The Foot: a retrospective analysis of publication patterns, 1991-2000"; Foot (The Foot), 11, 3, 113-118.

[Mibazaar 2007] http://www.mibazaar.com/

[O'Reilly, T. 2007] what is Web 2.0 Design Patterns and Business Models for the Next Generation of Software, http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

[Programmableweb 2007] http://www.programmableweb.com/

[Synnestvedt et al. 2005] Synnestvedt, M. B., Chen, C., Holmes, J. H.: "CiteSpace II: Visualization and Knowledge Discovery in Bibliographic Databases"; Proc. American Medical Informatics Association (AMIA) Symposium (2005), 724-728.

[Taylor 2001] Taylor, E. W.: "Adult Education Quarterly From 1989 To 1999: A Content Analysis of All Submissions"; AEQ (Adult Education Quarterly), 51, 4 (2001), 322-340.

[TechSoup 2007] Mashups: An Easy, Free Way to Create Custom Web Apps, http://www.techsoup.org/learningcenter/webbuilding/page5788.cfm?cg=searchterms&sg=mashups

[Tutarel 2002] Tutarel, O.: "Geographical distribution of publications in the field of medical education"; BMC ED (BMC Medical Education), 2, 3 (2002).

[White and McCain 1998] White, H. D., McCain, K. W.: "Visualizing a Discipline: An Author Co-Citation Analysis of Information Science, 1972-1995"; JASIS (Journal of the American Society for Information Science), 49, 4 (1998), 327-355.

[Wikipedia 2007] http://www.wikipedia.org/

[YouTube 2007] http://www.youtube.com