# International E-Conveyancing Strategies: Lessons for South Africa

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#### Abstract

Conveyancing is the legal process of creating, transferring and dealing with interest in land. In a global world, where there is an increased use of technology to streamline and implement fast and efficient client service delivery, it would suffice that the registration process of property be digitatised. Yet in South Africa and other countries this process remains manual. Different countries have looked at innovative e-conveyancing strategies and implemented these strategies successfully. It is the aim of this article to review the different e-conveyancing strategies used by different countries and how they were implemented giving focus to the South African conveyancing process. The article examines the conveyancing process of South Africa through the use of a conceptual framework, mapping the different stakeholders involved in the end-to-end conveyancing process. This article presents the benefits associated with e-conveyancing for the South African context and gives recommendations on the implementation of this process within South Africa.

Keywords: e-conveyancing, electronic processes, digitisation of data

#### 1. Introduction

Conveyancing is defined as the legal process of creating, transferring and dealing with interest in land (Rajasekhar, 2006). Although conveyancing is a legal concept, the principles of business and management still apply to conveyancing. The conveyancing process comprise of sub processes that are managed by individual entities. These entities may comprise of public and private entities and together form the property supply chain. Their activities in South Africa are not well coordinated or interfaced throughout the value chain which adds to the complexity, tediousness and cumbersomeness of handling a property transaction in South Africa. Improvements in technology have enabled many entities to incorporate these improved technologies into their manual processes. Technology enables entities to collect, store and disseminate information quicker, more efficient and to have better control over their respective processes. Streamlined processes may lead to faster processes which can lead to cost reduction (Davenport, 2013).

In South Africa the property process starts with a seller who appoints an estate agent to find a buyer for his/her property. Data, e.g. name, street name, surname, is obtained by an estate agent who collates this data to form information, e.g. an address, which is used to complete an offer to purchase between a buyer and seller. An application form for finance is then completed, if necessary, and submitted to a bank. This application may be electronically submitted to banks by means of a Comcorp system, but smaller entities may still submit the application via fax or email. The bank in turn will follow its own processes to assess the application where after a conveyancer is instructed electronically to attend to the transfer of title. The conveyancer hands in a manual paper-based application to the Deeds Registry for registration. This step is called lodgement. The various processes collate to form either a positive or a negative registration system. In a positive system the transaction is guaranteed by the State, whereas in a negative system the State does not quarantee the transaction. South Africa largely follows a negative system, but has certain

elements of a positive system as well, which makes the South African registration system very unique.

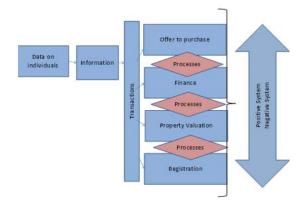


Figure 1: A simplistic systems view of conveyancing processes

# 2. Conveyancing Systems

There are many stakeholders involved in the conveyancing process such as buyers, sellers, estate agents, mortgage originators, conveyancers, banks, municipalities, Deeds Registries, Tax Registries to name a few. It is clear that more than one estate agent may be involved. One estate agent represents the buyer and another the seller. More than one conveyancer may also be involved: 1) the conveyancer appointed by the seller to attend to the transfer, 2) the conveyancer appointed by the bank where the seller has a mortgage loan to attend to the cancellation of the exiting loan. Municipalities need to provide rates and municipal figures and the Revenue Services attend to taxes that may be payable for the transaction. The Master of Court becomes involved in deceased or insolvent properties. CIPRO may need to provide information on non-individual buyers and sellers. Figure 2.1 below is an illustration of the various entities involved in the conveyancing end-to-end process. The various lines show the direct relationships between the various entities. Not all of the entities have direct contact with each other, although the parties all have a vested interest in the registration of the property in the name of the new buyer. Many of the stakeholders such as estate agents and mortgage originators only receive their commission after registration has taken place.

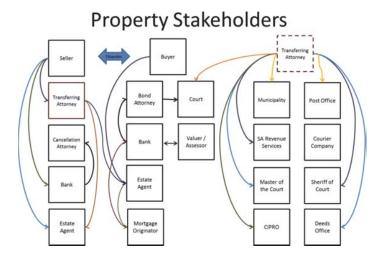


Figure 2: Conceptual Framework for the South African conveyancing processes

There are many stakeholders involved in the conveyancing process in South Africa, both public and private entities. It may be difficult to keep track of the progress of applications. In a global world, the use of technology has increased and

people tend to prefer conducting their business online (Zamith Brito & Mariotto 2013). Online marketing initiatives of estate agents have increased, yet the registration process itself remains manual in many countries, including South Africa (Interviews with banks, 2013). Many countries however, have looked at innovative solutions to dematerialise the title deed and have implemented these innovations incrementally (Sandberg, 2012).

