Information seeking and use by newspaper journalists

Simon Attfield and John Dowell
Department of Computer Science, University College London, London, UK

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Abstract Reports an interview study into information seeking and use by journalists at a national British newspaper. Describes work activity in the context of a series of behaviour shaping constraints and cognitive and external resources. Describes the journalist’s information seeking as motivated by originality checking (of the angle), developing a personal understanding, discovering/confirming potential content and also describes information gathering and managing multiple information spaces. Shows how these are motivated by context, facilitated by resources, and how they enrich the journalist’s resource space. Also shows that journalistic work is uncertain as a function of an uncertain context and their continually evolving plans. These result in provisional and unstable relevance judgments, and, during later stages, the reinitiating of preparatory information seeking activities, including the relocation and review of previously read documents. At the end presents a model to summarise the findings.

Introduction

Research in information science has seen the emergence of a trend, identified by Dervin and Nilan (1986), of exploring the contexts of information seeking and use. A number of key features are characteristic of this approach; these include the aim of being receptive to differences manifest in different information seeking and use situations, extending the focus of research beyond users’ information system encounters to the wider context of use, exploring user’s cognition as well as observable behaviour, and frequently adopting qualitative methodologies to provide rich accounts of the information behaviours of smaller groups of individuals.

A number of researchers working within this paradigm have the studied information seeking and use as it occurs within work situations. For example, Ellis and Haugan (1997) report on the information seeking patterns of engineers and industrial research scientists. Their description is embedded within a detailed account of different project types and project phases. In the context of these, the authors identify eight major information seeking activities or “characteristics”:

1. surveying;
2. chaining;

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Similarly, in a study of information searching by lawyers, Kuhlthau and Tama (2001) have reported that, among other things, the lawyers in question engaged in a range of both routine and complex tasks, and that for complex tasks they emphasized need uncertainty during the early stages of constructing a theory or strategy in a case, a finding that is consistent with Kuhlthau’s (1993) ISP model, and the consequent need to be able to explore materials in a way that is ill-supported by traditional keyword systems.

The research reported here adopts a similar approach to those of Ellis and Haugan (1997) and Kuhlthau (1993). We present findings from a qualitative interview study carried out at The Times newspaper in London during 2001 in which we identify a series of information activities of news journalists. The aim is provide a rich description of the forces motivating these behaviours in terms of the constraints imposed by the requirements of the product they produce, the situation within which it is produced, and the resources that provide the means for its production. The study forms part of a project aiming to specify system requirements for integrated information retrieval and authoring systems based on an understanding of journalistic information behaviours. In this paper we present findings that form the first part of our project. Design implications will be reported elsewhere.

In their study of lawyers, Kuhlthau and Tama (2001) prompted the lawyers to explain the process of their work, and, as part of their reporting, place some emphasis on how the lawyers exploit the material properties of particular resources to support particular cognitive activities. Specifically, the lawyers expressed a preference for printed text since these seemed better to promote serendipitous discovery (compared to analytic searching), and also since a number of texts could be arranged in the physical workspace in a way that enabled them to maintain orientation in their task and perform continual cross-referencing. All of these were particularly valued during the construction of a case strategy.

The idea of explaining decisions and behaviours in terms of the physical properties of resources and the way in which these can play a role in particular kinds of cognitive activity has also emerged in recent years in HCI research as part of the distributed cognition approach. A particularly relevant example is a study by O’Hara et al. (2002) in which the authors explored the use of multiple source materials during text composition by a range of professional and academics.
The present study adopts a similar approach. With the view that information seeking not only includes the initial location of information, but also its subsequent management and relocation, our concern has been not only with the initial retrieval of information, but also with the ways in which journalists organise and use information throughout the wider constructive task. In part, this is a response to the need for integrated systems to consider information seeking not as an end in itself, but as frequently deeply embedded within the wider goal of constructing a new information artifact. As Kuhlthau and Tama (2001) comment, for the most part:

... information systems and services have been designed to support information seeking and gathering without consideration for accommodating the ultimate need of applying information to accomplish work tasks.

