# Editorial

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**Biographical notes:** Hakim Bendjenna is an Assistant Professor in the Department of Computer Science at Tebessa University, Algeria. He received his PhD in Computer Science from Mentouri University, Algeria and Toulouse University, France. His research interests lie in the general field of software engineering and decision support with special focuses on requirement engineering. He has taught primarily introductory programming courses and courses in software engineering for over ten years. He also frequently serves as a program committee member for various international conferences and workshops.

Lawrence Chung has been working in requirements engineering and system/software architecture. He was the principal co-author of the research monograph 'Non-functional requirements in software engineering', and has been involved in developing 'RE-Tools' with Dr. Sam Supakkul (a multi-notational requirements modelling project), 'HOPE' with Dr. Rutvij Mehta (a smartphone app project for people with difficulties), and 'Silverlining' with Dr. Tom Hill (a cloud computing and big data project). He has been a Keynote Speaker, Invited Lecturer, co-Editor-in-Chief for *Journal of Innovative Software*, editorial board member for *Requirements Engineering Journal*, Editor for *ETRI Journal*, and Program co-Chair for various international events. He is currently on the Faculty of Computer Science at University of Texas at Dallas. He received his PhD in Computer Science in 1993 from University of Toronto.

We are pleased to introduce this special issue of the *International Journal of Information and Communication Technology* (*IJICT*). As the field of information technology (IT) continues to grow and expand, it impacts more and more organisations worldwide. The relationship between IT and organisation development is a central concern in the field of information systems (IS). Moreover, the alignment between business processes and IT is a major issue in most organisations, as it directly has an impact on the organisation's effectiveness, agility and flexibility. We can observe that, due to the advancement of IT,

the manner whereby organisations work has been completely changed and more work gets done within the stipulated time without any distorting the environment. The problems can easily be diagnosed and solved fast and also give help in preventing the same in future. With the emergence of new IT techniques, organisational problems can be solved more easily and faster. This, in turn, would imply that business strategies should be developed with IT in mind, hence, necessitating much more attention needs to be paid to IT strategy development than it has been paid in the past.

For more than 50 years, more precisely since electronic data processing became an essential tool in the business world, IT strategies has been investigated by IS researchers (Freedman, 2003; Hu and Quan, 2005; Lin, 2009; Oh and Pinsonneault, 2007). Since the mid-1990s, studies attempting to assess the impact of IT on organisation development have intensified. Most of them have sought to assess the impact of IT on organisational processes, financial performance, productivity and workers (Bharadwaj, 2000; Brynjolfsson and Hitt, 1996; Gregor et al., 2006; Loveman, 1994; Melville et al., 2004; Scheepers and Scheepers, 2008; Tallon et al., 2001).

The role of IT has also been found to differ among firms of different economic sectors, having distinct intensities of IT use (Mittal and Nault, 2009). According to Hu and Quan (2005), industries with intensive use of information, such as banking, financial and insurance services, would benefit more from IT investments than those industries with low information intensity, such as energy, mining and construction. For some industries, information is the main product moving through the primary value chain and the use of IT can result in significant improvements in operational efficiency. The pioneer work of McKenney and McFarlan (1982) studied IT intensive user firms, focusing on what they called informational islands that exist throughout the different areas in a single organisation. One decade later, Glazer (1991) established that measuring the intensity of an organisation's use of information should be taken according to the degree to which its products and operations are based on the information gathered and processed.

In general, as indicated in some other literature (Dewett and Jones, 2001; Gupta and Sanjay, 2004), IT is understood to offer substantial information efficiencies and synergies to an organisation. It enables the employees to search for and absorb new knowledge that is relevant to a problem at hand. They also suggested many useful properties of IT that can affect organisational efficiency. IT facilitates efficient communication – the ability to communicate more easily and less expensively across time and geographic location. It also improves the decision-making efficiency, including the ability to store and retrieve large amounts of information more quickly and inexpensively. Moreover, it enhances the motivational effects of cultural values that are supportive of efficiency or innovation (Trice and Bayer, 1993).

In this special issue, our aim is to publish papers that deploy concepts to introduce and analyse the adoption or diffusion of IT in organisation. The issue includes nine articles, dealing with various forms of information whose image, voice and text providing a nice mix of contributions. It contains the extended and revised versions of some carefully selected papers that were presented at IT4OD conference, which took place in Tebessa, Algeria, during October 19–20, 2014. Papers were selected on the basis of fundamental ideas/concepts rather than the thoroughness of techniques deployed.

