

2016

# Digital Identity in Mobile Products for Digital Innovation

Francois Perry

*The University of Cape Town, francoisperry@gmail.com*

Michael Pollock

*The University of Cape Town, Michael.pollock@uct.ac.za*

Follow this and additional works at: <http://aisel.aisnet.org/confirm2016>

---

## Recommended Citation

Perry, Francois and Pollock, Michael, "Digital Identity in Mobile Products for Digital Innovation" (2016). *CONF-IRM 2016 Proceedings*. 52.

<http://aisel.aisnet.org/confirm2016/52>

This material is brought to you by the International Conference on Information Resources Management (CONF-IRM) at AIS Electronic Library (AISEL). It has been accepted for inclusion in CONF-IRM 2016 Proceedings by an authorized administrator of AIS Electronic Library (AISEL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# 25. Digital Identity in Mobile Products for Digital Innovation

Francois Perry  
The University of Cape Town  
francoisperry@gmail.com

Michael Pollock  
The University of Cape Town  
michael.pollock@uct.ac.za

## *Abstract*

Mobile computing growth has led to a world connecting people, devices, organisations and appliances. This world of ubiquitous computing is served through multiple digital products and services, which provide value to the user. The user is the central player in this digital landscape and the importance of identifying and understanding the user is significant to the creators of digital products and services, or digital innovation. The purpose of this paper is to explore the relationship between digital identity and digital innovation in the context of mobile computing. Exploring this relationship will help further the understanding of whether the presence of digital identity has a positive influence on digital innovation. The exploratory study was conducted using qualitative and quantitative strategies within an inductive approach in order to understand the concepts of digital identity and digital innovation. The Holmström-Nylen (2015) Framework was amended to measure the presence of digital innovation in the product or service and also to classify the relationship between digital identity and digital innovation. The results identified a series of themes and causalities between the implementation of digital identity and mobile computing for digital product or service. The results also suggested a possible relationship between digital innovation and digital identity, depending on the surrounding organisational factors, however there was not enough conclusive evidence of an enabling role between digital identity and digital product or service innovation.

## *Keywords*

Digital Identity, Digital Innovation, Digital Innovation Framework, Mobile Computing, Mobile Products, Mobile Services

## **1. Introduction**

The past decade has seen an exponential growth in mobile computing and massive consumer demand for mobile technologies (Schmidt & Cohen, 2013). The evolution of the Internet, increased connectivity and cheaper computing hardware laid the foundation for mobile computing to flourish. Mobile computing, for instance in the form of mobile banking, has seen phenomenal growth in Africa (Brown, Cajee, Davis & Stroebel, 2003). The unique characteristics of mobile devices and mobile computing allow increased technology complexity, security and network connectivity (Al-Khouri, 2013).

The user adoption of mobile computing and mobile products or services across numerous mobile platforms, burdened the same user with multiple virtual identities and credentials across these multiple products and services. The need to maintain one's digital identity in the digital world has become very prominent (Alotaibi & Wald, 2013). The concept of identity is elusive and used

in different contexts for diverse purposes with no single described definition (Adams & Williams, 2013; Jenkins, 2008). For this paper, digital identity is defined as an identity experienced through the use of technology or digital devices such as a computer, mobile device or the Internet (Rodrigues, 2011).

The foundation of the understanding for digital identity spreads from the idea that each digital identity represents an individual in a certain context in the digital world. The purpose of the user's digital identity is to connect the specific individual or physical person with the associated digital entity (Al-Khoury, 2014; Davis, 2014).

Digital identity is further explained as the unique set of attributes or various combinations of attributes relating to a specific user (Camp, 2004). At the simplest conceptualization of digital identity, the identity is understood as one piece of data or, at the most complex, the sum of all the available data related to that specific entity in time. It is essential to view the digital identity as the sum of all the individual attributes, and fundamentally inseparable from the collection as a whole, constructing the user's digital identity (Soeder & Barber, 2014; Sullivan, 2011). Thus digital identity is the intersection between digital technology and identity in the digital realm (Ayed & Ghernaoui-Hélie, 2012; Knight & Saxby, 2014; McLaughlin, Malone, & Jennings, 2009).