This study, then, first seeks to explain journalists’ information behaviours in terms of the constraints imposed by their situation, and also to extend beyond an account of information seeking to include descriptions of the management and relocation of information throughout the news report lifecycle. It is in these regards that it extends beyond a previous survey and classification of journalist’s information needs by Nicholas and Martin (1997). The particular perspective taken here is one of process rather than of survey.

In the next section we provide a little context in terms of a short history of developments in electronic news cuttings archives and the Internet within the news industry, and the move towards integrated systems. Following this we describe our method and findings. At the end of the paper we summarise our findings in terms of a model and discuss the results.

The emergence of the journalist end-user: a brief history

The late 1980s saw the beginnings of a revolution in information seeking in news media companies with the introduction of online news cuttings archives. In the US newspaper industry, 1985 was described as something of a “watershed” for the installation of electronic cuttings databases (Herron, 1986) with this being followed by considerable growth (Ward et al., 1988). At this time, systems tended to be confined to library departments with searching normally performed by librarians. During the early 1990s uptake increased considerably, and searching by journalists became more commonplace (Nicholas and Martin, 1993). By this time it was recognized that electronic cuttings archives had become “necessities” in many medium-sized and large newspaper libraries (Hansen and Ward, 1991). By the late 1990s, access to online news cuttings archives had reached the journalist’s workstation in many news companies.

In contrast, take up and use of the Internet by journalists, in the UK at least, has been slower and perhaps less enthusiastic than that of the cuttings archive. In a joint interview, questionnaire and observational study, Nicholas et al. (2000) assessed the impact that the Internet was having on information seeking
within the British media. Data were gathered from journalists and media librarians from a large number of news media organisations, and the results showed that Internet use consisted predominantly of searching the World Wide Web, but at that time Internet use in general was limited. The study showed that the primary reasons for this were the perceived potential for information overload and concerns over information authority.

For the journalist end-user, the development of greater proximity between online information retrieval tools and text editing tools undoubtedly brought with it the potential for greater integration between the tasks of information seeking and news writing. Following this theme of integration, the BBC and the Associated Press are now producing the Electronic News Production System (ENPS) a fully integrated newsroom system, incorporating both text editing and information retrieval tools within a single software environment. We take these developments as positive for the user, perhaps permitting a more spontaneous mode of work, but we also consider that designing value into such integration can be best attained through an understanding of how information seeking activity embeds within and is determined by the task of news writing.

**Method**

The data in this study were predominantly gathered through unstructured interviews with 25 journalists at *The Times* in London, comprising 19 home news writers, four feature writers, one obituary writer and one systems editor. Levels of experience ranged from one to 36 years. Data were additionally gathered through e-mail correspondence.

Interviews were conducted at the workplace and lasted between 20 and 40 minutes. Typically, these began with the researcher prompting the journalist to describe the work assignment process, and then steering the discussion towards issues of information seeking and use during that process. In an attempt to identify prototypical information activities along with their motivation, circumstances and means, an emphasis was placed on understanding why, when and how each activity would be done.

Interview transcripts were then analysed using a Strauss and Corbin’s (1998) Grounded Theory approach. Grounded Theory is a data-driven emergent methodology for building models from qualitative data. In accordance with the approach, the analysis began with “open coding” i.e. the identification and grouping of concepts (categories) within the transcripts, and the grouping of these further into more abstract concepts and so on. Since the aim of the study was to model information-related activities (e.g. searching, reading, highlighting) particular attention was paid to coding these. As the analysis continued, open coding was combined with “axial” coding i.e. the identification of relationships between concepts, which effectively contextualises the identified phenomena. A coding paradigm was gradually established which
acted as a framework for axial coding by specifying relationship types of interest. However, whilst a coding paradigm, like any framework, can guide the identification of some relationships, it can also preclude the identification of useful, yet non-paradigmatic relations, and thus can threaten the data-driven principle at the heart of Grounded Theory analysis. Consequently, the coding paradigm was intentionally applied in a flexible way, and developed continually throughout the analysis. The coding paradigm is shown in Table I.

