

Exploring users' video relevance criteria ---- a pilot study

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Relevance is one of the most fundamental concepts in information science. However, among the large body of relevance literature, very little of the research studied users' relevance judgments when concerning video. The pilot study described in this paper conducted exploratory work in this direction. The time-line interviewing method proposed by Dervin (1992) was applied in the study due to its exploratory and descriptive nature. Four participants were interviewed in early 2003, including a professor in communication studies, an art professor, a news video librarian and a video editor. Using inductive content analysis methods, three categories of relevance judgment criteria were summarized: textual (e.g., topicality, recency, and nationality), visual (e.g., cinematography, objects/events, and style) and implicit (e.g., interest, familiarity, and appropriateness). Topicality was still considered the most important criteria for video relevance judgments, however, users also liked to see visual surrogates, especially those surrogates that contained motion. A more formal study is planned, and we expect that the results will not only enrich the relevance literature but also have implications for video indexing and retrieval research.

Introduction

The rapid development of digital video retrieval techniques such as, audio/visual indexing and abstraction and query by example formulation, have resulted in highly accessible digital video libraries. However, the challenges are more than just technical. There is another crucial part missing here, the users. To create a system that effectively supports users, it is essential to examine the users' needs, preferences, and work contexts (Payette, 1998). Although library and information professionals have already fully recognized the importance of studying the nature of users' information seeking behaviors and produced much related literature, few of these works are explicitly related to video searching. There is also a large body of literature discussing how people make relevance judgments when searching for textual information, but very few of these works focus on searches conducted to retrieve audio/visual materials. This situation could be explained by the lack of digital video libraries as a test bed to study people's information seeking behaviors and relevance judgment processes.

Relevance is one of the fundamental and central concepts in information science. Relevance-based measures -- recall and precision, are the two most commonly used criteria to evaluate the effectiveness of information retrieval systems. In addition, relevance is also a necessary part of understanding human information behaviors (Schamber, 1994, p.36). Therefore, research on users' video relevance judgment can not only enrich the literature of video information seeking literature, but also give implications to the design of effective video retrieval systems and browsing interfaces to serve users' needs. As Shatford (1994) notes, relevance criteria suggested from empirical user studies can be regarded as possible access points to images and videos. And thus relevance criteria provide clues as to the metadata needed for video retrieval systems. .

The pilot study in this paper conducted preliminary work on video relevance research and tried to answer the following questions: *what relevance criteria do people use when they search videos, and in particular, what visual criteria do they apply?*

Background

Since its first appearance, relevance has been one of the most confusing and debated concepts in information science, in spite of its importance in the field. Intuitively, people understand what relevance means and often use it in their daily information retrieval activities, yet researchers cannot reach a consensus on a scientific definition of relevance. Normally speaking, there are two types of definitions for relevance: *system-oriented* relevance or *user-oriented* relevance. The *system-oriented* definition focuses on the relations between a specified search request and the retrieved documents, whereas the *user-oriented* definition concentrates on the relations between users' information needs and the retrieved documents. Many researchers have expressed this dichotomous view of relevance concept: Vickery's (1959a, 1959b) *relevance to a subject* and *user relevance*;, Schutz's (1970) *topical relevance* vs. *interpretational relevance*;, and most notably, Swanson's (1986) *objective relevance* and *subjective relevance*.

“Relevance is not a single notion, but many” (Wilson 1973, p.458) and the multidimensional nature of relevance has been agreed among researchers: for instance, *topical relevance*, *dynamic relevance*, *psychological/cognitive relevance*, and *situational relevance*. *Topical relevance*, also termed system relevance, “is a determination of the intellectual content of a document, usually in terms of some subject classification” (Froelich 1994, p.125). Topicality is always regarded as the most common and important criterion for relevance judgment, and is also the main criterion applied to the design of information retrieval systems. *Dynamic relevance* concerns the change of users’ relevance criteria at different information seeking stages. *Psychological/cognitive relevance* (Wilson 1973 & Harter 1992) allows researchers to focus on the individual users and “their cognitive states at a given time” (Harter 1992, p.607) during their interactions with the information systems. *Situational relevance* (Wilson, 1973, Schamber 1994) studies the relationship between information and the user’s information problem situation. The psychological/cognitive and situational dimensions always contain some relevance criteria that only the users can identify. These different dimensions or views of relevance are not independent of each other and “there exists an interlocking, interplaying cycle of the various systems of relevance” (Saracevic 1975, p.38). These interconnected relevance dimensions lead to a variety of relevance judgment criteria beyond-topicality from the users’ perspectives.

