

SIMS 247

Information Visualization

Final Project Proposal - NewsEye

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The Goal

It seems like every day we are bombarded with reels of newscasts, papers, stories, blogs, podcasts, and radio, thousands of different perspectives on what is happening where and to whom. Yet despite the number of voices that we have access to, we find that most of what they say is dominated by a handful of media barons, is focused on the Western world, and caters to gossip and sensationalism. It comes to the point where there is just so much information that we start to recoil from the plethora available and give up any hope of following events around the world in a systematic, objective way. The problem is that modern newspapers are stuck on the paradigm of paper and, moreover, are motivated by the desire to enthrall, entertain, and capture our imagination. They compose themselves, in large part, on the voices of politicians, the faces of children, and the English-speaking world. The dream of an objective newspaper has long been disproven, but what can information visualization do to promote a more equitable worldview?

The goal of this project is to envision a better way to express the state of the world today, given data from newscasts from various independent organizations working on a global scale. The format will be an interactive map, with nodes in different colours to express different types of events, sizes to express priority, and order to reflect age. A necessary and important assumption is that the source data is formatted in a consistent and objective way, such as daily press releases or e-mail updates.

The Scope

Due to time and resource limitations, this phase of the project will focus only on developing the front-end user interface to the map. It is hoped that the back-end will be developed at a future time, possibly for a project with the Applied Natural Language Processing course.

The User Task

The hope is that, by having such news-calibre information distilled down to its essence – location and type – the casual browser will be able to get a flash update on the state of the world today. Moreover, extrapolating from the different sizes and intensities of the issues at stake, he or she will gain some small measure of perspective in judging the global emergencies. She will be able to easily perform a comparative analysis of situations occurring around the world, track geographic regions of personal interest, and gain some perspective on the historic context of stories, even if only within the span of a few days or weeks. Due to the unavoidable bias of human-reported media, it is necessary to provide a mechanism by which to identify the source of all these news stories, because ultimately the reliability of the news source is more important than the story itself.

Related Work

A book could be written on the different types of news visualizations that have emerged on the web over the past 5 years. Here, we will provide a broad overview of the different approaches that have been taken, followed by a specific look at news maps employing geographic layout, and lastly we will touch on two complementary but vital aspects of news data: coverage and source.

Abstract News Visualizations

There is something inherently appealing about the idea of extrapolating news stories to present them in some sort of abstract space, that will provide insight into relations, relevance, and history; the idea being one of the central mandates of information visualization, that visual components have the power to amplify meaning and transform ways of thinking. However, the following examples will illustrate how, while such an approach can definitely serve to convey a message or idea with the news, that message is typically far from objective. We will argue that abstract visualization are simply not sufficient to provide an unbiased, analytical tool for news analysis.



Figure 1: Abstract News Visualizations.
Top Left: Newsmap. Top Right: 10X10. Bottom: In The News.

Newsmap, on the top left of Figure 1, is probably the most cited example of a news visualization and a classic example of a text-based treemap. It harvests data on an hourly basis from Google News, displaying the headlines of major stories proportional to the number of related stories that Google reports. This is a fantastic tool to get a one-second glimpse of what the world is talking about today; however, as a news-analytic tool, it actually promotes the bias in popular media. By highlighting much-publicized news, stories with less coverage shrink to illegibility or disappear altogether, and we are left only with the information that is already most available to us [Wes05].

10X10, on the top right, draws on the idea that a picture is worth a thousand words, and that news is best portrayed through the impersonal, digital eyes of a camera. However, while a camera may be objective, the person shooting, filtering, editing, and choosing its images are far from. Only very specific types of stories will be suited towards pictures, such stories often lending themselves towards the dramatic, the exceptional, or simply the beautiful. Moreover, the camera itself is biased towards countries and situations in which there are people around to take pictures; whereas for many parts of the world, simply getting the any sort of news out to the public attention is a feat of itself [Har05].

In The News shows data from Google's "In The News" sidebar, a list of proper nouns most frequently appearing in a day's stories. The size of a bar refers to the relative amount of coverage, the color refers to the growth or decay of that term on that day, and the animation reveals patters in who is talked about when and for how long. This is a fun visualization to play with, but, being far from intuitive, attracts those who have an interest in visualization more than those who have an interest in news [Rod05].

Wordnews and Today's Front Pages are also good examples of news visualizations, that suffer from the same sort of fallbacks as the above [Fis05, New05].

Geographic News Maps

An abstract visualization, by its very nature, introduces another layer of subjective bias; for this reason, we turn to a geographic visualization, which, although it may not remove any of the bias in news reporting, will at least provide some insight into which parts of the world are *not* being covered, and ideally which parts of the world are generating most of the news coverage.