The paradigm, however, is not entirely a posteriori since it is influenced to some extent by Rasmussen et al.’s (1994) work on the cognitive systems engineering framework and Vicente’s (1999) later, related work on cognitive work analysis, in which it is argued that a preliminary stage for designing for the support of complex, dynamic work (as journalism surely is) is the modelling of work activity as understood in the context of a space bounded by a set of “behaviour shaping constraints”. These authors also emphasise the representation of the available productive resources that support the work process (in this we include external resources, such as electronic archives, and internal, cognitive resources, such as domain knowledge) which can also be understood as constraining activity. The goal of understanding the behaviour shaping constraints and resources provided a priori motivation for including circumstance, rationale and means within the axial coding paradigm. Within our account of the study results, this focus manifests itself in the presentation of prototypical information activities in terms the operational work goals and constraints that delimit work objectives, and also the affordances and limitations of available resources (in this latter category we include the cognitive or internal resources of the journalists and also the physical or external resources of the situation). Together, we take work constraints and the properties of available resources as explanatory concepts providing an account of why people do what they do, and why they do them in the particular way that they do.

We treat the resulting analysis as “scaffolding” on which our account is built. Hence, categories will be implicit in what follows. Also, based on the Grounded Theory maxim that rigour lies in grounding emergent theory in raw data, we give particular emphasis to raw interview extracts as embedded within an overall narrative.

<table>
<thead>
<tr>
<th>Circumstances</th>
<th>The circumstances under which a particular activity would be performed</th>
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<tr>
<td>Rationale</td>
<td>The reason for the activity being performed</td>
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<td>Means</td>
<td>The way in which it is performed</td>
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<td>Difficulty</td>
<td>The ease with which it is performed (given the current means)</td>
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<td>Consequence</td>
<td>The effect of performing a particular activity</td>
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<tr>
<td>Frequency</td>
<td>How often the activity is performed</td>
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<tr>
<td>Desired means</td>
<td>How the interviewee might prefer to perform the activity</td>
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Table I. The framework of relations (coding paradigm) used as a guide for the identification of relations during axial coding.
Findings

How an assignment gets started – establishing an angle

At about 11.30, following the first of the newspaper’s twice-daily editors’ conferences, editors return to their desks and assign stories to journalists in their respective sections. They then follow-up these job allocations with individual briefings. During this initial period the editor will communicate the intended word-count and deadline for an assignment and also the approach or “angle” for each story will usually be determined.

Campbell (1997) refers to an angle as a “perspective that dominates a story”. In our study, research and writing was reported as always being guided by an angle. It was described as a “thrust” or “driving force” of an assignment – the new “twist” or “hook” that directs the story. An angle was also described as a proposition or statement. In the following extract one journalist relates this idea to the tragic events of the 11 September.

To start off with, there was the straight reporting of facts: a plane has hit the World Trade Center, then a second plane has hit the WTC... The default angle is “what has happened”...

Most notably though, an angle was often presented as a hypothesis or conjecture about something suspected of being the case, and this is one sense in which it can be understood as motivating subsequent information seeking. QC continued:

But this soon develops, the new “angle” comes into play. I remember on the day that by the time of the second plane, I and others were saying: “This must be an act of terrorism, because this is not coincidental, an accident...”. So had I been writing the story, I would have begun building up information to support my hypothesis that the acts of September 11 were terrorism. The standard journalistic questions of who, what, why, when, how would have been asked about the events against the backdrop of my hypothesis of terrorism.

And he summarises:

Essentially there is an angle to all news and features; it is really a working hypothesis that translates the gathered facts, which may include some speculation, into a coherent account (QC).

The angle then becomes a dominant constraint or goal determining the work that is to follow.