The shift from electronic commerce to mobile commerce ushered in the reality of ubiquitous computing, connecting multiple devices through multiple channels. The need for a user to be identified on each of these devices and channels has driven the importance of digital identity (Kumar, Joshi, & Saquib, 2015).

The combination of digital identity and mobile products produces unified user identification across multiple channels and devices, empowering the user to interact and transact with digital entities and services through these devices in the digital world (Al-Khoury, 2013). Rapid growth in mobile computing, devices and interconnectivity encourages mobile product and service innovation. This digital innovation needs to focus on the user's interaction with the mobile products and services with one important component being the user's digital identity.

Digital innovators are noted for their ability to use digital technologies to join two things together in order to create something valuable and new (Fichman, Dos Santos, & Zheng, 2014). Mount (2012) defines innovation by extending Rogers' definition "an idea, practice or object that is perceived as new by an individual or other unit of adoption" (1995, p. 12) from idea to include product, service or process and to classify that an idea only becomes innovation once it has been commercialised to the market. Fichman et al. use the concept innovation and include the term digital, to very broadly define digital innovation as "a product, process, or business model that is perceived as new, requires some significant changes on the part of adopters, and is embodied in or enabled by IT" (2014, p. 330).

Holmström & Nylen observes the following for digital innovation, "*As information is increasingly digitized and mobile devices accelerate in pervasiveness and processing power, an arena and architecture for innovation is opened up—one in which physical and digital components are combined. Recent research has highlighted how the unique properties of digital technology enable new types of innovation processes that are distinctively different from the analog innovation processes of the Industrial Era.*" (p. 58, 2015)

## **2. Research Objectives**

The key question to this research study was: What is the relationship between digital innovation and digital identity in mobile products? In answering this question, the study's objectives would be met. These objectives were to determine the use and implementation of digital identity in products and services, understand how digital identity relates to mobile computing, and determine if digital identity enables digital innovation. By meeting these three objectives, the relationship between digital identity and product or service innovation in mobile computing can be better understood.

## **3. Methodology**

A review of existing literature revealed that research into the relationship between digital identity and digital innovation in mobile products or services is limited. As such the research conducted for this study had an exploratory purpose of gaining new insights and building theory in these areas.

The research study adopted an inductive approach to develop a theory to understand the relationship between digital identity and digital innovation in mobile products or services. The fixed mixed method research design was used, since the decision was made at the beginning of the research study to use qualitative and quantitative research methods (Creswell & Clark, 2007).

The primary data collection strategy was semi-structured interviews, conducted one-on-one using pre-created questions allowing for some degree of structure. The questions were formulated to be open-ended and encouraged engagement from the research participants. This mechanism allowed the researcher to ask additional questions, change the order of questions or skip questions based on the participant's level of collaboration (Saunders, Lewis, & Thornhill, 2009). The duration of each interview was approximately between 1-2.5 hours. The decision was made not to record the interviews as some of the participants indicated they are not comfortable with a recording, so handwritten field notes were used to record the interview data. The semi-structured interview responses were interpreted using a qualitative analysis method, and were used as the main data source for the quantitative analysis against the theoretical framework.

Non-probable, purposive sampling method was used to appropriately identify participants for the semi-structured interviews. This enabled the researcher to personally select possible interview participants who were likely to provide data in support of the research objectives. The sample population consisted of South African based companies ranging across multiple industries, sizes and operating locations. The interview participants included C-level, senior IT and business management and were in high level decision-making positions within their respective organisations. The researcher confirmed that each participant's organisation had a definite mobile product presence and that each participant had enough knowledge about the area of study to provide valued responses.

A thematic analysis approach was used for the qualitative data section of the study and the theoretical framework was used for the quantitative data section of the study. Thematic analysis was used to uncover the high level themes in the data. The analysis involved an iterative process of reading, analysing and grouping the similar concepts together. The continuous iteration and refinement of the concepts allowed parent and sub themes to emerge.

