

# Chapter 1: Digital Memories and the Personal Content Explosion



This book sets the stage for understanding *personal content experience*. This is a vast topic, tightly coupled with increasing mobility, our personal memories, and daily communications with others.

We introduce and explore issues such as context capture, user interfaces for continuous mobile use, UI design for mobile media applications, metadata magic, virtual communities, and ontologies. User interactions and behavioural patterns with personal content are also covered, resulting in a “GEMS” lifecycle model for analysing media devices, services, applications, and user interfaces. We examine personal content from a number of viewpoints, and present a mobile prototype software framework, complete with extensible ontologies, which realizes the requirements of an enjoyable personal content experience.

The reason why *you* will become attracted to this topic is evident, even if you are not a researcher or practitioner in one of the relevant fields. Personal content experience – capturing, enjoying, and sharing our digital past and present – inherently concerns us all to a large degree. Understanding this vibrant area of research, development, and everyday life is what this book is about.

## 1.1 Digital Us

You are becoming digital. Already, your life is digital in many ways. Increasingly everything you do with other people, and the world around you, is digital. Like it or not, you are part of a great information whirlwind that weaves your digital life patterns with those of myriads of other people – and machines.

A remarkable part of your digital life is being stored by authorities, your employer, hospitals, the loyal customer program of your favourite chain store, and countless others. This information *about you* identifies you, stores your medical history, skills, salary history, behaviour as a consumer, and, indeed, faults and committed crimes, if any. You do not have much control over it, except for some reviewing and reclamation cases. This is essential information about you, and the consequences of possible errors may be severe. Yet you are not responsible for its maintenance.

The information described above is information about you. Yet it is not *yours*, since you do not possess it nor can freely control it. When discussing your digital life, the other side of the coin is *your* personal information, something that is important to you and that you possess. This is information that we refer to as *personal content*,<sup>1</sup> the topic of this book.

Your personal content is among the first aspects of your life to go digital. Your daily communications, photographs, favourite music and movies, heart rate and step count logs, contacts stored in your mobile phone, and frequently travelled routes are, among other content types, your personal content. All digital, all existing in a virtual realm consisting of a series of 0s and 1s, all created either implicitly or explicitly with a myriad of digital devices, such as camcorders, GPS navigators, or mobile phones. This is content that you are responsible for taking care of; it is content that is meaningful to you; it is content that you

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<sup>1</sup> In many contexts the term *personal information* is associated with office activities, such as calendar, to-do items, and e-mail as implied by the common acronym PIM (Personal Information Management). This is why we prefer the term “content”.

have interacted with. It is content that forms, in increasing amounts, the record of your own invaluable personal history. As your personal content is getting digital, the ways you create, share, and experience it are also about to change.<sup>2</sup>

The transition from analogue (or physical, if you prefer) to digital personal content is much more fundamental than it first appears. Digital content is not merely an addition to analogue personal content, but rather is the dominant way to manage and experience personal content – or most parts of it. Once the content is in digital form, it can be manipulated in countless ways, reused, distributed, and shared with practically no extra effort, and experienced through a variety of different devices. As a consequence, new behavioural patterns will appear as the way people capture, share, and re-live their experiences and personal history changes.

Consider an obvious case – photography. The digital change has become strikingly evident in this domain. The sales of digital cameras have surpassed the sales of traditional film cameras, and today the sales figures are astonishing – for instance, during the first seven months of 2006, the sales of digital cameras grew by 20.3%, while the sales of film cameras went down by 67.1%.<sup>3</sup> This implies that the services offering analogue film development are becoming rare and expensive, which further boosts the trend of personal content digitalization.

As a consequence, people are now taking digital photos instead of film photos. But what do they do with the photos? Some people use digital cameras just as they used film cameras. They print out the photos, and then sweep the memory card clean as if changing the film, and continue shooting. However, many people transfer the images to a PC, a set top box, or some other digital storage device. Even the photos that are not printed are in most part retained. Over the years, this collection of personal information becomes invaluable. It is content that people wish to access, share, sometimes re-organize, but definitely not lose.

But it is not just photographs that we are talking about here. While photographs often depict important bits and pieces of our personal histories, so do *messages* sent and received; *personalization settings* for our devices; self-created and maintained *characters in an online game*; *ratings* given to a certain song; *health information* measured and recorded by devices such as heart rate monitors; *music* listened to on a special occasion; and so on.

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<sup>2</sup> Content created by the users themselves is also sometimes referred to as “Consumer Created Content”, or CCC.