Through the interviews, though, it became evident that the determination of a good angle is itself constraint driven. We elaborate these constraints as originality, truth and newsworthiness.

The originality constraint

First, the angle must represent some proposition that the readership is unlikely to have encountered previously. This is the constraint of originality. We will see below how a first task for the journalists is to test the originality of the angle against previously published articles.
Second, as a hypothesis, the viability of an angle depends on the extent to which it is representative of a true situation. ZS, a features writer, said:

It may not turn out to be true, and in the end the facts may not support the chosen angle, so then you have to change the angle.

This is the constraint of correspondence.

Finally, the angle must also outline an idea that will engage the readership – this is the newsworthiness constraint. In a discussion about negotiations between the journalist and the newsdesk regarding the best angle, AV expressed the tension between finding an angle that is true (correspondence) and also interesting (newsworthiness). Here he paraphrases the newsdesk:

...“oh no, no, no, we want the truth, but we just want to make sure we get the right angle, I want a good punchy story as opposed to some boring rubbish.” ... And at the end you could get it wrong in both ways ... (AV).

No doubt, originality, truth and newsworthiness, do not represent an exhaustive set of constraints acting on the determination of a good angle. For example, a news organisation might favour angles that promote a particular political perspective. However, here we strictly limit our reporting to those constraints which emerged from the study data.

We frame an angle, then, as a perceived assignment opportunity lying at the intersection of the originality, correspondence and newsworthiness constraints as depicted in Figure 1. We show that each constraint references a different primary realm within the journalist’s work context: originality references the world of previously published news, correspondence references events and states that form the subject matter of news, and newsworthiness references the readership.

The determination of an angle, then, is an insight that depends on knowledge of this context, and as such is a function of journalistic expertise. As we will see, though, in the early stages it is usually only provisional. As a journalist’s research and writing unfold, part of their job is to test or otherwise monitor the angle against these constraints as the solution of best fit.

**Originality checking**

Motivated by the originality constraint, a features or news journalist often begins an assignment by searching one of the electronic news cuttings services to assess the originality of the angle. CJ explained:

So the first thing that I will do is to check on the database past stories to see what has already appeared. One of the reasons for that is to make sure that whatever you are writing hasn’t already been written before, because every news story has got to be new ... and if it has been written before then maybe you can still write it, but you have to find a new angle to go in on.
Broadly, a concern was expressed not to replicate a story appearing in a publication that the readership may have read previously.

Interestingly, above CJ indicated that originality checking is only one reason for this initial search. In many of the accounts of search activity, interviewees described pursuing multiple concurrent information goals. In the following, MG describes extending this initial search motivated by the goal of developing a better personal understanding of an issue:

Obviously the main interest is whether it has been in a British newspaper ... but I like to know whether it has been in the LA Times and the cutting might well tell you something useful anyway ... it might give you background on the stories ... things in the background that are not apparent to you when you are looking at the thing to write a story ...

And in the following extract, DI describes integrating originality checking with the gathering of potential content that she might later include in her copy[1]:

... the first thing you do is go into your database ... to find out if a similar story's been written before ... and erm ... just to see maybe if another story's touched on it in the past, say, that you can pull out bits from that and add it to your story.

In the model we present below, we show that alongside the goal of originality checking, the goals of constructing a personal understanding and generating potential content are active during the preparation phase of the assignment.
process. We will examine these in more detail later, but for now we will simply note the significance of two or more concurrent information goals merging into a single information seeking activity. In Activity Theory, the merging of multiple goals into a single activity has been referred to as “polymotivation” (Cole, 1996). The examples above certainly indicate polymotivation. Indeed, given the user costs of information seeking, the integration of multiple information goals into a single search activity may well represent sound action economics; in the context, that is, of limited time resources.