The theoretical framework used in the study is a modified version of the proposed framework by Holmström & Nylén (2015) for diagnosing and improving digital product and service innovation. Holmström and Nylén (2015) created the framework to help organisations effectively manage their digital product and service innovations.

Many organisations claim to be creative, innovative and leaders in their field despite using any methods, instruments or metrics to define and measure the claimed innovation (Şimşit, Vayvay, & Öztürk, 2014). In addition, no obvious theoretical or practical pattern explains differences or similarities between organisations being innovative and claiming to be innovative (Khurum, Fricker, & Gorschek, 2014).

In the Information Systems (IS) field the research for digital innovation predominantly focuses on the assimilation and diffusion of digital innovation and technologies and provide insights into the adoption behaviour of users and organisations (Fichman, 2000).

Furthermore, the common innovation models in IS theory focuses on the acceptance of technology, examples include The Theory of Reasoned Action, Theory of Planned Behaviour, Technology Acceptance Model, Diffusion of Innovations Theory and Unified Theory of Acceptance and Use of Technology (Alotaibi & Wald, 2013). None of these models measure or determine if digital innovation occurred or is present at organisations or companies.

The framework presented by Holmström & Nylén (2015) specifically accommodates digital innovation in digital products and services and purposefully considers the unique properties and challenges associated with digital technologies in the framework. This seems like a perfect fit for the current research study except for one point, the intention of the framework is to manage digital product and service innovation, not measure it. To cater for this, the framework was amended and used to measure digital innovation and the possible relationship between digital identity and digital innovation.

### **3.1 Theoretical framework**

Digital technology exhibits unique properties and produces rapid and new innovation processes and types, which are difficult to predict or control. The framework presents five key areas of assessment to manage digital product or service innovation: user experience, value proposition, digital evolution scanning, skills and improvisation (Holmström & Nylén, 2015). The five key areas are aggregated into three dimensions intersecting the organization's products, digital environment and organizational properties. Each area is measured by various elements represented below in Table 1.

#### *3.1.1 User Experience*

The digital product must provide a rich user experience and be easy to learn and use. The user experience is measured by three elements: usability, aesthetics and user engagement. Usability considers intuitive navigation and information presentation, while aesthetics evoke a positive emotional response through the product design and appearance. User engagement encourages meaningful user experiences and continuous use from the user.

<b>Dimension</b>	<b>Area</b>	<b>Element</b>
<b>Product</b>	<i>User Experience</i>	Usability Aesthetics Engagement
	<i>Value Proposition</i>	Segmentation Bundling
<b>Environment</b>	<i>Digital Evolution Scanning</i>	Devices Channels Behaviours
<b>Organisation</b>	<i>Skills</i>	Roles Teams
	<i>Improvisation</i>	Flexibility Change Creativity

**Table 1** - Holmström-Nylen (2015) Framework

### *3.1.2 Value Proposition*

The value proposition deals with how value is generated and captured in the mobile product and how the user recognizes the value the product presents. The assessment of the value proposition is done through customer segmentation and bundling, allowing for new arrangements and logic of revenue streams linked to the digital innovation.

Customer segmentation comprises the analysis of the organization's customer base to understand the different customer groups in order to make strategic decisions on how the product or service must interact with the different customers. The customer segmentation further allows the organisation to position the product or service accurately in the market. Another part of the value proposition includes. Bundling, in this context, refers to the grouping of different product and service offerings.

### *3.1.3 Digital Evolution Scanning*

Digital evolution scanning is the process of identifying and exploiting new opportunities for innovation by creating or combining digital products. Organizations must continuously monitor and analyse the progress of digital technologies and usage patterns. This is achieved by continuously collecting information on newly developed or future devices, hardware and digital distribution channels. Digital evolution scanning also involves the observation of new or changing user behaviours within the product or service.

