Emerald Insight

The Electronic Library

A comprehensive concept map for adequate protection and effective
management of personal information in networked Chinese services
Xiaomi An Wenlin Bai Hepu Deng Shuyang Sun Yu Dong Wenrui Zhong Jufang Hu

Article information:

Users who downloaded this article also downloaded:

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald
for Authors service information about how to choose which publication to write for and submission
guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company
manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as
well as providing an extensive range of online products and additional customer resources and
services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the
Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for
digital archive preservation.

A comprehensive concept map for adequate protection and effective management of personal information in networked Chinese services

Xiaomi An

Key Laboratory of Data Engineering and Knowledge Engineering of the Ministry of Education, and School of Information Resources Management, Renmin University of China, Beijing, China

Wenlin Bai

School of Information Resources Management, Renmin University of China, Beijing, China

Hepu Deng

School of Information Resources Management, Renmin University of China, Beijing, China, and School of Business Information Technology and Logistics, RMIT University, Melbourne, Australia

Shuyang Sun, Yu Dong and Wenrui Zhong

School of Information Resources Management, Renmin University of China, Beijing, China, and

Jufang Hu

University Library, Renmin University of China, Beijing, China

Abstract

Purpose – This paper aims to develop a comprehensive concept map to guide adequate protection and effective management of personal information in the provision of networked services in China through comprehensively considering the multi-disciplinary perspective of personal information protection and management with respect to their multi-dimensional applications, multi-directional controls and multi-contextual analysis in today's networked environments. There are different perspectives on what personal information protection and management is about, why and how personal information should be protected and managed in the literature. Little, however, is known about the relationships between

these multiple perspectives and their implications to personal information protection and management in the real-world practice.

Design/methodology/approach – A multi-methods approach is adopted in the study, including a comprehensive review of the related literature, a content analysis of the relevant laws, polices, standards, a multi-cases study of the relevant network services providers and an online survey of the Chinese citizens who are the end-users of the networked services to adequately achieve the objective of this study. The concept map building technique is used as a tool for conducting the meta-synthesis of the findings from multiple data resources in the development of a comprehensive concept map for personal information protection and management.

Findings – This study rationalizes the importance of the identification of personal information for adequate protection and effective management. It identifies five perspectives on personal information protection and management, namely, law, economics, sociology, information technology and information resources management for their applications at the organizational level. Five types of personal information are identified in the study for protection and management, namely, identifiable personal information, personal identity information, personal moral right information, personal civil right and interest information and personal business and transaction information. An integrated approach consisting of risk control, security control and users control is proposed for personal information protection and management in the provision of networked services in China. The study shows that not enough attention has been paid to the personal information protection and management from multi-disciplinary perspectives with respect to their multi-dimensional applications, multi-directional controls and multi-contextual analysis in the literature. There is a lack of understanding of what, why and how personal information is protected and managed in real-world practices in China.

Practical implications – The investigation of the issues of personal information protection and management with respect to the relevant laws, polices, standards, networked services and organizations can lead to a better understanding of what, why and how personal information is protected and managed in real-world practices in China. The development of a comprehensive concept map for personal information protection and management can be used as an effective guideline for the formulation and implementation of appropriate strategies and policies in individual organizations for providing their stakeholders with quality-networked services in today's highly connected network environment in China.

Originality/value – The paper is the first step of a comprehensive study on the protection and management of personal information for the provision of networked services in China. It provides a solid foundation for further research with respect to the personal information protection and management. It is the first of this kind of studies to answer the questions of what types of personal information needed to be protected, why and how they should be protected in conformity with laws, regulations, polices, standards and the needs of networked services and business activities of organizations.

Keywords China, Information resources management, Personal information protection, Networked services

Paper type Research paper

1. Introduction
With the rapid development of e-government and e-business in China (Molla and Deng, 2009), an increasing amount of personal information is collected, processed, shared and stored while providing networked services to support business collaborations and innovations (An *et al.*, 2014) within and across organizations. This leads to numerous problems in handling personal information, including excessive collection of personal information, publishing personal information without consent and illegal selling of

personal information (Li, 2009; Mu *et al.*, 2013; Sun, 2014). As a result, adequately protecting and effectively managing personal information is becoming critical for the sustainable development of the information economy in China (Byrne *et al.*, 2005).

Protecting and managing personal information for information security in organizations is necessary for building a secured, trusted and well-organized information consumption market in China, according to the State Council's *Opinions on Promotion Information Consumption of China* (State Council, 2013). Numerous laws and regulations have been developed in China and various strategies and policies have been formulated for facilitating the integration and sharing of personal information to provide citizens with one-stop networked services in the National Development Reform Committee (2014). There are, however, few actions plans and management mechanisms for protecting and managing personal information in networked services throughout their entire life in organizations.

Much research has been done in China on personal information protection and management, leading to the development of various perspectives on what personal information protection and management is about, as well as why and how personal information should be protected and managed (Hong, 2010; Jiang, 2008; Kong, 2009; Lang *et al.*, 2008; Sun, 2014; Yao, 2012; Zhang, 2006). Little, however, is known about the relationship between different perspectives on personal information protection and management and their implications to real-world practice. Few studies have been conducted to identify the requirements for personal information protection and management with respect to existing laws (An *et al.*, 2011; Zhang, 2006). Furthermore, existing studies have been limited to the identification of various personal information protection and management problems that may affect people's lives (Li, 2009; Sun, 2014). There has been little research performed to understand what types of personal information exist that need adequate protection and effective management (Mu *et al.*, 2013).