**Developing personal understanding**

In our study, interviewees emphasised the importance of developing their personal understanding of an issue to support further information seeking and also to provide their readers with an informed interpretation of events. A science correspondent described the importance of background research in preparation for an interview:

> I certainly wouldn’t like to have spoken to him without having researched the subject before, because I didn’t know anything about it and I wouldn’t have known the questions to ask (GQ).

Developing a better personal understanding also facilitated more focused information seeking with respect to online cuttings archives. A junior news journalist said:

> It’s a question of finding out key points ... and then using Lexis[2] to investigate them further. You can home in on a particular issue (RK).

On background information facilitating an informed interpretation, MG said:

> It just puts the whole thing in context and enables you to interpret the latest story in the light of what’s gone before ... But you don’t always have that knowledge yourself, so you have to acquire it from somewhere else.

Unsurprisingly, the need for greater knowledge tended to be associated with novices and journalists working “off-patch”, but the need to develop personal understanding was also described as “frequent” but “difficult”. For news writers in particular it often conflicted with deadline constraints. Where this goal gave rise to independently identifiable information seeking this usually consisted of searching electronic cuttings archives with a selective preference for articles from broadsheet newspapers of some length, such as feature articles. Occasionally an article would feature an explicit chronology in relation to an issue and these were valued. Also, where the subject of enquiry was a person, there was a preference for locating person profiles.

Finally, in anticipation of our model, we identify the journalist’s knowledge as a work-system resource. In these terms, the goal of constructing a personal understanding is one of developing a work-system resource intended better to support the work goals.
Discovering/confirming potential content

Above, we showed how the goal of originality checking could stand in a polymotivational relation with respect to the goals of developing a personal understanding and gathering potential content for an article. In this section we focus on the gathering of potential content as a logically discrete, if not temporally discrete, goal.

QC described an angle as a hypothesis against the backdrop of which he would then be searching for information. In this sense the angle acts as a macro-question supervening over, and prompting lower-level information needs. Looking for information to support an angle was often expressed as the task of looking for supporting facts and figures. CJ said:

My job is to look into it to see whether their [the editor’s] ideas are right, or if they have got the right end of the stick, and to try and find enough facts and evidence to backup their idea. Furthermore, QL, a features writer, said:

... you’re then all the time sifting the facts to see whether they’ll go into that scheme (the angle).

The terms “sifting” or “skimming” were used frequently to describing this activity. Adler et al. (1998) define skimming as:

... reading rapidly in order to establish a rough idea of what is written, and to decide whether anything is useful, or whether anything needs to be read in more detail later.

As well as describing information as potentially “relevant” the interviewees often spoke of information being potentially “useful”.

Information gathering

Once “useful” information had been identified in a cutting, it would then be collected and stored as part of a small, but evolving, assignment-specific collection developed as a material resource to support further information seeking or the later writing process. The means of gathering depended on how much information in a cutting was deemed potentially useful. Where this was small, interviewees made hard-copy notes or transferred information into a separate computer text file. Where a document contained larger amounts of useful information, a preference was expressed for printing. DI said:

Where I’m doing a few Lexis searches and it might be something so small I can’t be bothered to print it out so I just write it down and move on to the next search.

Notably, where information was transferred into a dedicated word processor file many journalists gave a name for this resource. For example a media correspondent said:

... the first time you pick up this information is usually when you grab it and you put it into your story or you put it into your cut and paste sort of basket where you are collecting things, and then you would go back (OL).
Other terms used included “work paste pad”, “holding document” and “kind of database”. This naming we take as significant in indicating the ubiquity of this resource as an intermediate product of the work task.

Where a cutting was printed, interviewees commonly reported highlighting or otherwise marking documents to identify “facts and figures” that they thought useful. This was done to support later ease of reference:

I have been working for half an hour on one person and I already have two-dozen sheets of paper, and the circles and the scribbles and lines help you weed out what you want (QF).