### *3.1.4 Skills*

Due to the rapid pace of digital innovation, organizations constantly require new skills to keep innovating. Organizations must regularly evaluate the people and roles required to form dynamic innovative teams. The organizations must also support and encourage continuous learning related to digital technologies.

### 3.1.5 Improvisation

Organisations must promote creativeness and implement structures to assess and coordinate the space and flexibility needed for creativity. Specific time should be allocated for improvisation to occur and the focus on co-ordination is the key to deal with potential overlaps and waste of time during the improvisation process.

### 3.2 Evaluation and Scoring

The amended framework was used to assess the potential relationship between digital identity and digital innovation in the different mobile products or services. This was achieved by asking the participants to explain or provide their insights into the impact or role digital identity had on the framework's *dimensions* and *areas*.

For the assessment of the relationship between digital identity and innovation the framework's *dimensions* and *areas* were grouped together totalling to 8 subjects of focus across the 3 dimensions. It must be noted that the framework's *dimension* segments not only served as the summarized view of the different areas, but also as a subject of focus.

The first question related to the framework area and the second question to the framework dimension, continuing in this manner until all 8 subjects were covered by the interview questions. The example below illustrates the flow of questions in the first framework area exploring the relationship between digital identity in the innovation dimension and areas.

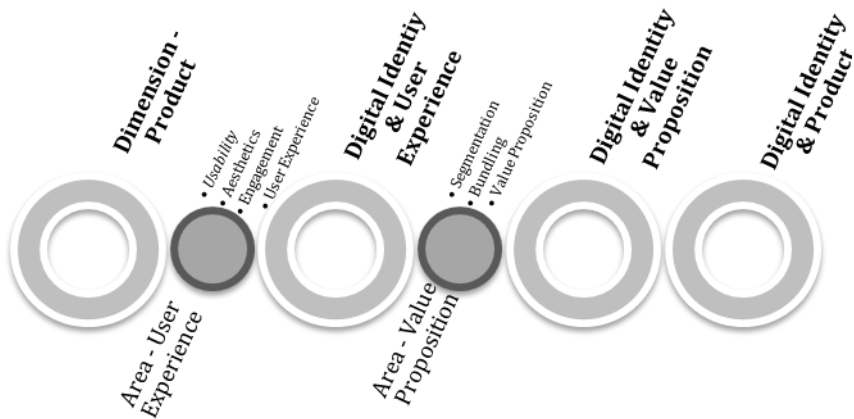


Figure 1 – Framework Question Flow including Digital Identity

A classification and scoring system was used to assess the participant's responses for the relationship between digital identity and digital innovation, detailed in Table 2.

Classification	Score
Present/Influence	1
Possible/Potential Influence	0.5
Absent/No Influence	0

Table 2 – Digital Identity Relationship: Classification & Score

The response for each question was assessed and the digital identity influence is classified as either Present, Possible or Absent. The participants were also encouraged to provide, when possible, contextual information with each answer. The classification of each question was assigned the corresponding score and the total was calculated representing the participant's overall digital identity and digital innovation relationship score. Eight subjects and questions represent the relationship assessment, allowing for a maximum possible score out of 8.

The summarized view of the assessment includes each participant's total score and percentage for digital innovation and relationship between digital identity and innovation.

## 4. Analysis

Each participant described the impact or role digital identity had in the framework's dimensions and areas. The results were grouped, categorized and scored according to the measuring scale of the digital identity influence: present/influence, possible/potential influence and absent/no influence. Table 3 presents the participants' results.

