Idea Management in Creative Lives

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Abstract
This research explores how ideas occur in creative work and the strategies and tools used to represent and develop them. We describe the analysis of an open questionnaire survey of creative practitioners’ use of devices to represent ideas and capture inspirational material. Unconscious processes, novel experiences and time away from practice frequently provoke ideas. Our analysis finds that ubiquitous devices are important to practitioners for making initial representations for personal use. Paper and pen remains by far the most common device employed, however respondents perceived organisational advantages in new technology. Representations are created as initial memory aids, platforms for development, or to share ideas. A single representation is rarely suitable for all these purposes.

Keywords
Creativity, Idea Representation, Personal Information Management

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction
With the proliferation of computer technologies supporting the capture, representation, organisation and communication of multiple media forms, a wealth of new tools are available for the management of ideas by creative practitioners. Personal information management has been a strong focus in the CHI community and is also the perceived market for countless products entering the market over the last two decades [6]. Whilst the use of these devices for capturing ideas has been implicit in some research (e.g. [3]), there is value for designers in understanding idea management as a specific form of represented information in a world where creative employment and the use of technology in creative tasks is increasing.

In this paper we review research concerning how and where ideas occur, use an open questionnaire to elicit detail on practice and describe our initial analysis of the responses of 27 creative practitioners discussing their strategies of idea generation, representation,
communication and management and the devices they use for these purposes.

**How Ideas Arise and are Developed**

The nature of creativity has been studied and described in a variety of ways, with essential threads and divergent arguments. There are some conflicting notions of what creativity is, however in general it can be defined as the production of novel and valuable outcomes through ideation, representation and evaluation [2]. A commonly accepted theory is that novel ideas occur through bisociation – a connection between multiple thought matrices in the brain [7]. These novel associations are likely to occur during periods termed as ‘incubation’ in many creative process models, where a lack of conscious effort is combined with a continuing attachment to the problem. In our previous field studies of collaborative musical composition we noted that initial ideas were commonly brought to meetings to be shared and used [2]. We therefore realised that important parts of the creative process were not being observed through this methodology. This has led to our current interest in the elements of creative processes that occur away from the studio or office and methods to elicit data on this.

Gelernter argues that we experience a spectrum of thought between analytical, highly focused concentration and metaphorical, low-focus thought processes, where more unusual connections are made between items widely distanced in memory. Low-focus thought occurs due to physiological influences such as tiredness or through the performance of mentally undemanding tasks such as driving or walking, allowing the mind to wander [4]. An emotional interest in specific themes or problems means that associations of possible relevance are recognised despite the person not intentionally thinking about the topic, perhaps creating a ‘eureka’ moment.

Alternatively, forms of bisociation may occur where an individual’s communication is associated with another individual’s thought, or if an external artefact in the environment provides inspiration in a similar fashion. Finally, novel ideas appear through interaction with and exploration of the medium or other representational forms. This is central to Schön’s theory of reflection in action, that creative problem solving occurs as representations talk back to their creators [8].

In summation, original ideas occur through:

1. Inspiration from the surrounding environment.
2. Interaction with others.
3. Internal bisociation, occurring most commonly whilst performing mentally undemanding tasks.
4. Interaction with the medium or representation.

It is therefore clear that the time and place of inspiration is unpredictable, and that important idea generation occurs away from contexts where creative work is intentionally performed. The value of an idea is dependent on the context it is to be employed in, giving practitioners a reason to store interesting ideas until they are in a position to use them. Implementation then requires development from the initial concept to a feasible, defined output. Our survey probes these issues and the strategies employed by practitioners to address them.
Open Questionnaire Survey

Open responses were requested to the ten questions presented in table 1, aiming to elucidate description of processes, experiences of ideation away from practice, opinions of the use of technologies and the integration of devices in to practice. With this method we can capture a depth of information about creative lives, rather than single instances of work. Respondents were recruited from local art groups, online groups for creative professions and university notice boards. 17 respondents considered themselves professional practitioners with 10 amateurs. Respondents covered a wide range of domains, including writing, music, design, film and visual art.