This paper develops a comprehensive concept map for guiding adequate protection and effective management of personal information in providing networked services in China. A multi-methods approach is adopted in the study, including a comprehensive review of the related literature, a content analysis of the relevant laws, policies and standards, a multi-cases study of the network service providers and an online survey of citizens who are the end-users of the networked services. The concept map building technique is used for the meta-synthesis of the research findings from multiple data sources. This leads to the identification of the different types of personal information and the development of a comprehensive concept map for adequate protection and effective management of personal information in the provision of networked services in China.

The paper is structured as follows. Section 2 presents a review of the related literature on personal information protection and management from a discipline-based perspective. Section 3 investigates the classification of personal information for protection and management with respect to existing Chinese laws and regulations. This paves the way for the identification of the types of personal information for protection and management in the provision of networked services in China in Section 4. Section 5 presents the result of the online survey, leading to the development of a comprehensive concept map for personal information protection and management in a networked service environment in China.

2. Discipline-based personal information protection and management

Personal information protection and management is about the protection of individuals with respect to the processing and management of personal information (Mu *et al.*, 2013; Sun, 2014). This involves obtaining, recording and holding personal information and carrying out operations on the information, such as collecting, organizing, adapting, altering, disclosing, sharing, disseminating, aligning, combining, blocking, erasing and destroying personal information during various activities.

There is an increasing need for personal information protection and management in the world due to the concern of individuals about how their personal data are collected, used and shared (Bélanger and Crossler, 2011). With the rapid advance of information and communication technologies (Tian *et al.*, 2008), the fast development of electronic government (Deng, 2008; Karunasena and Deng, 2012) and the increasing collection and sharing of personal information through the provision of various networked services (Sun, 2014), adequate protection and effective management of personal information is becoming increasingly critical for every organization in today's networked environment.

The importance of protecting and managing personal information in a networked environment stimulates much research in this area (Bélanger and Crossler, 2011; Beldad *et al.*, 2011; Bulgurcu, 2012). A review of the related research in China revealed that five disciplines were present in this area, including law (Yao, 2012; Zhang, 2006), economics (Hildebrandt *et al.*, 2013; Murphy, 1995), sociology (Beldad *et al.*, 2011; Bulgurcu, 2012), information technology (Bélanger and Crossler, 2011; Xia *et al.*, 2007) and information resources management (An *et al.*, 2011; Sun, 2014). In each discipline, there were different concerns and focuses on why and how personal information should be protected and managed.

The law-oriented personal information protection and management focuses on the preservation of an individual's privacy and the respect for personal and human dignity (Jiang, 2008; Kong, 2009; Zhang, 2006). With the consideration of this perspective for personal information protection and management, specific legislations and regulations are developed and implemented for the protection and management of the right to privacy, the right to be informed and tort. Such protection and management is often carried out at the national level with an emphasis on the security of personal information and their authorized use in the process of providing citizens with networked services (Yao, 2012).

The economics-based personal information protection and management encourages a fair use of personal information in a networked society (Hildebrandt *et al.*, 2013; Murphy, 1995; Nam *et al.*, 2006; Zwick and Dholakia, 2001). With such a view, personal information is treated as information assets for businesses and individuals. The adequate protection and effective management of these information assets can be achieved by balancing the property right and the civil right in a specific society. Usually, the development of the code of conduct is commonly used for this purpose. Such protection is at the professional level with a focus on a consent access and a secured use of personal information.

The sociology-based personal information protection and management aims at maintaining social order to protect human dignity and civil rights and to minimize the negative impact of personal information use on the society (Beldad *et al.*, 2011; Bulgurcu, 2012; Wilkinson and Thelwall, 2011). This is realized through developing

the awareness of citizens on their obligations for personal information protection and management. Such protection is at the societal level with a focus on good behaviours at information collecting, storage and access in conformity with the moral rights, ethical norms and the code of conduct in a society.

The information technology-based personal information protection and management strives to provide secured services in today's dynamic environment (Ackerman, 2004; Bélanger and Crossler, 2011; Shilton et al., 2009; Xia et al., 2007). To effectively protect and manage personal information, numerous information security management techniques, including protocols, password and authentication are widely used (Alkalbani et al., 2014). Such protection is at the system level with a focus on the security of individual systems in organizations.

The information resources management-oriented personal information protection and management tries to avoid leaks and violations of personal information (An et al., 2011; Barber, 2006; Mu et al., 2013; Sillitoe, 1998; Wu, 2014). This is because such leaks and violations bring harms to the interest of individuals and public administration which may affect the national security in some circumstances. To adequately protect and manage personal information from this perspective, the entire life of personal information throughout their collection, storage and access needs to be effectively managed. Such protection is at the service level with a focus on the provision of secured services.

There are multi-dimensional views on personal information protection and management from the national, professional, societal, system and service perspectives (An et al., 2011). An investigation of the relationship between different perspectives leads to the development of a discipline-based concept map for personal information protection and management as shown in Figure 1. The concept map shows that personal information protection is the major focus of all the personal information studies. There is only one disciplinary area referred to as information resources management that pays attention to personal information management. From this perspective, personal information should be managed as organizational resources and protected as business assets (An et al., 2011; Mu et al., 2013). With this in mind, an integrated approach has to be developed for the protection and management of personal information along the life of personal information in the provision of networked services.