In The Netherlands, notaries are responsible for conveyancing functions. In New Zealand and Australia individuals are able to handle their own conveyancing. An electronic registration system was implemented in Victoria, Australia which was not well used by stakeholders. The Government of Australia is now undertaking a national project to introduce a national electronic registration system. Their first role is to harmonise the differences in the registered land statutes between the various states (Park, 2009). The Land Act in New Zealand was also amended before any other initiatives could be carried out (Muir, 2012). The provision of online registration proof was made possible by means of an update of the Cadastre Act, which makes this an official procedure that is endorsed by Parliament (Lentze, 2013). In order for South Africa to make similar progress, it would mean that they would need to relook legislation that pertains to land transfers. Therefore, additional responsibilities to adopt safe practices and processes have an impact on the regulatory and compliance side (Low, 2010).

In the Netherlands the land registration (administrative system that contains the essential legal and administrative information of a land parcel) and the cadastre (surveying and mapping information system) are combined into one organisation. All cadastral registers and maps are in digital format, but the two systems are interfaced to coordinate the on-going updating of the cadastral registers and maps (Wakker, van der Molen & Lemmen, 2003). A public notary executes the transfer deed online. An official copy of the deed is then registered online at the relevant Land Registry Office. The registration of the true digital copy of the deed takes place immediately after the execution of the deed submission and the notary receives a receipt via the internet within minutes of providing evidence of registration (Lentze, 2013). This procedure was made possible by means of an update of the Cadastre Act in February 2005, which makes this an official procedure endorsed by Parliament (Lentze, 2013).

The Land Transfer Act of New Zealand was amended in 1998 and this amendment made provision for the computerisation of the title registers. A computerised land registration system namely Landonline, was developed in 2002 and was operationalised over a few years (Muir, 2012). However, this system initially allowed for title information to be maintained electronically, but transfer documents still had to be completed and submitted manually. The e-dealing system which was introduced in 2003 has since enabled parties to submit transfers, mortgages and discharges of mortgages electronically in a shared workspace between the buyer and seller or their representatives (Christensen, 2004). The transaction must be certified and digitally signed by an authorised conveyancer for each party. Once the transaction passes certain business rules, it is registered automatically and the corresponding title is updated with the new ownership details immediately (Muir, 2012). This system is partly modelled on the 'e-Registration system' operating in Ontario, Canada. However it appears that both the Canadian and the proposed Australian system are limited to the electronic submission of documents. Manual intervention of staff in the Land Registry in examining and processing the electronic document is still necessary (Low, 2010). Paper certificates are no longer used in New Zealand, British Columbia and Ontario (Low, 2010).

The United Kingdom (UK) has made great progress toward the implementation of an electronic conveyancing system. Legislation was amended in 2002 in terms of which the register only will confer title to land on an individual (Mostert, 2011). Many publications and stakeholder involvement had taken place in the planning phase of their electronic conveyancing system. For example, the e-conveyancing process in England was implemented in 2006. It addressed the problems with paper-based registration. The system makes it possible to monitor the efficiency of the various persons involved in property transfers. It enables the electronic settlement of accounts (Mostert, 2011:42). An e-signature is valid only for the lifetime of a specific conveyancing transaction (Sandberg, 2010:106). The full implementation of an electronic registration system in the United Kingdom is yet to be finalised due to identification issues that have not yet been resolved (Sandberg, 2010:106).

An Australian e-conveyancing system was launched by the Department of Sustainability and Environment of Victoria, Australia in 2006 (eGovernment Resource Centre, 2006). It was initially used by a few smaller financial institutions. A more modern version that was launched in 2008 created potential for the system to be used by more entities. Each user must meet specified access requirements and must protect their security items, i.e. Public Key Identity (PKI), Certificates, pins and passwords (Ostrzenski, 2012). The conveyancing system has been ignored by conveyancers who fear additional liability exposure and the big banks who refuse to work with eight different systems as each state need to adhere to their own statutory system, processes and regulation. The banks prefer a single national electronic conveyancing system that will enable consumers across the country to use the same electronic system to settle all property transactions (Merritt, 2009). Differences and inconsistencies of the registered land statutes between the eight

different schemes of the various states are being removed (Park, 2009). The National e-Conveyancing Development Limited (NECDL) is currently designing a national electronic conveyancing system, using the Victorian system or substantial parts of it to form the basis of a single national system (Clark, 2011). This suggests that a shift is occurring in traditional development strategies moving away from a top-down approach towards more bottom-up approaches characterised by a decentralised style of policy making that also stimulates interaction between private and public bodies (Hermans, Haarmann, & Dagevos, 2011). The need to stimulate sustainable development globally is also increasing.

