

# Personal Information Management for Creative Practitioners

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## ABSTRACT

Personal information management is of concern to a wide variety of people with comparable and contrasting needs. Our particular interest is in understanding and designing support for creative practitioners, and our exploration of this has led us to PIM as a research focus that shares extensive ground with support for idea representation in creative lives. As a wider concern, we would argue that creativity plays a highly valued role in the work and lives of people generally, and that an understanding of how creative practitioners represent and manage ideas has implications for PIM support in general.

## INTRODUCTION

Creativity is commonly defined as a *process resulting in the production of outcomes that have some level of both novelty and value*. Dissecting this definition we first identify that creativity involves the externalisation of ideas from the minds of those involved in the process. Secondly these ideas hold some form of novelty, Sarmiento and Stahl summarise that creativity “involves extended efforts to articulate, critically consider, and communicate notions that are not already part of the taken-for-granted life-world” [11]. Finally ideas have value, which leads us to assume that some form of evaluation takes place. Both the extent of novelty and the measurement of value are contextual, subjective notions varying with the aims of practitioners.

Our research concerns the interaction of creative practitioners with representations of their ideas, and aims to produce an understanding of creative processes that is of use to the designers of support tools for this purpose. Recent work has included an open questionnaire survey of practitioners from a wide range of domains, discussing their use of tools to represent ideas and the role of these devices in their practice. We are also conducting studies providing smartphones as support tools for collaborative filmmaking tasks performed over a period of several weeks. Additionally we have undertaken iterative prototype design and evaluation projects in the domain of musical creativity to better understand support needs [2,3].

Shneiderman notes the possibility of pushing beyond Memex towards Genex, an integrated set of tools that generate excellence by combining access to information

with support for creation, refinement and dissemination [13]. Realisation of this requires a holistic understanding of practitioner’s use of tools and processes. The development and management of ideas and other information in creative endeavours is poorly understood.

PIM is highly relevant to the study of these processes, particularly at the level of creative lives. This encompasses interaction with media and the completion of specific projects, but also focuses on the retention and management of ideas and information that may have future potential. The diligent collection of ideas is a preoccupation for many practitioners. We begin our exploration by comparing and contrasting idea representations with other representations of information.

## UNDERSTANDING IDEA REPRESENTATION IN PIM

Idea representations have specific characteristics and purposes that differentiate them from representations of information in general. In particular information is generally used to construct knowledge [7], while in creative processes disparate pieces of information are associated through an internal process – termed bisociation by Koestler [10] – to construct novel ideas. Information is a medium for constructing both knowledge and ideas, but comparing definitions, a major contrast is that the former provides understanding while the latter describes possible action. Where knowledge is built through logical connections between information, novel ideas more often connect pieces of information through metaphoric relationships. The processing of information through the mind and interaction with media is key to working with ideas, as is the organisation and review of created representations. Ideas are not *acquired* in the sense that information can be, but *emerge* from a person or group.

Our research suggests that ideas are represented for the purposes of retention, development and communication [2,3], and that one representation is rarely appropriate for all three purposes. The processes involved in creating and using representations differs for each purpose:

Questioning creative practitioners, we find evidence that important ideas regularly occur away from practice, as Gelernter would argue that the mind is capable of making more disparate associations in less focused states [6].

Coupled with this, the value of an idea is highly dependent on the context it is employed in. The retention of ideas is therefore essential to practitioner's long-term work, with most practitioners developing coping strategies and many carrying devices ubiquitously, allowing them to create representations across a wide range of circumstances and in a variety of media. However our research also highlights the limitations of these representations, often being considered for personal use only and impossible for others to understand. Additionally initial representations are often produced in unsuitable conditions, and convey vague, partially formed notions. Survey respondents have repeatedly mentioned having ideas whilst in bed, driving, or using public transport, and struggling to retain them in these contexts.

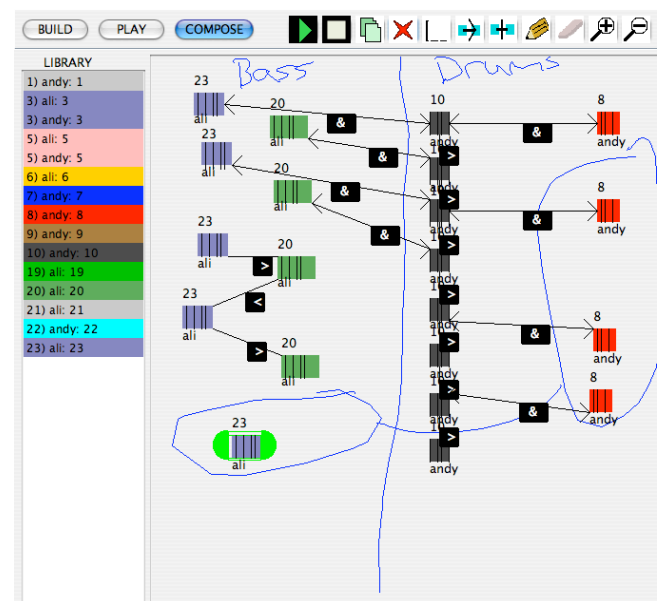
Though ideas must hold some interest for a discerning practitioner to actively record them, it is through development and combination that ideas are fully evaluated and realised. Representations for this purpose form part of a distributed cognitive system described by Schön as 'reflection-in-action' [12]. The development process can generate a large number of representations, many of which will hold little value soon after being created, as they are used to bridge gaps where unaided thinking is insufficient to proceed [8].