Developing an integrated approach for personal information protection and management requires a comprehensive understanding of existing laws and regulations in this area (An et al., 2011; Mu et al., 2013). An investigation of the laws and regulations on personal information protection and management in the most comprehensive Chinese legal database (pkulaw.cn) shows that there are 29 relevant laws in China. A
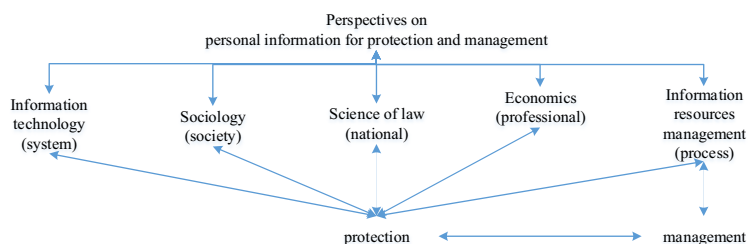
Figure 1.
A discipline-based concept map for personal information protection and management

critical analysis of these laws shows that there is no clear definition on what personal information is about in these laws. There are five types of personal information for protection and management, which are as follows:

(1) identifiable information;

(2) identity information;

(3) business and transaction information;

(4) moral right information; and

(5) civil right and interest information.

Identifiable information consists of names, addresses, working units, photos, images, correspondence letters, dairy, e-mail messages and other materials that can be used to identify individuals. There are three laws in China, including the *Law of the People's Republic of China on Prevention of Juvenile Delinquency* (2012), the *Law of the People's Republic of China on the Protection of Minors* (2012) and the *Criminal Procedure Law of the People's Republic of China* (2012), that directly define what identifiable personal information is about.

Identity information refers to identity cards, passports and customer identity materials. These materials have rich personal information that can be used to uniquely identify individuals in any circumstances. Three laws were introduced in China for protecting personal identity information, including the *Passport Law of the People's Republic of China* (2006), the *Anti-Money Laundering Law of the People's Republic of China* (2006) and the *Law of the People's Republic of China on Resident Identity Cards* (2011).

Business and transaction information includes finance transaction records, medical records and mail. Three laws are relevant for the appropriate definition of such personal information and their effective protection, including the *Anti-Money Laundering Law of the People's Republic of China* (2006), the *Tort Law of the People's Republic of China* (2009) and the *Postal Law of the People's Republic of China* (2012).

Moral right information refers to women's pictures relevant to reputation, honour, privacy, portrait and other personality right information. Due to the importance and sensitivity of such personal information, the *Law of the People's Republic of China on the Protection of Women's Rights and Interests* (2005) was introduced for adequately protecting and effectively managing such type of personal information.

Civil right and interest information refers to the data about personal liberties related to the right to life, the right to health, the right to reputation, the right to honour, the right to portrait, privacy right, the right to free choice of marriage, guardianship and ownership, real right for usufruct, real rights granted by way of security and copyright, patent right, exclusive right to use trademarks, the right of discovery, stock right, right of succession and property right and interests. The *Tort Law of the People's Republic of China* (2009) was introduced for protecting such personal information in Chinese society.

Figure 2 shows the relationship between the types of personal information for protection and management based on existing Chinese laws. Based on this relationship, an adequate control of the identifiable personal information is a key to personal information protection and management (Sun, 2014).

3. Classification of personal information for networked services

Much personal information is collected, processed and shared across various platforms and organizations in the provision of networked services in China (Ministry of Industry and Information Technology of the People's Republic of China, 2013a; Standing Committee of the National People's Congress, 2012). An investigation of the relevant laws, regulations and standards with respect to the provision of networked services in China shows that there are no laws existent on personal information protection and management for networked services. There are only five policies (Ministry of Industry and Information Technology of the People's Republic of China, 2013b, 2013c; Standardization Administration of the People's Republic of China, 2012; Standing Committee of the National People's Congress, 2012; State Administration for Industry and Commerce, 2014) that have specific concerns about personal information protection and management. These policies define personal information as identifiable information which can be classified into different categories for different concerns according to different regulatory and authority documents. Figure 3 shows a concept map for personal information protection and management with respect to networked services in conformity with the Chinese regulations, policies and standards.

Personal information can be classified into personal general information and personal sensitive information for protection and management (Standardization Administration of the People's Republic of China, 2012). Personal general information is referring to information that is not sensitive. Personal sensitive information is information that can bring negative impacts to identifiable information subjects once it is leaked or revised, such as an individual's identification card number, telephone number, nationality, political attitude, religion, DNA and fingerprint. Such a classification can be used for personal information protection and management based on the professional and industry recommendations with respect to the provision of
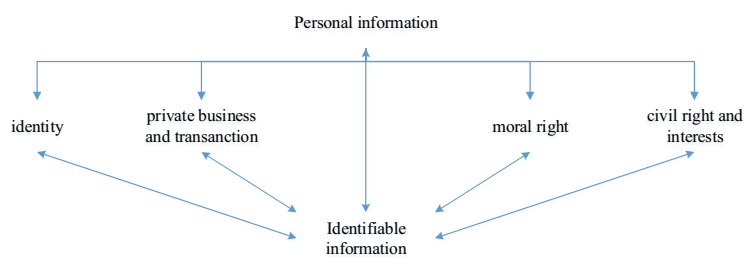
Figure 2.
A law-based concept map for personal information protection and management
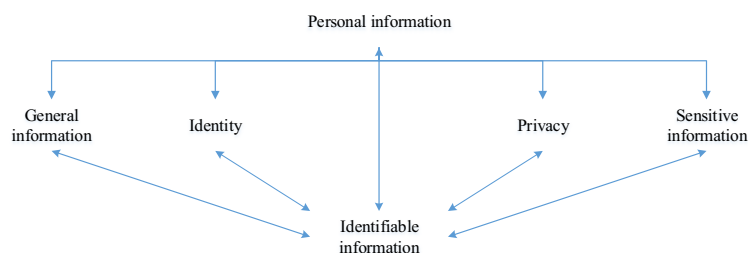
Figure 3.
A concept map for personal information protection and management in networked services

networked services. It provides a guideline for the authorized use of personal information through the process of collecting, processing and sharing of personal information (Standardization Administration of the People's Republic of China, 2012).