The current electronic system for conveyancing in Barbados was designed by an attorney of law who does not seem to practise conveyancing. The vendor has been unsuccessful in convincing most law firms to start making use of the system (Savatri, 2012). It seems as if this attorney is viewed as a rival and the conveyancers may have doubts as to the efficacy of the system and the lawyer's capability and conveyancing experience to have put together a system that could be useful for conveyancing (Savatri, 2012). Born-residents who wish to acquire property in Barbados must obtain permission from the Exchange Control Authority (ECA) of the Central Bank of Barbados. One requirement is that the entire purchase price be brought into Barbados and registered with the ECA. Failure to do this may result in proceeds of the sale of the property in future not being able to be remitted out of Barbados (Hathiramani, 2011).

In The Netherlands a purchase agreement that applies to real estate may be governed by either Dutch law or foreign law. No distinction is made between Dutch and foreign investors where entitlement to immovable property is concerned. No additional restrictions apply to foreigners that do not apply to Dutch participants (Wessels, Tinnemans & van Drunen, 2012).

# 3. The Security of Title

Under the common law system in Barbados, a title must be traced back to previous owners which have to be at least 20 years old. This system is linked to recording of title deeds, but the cumbersomeness of searching for legitimate previous titles have resulted in the adoption of a second registration system of title. Under the registration system in Barbados, no title deed is issued, only a certificate of title. The certificate of title contains all the relevant information regarding the title, but this title is guaranteed by Government. This title certificate is registered in a central register at the Land Registry and is issued as a paper-based document (Savatri, 2012).

Any alteration in a document may leave a physical mark which may be picked up by the officer manually checking lodged documents in a paper-based system. However, the effectiveness of this safeguard is dependent on the vigilance of the examining officer (Low, 2010). An electronic system's method of controlling access may be divided into two parts namely, the identification process (a claim of identity) and the authentication process (to validate the person's identity). There are various authentication techniques including, a token-based authentication e.g. a smartcard, knowledge-based authentication for example a password or pin and biometrics such as fingerprints, facial image or a retinal scan (Low, 2010). Land-online uses a multi-layered authentication security system (i.e. a combination of authentication methods) that incorporates a unique electronic identification digital certificate, password and passphrase to enhance the security (Matheson, 2012). According to Low (2010), the technology used to digitally sign a document is a public key cryptography administered via a public key infrastructure (PKI). A digital signature is not witnessed. All potential users need to go through a registration process to gain access and each user's identity must be independently verified. This restricted access should reduce opportunities for fraudulent interventions by outsiders, although identity fraud may still be a problem (Low, 2010).

Israel has been using an electronic system for more than ten years, but the process itself has remained very manual. Paper-based documents and deeds are delivered to the Registry for registration (Sandberg, 2010). A draft bill was passed in October 2008 whereby a biometric data bank was to be established that would contain fingerprints and facial features of all Israeli citizens and residents. The Israeli biometric database ensures that people stay uniquely identified as per the biometric information, thus limiting the risks of both identity theft and adverse identification (The Israeli biometric database bill). Israel is proactively looking at ways in which to improve the authenticity of an electronic conveyancing process. Although the process has been in place for more than ten years, it remains a paper based process (Sandberg, 2010).

In South Africa, a pilot study was conducted in 2011 whereby the South African Home Affairs Department electronically verified the fingerprints of applicants at selected banks. Where fingerprints could not be verified, an automatic message was sent to South African Banking Risk Identifier (SABRIC) to investigate possible fraud. The pilot was very successful but a large-scale implementation of the project is not possible due to capacity constraints identified by the Department of Home Affairs (SouthAfrica.Info, 2011). A successful implementation of the project could assist to combat identity fraud in South Africa. Introducing private companies like MTN and Vodacom into the process could assist

with residential address verification. The address verification could digitise the current Financial Intelligence Centre Act 38 of 2001 (FICA) a legislative requirement in South Africa. The FICA Act is aimed at limiting money laundering and other organised crime related activities in South Africa. In terms of this Act stringent requirements must be adhered to which include identifying all customers, verifying all information gathered in the identification process and keeping records of all this information and documentation.