<sup>3</sup> <http://www.imaging-resource.com/NEWS/1158601458.html>

Indeed, while self-created content is an important type of personal content, it is not the only one. We assume that all content that you have interacted with and that is in your possession, is personal in nature (personal content is defined in section 3.1). The personal content experience is not only about *creating* and *storing* content, but is also about *enjoying* it.<sup>4</sup>

Another important aspect of personal content experience is the relationship between the pieces of personal content and general databases, because storing the information in databases makes it possible to associate personal events and interactions with other events that have taken place. This opens up new horizons for defining what a personal content experience is, especially when people wish to relive past experiences.

Content digitalization enables new ways to access memories and share them with other people. Sharing and experiencing together connects personal content tightly with communication in general. With the rapid spreading of mobile phones that enable instant sharing of experiences, we are currently witnessing one of the most remarkable transformations in human communication history and, at the same time, a fundamental change in personal content. Thus, we analyse these two emerging, heavily intertwined trends:

1. the increased mobility of people and their devices, driven by mobile communications and mobile devices for experiencing content; and
2. the explosive growth and increasing importance of personal content.

Together these two trends are likely to fundamentally and persistently change many aspects of our daily lives.

Content management is far from easy. The devices are not easy to operate, they do not connect seamlessly to each other, and information is all too easily lost, not to speak of all that navigation and browsing inside countless folders to locate a desired content object. There is indeed a need for further research and development in this area.

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<sup>4</sup> Contrary to common practice, we prefer the verb *enjoy* to *consume*. Enjoying captures the essence of a wide variety of interactions with personal content, while consuming has a passive tone to it.

## 1.2 You and This Book

Although *content management* is a term often associated with information managers and Web content managers in enterprises, personal content must be manageable by anyone. The term “personal” provides the point of origin for all discussions in this book. This is the primary reason why we prefer to speak of personal content *experience* rather than personal content *management*.

Unfortunately, the field of personal content experience is as tangled as any. The terminology does not exist, there are no theoretical frameworks available to understand the topic in a broader context, and the term brings about twice as many opinions as there are speakers. And yet the domain is expanding in the consumer domain like a wildfire, with more and more technologies, products and services brought to the confused consumers. Therefore, the purpose of this book is to set the stage for understanding, facilitating, and enhancing personal content experience.

Several essential factors for a satisfying personal content experience can be identified. These factors are discussed in detail throughout the book, and can be summarized as follows:

- Instantaneous *ad hoc* access to one’s own content with sufficient quality;
- Sharing content and vivid re-living of experiences through content;
- Trustworthiness and privacy – confidence that personal content will be kept safe and preserved;
- Joy of (re-)discovering;
- Seeing the object as a part of whole (relations);
- Exploiting mobility, metadata, and context to make content smart.

The above list is just the tip of the personal content iceberg. It is not only individual users or user groups and their experiences and behaviour that we will discuss; and it is not only the essential technologies that we will show are needed to put all the bits and pieces together. We will also address many societal issues, such as social acceptability and privacy; copyright and liability laws; issues related to mass media and media (re)production; new distribution paradigms, such as viral marketing and super-distribution; new or enhanced business opportunities, such as online services for content analysis, processing, and filtering; and so on. Because personal content is inherently tied to many

aspects of our culture and society, it should not be studied separately. We will try to address the *personal content ecosystem* – not only the content itself, but also the variety of human behaviours and processes related to it, and the technical solutions that are needed to support such processes.

We cannot cover all aspects related to personal content experience in detail (it would require a series of thick books) but will focus on some key areas, and then briefly introduce some related issues.

We will assume a consumer-oriented view: when we introduce a technology, we will also show how it relates to the life of the design personas introduced in the Prologue. We strongly believe that it is possible to build systems that are understandable by the average person in terms of purpose, use, and outcomes, even though they may contain non-trivial mechanisms that handle complex data streams. The *user-centred design* approach emphasises people over technology.

This book combines views of personal content, consumer-oriented media and content management technologies, global megatrends, user interfaces, and software design. We will discuss the components of personal content management systems, ranging from system and database levels to middleware, applications and services, user interfaces, and users.

The topic of personal content spreads across several disciplines and professions, and we explore them from several different points of view. The aim is to identify the aspects that are critical for the general public and discuss the consequences they imply to the system design, application design, and user interface design. Beyond technical aspects, we also discuss the changes in use patterns and social behaviour, provoked by the mobile personal content phenomenon, and show that the impact is more fundamental than it may first appear.