Since the 1990s, there has been an increase of studies regarding relevance judgment processes by real users, with real tasks and applying various kinds of naturalistic methods such as interviews, case studies and quasi-experiments. Schamber (1991a; 1991b) used open-ended time-line interviews with 30 users from three weather information fields. She found 10 criteria grouped into 3 categories mentioned by weather information users: (1) *Information* (accuracy, currency, specificity, and geographic proximity), (2) *Source* (reliability, accessibility, and verifiability through other sources) and (3) *presentation* (dynamism, presentation quality and clarity). Among those 10 criteria, *presentation quality* and *currency* were the two most frequently mentioned by users (14.2% and 14.1%), while *accuracy* and *clarity* were the least mentioned (5.3% and 4.2%). Park (1992, 1993) derived from academic users differing criteria affecting relevance judgment which can be grouped into three categories: (1) *internal context*, containing criteria pertaining to the user’s prior experience (for instance, expertise in subject literature, educational background); (2) *external context*, factors concerning the search that is taking place (for instance, purpose of the search, stage of research); and (3) *‘problem (content) context*, representing the motivations and the intended use of the information (for instance, obtaining definitions of something, or frameworks). Barry (1994) conducted an empirical investigation eliciting users’ criteria as they read citations and full-text documents. She categorizes 23 criteria into 7 general classes: (1) *information content of the document* (depth/scope, objective accuracy/validity, tangibility, effectiveness, clarity, recency), (2) *user’s background/experience* (background/experience, ability to

understand, content novelty, source novelty, stimulus document novelty), (3) *user’s beliefs and preferences* (subjective accuracy/validity, affectiveness), (4) *other information and sources within the environment* (consensus, external verification, availability within the environment, personal availability), (5) *sources of the documents* (source quality, source reputation/visibility), (6) *document as a physical entity* (obtainability, cost), and (7) *user’s situation* (time constraints, relationship with the author). In her empirical studies, Barry found that criteria pertaining to information content of the document and users’ background/experiences were mentioned most by the users (35.1% and 21.6%), while criteria pertaining to the document as a physical entity and the users’ situation were mentioned least (2.7% and 2.9%). Wang (1994, 1998) investigated the cognitive aspect of end-user document selections and the processes of decision making. She found that 11 criteria were employed by the users in selecting document surrogates. The criteria, and their proportions mentioned by the users are: topicality (65.3%) , orientation/level (intellectual level or audience)(9.4%) , quality (9.4%), discipline (subject area) (2.7%), reading time (affordable time) (0.8%), availability (0.2%), special request (required skill or tool) (1.0%), novelty (5.3%), recency (2.8%) , authority (1.1%) , and relation/origin (1.7%).

Numerous empirical studies have been conducted to elicit users’ relevance judgment criteria. Many of the criteria found in those studies are similar to each other. Considering the differences in research methodologies and environments applied in different studies, it can be said that user relevance criteria studies strongly support the notion that “there is a finite range of relevance criteria that is shared across users and situations” (Barry 1994, p.157). Based on those empirical studies, it is apparent that criteria related to information content (e.g., topicality) are the ones most frequently mentioned by users. For instance, topicality accounted for 65.3% in Wang’s (1994,1998) study, information content of the document 35.1% in Barry’s (1994) study, and topical relatedness 68% in Tang & Solomon’s (1998) study.

However, among those various relevance criteria studies, very few of them looked at how users search video retrieval systems. Users’ criteria for video relevance judgments may be much more complex than their criteria for textual document relevance judgments due to the complicated spatial-temporal characteristics of videos, users’ varying and diverse video information needs, and also the ability of users’ to engage and decode video content in multiple ways. Moving image documents contains multiple channels of information: visual, audio and textual. As a result, users have a diversity of audio/visual information needs for videos: they might want to find videos on a specific topic, a

specific event, a specific scene, or a specific video style. Based on their different backgrounds and information needs, users' understanding of the video content can also vary. Although there is lack of research on video relevance judgments, several studies on image relevance judgments could have some implications, since images share many similar characteristics with videos. These are discussed below.