Marking documents or transferring text into a “basket” effectively generates a small(er) collection of information with higher relevance density than the source documents. The intention is to support reference. Interviewees often reported that by marking important facts they would save time later. Implicit in this, of course, is a user-judgment about the limitations of a cognitive resource – they do not expect to be able to remember all of the information and expect to need reminding. But we give key significance to the generation of this collection as a means of reducing user costs associated with locating valued information later, particularly during writing.

Throughout preparation, with its constituent goals of originality checking, constructing an understanding and gathering material, the journalist’s concept of the final report evolves. The angle, as an initial conjecture, stands only as an outline. CJ explains:

…the ideas will take shape all the time … at the point that they change all the time. It is only really when you have to sit down and actually write it that I would have to decide what way to go into the story … I am preparing it … I am preparing all the time.

Planning is ongoing and reactive to the opportunities presented by the situation and the collection that forms represents the approximate expression of these plans. Like the provisional nature of the angle, information is also gathered on a provisional basis. Not all of it will be included, rather the collection represents a distillation of content options. As such, the collection can also be exploited as a content checklist:

I go through documents highlighting important bits and then I go back through as I’m writing. I go back through as I’m writing to make sure I have included everything – as a checklist (DI).

Managing multiple information spaces

As we have seen, information gathered from sources, including news cuttings archives, will be stored as a user-generated collection to facilitate low cost referencing. Cross-referencing during writing was described as frequent, and interviewees often explained that, when writing, they would manage their physical workspace to support low-cost accessibility.

Where information had been collected in a separate computer file, the journalist would usually work with the screen split between this and their developing copy file. Where cuttings had been printed (and highlighted)
these would be arranged at the computer. Indeed, the capacity for paper to support accessibility when referring back was sometimes cited as a reason for printing:

I usually print cuttings because you can highlight them and it’s quicker to have the page in front of you rather than to scroll on screen. If you didn’t print them then you would have to go back and do the search again to find the info (DI).

We have argued that report planning is ongoing and reactive. As the journalist gathers information, so they will review their writing intentions. Above DI articulates a desire to avoid searching for a cutting more than once. A testament to the plan as an evolving, developing idea, however, is the fact some journalists reported that when they initially read a cutting they would sometimes fail to collect information that later they would consider important – forcing information seeking to be reinitiated. A news journalist reported consistently failing to record the date of an article, and a features writer said:

Sometimes you remember seeing a fact that you forgot to copy and so you have to go back in [to an electronic cuttings archive] to find the article it was in (ZZ).

**Constraint volatility**

Researching and writing for a news or feature article can be an uncertain business. Interviewees frequently talked about plans for a report being “overturned”. Destabilisation was observed to arise from changes in two assignment specific constraints: the angle (as understood by the journalist), and the required word count for the final report.

*Changing the angle*

Changes to the angle came about either because it was found to transgress the originality constraint, the correspondence constraint or it failed to optimise newsworthiness.

The journalist seeks information to support and test the angle, and new information can arise that shows an angle to transgress the correspondence constraint. Above ZS said:

It [the angle] may not turn out to be true, and in the end the facts may not support the chosen angle, so then you have to change the angle.

As we have also seen, in addition to satisfying the correspondence constraint, the angle must also maximize the newsworthiness constraint. Changes to the angle can occur to better maximise the newsworthiness constraint. These changes can be motivated from the bottom up (by the journalist on the story) or from the top down (by editorial supervisors). Here, BL describes having such an insight:

Writing plans can change “relatively frequently”. You might come up with what you think is a better idea than the one that the newsdesk gave you. You’ve then got to, of course … convince the newsdesk that you’ve got a better idea …
Alternatively, the editorial supervisors may have new insights:

The most likely change would be that the newspaper has decided to take a different angle on the story . . . The decision might have been early in the day to approach a story from one particular angle, and by the end of the day . . . there might be a decision to approach it in quite a different way . . . (CJ).

**Changes in space allocation**

A second source of volatility is a word-count revision. Part of the role of the editorial staff is to make decisions about newspaper page layouts and changes in plans at this level will propagate down to the journalists working on the stories. AV explained:

The newsdesk may ask, an editor may ask or a sub[3] may ask for more information, and you try and find out.