A study of the following visualization will provide some insight into best practices to follow and pitfalls to avoid in our own system.



The first example we will look at is the Climate Hot Map from the Union of Concerned Scientists – the top image in Figure 2. The highlights of this map are that it provides straightforward details-on-demand for each story as well as strong contrast between “fingerprints” and “harbingers” of climate change. Problems include the density of data points, which tend to obscure geographic location, and the use of icons, and a distracting color scheme for background elements. As Stephen Few argues, the “data ink” and data colour of a representation should have a direct mapping to information elements [UCS05].

The News Maps provided by Google Zurich – the middle image in Figure 2 – supports embedded headlines drawn from the Google database. However, it is not an interesting or terribly informative interface, does not provide geographic specificity, and does not support zooming or panning. Essentially, it is dry and uninteresting [Osi05].

Figure 2: Geographis News Maps. Top: EOGEO ICT. Middle: Google News Map. Bottom: Google News Earth

NewsGlobe, provided by Daden Consulting, is possibly the closest thing to what we envision. It gives an overview of world news, zooming, panning, and details on demand – including the ability to open up the original story in a side window. The most outstanding problem with the Google Earth implementation is that, by its 3D nature, it necessarily obscures a hemisphere of the globe at any given view. Moreover, it does not make full use of the affordances that are available, such as color, shape, and animation. Lastly, it provides no direct mapping to support information about the news source [Dad05].

Other examples with similar problems can be found at the Earth Observation and Geospatial Information and Communication Technologies, the Seismic Monitor

developed by the IRIS consortium, and P. Mikhail's World News Map [EOG05, Iri05, Mik05].

Additional Dimensions of News

Two final examples that bear mentioning are Buzztracker and Newsquake.

Using basic natural language processing techniques, Buzztracker identifies and highlights the parts of the world that are currently receiving the most news coverage, while Newsquake – whether intentionally or not – highlights where most of the world news is *originating* from.

Buzztracker, in particular, provides a very beautiful, intuitive depiction of world news, maintaining relevant relationships and geographic locations while ensuring that every line and colour contributes to meaningful information [Mod05, Cre05]. Both

provide valuable analysis and insight into the nature of news coverage; it is our belief that the kind of information made available in these visualizations should be integrated into a more general news visualization application, because this is data that changes constantly and is relevant to every story that we read.

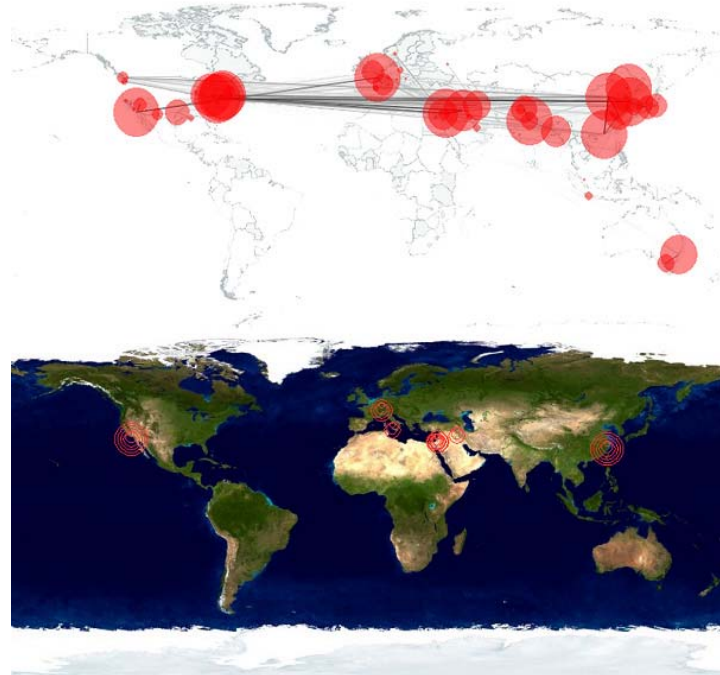


Figure 3: Further Dimensions of News. Top: Buzztracker. Bottom: Newsquake.

Tying These Ideas Together

Our goal here is to take what has been done before, integrate lessons learned from the above, and stretch the limits of how much information this type of visualization can convey. This is a visualization project, and not simply a mapping tool, because of the multi-dimensional nature of the data and the parallel encoding which will be used. As the density of information builds, we anticipate dealing with many visualization problems, from occlusion to distortion, where we will need to come up with creative solutions while maintaining the integrity of the data representation at all costs.