Personal general information is the electronic personal identity information and electronic personal privacy information collected and used in the provision of network services (General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China and Standardization Administration of the People's Republic of China, 2012). Such information has to be protected. The application of the law above is mandatory for network service providers, relevant enterprises and individuals. The legitimate, proper and necessary collecting and adequate use of personal information in conformity with the laws and regulations is required (Standing Committee of the National People's Congress, 2012).

Personal sensitive information refers to user information, such as a user's name, birth date, ID card number, address, telephone number, account, password and relevant information (General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China and Standardization Administration of the People's Republic of China, 2012). Such information can be used to identify the user and the time and place he or she used networked services. The protection and management of such information is mandatory for network service providers and other stakeholders (Ministry of Industry and Information Technology of the People's Republic of China, 2013b, 2013c; State Administration for Industry and Commerce, 2014).

The discussion above shows that there are multi-disciplinary perspectives for personal information protection and management with respect to the multi-dimensional nature of the personal information. Different types of personal information that need to be protected based on the law in China are shown in Figure 2. The types of personal information shown in Figure 3 have to be protected in networked services with respect to regulations, policies and standards. To adequately protect and manage personal information, an integrated concept map is developed (Figure 4). Such a concept map shows that protection and management of personal information is not only required to be in conformity with legal requirements, social obligations, economic benefits and quality systems but also for the provision of quality networked services. To achieve this, an appropriate classification of personal information with respect to multi-disciplinary concerns and their multi-dimensional applications is desirable, as such a classification provides all the stakeholders in personal information protection and management with opportunities for their adequate protection and effective management in a networked service environment.

4. Research methodology

To understand how people who use networked services think about personal information protection and management and to identify how personal information is protected and managed in their work practices, a multi-cases study is conducted. The multi-cases study involves conducting interviews, document analysis and visiting websites of the selected cases. The cases selected from six cities in China consist of three public information resources service providers (A1, A2 and A3), six provincial and municipal archives repositories (B1, B2, B3, B4, B5 and B6), five urban development specialist archives repositories (C1, C2, C3, C4 and C5) and two network information
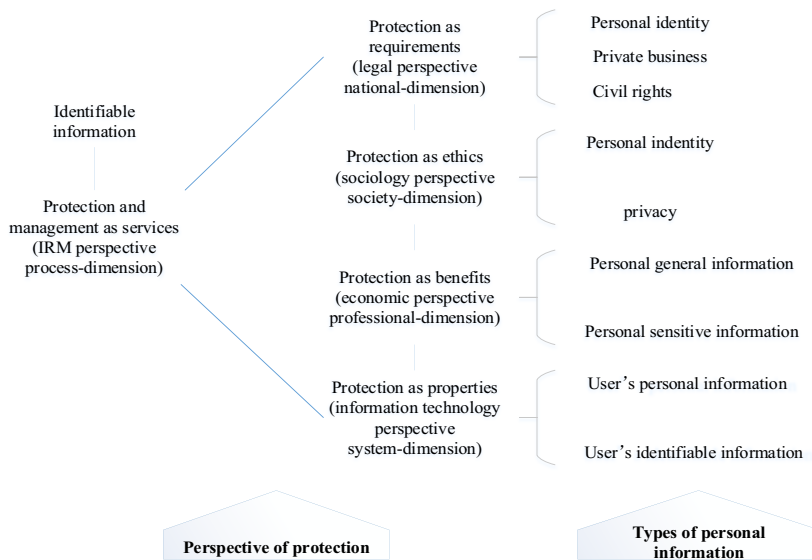
Figure 4.
Integrated concept
map for personal
information
protection and
management in
network services

service providers (D1 and D2). The criteria for case selection are the relevancy,
reputation of network service providers and accessibility.

A semi-structured interview of more than one hour is conducted with the senior
manager of the case organization. The interview process is recorded with the consent of
the interviewees. Document analysis and website visits are conducted to prepare the
interview to understand why and how personal information is protected and managed
based on the organizational policies, standards and guidelines. Ground theory is used
for guiding the data analysis. Individual concepts and classifications are reviewed for
ensuring the reliability and consistency of the research findings. The research findings
from interview, document analysis and website visits are summarized below.

5. Results and discussion
Public information resources service providers The study shows that A1 and A3
provide the public with networked services. A2, however, only provides special
networked services to urban planning authorities. All the interviewees agreed that
personal information is collected, processed, deleted and used in their business activities
to satisfy their business objectives. There are specific security control mechanisms
existing for personal information protection and management within their information
security management systems. No independent and separated personal information
protection statements, however, can be identified within each organization.

Provincial and municipal archives repositories The six public archival information
services institutions investigated have provided one-stop service platforms for sharing
various types of Minsheng archival resources within their regions. *Minshen archival
resources* refers to the records relevant to an individual's daily life, such as real estate
archives, marriage archives, family planning/birth control archives and education
archives. These archival resources are important evidence of a person's identity and
activities within a community or organization. There are three types of users who can

access such archives, including the creators of the archives, the creating agencies and others who have legitimate and appropriate rights to use the archives. All users have to provide valid documents, such as an ID card, household register, and similar, for accessing the archives. The six public archives service providers agreed that they have well-organized user-control mechanisms for sharing and reusing personal information in their care. There are, however, no independent and separated personal information protection and management statements within each organization as in the case above.

