

# iPad as PIM Device: Input, Interrelation and Indexes

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## Abstract

This paper presents preliminary results from components of a larger research study which explores the processes and challenges of information workers conducting personal information management (PIM) within offices. Here, we focus on the findings specific to users of iPad-style tablet computers with the Evernote PIM software; data reported was collected using several online questionnaires and semi-structured interviews; content analysis and open coding techniques were used to analyse the data. Our results suggest three themes — input, linking and tagging fatigue — that regularly impact users of this software, these themes are not specific to Evernote, and are common to many PIM tools. Our results give insights into the use of software for PIM, generally, and specifically the use of software on iPad-style tablet computers for PIM, and we provide suggestions for future work to improve tools and practices.

*Keywords:* personal information management, human-computer interaction, mobility

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## Introduction

Personal information management (PIM) is the process of acquiring, organising, maintaining and retrieving the multitudes of information items that an individual uses to fulfill their various roles, both professional and personal. Efficient PIM improves quality of life for individuals, through better use of time, energy and resources (Jones, 2007; Whittaker, 2011). The rise of consumer mobile computing has led to numerous tools designed specifically to raise the efficiency of PIM. Here we present preliminary results from a larger ongoing study of personal information habits by knowledge workers; this paper specifically discusses the methods by which users of Apple iPad tablet computers input information into PIM software on these devices, and how the choice of method affects the various stages of PIM. The PIM software tool primarily discussed here is Evernote, a combined service and cross-platform application geared around notetaking and archiving; Evernote supports folders, tagging, text formatting, images, photos, searching and archiving in notebooks (Evernote Corporation, 2012).

PIM is frequently examined through the lens of a variety of frameworks — this work applies the framework conceived by Barreau (1995), which encompasses the four stages of acquisition, organisation, maintenance and retrieval. The goal of the preliminary work presented in this paper is to provide initial analysis of results around the design of PIM software for the Apple iPad. Several themes relating the use of tablets for PIM are identified and introduced in this paper: data input, data linking, and tagging fatigue.

## Methodology

The work reported here is derived from data collected from twenty-six face-to-face semi-structured interviews and sixty online questionnaire responses, both protocols taking place in 2012. Interviews were up to 90 minutes in length and revolved around the challenges office-based knowledge workers face in organising their personal information across physical and digital mediums; interview

participants are referred to as P1 to P26 in the remainder of this paper. The design of the questionnaire and semi-structured interviews was strongly influenced by past PIM studies (Malone, 1983; Whittaker & Hirschberg, 2001). Participants were aged between 21 and 68 years of age, and none were engaged in technology-related professions.

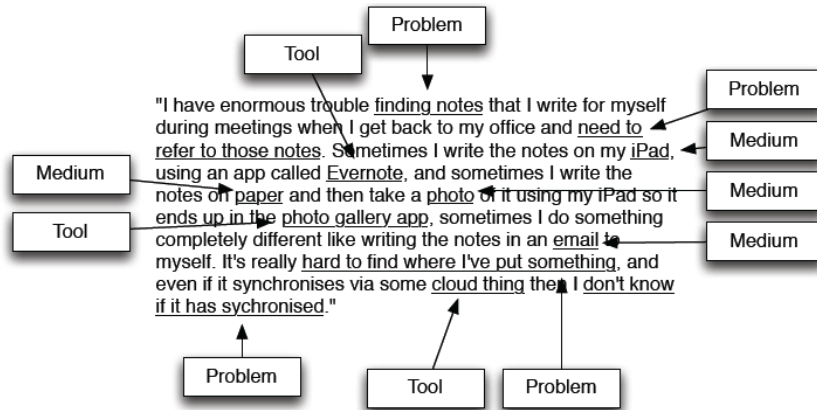


Figure 1. A sample of one stage of the coding process used in data analysis.

During the interviews, participants discussed how, when and why they used their iPad for PIM — the interviewer sought self-reported data from participants around activities in each of the stages of the Barreau (1995) PIM framework. An open coding-based method was used on the interview data, and the initial analysis here concentrates on the themes of input, linking and tagging fatigue, with an emphasis on deriving suggestions for design of future iPad, and other platform, PIM software. The coding scheme resulted in key themes, such as strategies, problems, tools, and challenges, which were used to mark up the data for further passes. Data from an online questionnaire is also reported, the online questionnaire related to the use of iPad-style tablet computers for PIM — results here report on the initial sixty participants in this questionnaire.

### Findings

Our participants used their iPads for a wide range of PIM purposes, from creating long documents via the on-screen keyboard, to audio recording meetings, to drawing diagrams on the screens. All participants from the semi-structured interviews reported themselves as being active and highly regular users of the Evernote for iPad software. Here we present the three main themes developed from the initial analysis of the interview and online questionnaire data, those themes being: data input, data linking, and tagging fatigue.

Themes	Stages of Barreau's (1995) framework	
Data Input	Acquisition	
Data Linking	Organisation	Maintenance
Tagging Fatigue		

Figure 2. Themes identified, as related to relevant components of Barreau's (1995) PIM framework.