NewsEye

Our solution is an application called NewsEye. The name derives from the concept of a Bullseye, the center of a dartboard and the symbol of success. As we shall see, the dartboard metaphor will be useful in describing the rings with which news stories are portrayed.

Tools

The first draft of this project took form on pen and paper, with a few coloured crayons thrown in for good measure. The first product that resembled a prototype was developed in Adobe Photoshop. The current implementation sits on top of the Piccolo graphics framework, using a static background image of the world and drawing data dynamically from a MySQL backend.

Future work on text categorization might be developed using the NLTK Toolkit, an Open Source natural language toolkit in Python.

Data

The data for this initial prototype is a set of about 300 stories collected in the month of May, 2003, from a cross-section of leading newspapers including CNN, BBC, and Sports Illustrated. News sources were chosen with a bias towards websites that maintained a publically available archive of their content years after the fact, in order to make current and future work developing details-on-demand a possibility. Each story is categorized, by hand, to one of six categories: War, Politics, Sports, Disaster, Business, and Crime. Notes that these categories are more an artefact of the data that was available, rather than a result of a comprehensive analysis of what kinds of categories news naturally falls into. Priorities were assigned based on the frequency of a story reappearing across several news sites. While we desired to model some way of seeing relationships between stories, this relationship set was not easily available, so for the purposes of this mock-up, such relationships were generated at random.

Visual Components

One of the primary goals of this project is to encode as much context as possible for each news story in such a way that a naive user could easily grasp an overview of world events, while a more advanced user would be able to discern subtle visual components in order to draw more details out of the visualization. Thus, it was very important to us to make use of the full set of visual affordances that were available without cluttering the screen. Table 1 highlights the main static features adopted while Table 2 highlights the interaction tasks to be supported.

Table 1: NewsEye Visual Affordances

Visual Affordance	Data Element	Encoding
Position of Center	Location	A point in the center of each ring demarcates the geographic location of the story.
Width of Ring	Priority	Greater width implies higher priority.
Order of Rings	Age	The outermost ring is the oldest story, while the bullseye is the newest.
Color	Type	Color reflects the type of story: blue, war; peach, politics; brown, sports; purple, disaster; green, business; and yellow, crime.
Links	Relationships	Links between rings illustrate relationships between stories.
Animation	Source	Rings will animate outwards from the geographic location where they originated. (Not Implemented)

Table 2: NewsEye Interactive Tasks

Visual Affordance	Encoding
Overview	Start-up image is an overview map of the world.
Zoom and Pan	Continuous zooming provided with mouse interaction: pressing the left mouse button activates zooming, pressing the right mouse button activates panning, and mouse movement generates direction and speed.
Filter	Stories can be filtered by type, time period, starting and ending date, geographic regions, and topic. (Not Implemented)
Details-On-Demand	Clicking on any ring will provide a summary of the news story in the context of the map, as well as a link to the actual story. (Not Implemented)
Relate	Mousing over a ring will highlight related stories around the globe.
History	A time filter allows the user to specify how much history to show at each location. (Not Implemented)
Extract	Users should be able to identify stories of interests and extract them to a subset of the news map. (Not Implemented)

The Occlusion Problem

The components listed above are far from all that is needed in order to produce a powerful and motivating visualization. Some of the problems with the system as we have presented it so far can be seen in Figure 4, one of our initial prototypes. While it implements many of the encodings we have outlined above, there are two fundamental problems that override any meaningful interpretation.

- 1) Top-level nodes occluding all other nodes.
- 2) Multi-layer text rendering all text unreadable.

We had hoped that the first problem would be alleviated by the variable transparency of different nodes, but as you can see, no more than two or three nodes are obvious at any given geographic locations. For places such as New York, the Middle East, and Beijing, where several stories might arise in a single day, two or three visible nodes is simply not enough.



Figure 4: News Map with Label and Node Occlusion

Bullseye

The node occlusion problem has traditionally been solved by modelling the physics of repulsion between separate nodes, causing nodes to spread out across the available screen space [Hee05]. This solution is not acceptable for this application, because shifting the node position would provide misleading information about the locality of the story.

Our solution was to implement a series of time-based concentric circles for each location, somewhat akin to the rings on a tree, only with the newest, typically most important story in the bullseye. Hence, we derive the name for our application: NewsEye. To deal with the text occlusion problem, we set the line stroke of the text to match its source node, in the hope that the colour and transparency would make the image more readable. Figure 5 is a snapshot of the bullseye implementation as we have outlined here.