Markkula and Sormunen (1998) studied journalists' routine illustration tasks and also their requests to the image archive in Aamulehti, the second largest daily newspaper in Finland. The journalists' photo search goals were "to make the illustration of the page attractive, balanced and dynamic" (p. 9). The researchers found that when the journalists made their relevance judgments, their particular criteria and as well as the relative importance of the various criteria employed seemed to depend on the work situation, such as "the article, the lay-out, the page as a whole, the section and its illustrative style, the whole newspaper and its editorial policy and the ethical rules journalists follow" (p. 9). However, when asked, the journalists always mentioned one crucial criterion: *the technical quality of the photo*. Additionally, *topicality* was always the first criteria they used to start their searches and *visual attributes* (e.g., aesthetic attributes or emotional feelings) were the sole criteria at the last selection phase.

Another image relevance study is Choi & Rasmussen's (2002) investigation of the criteria which image users apply when making relevance judgments. Thirty-eight participants who needed visual information for their study of American history searched all of the pictorial collections contained in *American Memory*, the National Digital Library of the Library of Congress, which is publicly accessible on the web. There were two types of relevance criteria questionnaires used: the pre- and the post-test questionnaire, which included 9 criteria summarized from the literature: topicality, accuracy, time frame, suggestiveness, novelty, completeness, accessibility, appeal of information, technical attributes of images. The results found that *topicality* was still the most important factor across the information-seeking stages. Among others, *image quality* and *clarity* were also important. They also found some changes during different search stages: in the stage of defining information problem, criteria that had higher rankings were topicality, accuracy, completeness, suggestiveness, and time frame; whereas in the later stage where the user had seen the image, the rankings of the criteria changed to topicality, time frame, accessibility, accuracy, and completeness. Choi & Rasmussen (2002) also suggested some unique features of relevance criteria for image retrieval. For instance, *authority* seemed less important in their study than in the earlier textual information relevance studies, while *subjectivity and affectiveness* (emotional reaction to an image) were of great concern in the selection stage. This actually corresponds with Markkula and Sormunen (1998)'s findings that *visual attributes* were the sole criteria at the last selection phase.

These relevance criteria about image searching have some similarities with those about textual information searching; for instance, topicality is still the most important and often the first

criteria people use. However, there are also some criteria that are unique to image searches, such as affectiveness and technical quality of the image. As for videos, the relevance criteria could be even more complicated, since videos contain both spatial and temporal information. The study shown in this paper gives a tentative taxonomy of the criteria people use when they search videos.

Methodology

Two different methodological approaches have been used in relevance research: earlier quantitative experimental methods were in widespread use and more and more recently naturalistic qualitative methods have become more prevalent. The rationale for choosing a research methodology should be based on the nature and purpose of the problem: how people understand relevance. Park (1994) notes that, "if it is believed that the nature of user-centered relevance is involved with an individual's mental processes and involves cognitive changes, the choice of naturalistic inquiry seems to be appropriate. (p.137)". Naturalistic inquiry method is, thus, an appropriate method when there is a desire to reflect the underlying meaning of relevance in users' particular contexts because of its potentially complex and subjective nature.

In this pilot study the time-line interviewing methods proposed by Dervin (1992) were applied for data collection, as suggested by Schamber (2000), and inductive content analysis was used for data analysis. Dervin's (1992) time-line interviewing takes taps respondents' experiences in sequential orders. As Wang (1999, p. 65) explains, "Time-line interviews in combination with the critical-incident technique focus on a specific past incident in order to reconstruct an information-need situation and the step-by-step activities related to information gaps and gap bridging.... In a time-line interview, an information-seeking event is reconstructed by the user: when and how it occurred, what gaps were perceived, what kind of help was needed, what was the result." In this pilot study, participants were asked to recall one recent job-related situation, in which they needed to find some videos, in sequential order: why they needed the videos, where they went to search the videos, how they began the search, how they browsed the results and how they used the video as well. Their result-browsing stages were the most critical ones, since they actually showed how the participants made their video selections. All the interviews were audiotaped and transcribed. The approach to content analysis was inductive and three coding schemes were derived from the interview texts: textual criteria, visual criteria and implicit criteria.