Analysis of Responses

Questionnaire data was coded, with recurrent themes analysed using the Weft QDA environment [9]. It was clear from the lengthy responses that creative practitioners critique their own processes and are motivated to shape them as part of their work. Processes are therefore subject to individual variation but common issues and needs emerge.

Devices Used by Respondents

In response to question 1, the essential tool was clearly paper and pen, mentioned in various forms by 26 of the 27 respondents. Cameras and audio recorders were also popular devices, each mentioned in 9 responses. Whilst we expected a bias towards technologically aware practitioners given that the questionnaire was delivered online, mobile technology use was comparatively low, with only 5 respondents mentioning use of a mobile phone as a representational device and 3 using a PDA.

<table>
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<tr>
<th>Table 1: Questions Used in the Survey</th>
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<td>1) What tools do you use to record ideas and inspirational material? (e.g. a notepad, diary, dictaphone, PDA, Post It notes, mobile phone, laptop or anything else) Please describe when you have these tools with you and how you make use of them:</td>
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<tr>
<td>2) Describe how you represent ideas and inspirational material using the tool(s). What form do they take? (e.g. written text, sketches, photos, video, voice recordings, scraps cut from magazines etc):</td>
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<td>3) How do you integrate the tool or tools with the rest of your work? When and why do you refer to it?</td>
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<td>4) Can you recall ever having a good idea at an unexpected or inappropriate time? Examples of this would include when you were travelling, in bed, shopping or doing any other activity away from your work or practice. Does this happen often?</td>
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<td>5) If you can, please describe a situation like this and what you did about it:</td>
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<td>6) Do you feel that you have forgotten good ideas in the past because they occurred at an unexpected time and you could not record them?</td>
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<td>7) Other than as part of a completed piece of work, do you share you ideas with others in any way? Please describe how and why:</td>
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<td>8) Do you ever show the tool(s) mentioned earlier to other people? If so, when and why?</td>
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<td>9) Apart from using the tool(s) mentioned earlier, how do you present your ideas to other people?</td>
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<td>10) If you collaborate with other people, how do you come to decisions about what to do next as a group? What tools, if any, do you use as part of this (e.g. paper and pen, a computer etc) and how are they used?</td>
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Our analysis of participant’s responses supports the understanding of ideation developed by Gelernter. Ideas are particularly likely to occur during activities provoking low-focus thought. 12 respondents related the need to constantly carry a representation device, most commonly a small notepad and pen. The occasional use or consideration of using a mobile phone was mentioned in this role, particularly given it’s additional abilities as a camera and voice recorder. A musician noted that on having a good idea “I try to find something to sing it into. Could be a cell phone with voice recording, or I call my voice mail and leave a message”. It appears that mobile phones or similar devices - since they are consistently carried - could provide useful support, but are as yet untried or unpopular with the majority of practitioners. One respondent noted that the experience of trying to record ideas on a mobile phone “doesn’t really inspire me to carry on with them”.

11 respondents remarked upon trying to sleep as a situation where ideas occurred regularly but were difficult to capture effectively. 5 respondents mentioned similar problems whilst driving. These situations were common enough for several practitioners to develop personal solutions, specifically keeping a notepad, light and pen next to their bed, or purchasing an audio recorder to use in the car.

Three essential purposes were identified for the capture of external stimuli and the representation of ideas. These are retention, feedback, and communication:

Retention and Organisation of Ideas
The occurrence of ideas away from practice was familiar to 26 of the 27 respondents, but the strategies for dealing with this were markedly polarised. 9 respondents worried about the potential loss of ideas and felt they had forgotten good ideas in the past, while a further 8 stated that the appearance of ideas - whilst important to their practice - did not require immediate representation and that a further level of mental distillation was important. The following quotes are exemplary of these contrasting positions:

"Once or twice I’ve been caught out (say, on a walk) without my notebook. When this happens, generally I try to just keep repeating it in my head and bolt home as quickly as possible to write it down. Can be tricky though - I’ve totally lost whole chunks of music because somebody talked to me when I was trying to do this”

"I have so many ideas all the time that most get forgotten. The ones that you work with are the ones that recur or contain special meaning”