The purpose of this book is twofold. On one hand, we make practical statements on how certain essential technical issues can be addressed and solved, and provide a reference software architecture design for a mobile personal content management system, coupled with comprehensive design drivers and criteria for user interfaces designed for content management in mind. These aspects are backed up with results, which we have gained from research – analysing societal, cultural, and behavioural trends in addition to technology evaluations. From this point of view, this book is best suited for software developers, user experience and interface designers, team managers, and other practitioners and professionals dealing with application and system development, especially those related to mobility, consumer media, and personal content management.

On the other hand, besides challenges in technology, user interfaces, and societal and behavioural concerns, the personal content explosion provides huge potential in new innovations in related services and business models. Thus, our intention is to increase awareness and understanding of this broad topic, and to boost innovation by challenging prevailing assumptions and discovering unexpected aspects of personal content as a research and business domain. Therefore, the book makes good reading for technology evangelists, lecturers addressing content and media, innovators, and those seeking new business opportunities within the personal content domain. We do not provide ready-made “become-a-millionaire” solutions, but rather whet the appetite with a variety of thought-provoking approaches from different points of view.

Regardless of your background, we sincerely wish that you, the reader, will become inspired, educated, disturbed, influenced, or otherwise moved when reading these pages. We also hope that this book will act as a booster for addressing this vast interdisciplinary research and business domain.

## 1.3 Contents at a Glance

The rest of the book is structured as follows:

### **Chapter 2: Trends Towards Mobility**

Chapter 2 begins by introducing mobility and several aspects that tie mobile use and personal content together. We present a concise history of mobility and content digitalization, discuss several technology developments that are relevant in the context of personal content experience, characterize various mobile devices, and reveal why manufacturers are frantically trying to cram every possible function into your watch. Together, these trends paint a picture of how personal devices will evolve in the mobile years to come.

### **Chapter 3: Mobile Personal Content Uncovered**

Chapter 3 focuses on personal content and its inherent characteristics. We define the term personal content, and provide methods for content categorization based on a number of factors. We analyse personal content from a number of viewpoints, and discuss the effects mobility has on the content. Finally, we present a high-level model for addressing different user-level aspects of personal content management. We call this model “*Get-Enjoy-Maintain-Share (GEMS)*”, and show how it



can be applied in analysis and design of mobile devices, applications, and services related to personal content.

#### **Chapter 4: Metadata Magic**

In Chapter 4, we discuss metadata (data about data), one of the most important technology enablers related to personal content experience. We inspect metadata from several points of view, including existing metadata formats and frameworks, user benefits, the relationship between metadata, mobility, and context-awareness, and metadata management implementation issues. We also address closely related topics, such as increasing the semantics of content.

#### **Chapter 5: Realizing a Metadata Framework**

The beginning of Chapter 5 introduces the challenges related to distributed mobile content, and points out that metadata management is the key to solving these challenges. We discuss why metadata management cannot be left to applications alone but why a system-wide metadata framework is needed. We also discuss different types of metadata available in mobile devices. We then move deeper into metadata ontologies to ensure interoperability between applications and show how to create future-proof metadata taxonomies (and why!). We also present the design and implementation of a prototype content management framework, targeted especially at mobile use. Finally, we show how the framework functions in a mobile device.

#### **Chapter 6: User Interfaces for Mobile Media**

Chapter 6 focuses on mobile personal experience from the end-user's perspective. We start by providing a brief overview to users and then discuss how the user can interact with mobile personal content from various points of view. We discuss mobile user interface design to shed light on how user interfaces can be created based on the user's tasks. Finally, we illustrate what are the related tasks, and what is required from the UI perspective.

#### **Chapter 7: Application Outlook**

Chapter 7 combines what has been presented in the preceding chapters, and discusses application and service design for experiencing personal content. We present some general features of mobile applications and discuss several application types, and introduce existing implementations, while analysing their strengths and weaknesses. We focus on some contemporary and upcoming content-rich applications in the domains of location-based services, content sharing, games, fitness,



and others. Our purpose is not to merely present the applications, but to gain an understanding of the underlying features and regularities more generic in nature.

### **Chapter 8: Timeshifting Life**

Chapter 8 takes a look at the future. We try to identify trends and weak signals that can be extrapolated from the topics presented, and make assumptions about things to come and how to react to them. We also present some future requirements, and technological enablers that could potentially fulfil them. We also discuss potential threats and risks related to the digitalization of our personal histories. We consider whether it is desirable to be able to store almost everything in one's life versus discrete fragments, resulting in what we refer to as *timeshifting life*.

Now that we have introduced the contents, let us continue with the trends that have brought us to where we, *the new nomads*, are today.