Preliminary results

Four participants were interviewed for this pilot study: two professors, one news video librarian and one video editor. Participant 1 was a communication studies professor. This participant is well versed in documentary film making techniques and has written several books about film history. Participant 1 usually searches videos for his books about film history or for examples in the classes he teaches or for presentations that he makes. "I need to show segments, either for the presentations I made professionally to other film scholars or students in classes, so I am interested in segments, primarily, to illustrate what I am talking about". Actually, he had a variety of video information needs. Several examples he gave included: searching for contemporary German feminist films, exploring how directors and filmmakers differ in film styles using wide screen techniques, a history of dealing with depression in women in Japan, and how native people were treated in different countries. For the video source selection, he always used Filmfinder (an online video search engine at the University library) to search the films from the collection, and once he found some interesting films, he would use the Google search engine (www.google.com) to gather additional information about the film (e.g., the background of the filmmaker or of the film). Sometimes he would also go to IMDB (the Internet Movie Database www.imdb.com) to watch the movie trailer, and also view other additional information (e.g., reviews) the site provides. Finally, he checked out the video in question from the library or rented it from VisArt (a local film rental store).

Participant 2 is an art/communication studies professor. She was going to teach a video production class and was looking for various artistic videos to show to the class. "I would like to have a lot of videos for students to download, to edit in pieces." She usually went to the art librarian to ask for videos and also ordered videos from Video Data Bank (www.vdb.org), a Chicago art institution and distribution house. Before, she could only order videos through printed catalogues, but "it's hard to get any sense from it". Currently, she could visit their website, search by art categories and artists, and watch a short clip of each video before making the final decision.

Participant 3 was a news librarian from the university. Various professors in the School frequently ask her for videos to be shown in class. Their school library only held a small amount of video collection, therefore she often needed to either borrow or order videos from other sources. Most of the time, the professors know exactly which videos they want. For instance, a professor wanted a clip depicting the assassination attempt on President Regan. At other times, they only had a rough idea about their needs. For example, a professor wanted some videos about gender studies, with females used as stereotypes. This participant had an active list of sources she selected from and regularly used. Her first choice was the Vanderbilt University's Television News Archive (<http://tvnews.vanderbilt.edu>), because it had a timeline.

Next in line was the IMDB (the Internet Movie Database www.imdb.com), because it had explicit purchase information. Her third choice was the university catalogue, since she perceived it to be fast and efficient.

Participant 4 was a video post-production manager from a small video production company. This company produced various types of videos to sell to other companies: for instance, introduction videos regarding historical theatre or videos concerning health issues to sell to a surgical company. "My job is to manage all the video editors and overall to assist where the video was stored." The company had its own small video collection, which stored all the video clips they had shot themselves. The producers and the editors are highly familiar with the content of the video clips, often at the scene level, or even at the shot level. For this company and participant, it seems likely that low-level (scene or shot) indexing and descriptions would be beneficial.

Since these four participants had quite different video seeking tasks and therefore different information needs, their video selection criteria varied from one to another. Through the inductive content-analysis of their interviews, their selection criteria were summarized into three general categories: *textual* criteria, *visual* criteria and *implicit* criteria. Textual relevance criteria refer to criteria that can be elicited from textual metadata information (e.g., topicality, date and authorship). Visual relevance criteria indicate those criteria that can only be attained through investigation of visual materials or surrogates (e.g., video style, color, and camera angles). Both textual and visual relevance criteria can be seen as more objective criteria, whereas there are also some more subjective or implicit criteria which relate closely to users' own experiences or tasks (e.g., personal familiarity, interest and appropriateness). Figure 1 summarizes the various video relevance criteria summarized from this pilot study.

Textual relevance criteria

The participants generally started their video selection processes based upon the textual information provided: topicality, recency, authorship, genre, duration, reviews or price.

Topicality

Topicality refers to the aboutness and can include thematic or subject based facets of the video. Similar to the situation suggested in relevance literature regarding textual document judgments, topicality also seems to be the most important criterion for video selections. This was found to