Urban development archives specialist repositories The five specialist repositories provide networked services to their professional administrative authorities as part of e-government services to support open access to government information and to ensure the accountability of their services in urban planning and construction project supervision. Their networked services, however, are not open to the public. Their organizations are concerned more about serving the government. As a result, they have not paid much attention to personal information protection and management.

Business networked information services providers The two business information resources providers agreed that they provide networked services for enterprise-wide use. Their services are not designed for the public. As a result, personal information protection and management is not specifically stressed in their organizations.

A majority of the organizations investigated have specific control mechanisms for personal information protection and management in their operations. Few of them, however, are fully aware of the specific laws, regulations, polices and standards available to guide their work for personal information protection and management. All the organizations visited agreed that there is an increasing demand for personal information protection and management in conformity with the laws, regulations and policies available in China.

Different types of networked services have different concerns about personal information protection and management. The networked public services, for example, have the strongest demand due to the increasing expectation of the public for the delivery of public services and the accountability for public organizations to perform with respect to their missions. The networked information service providers, on the other hand, have the weakest demand due to the nature of their operations. This suggests that there is an increasing demand for promoting the awareness of the need for personal information protection and management in today's networked society (Adaem and Amnuay, 2013; Bulgurcu, 2012). To facilitate the protection and management of personal information, a practice-oriented concept map for personal information protection and management with respect to the provision of networked services is developed and shown in Figure 5.

The motivation for personal information protection and management is to facilitate the provision of better networked services and ensure the accountability of individual organizations (Standing Committee of the National People's Congress, 2012). The legal requirements, however, are still unknown due to the existence of separate laws for personal information protection and management. As a result, an integrated approach, as shown in Figure 6, is required for effective personal information protection and management in China. Such an approach consists of security control and user control based on the classification of personal information for protection and management in practices.

6. A comprehensive concept map for personal information protection and management

To understand whether people think about the personal information as general information or sensitive information, whether individual organizations have personal information and whether these organizations have measures for their protection and management, an online survey was conducted between June-August 2014 in Beijing, China. The survey instrument was developed based on the review of the related literature and the findings from the multi-cases study above. The questions in the survey instrument are organized into five sections, namely, identifiable information, identity information, business and transaction information, moral right information and civil right and interest information. A pilot study was carried out for ensuring the validity and reliability of the research findings from the survey.

In all, 314 valid questionnaires were received. business enterprises constituted 54 per cent, 33 per cent from government agencies and 13 per cent from other types of organizations. The sample represents common understandings of personal information protection and management in different organizations. Among the respondents, 43 per cent of respondents were from the business department, 22 per cent were from the general office, 16 per cent were from the information technology
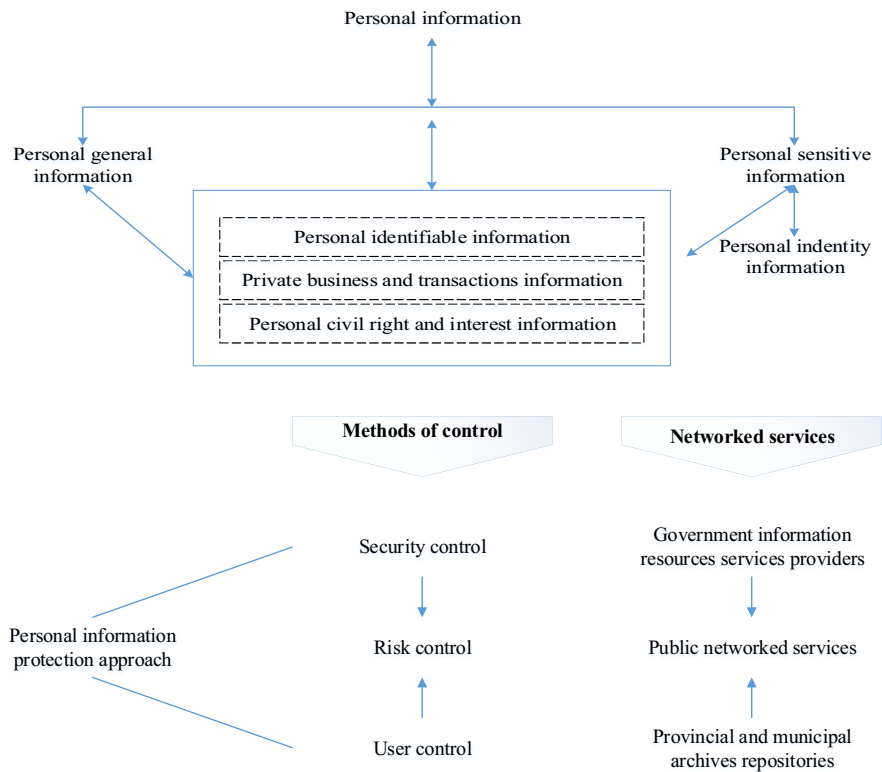
Figure 5.
A practice-oriented concept map for personal information protection and management in networked services

Figure 6.
An integrated approach for personal information protection and management in networked services

department, 17 per cent were from the personnel and finance division and 11 per cent were from other departments. This shows that the sample represents various perspectives of different disciplinary fields and their concerns about personal information protection and management in different business activities. Table I presents the survey results.