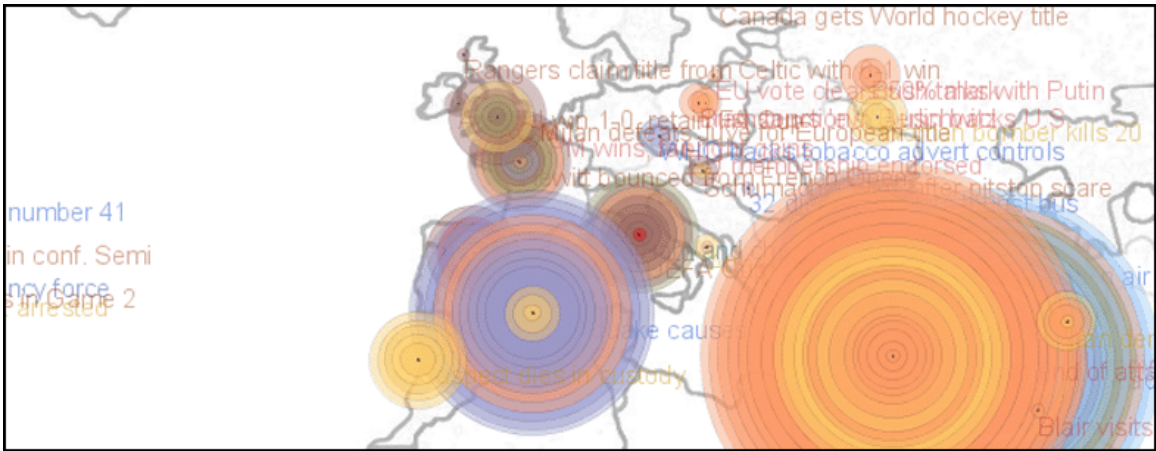


Figure 5: NewsEye with Node Ring Layout and Time-Mapped Label Transparency

Immediately, a much greater number of stories become accessible. One important change to note is that **the focus has shifted away from pinpointing high-priority events and towards highlighting the world's hotspots**, from which most stories are generated. As you can see in the bottom right of Figure 5, such an implementation cannot draw the tree structure for each node independently, but must alternate layers of rings in order to ensure that large rings do not occlude one another. Figure 6 is a snapshot of the current working NewsEye application, which fixes this problem.

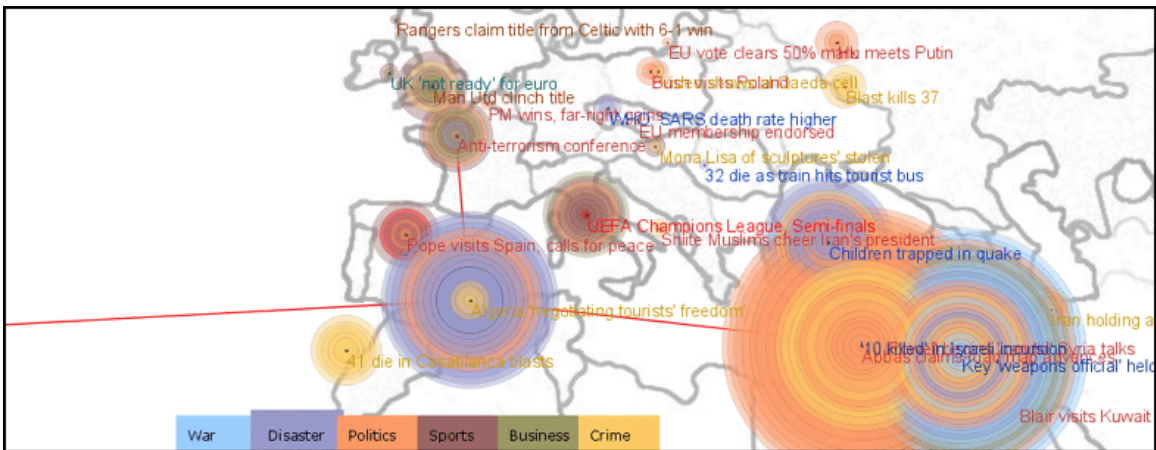


Figure 6: NewsEye with Overlapping Ring Structures and Top-Level Labels

With regards to the text occlusion problem, we determined that even if three hundred headlines are available to read, there is a limit on a user's reading speed and the number of stories that he can mentally digest. We ultimately decided that only a set number of stories should be highlighted at any given magnification of the map, with further details being available on demand. Thus, at the outset, only the most recent headlines for each occasion are shown.



Figure 7: Zoomed-In View of NewsEye

Based on peer feedback, the relationships lines were removed from the static image and supplied as details-on-demand, and a sticky legend with pop-up animation included at the bottom of the page. When mousing over any particular ring or headline, the headline was also printed at the bottom of the screen, in case other nodes or texts were blocking the active headline. Finally, the color scheme for both nodes and text was cycled several times to ensure that each color could be identified independently.