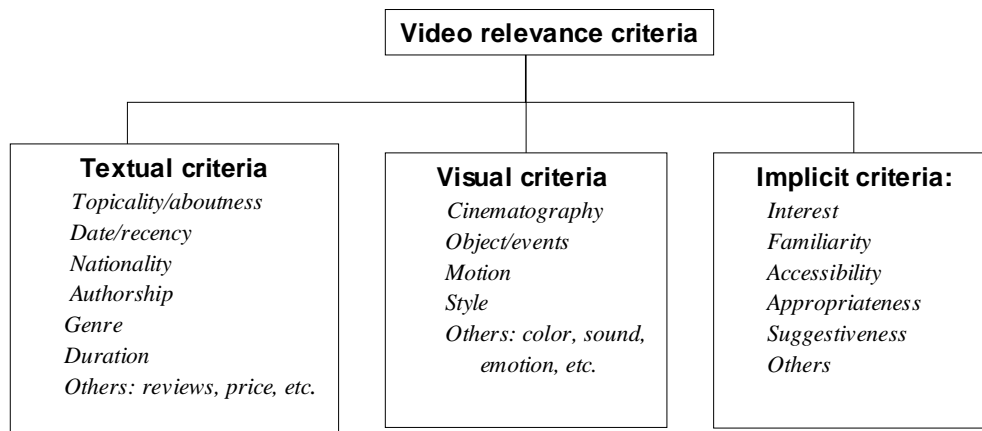


Figure 1. A summary of video relevance criteria

be true across all of the participants in this study. Topicality generally serves as a starting point for people’s selections and evidence of topicality can be found in titles, abstracts, or keywords. For the two professors, topicality was implicitly tied to what they were teaching in class. For video editors, it was tied to the kind of stories they wanted to produce. For instance, the professor from communication studies (Participant 1) said, “there is a history of dealing with depression of women in Japan, and that continues to these days. I want to find scenes, and films that talk about abuse of women in Japan”. The art professor (Participant 2) stated, “I want to know what kind of art it (the video) is dealing with”. She also expressed the desire to search art videos by categories of topic, “So I would like a category of video searching, some artistic videos and classify them by topic. So I know that this artist might work with some identity interests, this artist is working with continuous loops, so just different topics of video art and I could go through them”. It is interesting that the topical focus here is on techniques employed in filming. And finally, the news video librarian said, “one professor in mass communication wanted some videos about gender studies, females used as stereotypes”.

In addition to the topic of the whole video, the participants also expressed their desire for low-level video topics, as the scene or shot level. This is because when the participants searched for a video, they always wanted a small piece of it (e.g., 15 seconds or 3 minutes), but usually they needed to go through the whole video to find that piece. Therefore, a table of contents or other finding tool that shows the topics of video segments might be quite beneficial to these participants. “The thing that would be much helpful in the future would be somebody going through the video and cataloguing the scenes, based on different criteria, so there would be sequences of videos, that people can download and illustrate topics” (Participant 1). This was also crucial to Participant 4, since video

editors always need to pick scenes or shots and put them together.

Date/recency

The production date of a video is another important criterion the participants used to filter their selections. Participant 1 (the professor from communication studies) and Participant 3 (the news librarian) mentioned this criterion often. This made sense because, Participant 1 was conducting research on film history and Participant 3 handled news videos, both contexts in which the date was an important factor. “So I will search various contemporary films from all over the world...so recency is more important, and historical, sometimes I am looking for older films. To draw connections (between) what’s going on in the past, and what’s going on today” (Participant 1). Participant 3 liked to search news videos by date first and that was why she liked the Vanderbilt collection (<http://tvnews.vanderbilt.edu>) most because it listed all its news videos by date. Date was not so important to Participant 2 (the art professor) and Participant 4 (the video editor), since they focused more on the features of the video content.

Authorship

At times, the participants voiced interest about the director or filmmaker of a video, especially Participant 1 (the professor from communication studies) and Participant 2 (the art professor). Participant 1 studied and taught film history and thus he always wanted to know more background information about the filmmakers or directors. “Because it (the name of the director) sounds like a woman, I was looking for woman filmmakers”. Sometimes Participant 2 mentioned the artist who produced the video clip, since that might give some clues to the art style if she knew the artist well. Participant 3 (the news librarian) and Participant 4 (the video editor) did not mention this criterion at all.

Duration

Only Participant 4 (the video editor) and Participant 3 (the news librarian) mentioned the duration of a video or video clip. The video editor needed to know the exact duration time of each scene since he wanted to put different pieces of clips together. “(for this video), the link here would be 15 seconds, the link here would be 30 seconds, the link here would be 45 seconds”. The news librarian also stated, “Other things that were important were the length of the videos”. Participant 1 and Participant 2 did not talk about this criterion. Both participants mentioned trying to search for materials by using small pieces of video but also that the duration of that clip was unimportant.