Identifiable personal information. There are different views on what identifiable personal information is about based on the survey. Table I shows that over 50 per cent of respondents choose name, gender, political status, colour, birth place and education background as general information. More than 50 per cent of respondents selected birthday, fingerprints, physical traits, blood type, DNA, residential address, working unit, information with personal pictures or images and personal signature as sensitive information. A number of respondents (40 per cent) have their personal information like name, gender, birth date and political status recorded in their organizations. Nearly a third (30 per cent) of respondents have their personal information, including residential address, education background, working unit,

Category of personal information	Sensitive information (over 50% agreement)	General information (over 50% agreement)	Personal information in organizations (over 20% of organizations)
Identifiable information	Birthday, fingerprints, physical traits, type of blood, DNA, residential address, working unit, personal pictures or images and personal signature	Name, gender, political status, birth place and education	Name, gender, birth date, political status, residential address, education, working unit, pictures and signature
Identity information	Identification card and relevant evidential documents, passport information, household register, driver's license and records, social security number, customer identity information and member of professional societies	0	Identification card, evidential documents, passport information, household register, driver's license, social security number, customer identity and member details
Business and transaction information	Bank accounts, personal income, tax information, real estate information, work transferring information, telephone record, e-mail address, correspondence, diary, e-mail, IP address, passwords, questions and answers for passwords, message accounts, social media accounts and messages	Occupational information and work experience	Finance affairs information, personal income, tax information, real estate information, occupational information, work experience information, work transferring information, e-mail address and IP address
Moral right information	0	0	0
Civil rights and interests information	Marriage, social security, children and care groups information, donations, pensions, sexual life, health and birth status	Personal preferences and interests	Marriage, social security and giving birth status information

Table I.
Types of personal information for protection from surveys

information with personal pictures and personal signature, listed with their organizations. Fewer than 14 per cent of the respondents have their personal information like fingerprints, physical traits, blood type, colour and DNA in their organizations. Even fewer (under 20 per cent) of the respondents have adequate measures for their protection.

Personal sensitive information. There is a convergent view on what personal sensitive information is about based on the survey. Table I indicates that over 53 per cent of the respondents choose all the listed personal identity information as personal sensitive information, including the identification card and relevant evidential documents, passport information, household register, driver's license and records, social security number, customer identity information and membership in professional societies. Over 20 per cent of the organizations have all the above types of personal information. However, less than 23 per cent of the organizations have specific mechanisms for the protection and management of personal sensitive information.

Personal business and transaction information. There is increasing attention on safeguarding of personal financial information in today's networked society (Sprague and Ciocchetti, 2009). Table I shows that over 50 per cent of the respondents choose personal finance information such as bank accounts, personal income, tax information, real estate information, work transferring information, telephone record, e-mail address, correspondence letter, diary, e-mail, IP address, passwords, questions and answers for passwords, instant message accounts, social media accounts and content of messages as sensitive information. More than 50 per cent of respondents choose occupational information and work experience as general information. Over 20 per cent of the organizations have access to the personal information listed above. It is notable that less than 18 per cent of the respondents have specific mechanisms for the protection and management of sensitive information.

Personal moral right information. This type of personal information refers to the sensitive information that can cause conflicts and negative impacts on individuals as well as organizations. It includes criminal records, court orders, political attitude, family history information and religion (Lior, 2011; Watley and May, 2004). There is no response to all the questions from the respondents on this question. It seems that such personal information is not relevant to the respondents and their organizations with respect to their protection and management.

Personal civil rights and interest information. There is an increasing amount of attention being paid to protect and manage personal civil right and interest information (Zwick and Dholakia, 2001). Table I shows that over 55 per cent of the respondents choose information, including marriage, social security, information about children and adults groups who need special care, donation of remains, pension planning, sexual life, health and medical care and giving birth status, as sensitive information. A fairly larger majority (68 per cent) of the respondents choose personal preferences and interests as general information. Over 20 per cent of the organizations have marriage, social security and giving birth status information. Less than 14 per cent of the organizations have specific mechanisms for the protection and management of this type of sensitive information.

The study notes that personal moral right information is not regarded in real-world practices as relevant to organizations. Results show that personal identity information is all regarded as the sensitive information which needs special security controls (Sprague and Ciocchetti, 2009). Personal business and transaction information, personal identifiable information and personal civil right information are complex. This is because these types of personal information include both general information and sensitive information. As a result, they need to be identified with respect to the different concerns of the stakeholders in specific situations for the provision of secure services in a networked environment.

The study shows that not enough effort has been taken for the development of appropriate mechanisms with respect to personal information protection and management in the process of providing stakeholders with networked services in China. A meta-synthesis of the research findings from multiple data sources as above was conducted. This led to the development of a comprehensive concept map for personal information protection and management in China (Figure 7).