Figure 8 is a world-view snapshot of the current working NewsEye application.

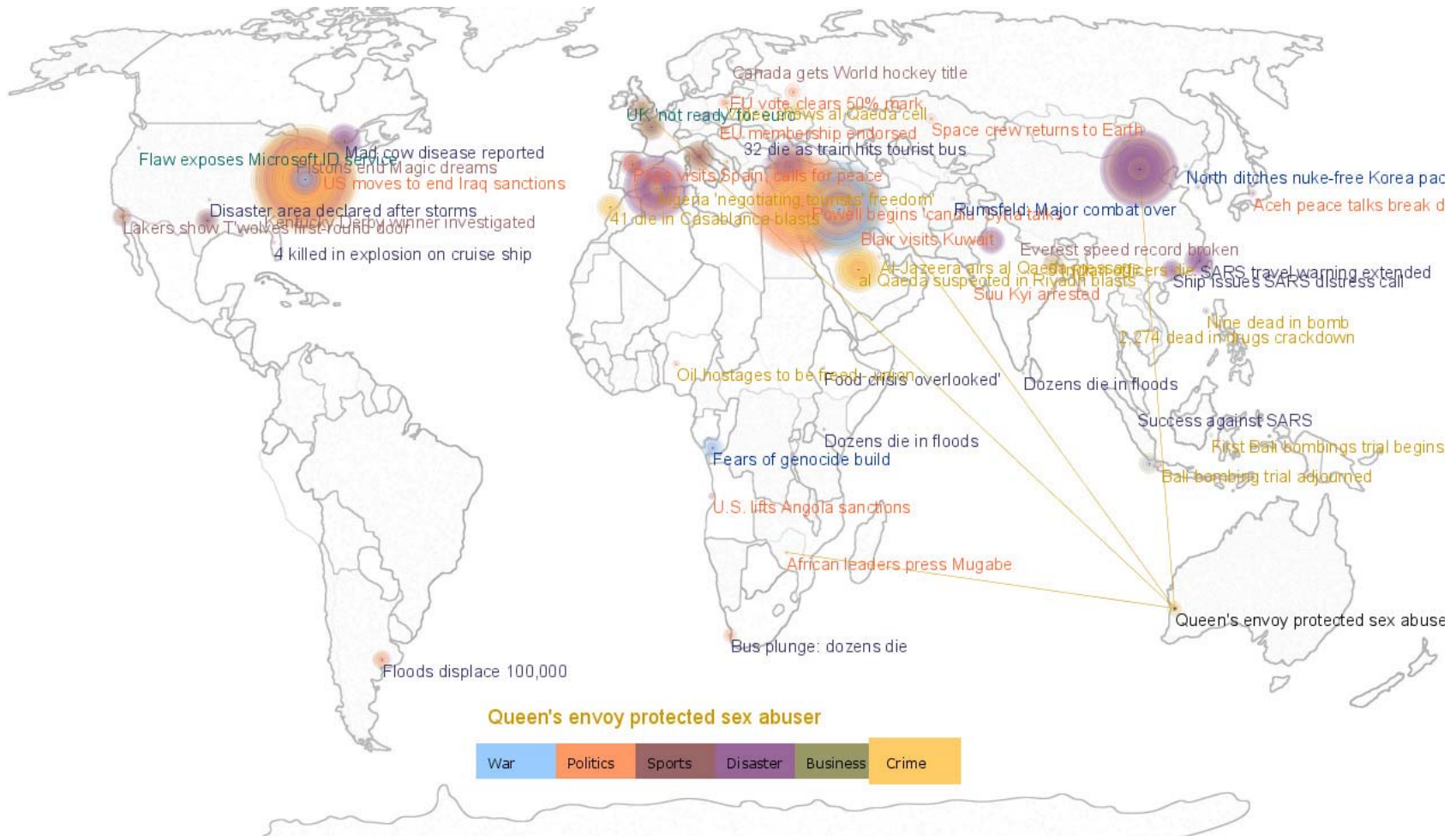


Figure 8: Full Screen Shot of NewsEye

Evaluation

To evaluate our design and guide future work, we have adopted a user-centred approach to design, beginning with an initial needs assessment and concluding the first design iteration with a more comprehensive usability test. We hope to keep end-users involved in evaluating and contributing to each future iteration of this project.