A good example of this kind of amendment was also recorded in the researcher’s field notes when an editor approached a journalist’s desk and asked for another 100 words on a story that he had previously filed[4].

**Implications of change**

A global change in direction can result in the need for a complete re-write. Tolerating this was regarded as intrinsic to the journalist’s job. Also, since the journalist gathers information on the basis of its value with regard to a particular angle, a change in the angle can render previously collected information less relevant. DI said:

This [angle change] means that sometimes you have to do some more information searching. This can mean going back through your cuttings to see if there’s anything else you want. The information that you already have can reduce in importance.

And CZ said:

When this happens [angle change] you can then look through the information that you have for other things perhaps to confirm the new information.

The possibility of returning to the preparatory phase and re-initiate searching was commonly recognised. When asked to expand, MV, a freelance journalist said:

Just simply really the fact that, having taken new directions, perhaps that work, that may in turn trigger new research, new names, new dates, new ideas might come up which you would then like to explore as well.

**The model**

In Figure 2 we summarise our findings in the form of a model of the newspaper report research and writing process. We show the major process stages of initiation, preparation and production, and describe constituent goals at each stage. We also show the process as being embedded within the context of product and resource constraints. We characterise the product constraints as
imperatives directed at the assignment product such as newsworthiness, correspondence with the facts, the assignment deadline etc. Resource constraints relate to artifacts at the journalist’s disposal, which may be used in meeting their task goals.

We also divide resources into two types: external, which includes information sources such as electronic news archives, the assignment specific collection and personal contacts as well as application software, paper, written plans etc., and internal, such as the journalist’s working memory and cognitive structures such as the developing internalised plan, and their accumulated knowledge of a subject.

Dark arrows in Figure 2 represent movement between stages with the dynamic nature of the process characterised by backward links. Light arrows represent the influence of the constraints on the process and, in the case of resource constraints, the influence of the process in developing resources.

To summarise, at initiation the journalist is briefed with a set of constraints specific to the assignment. Included in this is the required word-count and the deadline. Also at this time the provisional angle is established. The angle is a
hypothesis or conjecture that is the new “twist” or “hook” that drives the work, and is itself a perceived opportunity occurring at the intersection of the constraints of originality, correspondence and newsworthiness. As we have said, these constraints remain active throughout the process.

During the preparation phase the operational goals are to confirm the originality of the angle, develop a personal understanding (where required), to gather potential content and, through these activities, to evolve a plan for the report. Originality checking, developing a personal understanding and gathering potential content all give rise to information seeking activity. These goals are discrete but can nevertheless merge into a single activity such as searching an electronic cuttings service – this is polymotivation.

The goals of developing a personal understanding, gathering potential content and planning involve the journalist in developing his/her physical and cognitive resource space better to address the demands of the product constraints. In developing a better understanding the journalist enhances his/her knowledge in order to support further more targeted information seeking, and in order that he/she might ultimately present informed interpretations of events. Through gathering potential content the journalist generates and develops an external resource, namely an assignment specific collection, in the form of computer text files and/or highlighted documents, specifically with the aim of reminding him/herself of important facts and figures later. Anticipating the need to refer to this resource frequently during writing, referencing costs are reduced in the case of paper documents by highlighting information that appears particularly useful.

Finally, planning involves the development of another resource, i.e. content and structure plans, the content plan finding approximate external expression in the assignment collection and the structure plan remaining predominantly internal (cognitive). Plans, however, evolve and become more elaborate throughout preparation and, we propose, decisions continue to be made during the writing phase itself. Further, since any information is gathered on the basis of its perceived usefulness with respect to the evolving plan, information gathering is only done so on a provisional basis and hence these relevance, or “usefulness”, judgements have an associated uncertainty.