7. Conclusions

The paper fills in gaps in the literature by investigating the types of personal information for protection and management with respect to the relevant laws, policies, standards, networked services and organizations. It develops a comprehensive concept map for the adequate protection and effective management of personal information in the provision of networked services in China along the entire life of personal information and throughout the entire management process. The investigation of the issues of personal information protection and management with respect to the relevant laws, policies, standards, networked services and organizations can lead to a better understanding of what, why and how personal information is protected and managed in real-world practices in China. The development of a comprehensive concept map for personal information protection
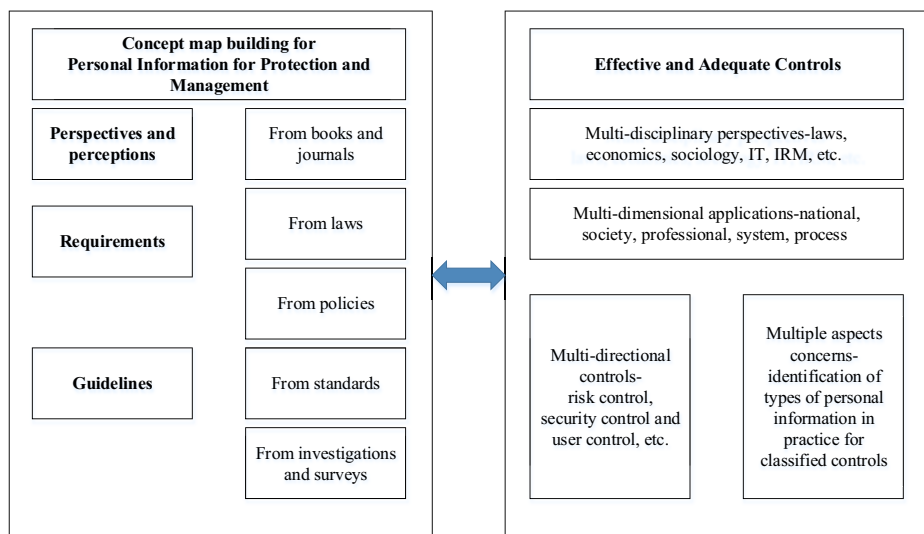
Figure 7.
A comprehensive concept map for personal information protection and management

and management can be used as an effective guideline for the formulation and implementation of appropriate strategies and policies in individual organizations for providing their stakeholders with quality networked services in today's highly connected network environment in China.

The paper is the first step of a comprehensive study on the protection and management of personal information for the provision of networked services in China. It is the first of this kind of study to answer the questions of what types of personal information need to be protected, as well as why and how they should be protected in conformity with laws, regulations, policies, standards and needs of networked services and business activities of organizations. It provides a solid foundation for further research with respect to personal information protection and management.

References

Ackerman, M.S. (2004), "Privacy in pervasive environments: next generation labeling protocols", *Personal and Ubiquitous Computing*, Vol. 8 No. 6, pp. 430-439.

Adaem, K. and Amnuay, Y. (2013), "Assessing privacy protection in alumni service", *International Journal of Computer and Electrical Engineering*, Vol. 5 No. 4, pp. 424-429.

Alkalbani, A., Deng, H. and Kam, B. (2014), "A conceptual framework for information security in public organizations for e-government development", *Proceedings of the 25th Australasian Conference on Information Systems*, 8-10 December, ACIS, Auckland.

An, X., Deng, H., Chao, L. and Bai, W. (2014), "Knowledge management in support of collaborative innovation community capacity building", *Journal of Knowledge Management*, Vol. 18 No. 3, pp. 574-590.

An, X., Mu, Y., Wang, W., Liu, J.J., Wang, W. and Ye, L.Q. (2011), "Analysis of current legal and regulatory requirements for personal information protection and management in China", *Beijing Archives, No*. 5, pp. 19-21.

Barber, G. (2006), "Personal information in government records: protecting the public interest in privacy", *Saint Louis University Public Law Review*, Vol. 25 No. 1, pp. 63-121.

Bélanger, F. and Crossler, R.E. (2011), "Privacy in the digital age: a review of information privacy research in information systems", *MIS Quarterly*, Vol. 35 No. 4, pp. 1017-1042.

Beldad, A., Jong, M. and Steehouder, M. (2011), "A comprehensive theoretical framework for personal information-related behaviors on the Internet", *The Information Society*, Vol. 27 No. 4, pp. 220-232.

Bulgurcu, B. (2012), "Understanding the information privacy-related perceptions and behaviors of an online social network user", Doctoral Dissertation, University of British Columbia.

Byrne, J., Martin, B., Deng, H. and Halpin, E. (2005), "The movement to an information society: a comparison of Australia and other leading information society countries", *Proceedings of the 5th European Conference on E-Government*, pp. 85-92.

Deng, H. (2008), "Towards objective benchmarking of e-government: an inter-country analysis", *International Journal of Transformational Government: People, Process and Policy*, Vol. 3 No. 4, pp. 162-176.

General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China and Standardization Administration of the People's Republic of China (2012), *Personal Information Protection Guidelines for Public and Commercial Service Information System of Information Security Technology*, China Standards Press, Beijing.

Hildebrandt, M., O'Hara, K. and Waidner, M. (Eds.) (2013), *Digital Enlightenment Yearbook 2013: The Value of Personal Data*, IOS Press, Amsterdam.

Hong, H. (2010), *Personal Information Civil Law Protection*, Law Press, Beijing.

Jiang, P. (2008), *Personal Data Information Protection by Laws*, Chinese University of Political Science and Law University Press, Beijing.

Karunasena, K. and Deng, H. (2012), "Critical factors for evaluating the public value of e-Government in Sri Lanka", *Government Information Quarterly*, Vol. 29 No. 1, pp. 76-84.

Kong, L. (2009), *Privacy Protection of Personal Data*, Wuhan University Press, Wuhan.

Lang, Q.B., Sun, Y. and Yang, L. (2008), *Introduction to Personal Information Protection*, People's Press, Beijing.

Li, L. (2009), *Development Report about Rule of Law in China No. 7*, Social Science Documentation Press, Beijing.

Lior, Z. (2011), "Moral rights: limited edition", *Boston University Law Review*, Vol. 91, pp. 1519-1568.

Ministry of Industry and Information Technology of the People's Republic of China (2013a), "Regulations of personal information protection of telecommunications and internet users", available at: www.miit.gov.cn/n11293472/n11294912/n11296542/15514014.html. Regulations (accessed 7 September 2014).