Pilot Study

After identifying news comprehension as the target problem, we conducted an informal interview with four internet-savvy users, three from the School of Information Management and one who just happens to spend a lot of time here. We asked what kind of information would be useful to have in the news, brainstormed how it could best be presented, and worked with some basic paper prototypes of the news map solution we came up with. This session inspired us to show links for related news stories, support some degree of semantic zooming, and challenged us to come up with interesting and informative animation sequences.

Participants

Following the pilot study and the development of a partially-functioning prototype, we conducted a more comprehensive usability test on the current prototype. The goal is to see if our design concepts truly match with the usability needs of real-world participants. This test was designed to cover a range of methods for identifying how users actually interact with a prototype.

When testing the usage, we identified a target group consisting of computer veterans and frequent internet users, comfortable with using the mouse, hyperlinks, searching for information online, and reading online news. The belief is that such an informed user group, with a vested interest in the source data, could point out specific errors or misrepresentation of data. Ultimately, we recruited five participants, one female and four males, with various backgrounds, including engineering/computer science, humanities, journalism, and law and justice. They all use computers and the internet constantly, prefer web-based journalism to newspapers and television, and are used to reading mostly text-based news online.

Process

The setting for the test was an office environment; the facilities included a laptop with NewsEye installed and a mouse.

The total time of the usability test is around twenty-five minutes, divided into four parts: introduction, warm-up, tasks, and discussion. At first, we gave the participants a brief, pre-determined introduction, welcoming them, explaining the purpose of this test, and giving the instructions. Here, in order to get more

neutral comments, we tried to avoid any words that described the project in the first person, such as “our design” and “our idea.” Secondly, because we wanted the participants to gain an overview idea of the entire system, we gave them five minutes to explore all the graphics and interaction features. Third, the participants had a five-minute task. The goal of the task was to find the most influential news on this day. Both the warm-up and the task employed cognitive walkthroughs. All monitor movements were videotaped and all dialogue was recorded. Lastly, in the discussion section, the participants filled out a questionnaire to rate the tool, provide suggestions, and answer multiple-choice questions.

Choosing an appropriate task was a difficult part in the evaluation process. Ideally, a good task will appropriately reflect the purpose and the features of the design, and help to create communication between users and designers. In order to find more potential problems, it is helpful if we accomplish the coding of most design ideas. However, because we are still in the early development stage and the newest version of NewsEye is still unfinished in terms of coding, we had hard time finding an appropriate task for participants. At the end, we decided to assign a broader task, participants are asked to point out the most influential news in this day, based on the visual features.

Through the testing process, we found that thinking aloud is a very efficient way of getting a lot of qualitative data from participants. By verbalizing their thoughts, participants enable us to understand how they view this visualization system. To avoid interfering participants’ action, we were not supposed to answer any questions or draw the attention of the user to certain aspects of the interface that the user is not clearly working with. However, there are still problems with thinking aloud. First, it seems unnatural to most participants to speak up when using a system and the tasks could feel harder to perform due to this. Although we continuously prompted the participants to think out loud by asking questions like “*what are you thinking now?*” and “*what do you think this message means?*” the participants still asking something such as, “*what should I say?*” or “*Umm, Umm, Umm... (the participants were silent and continuously moving, and clicking the mouse.)*” In addition, the other limitation is that participants always asking helps, for example, “*what is this?*” “*what does this line mean?*” and “*am I do anything wrong?*”

Results and Discussion

After reviewing the videotape and the questionnaire, we have created a list of interface problems.

Overview

Participants like the idea of spreading news out on a global map. They are accustomed to reading text-based news online, where it is difficult to link news in different categories happening in different countries. After testing NewsEye, all participants agreed that a world map helps them to perceive where each event happened. The overall rate of regional recognition is extremely high: 4.5 out of 5.

The Common Ground Between Designers And Users

It is easy for participants to identify single components on the background image, such as texts, colors, as well as the locations of the circles. Participants understood that texts correspond to dots and categories because of the colors and the animation. In the warm-up section, the participants listed the components and features they independently found in five minutes of open exploration. The following are a verbatim sample of the comments they gave:

“Colors mean categories of events.”

“Different categories of news shown in different color.”

“When you select the text on the map, some information display on the bottom.”

“Size and color of each dot is highly legible.”

The Gap Between Designers And Users

Although the meaning of simple component is fairly readable, participants had a hard time recognizing the time-based and relational information. The lines are the most confusing elements in this interface. Comments included:

“The circle means that how dense events are happening in this place, but what do the lines mean?”

“It’s hard to see what these lines mean from this interface, maybe the event has some relationships with other place...”

“I found the line links two locations, showing the relationship between the news, but what are these relationships?”