Like knowledge, ideas have no initial existence external to the individual, being made explicit through representation. The communication of ideas is often difficult due to their novelty, which can preclude the use of pre-defined concepts. As the expected outcomes of a creative task are ill defined as work proceeds, communication through idea representations supports a partial definition of goals and conveys tacit knowledge between collaborators. Various media and captured stimuli are used to convey ideas that are difficult to describe in language, particularly if the intended outcome is not linguistic. Collaboration in creative tasks also requires shared understanding of the constraining structure in which the project takes place. As projects proceed, the internal constraints – how employed ideas reduce the space in which complementary ideas can fit – must be shared for collaborators to converge on a coherent outcome [3].

### SUPPORTING CREATIVE PROCESSES THROUGH PIM

Representations of ideas often contain ambiguities, where practitioners postpone the definition of items outside their current focus or consider ideas at an abstract level. The informality required of tools to support idea representation is also reported with reference to general note taking by Dai et al, who found that structured applications are often avoided or fake information is entered in order to use them [5]. Formal structure supports useful actions such as searching and organising collections, but it appears that idea representation along with other PIM tasks require structure that can be created ad-hoc, post-hoc or that can be ignored when it prevents effective input.

Novel ideas emerge through novel processes, and there is wide variation in practitioner's processes even within the same creative domain [2,3,8]. A common finding throughout our studies has been that practitioners benefit from the freedom to use space to develop their own - somewhat ambiguous - meanings, to represent relationships, and to review multiple representations simultaneously. Figure 1 shows an interface originally developed for our Sonic Sketchpad tool, allowing users to manipulate and combine recordings freely in space [2]. Studying practitioners we have identified that a strength of physical media is its ability to be positioned in unconstrained ways. Paper remains the essential tool for creative practitioners partly because it supports the definition of structure and meaning ad-hoc. Replicating this in software, whilst maintaining the advantages computers bring through formalised structures is an important design challenge.



**Figure 1: A Freeform Space for Composition Representation**

The need to review and organise multiple media is another aspect of creative processes that has been problematic in general PIM. Bergman et al note that format related storage fragments documents from specific projects across multiple organisational structures [1]. Working across applications and media can create obstructive seams, and integration between tools is an important topic in creativity support research [2,3,13]. In our studies using smartphones, required conversions between applications and devices have been a source of great frustration to users when developing or communicating ideas.

Relating our research to the workshop theme of PIM beyond the desktop, we find two factors that can have an impact on support for creativity, firstly we are seeing new mobile support for representing ideas wherever they occur, and in a variety of media forms – e.g. where writing is

inappropriate, dictation is possible, where a picture is necessary so that an inspiration can be described, it is possible to do this using the same device. Secondly, collections of representations and captured material can be pooled and made available across networks, so that practitioners no longer suffer from the reported phenomena of having scraps of ideas in various media, locations or devices, any of which could be key to their latest project.

The opportunities for resolving fragmentation and the loss of important ideas through integration are clear, but there are also issues of organisation that may be increasingly apparent as integration occurs. Boundaries between devices, applications and media forms can provide useful structure as well as seams that are detrimental to fluid work. Individual preferences in organisation strategies are important to practitioners, leading to concerns over new technology adoption. Creative work contains an inherent pressure between needing structure to build upon, and the ability to break from structures as they become inappropriate. End user development and flexibility are therefore important notions in the design of all computer support for creative work [3].

#### COMMON AIMS AND PROBLEMS

Whilst we see support for creative practitioners as an area worthy of research, there is also scope for considering the relevance of these processes to the lives of people who do not consider themselves particularly creative. Researchers including Craft and Shneiderman have argued that creative processes are essential to activities occurring in our everyday lives [4,13]. Little 'c' creativity occurs when we create social networking profiles or organise social events. These researchers would argue that we perform these activities using the same processes as the artist or designer at work, with the same ill-structured nature to the task, and the generation, representation and evaluation of ideas. Jones & Bruce argue that PIM is mainly about the projection of personal information [9], and there is certainly a creative element to this activity.

From our perspective, the challenges of studying support for creative lives are similar to those for studying PIM in general. Short laboratory based studies throw little light on practices that only hold purpose in the longer term. Meanwhile practitioner's interactions with devices in the field are difficult to observe holistically as they occur sporadically across contexts and time scales where the researcher cannot follow. Getting participants to adopt new devices for study is also fraught with validity problems. To date our work has provided us with a wealth of initial data

from which to consider design requirements, but methods to effectively evaluate existing or prototype tools for idea management need further exploration.

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