The most prevalent types of fraud involved with land transfers are forgery of the victim's signature, identity fraud and misleading the victim into signing relevant documentation (Low, 2010). Technological advances have provided criminals with new ways to commit crimes. The most common way of committing fraud is by using the victim's identity documents and then forging their signature (Low, 2005). Restricted access improves security as fraudsters would need to gain access to the system before they are able to commit such a fraud. In this Wilson (2008) believes that "Digital signatures create long-lived, tamper-resistant evidence of 'who did what to whom' which is also critical to electronic transactions carrying high legal risks or compliance requirements". Authority information which includes credentials, affiliations and licences can be sealed into their digital certificate at the time of issue. Digital signatures can incorporate authority information directly to messages sent between parties (Low, 2010). A barcode label is an authentication token (Wilson, 2008). A barcode can be used to track the progress of the application at various stages in the process. The barcode also has specific information that is linked to the unique barcode. This will assist with identification of the documents as the pack of documents progress through the process without having to retype basic information that has been programmed along with the unique barcode. In South Africa the Deeds Office Tracking System (DOTS) in the Deeds Office works on the barcode premise to update relevant stakeholders with regard to the progress of applications lodged in the Deeds Office for registration. Public and private keys can be used together with a private identifier such as a password or pin to encrypt the data that is exchanged between the authenticated parties concerned. Encrypted data will invalidate the digital signature if any alterations were made after the digital signature was applied to it. Biometric identification may be used to further improve security (Xiao, Wilkinson & Anderson, 2012).

# 4. Some Benefits of E-Conveyancing for South African Conveyancing

The introduction of an electronic registration system should enhance the service delivery to customers as the total time from completing the offer to purchase to registration can be reduced. As a result, there is potential for faster registrations. Due to the electronic storing capabilities of an electronic conveyancing system (Obeid, Gerken, Madathil, Rugg, Alstad, Fryar, ... & Sanderson, 2013), as well as the ability to send documents and images via an electronic system, the use of paper may be reduced or even eliminated. Banks and conveyancers could reduce the costs associated with the storage of paper documents, as paper documents are currently necessary in court where legal disputes may arise (Interviews with banks, 2013). In addition to the manpower needed in the storage facilities, there are also costs involved to make and keep the storage facilities fire proof. Additional payments for misplaced and lost title deeds within their storage facilities are additional costs. This may happen where the deeds and other security documents are misfiled, or where the conveyancer did not forward the original title deed to the bank for storage. When the owner of the property cancels the bond with the bank after paying off the property, or where the owner requests a further loan, the bank needs to apply to the Deeds Office for a copy of the deed to be issued to the bank (Interviews conducted with banks, 2013). As it is this process takes time and the banks also need to pay for the copies. The forecasted savings could be used to invest in acquiring an electronic system to manage this process.

In the existing system poor quality documents that are lodged congest the South African Deeds Office examination process as records are rejected and resubmitted afterwards (Interviews with banks, 2013). The South African Deeds office is likely to improve the quality of applications with the introduction of an electronic system. The introduction of an electronic system (less finger errors) could lead to a reduction in the number of rejections at the Deeds Offices. The rejection of deeds at the Deeds Office due to errors, delays the registration and transfer of the property. Therefore the electronic system could result in banks earning more revenues due to earlier registrations.

E-conveyancing would enhance searching options of public documents such as title deeds and ante nuptial contracts, and the availability of information to the general public. It would produce better tools for the registration process (Whitman, 1999:234). The system may reduce fraud by sending alerts to parties where information has been changed or where any other form of tampering with the system has occurred. Electronic communication will make the entire process more transparent as all parties that are linked to the transaction will have full sight of the progress of the application.

An e-conveyancing system may enable electronic payments of taxes and other payments related to the property transfer. Electronic notifications will inform relevant parties of payments made or received. In addition, the buyer and seller payments may be exchanged electronically. This process has been successfully implemented with the trading of

shares in South Africa. The mechanisms and electronic systems are therefore already implemented by prominent and reputable organisations like Bankserv and Strate.

Online real time access to Land Registry records eliminates time spent searching for results (Landonline, 2014). Online documents reduce the time of deciphering written documents on old and faded paper. The quality of information available online is of a higher quality and more information may even be available on a standardised format. Secure back-up systems ensure safety of information which significantly reduces risk to the title register.