“But I can’t understand what these lines represent...is it connected...oh...I don’t know.”

One factor that exacerbates this problem is the fact that the relationship links are drawn on a layer below the story rings. Thus, it becomes hard to identify exactly which story is generating a link to which other story, as can be seen in Figure 7, the zoomed-in view of the interface. Placing the relationship link at a layer just beneath the current active ring would be one step towards making this information more understandable.

Second, participants had no intuition about how the order of tree rings reflected the age of the stories or how the width of the rings reflected their relevance. According to the note we made during the warm-up and task-based sections, they concluded that the tree rings illustrate the speed of news dispersion and the importance of the news.

“I can’t tell what the circles mean.”

“Why some spots are bigger, and why some are smaller, does this mean the numbers of events in this place or the impact, like global and local news.”

“From visualization, I think these four locations have the most influential news, which have the higher impact factor on the world, because the circles are the biggest.”

“I am looking for the most influential news in this map. Maybe this one, this dot has several colors and is connected to other...I am not sure...maybe this one, because of the size”

“If you move out from center, you can see these news are related, but they are in different categories.”

The third design problem is that most participants never realized they could change views by zooming or panning. They never even tried, and discovered this feature only by accident.

“Ha! Zoom-in and zoom-out when you use right button...Oh! I can drag it.”

“I didn’t even know that I can zoom-in and zoom-out to clearly see the detailed map...”

“Umm, can you enlarge this location in an extra window? there are too many events in this area.”

Additional Features

In order to improve the design, we asked the participants to rate different possibilities for future work that have not been implemented as yet, such as filtering, selection history, and details-on-demand. Everything we suggested was highly encouraged, particularly filters and details-on-demand. Comments include:

“It will better if you put more details about each news.”

“I want to know more detail about the news.”

“I need more details about this news. What this news mean...is this...”

The participants suggested that the display format could be a popup window, an extra window on the side, or conversation bubble. Participants also encouraged the addition of a time slider or a calendar, in which they could select a period of time, as well as a series of category buttons to isolate particular types of news.

Future Work

The main obstacle that lies before NewsEye is tackling the ring size and link interpretation information, because these are both central components to understanding what the image is about. One user made a very promising suggestion that additional animation could give more context to the rings: for instance, with an introductory animation sequence that shows all the headlines in sequence. Another participant suggested, in order to make the relationship information more clear, putting the names of the publishers, such as CBS or CNN above each link line.

The next item on the list of priorities is to provide further details about the news stories; as is to be expected, users are not satisfied with simply the headline of the news and its location, but want to know the story underlying the each image. This we would consider to be fundamental information to this project, and would take the form of a popup window or an extra frame on the side.

Once the groundwork is established, additional tools would be useful to identify patterns and fields of interest, in particular, filters for time and news type.

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Appendix A- Evaluation Questionnaire

Welcome, thank you for participating in this test. The purpose is to exam the usability of this information presentation tool, not you. Your feedback is highly appreciated.

A. Warm Up

Take 5 minutes to get familiar with the interface. Please speak aloud everything that you are thinking as you work your way through the interface. What you think the different visual components mean, what you discover, and the kind of data or conclusions drawn. This is called a 'Think Aloud'. With your permission, we will record your comments as we proceed. Please list all the features you find in this tool.

B. 5 min Task

Take 5 min to find the some of the most influential news on this day. Please write down as many details as you can about this news article, such as what kind of news it is, where it happens, when it happens, and why it is important.

C. Evaluation

Please answer the following questions, where

1 = Completely Disagree

3 = Neither agree or disagree

5 = Completely agree

	1	2	3	4	5
Do the colors match to each other?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the color differentials obvious?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the regions on the map easily recognized?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is it easy to locate where the news happened?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is it easy to understand the meaning of connections?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is it easy to link different cities by connection lines?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is it easy to understand the meaning of tree rings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is it easy to recognize when the news happened?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the text readable in terms of size?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the text readable in terms of color?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is it easy to coordinate texts with the dots?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the legend located correctly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the legend explain the category of news?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The information organization of this tool is	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The information presentation of this tool is	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The interface of this tool is	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your overall evaluation of this tool is	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Would this tool be useful to you on a regular basis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

D. Suggestion

1. What general suggestions do you have to improve this interface?
2. Do you have any suggestion about the connections?
3. Do you have any suggestion about the background image (the background map)?
4. Do you have any suggestion about the the interaction mechanisms?
5. Would the tool be improved if adding time filter?
 Yes No
6. What kind of time filter is recommended?
 select a particular date
 select a particular period
 others :



7. Would the tool be improved by adding a news category filter?
 Yes No
8. Would the tool be improved by adding a region filter?
 Yes No
9. What kind of region filter is recommended?
 Based on city
 Based on country
 Based on continent
 others

10. Would the tool be improved by adding the headlines popup when nouseover the circle (instead of locating next to circles)?
 Yes No
11. Would you like more detail about the news?
 Yes No
How much detail would you like?