Nationality

Nationality refers to a video’s country of origin. Participant 1 placed great emphasis on this criterion, because he was studying film histories in different countries. “I am looking for films by women directors, in German, more recently”. “I might look for how the native people are treated, how they are treated differently in Australia vs. in the United States, vs. in New Zealand” (Participant 1). Other participants only dealt with American videos.

Accessibility

Accessibility was another important criterion mentioned across all participants. This is quite obvious, since if they couldn’t get the videos they needed, the participants might need to change their selections. “Again, I will choose the videos that are accessible here...because that (the university nonprint library) is the collection that I have access to for free and the students have access too” (Participant 1). “The professors often come to me and say, ‘I want this video to show in tomorrow’s class.’ However, it always takes more than a week to order it” (Participant 3).

Genre

Genre may be regarded as an implicit criteria, since these four participants all had quite different backgrounds and information tasks, thus they were looking for quite different video types. Participant 1 (the professor from communication studies) was interested in documentaries; Participant 2 (the art professor) focused on art videos; Participant 3 (the news librarian) managed news videos and Participant 4 (the video editor) mostly used the documentary videos they shot themselves. Different types of videos have quite different characteristics.

Others

Participants also mentioned other types of information that affected their video selections, such as price and reviews. For instance, “It (the IMDB) is good since it has the purchasing information” (Participant 3). “The reviews in the IMDB are also what I want to read” (Participant 1).

Visual relevance criteria

Almost all of the participants expressed the desire to see some visual information such as images and clips from the videos before they made their final selections. Participant 2

(the art professor) and Participant 3 (the librarian) both said that the printed video catalogs did not offer sufficient information from which to make a purchasing decision. “I don’t want to commit several hundred dollars to videos that I haven’t seen” (Participant 2). Participant 1 (the professor from communication studies) also said, “You cannot tell the style of the video. You cannot tell the action, you cannot tell the feelings you get from the videos. You have to see it, (and) you have to hear it --- all of the non-verbal information that the textual information cannot give you.” Based on their different tasks and situations, the participants mentioned very different visual criteria, such as cinematography (e.g., camera angles, widescreen formats), objects/people/events contained in the videos, and video style.

Cinematography

Some participants (the two professors) were interested in film techniques, such as how the video was shot and how the camera was handled. Participant 1 would like to compare the different film techniques used by different directors. “Another (topic) about wide screen would be how directors, filmmakers develop styles using these wide screen characteristics. In a certain word, stylistic for technical, it would be on that basis I would select the segments”. And Participant 2 (the art professor), could infer the art style from the cinematography used in the video, “... because I see how they handle the camera, the feeling of it. Since I know something about the video art, I know what something like that is going to be. Not completely, I am not saying that I got it, but I know that I am going to pass on it” (Participant 2). Participant 4 (the video editor) also mentioned this criterion in the context of close-ups or landscape clips, but in these situations, the video content seemed to be more important. Participant 3 (the news librarian) did not mention this criterion at all.

Objects/people/events

When the participants had a chance to watch some video clips, the video content, such as the objects or events contained, could affect their decisions. It also corresponds to the fact that all participants wanted some scene- or shot-level topic descriptions. “Because I don’t like the handheld, interview, people talking, I don’t want that, so this clip tells me that I am not interested in this video” (Participant 2). Participant 3 (the video editor) also mentioned that when he put different clips together for video production, he focused on what was actually appearing in the clips. “I want that scene that the woman says this, the woman is discussing about her psychological effects. Just get me a clip (like that)”. Participant 1 and Participant 3 did not always have a chance to look at some sample videos, thus they did not mention this criterion.

Style

The participants often mentioned the word “video style” and said they liked this kind of video style, but not that kind. Style is an obscure concept and it can hardly be defined or agreed upon between different people. Usually,

the participants would say what the video looked like and what the video was about (beyond topicality). Style was generally the feeling that those participants got when they engaged the visual and audio information. For instance, Participant 2 stated, "So if you see several seconds of it (the video clip), you have a pretty good feeling what it was about... I tried to get through a couple of frames, (to see) the style of the video, and how it looks." Participant 1 gave his meaning of video style, "The style would be the visual approach, (how) the director applies to tell the story. It can be the camera, the editing, the design, and the scene. All of that stands for what the characters' point of view is about. So it has to do with the point of view the filmmaker takes on participants. It can be the camera working, the lighting, the sound, the scene design, like that." Participant 1 also mentioned the way a film approached a subject, which can also be seen as part of the style. "You can learn the general approaches of the film (from the trailer), at least (learn) what they are marketing, how they want to attract audiences, what they are selling, and what the producer believes is the most marketable thing." More interviews need to be conducted to explore what "video style" really means.