At the writing stage, journalists further manage their resource space to reduce referencing costs with respect to the information they anticipate will be useful by working with a computer screen split between an electronic assignment collection and also by arranging paper documents on the desk around their computer screen. Occasionally, though, they will realise that they have omitted to gather some information that they now need and will momentarily return to information seeking.

We have noted that the process is frequently destabilised and that this occurs as a result of product constraint changes. Specifically, the angle and the required word-count can change. During planning the angle, as a conjecture,
may be shown to be false. At any time new insights might offer an alternative angle that better optimises the newsworthiness constraint. Also, the entire process is embedded within a wider process – the production of a newspaper – and space allocation decisions may have a knock-on effect for the required word-count.

Such changes, to a greater or lesser extent, change the nature of the task. They change what the task is and result in the journalist reverting to previous process stages. Changes to the angle necessarily correspond with a return to the initiation stage. Since information has been sought and gathered according to the requirements of a now redundant, but nevertheless associated angle, information that was previously collected can be rendered less relevant and fresh information seeking can then be required and/or the assignment collection can be reviewed for other information to include. Changes in the required word-count can have a similar effect.

Discussion

Our activity- and constraint-based account of news and feature research and writing describes goals and activities associated with generating an information product motivated, focused and guided by a series of product constraints and also a set of constraints in the form of the affordances and limitations of the available resources. These factors not only describe the context for the work task, but also offer an account of what that work is. Product constraints collectively embody the goal while resource constraints dictate the means by which it can be achieved. This is a complex issue and can be elaborated far more than we have done here.

We have also given an account of ways in which journalists manage and develop their internal and external resource space better to support their goals. The user attempts to learn, and in the context of working memory limitations, they also manage external artifacts to reduce later referencing costs.

And we have described uncertainty in relation to the perceived relevance or potential usefulness of information encountered as a function of the dynamic nature of evolving report plans and also as a function of unstable product constraints.

Uncertainty has developed into a significant theme in information seeking theory. Notably, Belkin et al. (1982) describe uncertainty manifest in the information seeker’s inability to express their information need and Kuhlthau’s (1993) ISP model relates the user’s progress from uncertainty to certainty during the constructive process of integrating novel information into a deeper understanding i.e. learning (Kuhlthau, 1993). Ingwersen (1992) also discusses the transformation of a problem space into a state of uncertainty when a person cannot solve a problem or fulfill a goal by thinking.

Our account of plan development makes explicit a link between uncertainty in the user’s perception of information relevance, or “usefulness” (a form of
uncertainty about what they want) and uncertainty with respect to the product of their work. In other words, we make a link between uncertainty about what one wants and uncertainty about what one is going to produce. On this view, as a plan evolves, the user moves from uncertainty to certainty. We regard this as complementary to the idea of the progress from uncertainty to certainty occurring as function of the user constructing new understandings. Presumably, new understandings lead to more concrete plans and hence a greater sense of certainty about information requirements.

In this study we have also identified a further dimension of uncertainty, specific perhaps to the dynamic context of journalistic work. This is uncertainty that occurs as a result of product constraint changes i.e. the task itself changing. As new information is encountered, as events unfold and as new insights are gained and as required word lengths change, report plans can be revised and so new “facts and issues” become important. A central theme of building an information collection is the preservation of useful information. But at any time a commitment to information usefulness can only ever be provisional.

As a part of our future work we are exploring the implications of these findings for the design of integrated information seeking and authoring environments for journalists with particular emphasis on designing systems that are sympathetic to the information goals that we have described here, and particularly as they occur within the context of uncertain and evolving task requirements.

Notes
1. “Copy” is a journalistic term referring to the text of the report that they produce for inclusion into the publication.
2. Lexis Nexis (or “Lexis”) was one of the electronic news cuttings services in use at The Times at the time of the study.
3. A “sub” is a subeditor/copyeditor.
4. To “file” a report is to submit it (after writing) to subsequent editorial processes.

References


Vicente, K. (1999), *Cognitive Work Analysis*, Lawrence Erlbaum, Mahwah, NJ.