Participant	User Experience	Value Proposition	Product	Digital Evolution Scanning	Environment	Skills	Improvisation	Organisation	Score (8)
1	●	●	●	⊘	⊘	○	●	⊘	5.5
2	○	⊘	○	○	○	○	○	○	0.5
3	○	○	○	○	⊘	○	⊘	○	1
4	⊘	●	●	○	○	○	○	○	2.5
5	⊘	●	⊘	⊘	●	⊘	⊘	○	4.5
6	○	○	○	○	○	○	○	○	0
7	●	●	●	●	●	⊘	⊘	●	7
8	⊘	○	○	○	●	○	⊘	●	3
<b>Total (8)</b>	<b>3.5</b>	<b>4.5</b>	<b>3.5</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>2.5</b>	

Key – Present ●=1, Probable ⊘= 0.5, Absent ○= 0

**Table 3** - Innovation & Digital Identity Relationship Score

### 4.1 Product

Participants highlighted the significant and positive impact digital identity had on their different mobile product offerings. The focus on digital identity from the start of the product development



process allowed for the maximum product value realisation and improved the overall effectiveness of the product.

The implementation of the user's digital identity allowed for a user-centric and customised user experience. The digital identity generated additional security and trust allowing the user experience to be quicker, more engaging and contributed to the product's overall usability.

Participants also highlighted the influence of digital identity on the products' value propositions. The value proposition was only made possible in certain instances by linking the digital identity directly to the mobile product and product features. Participant 1 commented, "*I would say digital identity is actually key in our overall value proposition and in offering extended services like payments.*" Understanding the user through their digital identity allowed the user to be the central focus of the mobile product's value proposition.

## **4.2 Environment**

Using the user's associated digital identity enabled the creation of custom solutions for the mobile product's chosen devices and consumption channels. The digital identity furthermore allowed environmental specific mobile product features to be linked to specific users facilitating the use of these technologies. Without the facilitation of the user's digital identity it would have been exceptionally complex to implement and link these features between the mobile product and the user.

Through the use of the digital identity, the mobile product gathered enough contextual and usage data about the operating environment of the user and the product. This provided valuable information to support the business model in adapting to new environment changes relating to the mobile devices, usage channels and user behaviours. Participant 7 explained, "*The identity enables us to have environmental features linked to the user and provide very specific features to that user, for example, voice input through certain devices. Without the digital identity these features would be very complex to use.*"

The mobile devices additionally impacted the identification process, allowing for richer identity verification process. An added benefit is that the digital identity also had a positive influence on the required mobile product behaviours and through the digital identity the user could utilise the different available mobile specific features. Digital identity is furthermore used as the mechanism to track and observe the user behaviours and mobile device usage, allowing adaptability and greater learning in the mobile environment.

## **4.3 Organisation**

The implementation of digital identity in the mobile products facilitated deeper insight and understanding of the users. This allowed the organisations to discover and adapt to new types of users, behaviours and opportunities leading to changes in the mobile product. In most cases the organisations had to grow their current skillset, acquire new skills or create new roles to facilitate the new mobile product needs.

Digital identity further provided information and behaviours aiding organisations to be flexible in the dynamic mobile environment. This empowered the organisations to be acceptable to

change and encouraged the needed creative freedom to improve their mobile products, ultimately leading to better customer satisfaction.

The digital identity concept intrinsically challenged the organisation to consider and utilise the benefits it can generate to shape the organisation's overall strategy. Participant 8 summarised this viewpoint, "*I see digital identity as something that will get us to ask the questions that will provide the answers to help the organization going forward.*"

## 5. Discussion

Assessing the results for the relationship scores higher than 4, most of the participants provided positive feedback for the product dimension of the framework. The user experience area and the elements of usability, aesthetics and engagement received confirming answers when the participants discussed their product or service. This corresponds with previous studies indicating the importance of user engagement and providing the user with a valuable experience, through the product aesthetics and design as a differentiator in digital innovation (Straker, Wrigley, & Rosemann, 2015).

All the participants clearly articulated their value proposition and understood the customer segmentation for the product or service. The value found in digital innovations relates to monetary and non-monetary terms and detailing the offering allows for a better justification of the innovation and allows continuous development and commercialisation of the digital innovation (Antonopoulou, Nandhakumar, & Panourgias, 2014).