Others

The participants also mentioned the use of other audio/visual information, such as color and sound. Participant 1 gave an example where color was important. "If I am doing some research on color films, it would be different color sequences of videos, (and) how the colors are used differently in sequences of videos." Participant 3 also stressed the importance of the color and sound of the video for news video selections.

It seems highly likely that more visual relevance criterion would likely be found if more participants were interviewed. Due to current technical restrictions, many users still do not have the opportunities to see some visual surrogates before they watch the whole video, especially in the physical library environments. However, the visual information seemed to be an important factor for users to decide their video selections, in addition to the textual information.

Implicit relevance criteria

When the participants made their selections about which videos to use, sometimes their decisions were not affected by the actual video content per se, but by some subjective or implicit criteria according to their own tasks or situations: for instance, personal interest, familiarity, appropriateness and suggestiveness.

Interest

The participants sometimes mentioned whether the videos were interesting to them or not. Participant 2 (the art professor) and Participant 4 (the video editor) made numerous mentions of this criteria. That can be explained by the fact that Participant 2 did not have very specific video information needs and was looking for artistic videos

that were more attractive and appropriate for her class. "This type of video (stuff) is really boring. I can read (that) from the text ... I am interested in that, I think it's a funny technique to use. To me, this is going to be like a mock documentary. They are playing the ideas of corporations and truth, (and) that would be interested to me... I don't like these kinds of goofy artist type of style..." While Participant 4 stated, "video production is always a creative decision". Video editors always have their own tastes and also understandings of the videos, "Oh, I like that scene... that scene doesn't make sense".

Familiarity

The participants' video selections might also depend on how much knowledge they had on a topic, a director or a video. "I was looking under the filmmakers whom I am already familiar (with), if there is any recent film he or she has made as well" (Participant 1). "He is a performance artist, they are able to create stuff...I like his work, but I know what that (the video) is going to be, that's going to be a documentary about a performer. ...I know that's not what I am going to show in my class. So I can tell that" (Participant 2). Participant 4 always used the videos they produced themselves, "We just remember this clip has this (scene), this clip has that (scene). It is more like just out of memory."

Appropriateness

Participant 1 (the professor from communication studies) and Participant 2 (the art professor) mentioned appropriateness of the videos they were choosing since they were to be shown in class. "The anti-war (topic), I think is more appropriate for the contemporary situation" (Participant 1). "And I can go through the subjects that are appropriate for the class I am teaching" (Participant 2).

Suggestiveness

Sometimes the participants talked about whether an image or clip could engender inspiration from which to spin off other ideas or suggest alternate clips to look at. "You might not find the exact scene you need, but you might find a very short clip in the trailer that suggests that I should go and look for a longer clip" (Participant 1). "That's how I would use visual materials as well. You can find something that can spin off to something... yeah, inspiration, instinctual, or intuitive approach. That's the way I am looking at the images, it's more kind of looking, looking, what can spark to something else" (Participant 2)

There could be more implicit relevance criteria if more participants were interviewed, since these criteria are closely tied to the participants' situations/tasks, experience and knowledge, and could only be defined by the participants themselves. To collect these kinds of "tacit" information, establishing user profiles is a possible area of research.

Discussion

To sum up, the participants interviewed in this pilot study applied a variety of faceted criteria from which to make their video selections. To further complicate matters, one participant mentioned that his selection criteria might also differ depending upon the situation. “It varies, depends on what I am doing for my research. There is no one thing” (Participant 1). The participants’ backgrounds and tasks restricted what kind of videos they were looking for and what criteria they applied to make their video selections, which is also suggested in Wilson (1973) and Schamber’s (1994) proposals of *situational relevance*. However, there are also some criteria or information which all participants considered important during their video selection processes, for instance, *topicality* (especially low-level video topics), *visual surrogates* and *motion*. Additionally, the participants would generally use textual information (mostly topicality) as a first criterion to start their search, but would apply visual criteria for their final selections. These findings are in line with data reported regarding image relevance judgments (Markkula & Sormunen 1998, Choi & Rasmussen 2002).