#### 5. Conclusion

Digitised information seems to be the focus area of many countries and individual business entities with conveyancing seemingly lagging behind in this regard. It is evident that many different approaches have been followed by different countries (Wakker, van der Molen & Lemmen, 2003; Park, 2009; Low, 2010; Mostert, 2011:42; Muir, 2012). While many countries like New Zealand and Ontario have done away with title certificates, manual interventions to examine and process lodged documents still seem to be prevalent (Muir, 2012; Low, 2010). Stakeholder buy-in is important for the successful implementation of the e-conveyancing strategies. In Australia the electronic system was not widely used as the system did not address pertinent issues of key stakeholders, while in Barbados the issue seems to be more of stakeholder perception due to rivalry. The UK embarked on major stakeholder involvement and publications during their planning phase of their electronic conveyancing system and this resulted in successful implementation of their strategy (Mostert, 2011). The Netherlands has an electronic system which caters for an electronic submission of the bond documentation by a notary (Lentze, 2013). Israel seems to be taking the direction of digitisation as an e-conveyancing strategy by incorporating biometric data in order to verify a party's identity (Sandberg, 2010). Most of these electronic conveyancing systems still rely on much manual intervention. A paper title certificate document is still retained in addition to the electronic interfaces that have been put into place.

South Africa can learn significantly by investigating global implementation strategies of electronic systems. During a discussion in Parliament regarding the Deeds Registries Amendment Bill on 28 March 2003, it was already envisaged that an Electronic Deeds Registry System should be put into place (Parliamentary Monitoring Group). In 2014 discussions are still underway for the Bill that was passed in November 2013 to be finalised (Sabinet, 2013). In addition to the digitisation of deeds documents, it is advisable for the South African Deeds Registry to investigate an electronic system that will allow for the electronic lodgement of a property transfer during its first phase. It is recommended that this system should exist independently of the current role players operating in the South African end-to-end conveyancing process, to enable support from all stakeholders and also to avoid the forming of monopolies in the conveyancing value chain. The relevant statutes that need to cater for electronic communication and digital signatures should be amended in order to overcome the barriers that would delay the introduction of an e-conveyancing system in South Africa. It is recommended that the automatic electronic registrations of property transfers should be implemented with corresponding automatic and electronic payments to all relevant parties to the transaction.

Except for one publication based on a study of the Deeds Office in Kwazulu Natal (Shange, 2010), there is a lack of recently published academic literature on the South African conveyancing processes and systems. It is recommended that further formal study should be conducted into the South African conveyancing as a whole and the introduced framework on the South African conveyancing processes can be empirically tested. E-conveyancing holds tremendous value for property to be accessed, even though different countries have their own conveyancing processes and systems.

### References

Christensen, S. (2004). Electronic land dealings in Canada, New Zealand and the United Kingdom: Lessons for Australia). Murdoch University Electronic Hournal of Law. ISSN 1321-8247.

Clark, E. (2011). E-conveyancing in Australia: An important step along the journey to E-government [online]. Journal of Law, Information and Science, Vol 21, No 1, 2011:[62]-88. Availability: http://search.informit.com.au/document Summary;dn=051397976935126 ;res=IELHSS. ISSN: 0729-1485. [cited 26 May 12].

Davenport, T. H. (2013). Process innovation: reengineering work through information technology. Harvard Business Press.

eGovernment Resource Centre. (2006). Electronic Conveyancing to Save \$100 Million. Accessed 30 May 2012 from http://www.egov.vic.gov.au/victorian-government-resources/government-initiatives-victoria/property-and-planning-victoria/real-estate-and-property-victoria/electronic-conveyancing-to-save-100-million.html.

Hathiramani, V. (2011). Extrapolated from one-on-one /telephone interview between author and Hathiramani, V on 14 December 2011/17h00,Randburg.

Hermans, F. L., Haarmann, W. M., & Dagevos, J. F. (2011). Evaluation of stakeholder participation in monitoring regional sustainable