Interpreting the participants' responses and data, the skills area consisting of the roles and teams elements is the area where the most negative responses were recorded. This is somewhat surprising since most of the existing literature suggests skills, roles and teams are very important in digital innovation. Participant 5 observed, "*...another challenge is the scarcity of the required skills relating to innovation...*". Skills for problem solving, idea generation and creativity are necessary for innovation, and the composition and management of the teams allow digital innovation to occur. If innovation is a priority for an organisation, the best people need to be involved, supported and invested in by that organisation (Edgett, 2014; Gundry, Ofstein, & Kickul, 2014).

Şimşit et al. (2014) identifies innovative companies as a place where support and trust is nurtured and grown, a 'can-do' environment is created and all the employees have the opportunity to learn from failures. The researcher specifically did not ask any questions relating directly to the participant's organisational environment or philosophy towards innovation, but rather wanted the participants to mention this on their own accord. Participant 7 alluded to the 'can-do' environment in the organisation, "*When the company started, some people said, what we are trying to do is impossible, but we did it...*".

Participant 7 and 1 prominently referred to the connection between the digital identity and digital innovation. Participant 7 said, "*The digital identity also allows us to give different business functions across the whole ecosystem... The best user experience would only be possible through the digital identity... customized experience for the user through the identity. This would not be possible without the identity... if we lose the digital identity in the product, we would actually*

*lose the effectiveness of the product... our whole business is built around the user's digital identity”.*

Participant 1 also mentioned significance of digital identity during the innovation discussion, *“...I would say digital identity is actually key in our value proposition... by establishing the user identity the linking and sharing between different users became easier... without the user's identity it would not have been possible to include this feature...”.*

## **6. Results**

The participants with highest digital innovation score, participants 1 and 7, also had the highest digital identity score, suggesting a very distinct relationship between digital innovation and digital identity. This however cannot be interpreted in isolation, as both participants' organisations also exhibit certain external similarities. Both organisations are relatively newly established and made a conscious decision from the beginning to use mobile products as the only user platform. It is suggested that this mobile-product-first decision supported the digital identity realisation and then the combination of mobile and digital identity ultimately enabled digital innovation to occur. This is supported by certain participant's views that digital identity is currently being underutilised or not a focus for their organisation and mobile products are only recently introduced as a viable user platform. As a result their current products and services are not unquestionably digitally innovative.

## **7. Conclusion**

This study set out to explore the relationship between digital innovation and digital identity in mobile products. Three objectives were set to achieve this aim. The first objective was to determine the use and implementation of digital identity in products and services. Using the theoretical framework's dimensions and areas participants 1, 5 and 7 indicated the strong existence of digital identity with their mobile products. The framework further indicated a general notion of digital identity with participants 4 and 8. These results indicate the implementation or existence of digital identity in the different mobile products. The second objective was to understand how digital identity relates to mobile computing. The participants that scored highly in the theoretical framework's dimensions and areas additionally made reference to the value mobile products and mobile computing have on their different digital identity approaches. This suggests a strong relationship between the realisation of the user's digital identity and mobile computing. The third objective was to determine if digital identity enables digital innovation. The relationship between digital innovation and digital identity are suggested by the different themes and causality between the high scores for digital identity and digital innovation of participants 1 and 7, but are not conclusive enough in providing evidence of an enabling role.

The relationship between digital identity and product or service innovation in mobile computing is better understood after this study. From the findings digital identity is implemented, or at least present, in the innovation of products and services, digital identity is strongly related to mobile computing, but it is not conclusive as to whether digital identity enables innovation. Though a relationship is clear, further study is needed on the digital identity as an enabling influence on innovation to gain better insight into the relationship between digital identity and product or service innovation in mobile computing.