Although not a universal practice, the diligent collection of all interesting ideas and inspirations results in a valued resource for many practitioners. Recorded ideas are either relevant to a current project or considered worthy of retention for possible future use, with differing needs in each case: Ideas for current projects need representation in the context of the project, while the success of the representation of ideas for future use relies upon capturing the essence of the idea well enough to overcome the time between representation and review, and having ideas available at appropriate times. A respondent described the process of starting a new project as a "shuffle and cull" of his collected ideas, while another noted that they reviewed collected ideas during spare time on public transport.
6 participants reported using more than 4 separate devices in response to question 1, reflecting their desire to capture and represent in different modalities and the varied availability of devices as ideas occurred. The organisation of representations was considered a burden that the design of new technology might resolve. For example a professional writer using a PDA favoured the device because "it keeps me from losing notes on scraps of paper". Problems with adopting new technology were the overhead of digitising existing collections and increased ‘information fragmentation’ [6] as more devices are used.

Feedback, Evaluation and Development
Respondents generally discussed their creative process as a series of transitions where new representations were made based on existing ones, supporting the continuing development of the idea in a distributed cognitive system. In answering question 3, a professional composer and writer stated that he kept “writing and re-writing and re-sketching the structures and number lists until they look good. By then I don’t actually need to refer to my notebooks because my idea is clear enough to be entirely memorised - and often by that time, the piece is more or less finished”.

The development of ideas through multiple re-drafts is a counter-intuitive task to accepted technology design, since to repeat a task or copy from a sketch by hand would appear a productivity loss in the age of automated copy and paste. However the transition and transformation of material through the mind rather than external to the mind provides opportunities to make further discoveries and reprocess ideas through the cognitive system. This interaction requires practitioners to view and work with multiple representations and captures simultaneously. A reported strength of physical over virtual media was that it could be organised freely and viewed in this way.

Communication and Collaboration
In a introspective study of his personal use and development of an electronic notebook, Erickson described creating notes in a more sculpted form when using the developed tool, because of the realisation that they may be directly copied to a collaborator or in to a paper [3]. Here the majority of respondents considered devices for initial capture and representation personal tools, developing additional representations of ideas in order to communicate them. As initial representations were coded from a personal perspective, they would not make sense to others. Exceptions to this were mentioned where the device allowed the definition of aspects of an idea that could not be effectively communicated with language alone. A filmmaker noted that: “If I am working on a film and I want to convey an idea about the particular colours and tones of a scene then I use a scrapbook. This scrapbook contains many clippings from newspapers, magazines etc. This is because it is difficult to describe an exact colour or tone. If I say blue to the cameraman he may have one idea of blue and I may have another.” The ‘scrapbook of captures’ is particularly common amongst practitioners in visual domains. As John-Steiner notes, there is no precise dictionary for visual forms [5], making visual thinking powerful in creative tasks, but its communication in language difficult.

Discussion
To date this research has provided insight into the tools and strategies currently used by practitioners to retain,
evaluate and communicate ideas. Novel outputs come from novel processes, so it is unsurprising that practitioners develop individual strategies and are wary that the adoption of new tools could enforce unwanted structure or have unforeseen effects. However, common needs and difficulties emerge from the survey that we now aim to explore in detail for design.

In a study of information capture, Brown et al noted that design problems often occur because devices are optimised for the capture task itself, rather than the goals of the capture [1]. Representations and captures in creative tasks are memory aids, platforms for feedback and a means of communication. However a single representation is rarely appropriate for all these goals. In particular, initial representations created for individual use are often inappropriate for communication with others, and in developing ideas practitioners redraft representations in order to interact with their ideas in different forms.

For initial idea retention, devices should be ubiquitously available, supporting the immediate, sketchy representation of ideas by individuals in a variety of media and the capture of inspirational material from the environment. Devices should also support representation in varied contexts that constrain the user’s interaction. For feedback and idea development, the environment must support the review of multiple representations and captures simultaneously. For communication, devices should support conversation through the ability to share and refer to captured media, and for individuals and groups to develop further representations using captures. Devices should support the redevelopment of initial representations in order to make their content understandable to others.

Creativity is a human skill that heavily utilises interaction with media, therefore informed interaction design can make a significant difference. Our focus is now to combine the findings from this study with participatory design sessions, then to develop and evaluate prototype systems, engaging practitioners in the process of design and building further understanding of the management of ideas.

References