Ministry of Industry and Information Technology of the People's Republic of China (2013b), "Provisions on protecting the personal information of telecommunications and internet users", available at: www.miit.gov.cn/n11293472/n11293832/n12843926/n13917072/15514067.html (accessed 22 March 2014).

Ministry of Industry and Information Technology of the People's Republic of China (2013c), "Notice of the ministry of industry and information technology on strengthening the network access management of mobile intelligent terminals", available at: http://opinion.news.chengdu.cn/topic/2013-10/31/content_1305121.htm?node=12022 (accessed 27 August 2014).

Molla, A. and Deng, H. (2009), "Business participation in third party controlled e-marketplace: an exploratory model", *International Journal of e-Business Management*, Vol. 3 No. 1, pp. 20-34.

Mu, Y., Wang, W. and An, X. (2013), "Development of personal information protection system for government agencies", *Informatization Construction*, No. 1, pp. 22-25.

Murphy, R.S. (1995), "Property rights in personal information: an economic defense of privacy", *Georgetown Law Journal*, No. 84, pp. 2381-2417.

Nam, C., Song, C., Lee, E. and Park, C.I. (2006), "Consumers' privacy concerns and willingness to provide marketing-related personal information online", *Advances in Consumer Research*, Vol. 33 No. 1, pp. 212-217.

National Development Reform Committee (2014), "The state commission office of public sectors reform, ministry of industry and information technology, etc.", Notice of Work Relevant to Fostering Implementation of Information Services Project Benefit to People, available at: www.mof.gov.cn/zhengwuxinxi/zhengcefabu/201401/t20140116_1036140.htm (accessed 27 August 2014).

Shilton, K., Burke, J.A., Estrin, D., Govindan, R., Hansen, M., Kang, J. and Mun, M. (2009), "Designing the personal data stream: enabling participatory privacy in mobile personal sensing", available at: http://ssrn.com/abstract=1999839 (accessed 22 March 2014).

Sillitoe, P.J. (1998), "Privacy in a public place: managing public access to personal information controlled by archives services", *Journal of the Society of Archivists*, Vol. 19 No. 1, pp. 5-15.

Sprague, R. and Ciocchetti, C. (2009), "Preserving identities: protecting personal identifying information through enhanced privacy policies and laws", *Albany Law Journal of Science and Technology*, Vol. 19 No. 1, pp. 91-142.

Standardization Administration of the People's Republic of China (2012), *GB/Z28828-2012 Personal Information Protection Guidelines for Public and Commercial Service Information System of Information Security Technology*, China Standards Press, Beijing.

Standing Committee of the National People's Congress (2012), "Decision on the standing committee of the national people's congress on strengthening information protection on networks", available at: http://news.hexun.com/2012-12-28/149603728.html (accessed 27 August 2014).

State Administration for Industry and Commerce (2014), "Administrative measures for on line trading", available at: www.law-lib.com/law/law_view.asp?id=443546 (accessed 27 August 2014).

State Council (2013), "Opinions on promotion information consumption of China", available at: www.js.xinhuanet.com/2013-08/15/c_116951133.htm (accessed 27 August 2014).

Sun, S. (2014), "A study about the relationship between personal information utilization and protection in internet environment", Master's Dissertation, Renmin University of China, Beijing.

Tian, X., Martin, B. and Deng, H. (2008), "The impact of digitization on business models for publishing: some indicators from a research project", *Journal of Systems and Information Technology*, Vol. 10 No. 3, pp. 232-250.

Watley, L. and May, D. (2004), "Enhancing moral intensity: the role of personal and consequential information in ethical decision making", *Journal of Business Ethics*, Vol. 50 No. 2, pp. 105-126.

Wilkinson, D. and Thelwall, M. (2011), "Researching personal information on the public web: methods and ethics", *Social Science Computer Review*, Vol. 29 No. 4, pp. 387-401.

Wu, Y. (2014), "Protecting personal data in e-government: a cross-country study", *Government Information Quarterly*, Vol. 31 No. 1, pp. 150-159.

Xia, P., Wang, J. and Zhou, W. (2007), *IT Development and Personal Information Protection*, Economic Daily Press, Beijing.

Yao, Y. (2012), *Personal Information Protection from the Constitutional Perspective*, Law Press, Beijing.

Zhang, H. (2006), *Research Front of Personal Information Protection*, Legal, Press, Beijing.

Zwick, D. and Dholakia, N. (2001), "Contrasting European and American approaches to privacy in electronic markets: property right versus civil right", *Electronic Markets*, Vol. 11 No. 2, pp. 116-120.

Further reading

British Standard Institute (2009), *BS10012:2009 Data Protection-Specification for a Personal Information Management System*, British Standard Institute, London.

Copeland, A.J. and Barreau, D. (2011), "Helping people to manage and share their digital information: a role for public libraries", *Library Trends*, Vol. 59 No. 4, pp. 637-649.

International Organization for Standardization (2009), *ISO 704: 2009 Terminology Work – Principles and Methods*, Geneva.

About the authors

Xiaomi An is a Professor and Doctoral Supervisor at Renmin University of China.

1064

Wenlin Bai is a post doctor at Business School of Nankai University. Wenlin Bai is the corresponding author and can be contacted at: baiwenlin@nankai.edu.cn.

Hepu Deng is a Chair Professor at Renmin University of China and RMIT University in Australia.

Shuyang Sun is a PhD candidate at Renmin University of China.

Yu Dong is a PhD candidate at Renmin University of China.

Wenrui Zhong is a PhD candidate at Renmin University of China.

Jufang Hu is a Librarian of Renmin University of China.