- development. Regional Environmental Change, 11(4), 805-815.
- Interviews. 2013. Interviews conducted with major banks in South Africa.
- Landonline. (2014). Accessed from http://www.landonline.govt.nz/about-landonline/benefits-services on 19 March 2014.
- Lentze, M.J.J.R. (2013). Personal interview with notary firm Ellens & Lentze in The Netherlands. July 2013.
- Low, R. (2010). From Paper to Electronic: Exploring the Fraud Risks Stemming From the Use of Technology to Automate the Australian Torrens System. Bond Law Review, 21(2), 7.
- Matheson, K. (2012). Electronic conveyancing in New Zealand. Ezine Articles.com accessed online on 05/06/2012 from http://ezinearticles.com/?Electronic-Conveyancing-in-New-Zealand&id=3276800.
- Merritt, C. (2009). The Australian. Available from http://www.theaustralian.com.au/business/legal-affairs/state-secretly-pushes-on-with-ecv-bid/story-e6frg97x-1111117649310 (Accessed 25/5/2012).
- Mostert, H. Tenure security reform and electronic registration: exploring insights from English law. PER [online]. 2011, vol.14, n.3 [cited 2012-06-01], pp. 85-117. Available from: <a href="http://www.scielo.org.za/scielo.php?script=sci\_arttext&pid=S1727-378120110003">http://www.scielo.org.za/scielo.php?script=sci\_arttext&pid=S1727-378120110003</a> 00007&Ing=en&nrm=iso>. ISSN 1727-3781.
- Muir, R. (2007). E-conveyancing in New Zealand: Progress to Date and Future Developments.
- Obeid, J. S., Gerken, K., Madathil, K. C., Rugg, D., Alstad, C. E., Fryar, K., ... & Sanderson, I. C. (2013). Development of an Electronic Research Permissions Management System to Enhance Informed Consents and Capture Research Authorizations Data. AMIA Summits on Translational Science Proceedings, 2013, 189.
- Ostrzenski, V. (2012). Reconfiguring Perception and Procedure: An Exploration of the E-Commerce Record. Accessed 26 May 2012 from http://www.victoriaostrzenski.com/wp-content/uploads/2012/10/OstrzenskiTheECommerceRecord.pdf.
- Park, M., (2009). Removing the disharmony from Victoria's Land Title Registration System. Land Surveying Commission Seminar, Bulleen, 21 May 2009. Available at http://ssrn.com/abstract=1537710.
- Parliamentary Monitoring Group. (2003). Deeds Registries Amendment Bill: briefing & finalisation. Accessed on 30 May 2012 from http://www.pmg.org.za/minutes/20030327-deeds-registries-amendment-bill-briefing-finalisation.
- Rajashekhar, P.V., (2006). E-Conceyancing: Challenges and Ambitions. International Conference on Enhancing Land Registration and Cadastre for Economic Growth in India. 31 January 1 February 2006. New Delhi.
- Sabinet. (2013). Accessed from http://www.sabinetlaw.co.za/land-reform/articles/deeds-registries-bill-passed on 19 March 2014.
- Sandberg, H. (2010). Real estate e-conveyancing: vision and risks. Information & Communications Technology Law, 19(2), 101-114.
- Savitri, St J. (Savitri@clarkes.com.bb). (13 December 2011). RE: Study on real estate in Barbados. Email to Pillay. A (pillaap@unisa.ac.za).
- Savitri, St J. (Savitri@clarkes.com.bb). (5 May 2012). RE: Study on real estate in Barbados. Email to Pillay. A (pillaap@unisa.ac.za).
- Shange, M. B. (2010). A system-based approach to land registration analysis and improvements: A case study of the KwaZulu-Natal deeds registration system. University of KwaZulu Natal.
- SouthAfrica.info. (2011). SA banks begin fingerprint verification. Accessed from http://www.southafrica.info/services/consumer/bankprint-081111.htm on 20 March 2014.
- The Israeli "biometric database bill" English summary (n.d.). Available from: http://no2bio.org/home/english.html (Accessed 30 May 2012).
- Wakker, W., van der Molen, P. & Lemmen, C. (2003). Land registration and cadastre in the Netherlands, and the role of cadastral boundaries: The application of GPS technology in the survey of cadastral boundaries. Availability: http://www.lsgi.polyu.edu.hk/staff/zl.li/Vol\_5\_1/02-Holland.pdf
- Wessels, A., Tinnemans, M. & van Drunen, M. (2012). Introduction to the legal framework. Netherlands: The Real Estate Law Review Netherlands.
- Wilson, S. (2008). Public Key Superstructure. 7th Symposium on Identity and Trust on the Internet. Lockstep Consulting Pty Ltd.
- Xiao, Q., Wilkinson, D., & Anderson, M. (2012). Using biometrics and active RFID to improve security and safety in mass casualty management. *International Journal of Information Technology and Management*, 11(1), 2-17.
- Zamith Brito, E. P., & Mariotto, G. (2013). Benefits of Cooperation between Buyers and Providers: a study in the field of information and communications technology. Revista Brasileira de Gestão de Negócios, 15(47).