12. What is the better way to display the news?
 Mouseover the corresponsive circle and display on the side
 Mouseover the headline and display on the side
 Click the corresponsive circle and display on the side
 Click the headline and display on the side
 Click the corresponsive circle and jump to new page
 Click the headline and jump to new page
 Others (including any combination of the above)

13. Is it better if we adding more features?
 Yes No

What features do you recommend?

E. General Information

1. Your age is

- 15-20 20-25 25-30 30-35

2. You are

- female male

3. You use the computer

- constantly over 3 hours a day 1 to 2 hours a day
 a few times a day rarely never

4. You use the internet

- constantly over 3 hours a day 1 to 2 hours a day
 a few times a day rarely never

5. You read news online

- every hour everyday every 3 days
 every week never

6. Your major is

- fine arts physical sciences engineering/computer science
 business humanities health and medicine
 law and justice other _____

7. Your level of education is

- high school undergraduate graduate
 post-graduate community college other _____

Thank you very much!

Appendix B- Cognitive Walkthroughs

The following are selected comments from participants during the cognitive walkthrough of this application, that will guide future development in making this application more user-friendly.

Participant A

why this is Canada? Canada supposed in somewhere else.

Oh, this color is disaster!

Ha! Zoom-in and zoom-out when you use right button...Oh! I can drag it.

What is this?

The circle means that how dense events happening in this place, but what does the lines mean?

I want to know more detail about the news.

Oh, I can find the title here!

Can I click? Oh, these are just categories.

How about click the circle, nothing, how about double click, nothing.

It's hard to see what these lines mean form this interface, maybe the event has some relationships with other place.

SARS? OK, I see, the color corresponds to the category here.

This line links to here, but they are in different category. Are they different lines?

Does it just show the relationship between two event?

It only shows the titles...I don't know any content and detail.

I know it is in the disaster category, I know what SARS means, I know it under control, you can tell from the title and color that these news are related.

This title is about SARS, it supposed to be in the disaster category, but it is the color of crime? And why is this news related to something in Austria?

A lot of events happen in Washington, DC, a lot of events happen in China, a lot of events happen in the Middle East....but what is the most influential? SARS? War? But why it is related to China?

Participant B

I found the line links two locations, showing the relationship between the news, but what are these relationships?

The categories is not like the normal way, normally, it is world, entertainment, business, sport, health and whatever.

It is confused because the text is too closed to each other, you can't tell what are you looking at.

Canada is not here, it is Europe.

I need more time to understand the ideas behind the design.

Umm, can you enlarge this location in an extra window? there are too many events in this area.

It will better if you put more details about each news.

I'd like to start from Asia, because I am from there.

The circle is much bigger than others, I supposed this is the most influential news.

If you move out from center, you can see these news are related, but they are in different categories.

And the line between each other, related totally different titles and news? Are they all disaster? Maybe the line is trying to link news in the same category...although...is this a bug?

The news are grouped by the categories, and these lines link the news in the same category....that's what I saw.

Participant C

.....what should I say?

The different color shows different categories of news.

It will be easier to understand if the colors more stand out.

Am I do anything wrong?

But I can't understand what these lines represent...is it connected...oh...I don't know.

Why some spots are bigger, and why some are smaller, does this mean the numbers of events in this place or the impact, like global and local news.

I am looking for the most influential news in this map.

Maybe this one, this dot has several colors and is connected to other...I am not sure...maybe this one, because of the size.

Participant D

I am interested in this one...here is Finland, there supposed to be a line between this news title and Canada.

If this part become bigger, it will be better.

The two titles are overlap...could you avoid this.

What does it mean? I am not sure.

I need more details about this news. What this news mean...is this

How come there is line between China and Angola.

What are these lines...I can't find any relation between these two news. There should be some relationship, but I can't tell.

From visualization, I think these four locations have the most influential news, which have the higher impact factor on the world, because the circles are the biggest.

Participant E

The texts are overlapped...it's not clear to see the words.

The lines between two dots are not clear...why there are lines.

Umm...umm...umm...(silent, only click the mouse....)

I don't understand the function of these boxes...

The color should be the same...the texts and the boxes.

The circle is the biggest one and it is in the center....there are more colors...I think this one is the most important news in this day.
The second influential news should be this one...because the color is so strong.