## References

- Adams, A., & Williams, S. (2013). What's Yours is Mine and What's Mine's My Own: Joint Accounts and Digital Identity. *SIGCAS Computers and Society*, 44(1), 15–26.
- Al-Khouri, A. (2013). Identity and Mobility in a Digital World. *Technology and Investment*, 4, 7–12.
- Al-Khouri, A. (2014). Identity Management in the Age of Mobilification. *Internet Technologies and Applications Research*, 2(1), 1–15.
- Alotaibi, S. J., & Wald, M. (2013). Acceptance Theories and Models for Studying the Integrating Physical and Virtual Identity Access Management Systems. *International Journal for E-Learning Security*, 4(1), 1–10.
- Antonopoulou, K., Nandhakumar, J., & Panourgias, N. S. (2014). Value proposition for digital technology innovations of uncertain market potential. In *Twenty Second European Conference on Information Systems* (pp. 1–16). Tel Aviv.
- Ayed, G. Ben, & Ghernaouti-Hélie, S. (2012). Processes view modeling of identity-related privacy business interoperability: Considering user-supremacy federated identity technical model and identity contract negotiation. In *2012 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining* (pp. 906–913). Istanbul, Turkey.
- Brown, I., Cajee, Z., Davies, D., & Stroebel, S. (2003) Cell phone banking: predictors of adoption in South Africa—an exploratory study, *International Journal of Information Management*, 23(5), 381-394
- Creswell, J., & Clark, V. P. (2007). *Choosing a mixed methods design. Designing and conducting mixed methods research*. California: SAGE Publications.
- Davis, K. (2014). Bridging the Innovation-Policy Gap. *SAIS Review of International Affairs*, 34(1), 87–92.
- Edgett, S. J. (2014). People : A Key to Innovation Capability. *The European Business Review*, (April), 10–12.
- Fichman, R. G. (2000). The Diffusion and Assimilation of Information Technology Innovations. *Framing the Domains of IT Management: Projecting the Future through the Past*, 105–127.
- Fichman, R. G., Dos Santos, B. L., & Zheng, Z. (2014). Digital Innovation as a Fundamental and Powerful Concept in the Information Systems Curriculum. *MIS Quarterly*, 38(2), 329–353.
- Gundry, L. K., Ofstein, L. F., & Kickul, J. R. (2014). Seeing around corners: How creativity skills in entrepreneurship education influence innovation in business. *International Journal of Management Education*, 12(3), 529–538.
- Holmström, J., & Nylén, D. (2015). Digital innovation strategy : A framework for diagnosing and improving digital product and service innovation. *Business Horizons*, 58(1), 57–67.
- Jenkins, R. (2008). *Social Identity (Key Ideas)* (Third Edit). Oxon, United Kingdom: Routledge.
- Khurum, M., Fricker, S., & Gorschek, T. (2014). The contextual nature of innovation - An empirical investigation of three software intensive products. *Information and Software Technology*, 57, 595–613.
- Knight, A., & Saxby, S. (2014). Identity crisis: Global challenges of identity protection in a networked world. *Computer Law & Security Review*, 30(6), 617–632.
- McLaughlin, M., Malone, P., & Jennings, B. (2009). A Model for Identity in Digital Ecosystems. In *3rd IEEE International Conference on Digital Ecosystems and Technologies* (pp. 295–300).
- Mount, M. (2012). *The Mechanisms that Drive Disruptive Innovation*. University of York.
- Rodrigues, R. (2011). *Revisiting the legal regulation of Digital Identity in the light of global*

- implementation and local difference*. The University of Edinburgh.
- Rogers, E. M. (1995). *Diffusion of Innovations*. New York, New York, USA: Free Press.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students. Business* (Fifth Edit, Vol. 5th). Essex, England: Pearson Education Limited.
- Şimşit, Z. T., Vayvay, Ö., & Öztürk, Ö. (2014). An Outline of Innovation Management Process: Building a Framework for Managers to Implement Innovation. *Procedia - Social and Behavioral Sciences*, 150(231), 690–699.
- Soeder, B., & Barber, K. S. (2014). Trustworthiness of Identity Attributes. In *Proceedings of the 7th International Conference on Security of Information and Networks* (p. 4). New York, NY, USA.
- Straker, K., Wrigley, C., & Rosemann, M. (2015). The role of design in the future of digital channels: Conceptual insights and future research directions. *Journal of Retailing and Consumer Services*, 26, 133–140.