The first theme, data input, was identified as a significant point of consternation for users of iPad-based PIM software. The iPad alone effectively offers three means for inputting text: the on-screen keyboard, the cameras, and the inbuilt voice recognition of certain versions of the iPad. The revelation that the majority of our interview participants used the cameras as their primary input device for PIM using Evernote was intriguing; P6 provided a description typical of these participants: *“the way I take most of my notes in Evernote is by taking pics [sic] of the pages in my notebook. It’s kind of painful to take a picture, save it, then take another one when really they’re all pictures of the same set of notes and should be stored as one note in Evernote”*. The fact that our participants all seemed to rely on the camera as a primary form of data input — a primary part of the acquisition stage of PIM — is perhaps unique to the newest generation of tablet computers (i.e. iPad-style). While this data input technique could, perhaps, be equated to the use of a desktop scanner with a traditional personal computer, user interfaces and workflows within software, such as the Evernote app discussed here, are not at all geared towards this use-case.

The second theme identified was that of linking individual records together; as noted above, participants frequently used the device’s camera to capture handwritten physical paper notes into the iPad — the interface for doing this, despite Evernote supporting multiple image files being stored as one record, makes it difficult for users to capture multiple related images into one document. P19 again provides an exemplary comment: *“If I’ve scribbled all over my meeting notes I want to be able to take snaps of each page in say, a 10 page document, and store them all together. Evernote doesn’t really make it easy to do that but I do it anyway and then store them in a folder or tag them so that I know they’re related. I can’t link them together without additional effort, so I just don’t bother.”* This avenue may prove fruitful to future investigation. This theme links with the organisation and maintenance stages of the PIM framework — linking records together appears to be a significant shortfall of the current range of available software for iPad-style tablets, including Evernote, for the majority of our participants.

The final of the three themes that surfaced repeatedly during this initial analysis was that of tagging fatigue. Participants reported being stressed over the implication, as presented in the interface of the PIM software, that they needed to provide tags (keywords) for each record, feeling as though the software would make it difficult for them to locate the records again if they didn’t tag. Many past studies, such as Civan, Jones, Klasnja, and Bruce (2008), have discussed the experiences of users in tagging. P12 provided a comment that was typical of participants’ perspective on tagging in Evernote: *“I hate it. The UI makes me feel like I have to tag everything, and that I won’t be able to find it again if I don’t, but really search just works fine without tags applied and the continual appearance of tags, or the lack thereof, in the interface just makes me feel like I have more work to do to keep things organised.”* P14 also offers: *“Tagging is so much extra effort, I have to think about my note to much more, what I want to use it for in the future, things like that, that I often just don’t want to tag it. I really don’t care, or know, if it [tagging] will even help me find it faster in the future.”* We find this an interesting contrast from current scholarship in relation to tagging; recent work suggests that tagging might be the optimal solution for organising and refinding information for certain groups of users (Voit, Andrews, & Slany, 2012). It is often suggested that tagging, as an act of categorisation, causes an individual to put more thought into the purpose and contents of the item being tagged (Craik & Lockhart, 1972; Jones & Teevan, 2003; Jones, Anderson, & Whittaker, 2012). Here, our findings suggest that individuals are highly aware of this additional mental overhead required from tagging and, correctly or otherwise, assume that the overhead is not worth the effort for potential benefits in future refinding. This theme relates to all the stages of the PIM framework and suggests that a reappraisal of the role of tagging in, at the very least, iPad PIM software, may be worthwhile.

## Discussion

While PIM is rapidly becoming a highly-studied field, the use of iPad-style tablet computers — a recent emergence in the consumer world — for PIM is under-studied and represents a significant area of interest to information science, human-computer interaction and information retrieval. The findings here underscore the conception that techniques for managing PIM collections differ across different technologies (such as laptop computers, desktops and iPad-style tablet computers), and the strategies that individuals use are affected not only by the choice of software, but by the hardware features and form factor of the device the software is used on. Prior investigations of how people utilise PIM software tools have largely been focused on traditional desktop operating systems.

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The three themes identified above demonstrate that extant PIM software for iPad-style tablet computers is frequently failing to address, at the very least, the PIM needs of information workers. Data input, information linking and tagging are all core to the PIM experience, and while we chose to present the research through the lens of (the relevant components of) Barreau (1995) framework in this paper, other frameworks, such as Lin, Lutters, and Kim (2004), also identify these themes as equally important to PIM.

### Implications for Future Work

From these findings, we can offer several suggestions for improved design of PIM software on iPad-style tablet computers, including the development of more nuanced options for image capture using the cameras, improved linking capability between existing and new notes, and improved, or removed, tagging interfaces to allow users flexibility in their choice to tag. Existing applications fail to meet many needs of the users discussed here, resulting in a variety of hacked improvisations.

In future publications, the component of the research presented here will also be situated in the results of the broader PIM study that the data collection was conducted as a component of.

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