As suggested in relevance literature, topicality is still the most important criterion when people search textual documents. The results of this study agree with this finding when applied in a video information seeking context. To begin with, the participants always wanted to search or browse videos by different topics in their fields. “That would be very helpful, the topical catalogue, if somebody (is) going through the social issues ... like the American Film Industry catalogue films for different decades, some of their criteria, if applied in computer, that would be helpful, but they are not” (Participant 1). Moreover, when these participants searched for videos, they only wanted a small piece of video, but usually they needed to go through the whole video to find it. If videos can be catalogued and indexed at the scene or shot level, that would solve their problems. “The thing that would be much helpful in the future would be somebody going through the video and cataloguing the scenes, based on different criteria, so there would be sequences of videos, that people can download and illustrate topics... Based on the subject, people can click and watch it. That’s a good thing” (Participant 1).

As mentioned earlier, the participants expressed their disappointment at having to only using textual information as a means to select videos. They considered the textual information such as, topicality, date and authorship as a starting point to filter the videos, but for further selections, they wanted to feel what the video looked like. “They (the Video Data Bank) have a printed catalogue, you just go to the catalogue, go through the alphabetical artist list and some descriptions; it’s hard to get any sense from it” (Participant 2). “If you really want to learn what the film is like, what the film is about, the experiences of watching the

film, you need to have some visual and audio information” (Participant 1). Moreover, although the participants agreed that still image surrogates were effective, they also noted that watching a short clip from the video, would be highly beneficial. This was explained by the fact that trailers and clips contained sound and motion, which might offer experiences more closely aligned to the original videos. “I think this will be better. The sound is important. The frames are nice, but this (the clips) gives you more ... so I can get a sense of what it is about, from what I am looking at it. The clips really help” (Participant 2). “It would be more helpful if they have a short clip then I would watch and say that ok, this is the film I want to look at ... from the trailer, you can learn the general approaches of the film. At least what they are marketing, how they want to attract audiences, what they are selling” (Participant 1).

The preliminary results of the user-elicited video relevance criteria from this pilot study would not only enrich the current relevance literature by extending the research boundaries to the video information seeking area, but also have various implications for the design of video information retrieval systems. This is especially true for current content-based video retrieval research, as well as the interface design of digital video libraries. Since almost all of the participants expressed their desires for low-level video topical information, video segmentation and multi-level video indexing would be quite useful to satisfy users’ information needs. As video indexing is very complex and time-consuming process, not to mention indexing at the scene or shot level, tools such as VIVO (Yang et. al 2003) are needed to help video indexers input, edit and organize the multi-level information. Additionally, the participants wanted to see more visual information, especially motion clips before they made their final decisions. Therefore integration of multiple types of visual surrogates such as poster frames, storyboards and motion clips to the interface design of a digital video library would be useful to help users get some impressions of the video content. For instance, the redesigned Open Video Project (www.open-video.org) website added two new surrogates --- a short video clip and a fast-forward version of the video. This redesign led to large increase in the site visits. Finally, those user-mentioned visual criteria can also suggest new access points or features to the current content-based video retrieval research.

Summary and future work

This pilot study conducted preliminary work to investigate users’ relevance criteria as they searched for video information. The time-line interview method proposed by Dervin (1992) was applied to the study due to its exploratory and descriptive nature. Four participants who were experienced video searchers were interviewed. Inductive content analysis of the transcriptions of the

interviews has generated three categories of relevance criteria: *textual*, *visual* and *implicit* criteria. The results also showed that topicality was still the most important criteria applied by those participants, as suggested in the relevance literature for textual document search, but the participants also wanted to see audio/visual information and employed other criteria before they made their final selections.

A more extensive study will be conducted based on the initial results of this pilot study. In addition to the retrospective time-line interviewing method, an introspective method will be used by asking participants to engage in an actual search. It is hoped that this search will provide more accurate and complete information, since the current participants' memory may not be inclusive. More participants will be interviewed and they will be selected from among various different user groups such as, video editors, journalism professors and video librarians. The taxonomy of video relevance criteria developed in this pilot study will be tested and further extended.

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