The purpose of the paper by M. Amroune et al. is to propose a novel multi-criteria decision analysis process to prioritise requirements. The novelty is three-fold. Firstly, to prioritise requirements, they distinguished two categories of requirements according to their level of abstraction: low-level requirements and high-level requirements. Then, they

relate business goals of the high-level requirements to the requirements of low-level which contribute to their fulfilment. This will improve the completeness and traceability of requirements. Secondly, requirements prioritisation is based on their degree of contribution to the identified business goals and their importance. So, business goals become the evaluation criteria. Finally, this process takes into account relationships and dependencies that may exist between business goals.

D. Rattan et al. have conducted an empirical study on 18 MATLAB/Simulink models using ConQAT, an open source clone detection framework. Their study shows that there is a significant cloning in models with some interesting patterns of clones, which can play a significant role in improving maintenance.

The paper by M. Abbas et al. proposes a formal transformation of UML state machines conditioned with OCL constraints into FoCaLiZe specifications that can be refined to generate executable code. The proposed transformation supports communication between a class structure and its state machine.

H. Rahali et al. provide a method for enhancing speech corrupted by noise. The new speech enhancement approach combines RASTA, Wiener (WF) and the Gammachirp filter (GF) in series connection to construct a two-stage hybrid system (named RASTA-WF-GF) in frequency domain to enhance the speech with additive noise. Based on the analysis of the literature; it then constructively suggests remaining research challenges and provides some directions for future research.

The paper by N. Suresh Kumar et al. presents a new approach for remote sensing image retrieval schemes by utilising content base image retrieval with grid computing and advanced database concept – this approach is intended for speeding up both input processing and system response times. This paper presents the idea of parallel processing of input data, queries, and storing images in the database using advanced database concept like B+ or BST trees.

M.D. Ansari and S.P. Ghrera propose a novel intuitionist fuzzy feature extraction method to encode local texture. The proposed method extends the fuzzy local binary pattern approach by incorporating intuitionistic fuzzy set theory in the representation of local patterns of texture in images. The proposed intuitionistic fuzzy local binary pattern approach was experimentally evaluated for Lena image of the size 256*256. The results validate the effectiveness of the proposed intuitionistic fuzzy local binary pattern over the local binary pattern and fuzzy local binary pattern feature extraction methods.

In the paper of A. Beloucif and L. Noui, a novel lossless encryption scheme for digital images based on a combination of matrix transformations and XOR operation is presented. The numerical experimental results confirm that the proposed method achieves a high security level against brute force attacks, statistical attacks and sensitivity analysis, moreover, the suggested algorithm provides good randomness properties.

T. Mekhaznia and A. Zidani provide in the last paper, and for a first time, a detailed study about the performance of two swarm intelligence algorithms, BAT algorithm and wolf pack search (WPS) algorithm for cryptanalysis of some variant of Feistel ciphers. Experiments were accomplished in order to study the effectiveness of such algorithms in solving the considered problem. Moreover, a comparison of VMMAS, PSO and DE algorithms establishes this advantage.

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## References

Bharadwaj, A. (2000) 'A resource-based perspective on information technology capability and firm performance: an empirical investigation', *MIS Quarterly*, Vol. 24, No. 1, pp.169–196, DOI: 10.2307/3250983.

Brynjolfsson, E. and Hitt, L. (1996) 'Productivity, business profitability, and consumer surplus: three different measures of information technology value', *MIS Quarterly*, Vol. 20, No. 2, pp.121–142, DOI: 10.2307/249475.

Dewett, T. and Jones, G.R. (2001) 'The role of it in the organization: a review, model, and assessment', *Journal of Management*, Vol. 27, No. 3, pp.313–345.

Freedman, R. (2003) 'Helping clients value IT investments', *Consulting to Management*, Vol. 14, No. 3, pp.33–39.

Glazer, R. (1991) 'Marketing in an information intensive environment: strategic implications of knowledge as an asset', *Journal of Marketing*, Vol. 55, No. 4, pp.1–19.

Gregor, S., Martin, M., Fernandez, W., Stern, S. and Vitale, M. (2006) 'The transformational dimension in the realization of business value from information technology', *The Journal of Strategic Information Systems*, Vol. 15, No. 3, pp.249–270, DOI: 10.1016/j.jsis.2006.04.001.

Gupta, M.P. and Sanjay, K. (2004) 'Information technology usage: the Indian experience', *Vikalpa*, Vol. 29, No. 1, pp.83–91.

Hu, Q. and Quan, J.J. (2005) 'Evaluating the impact of IT investments on productivity: a causal analysis at industry level', *International Journal of Information Management*, Vol. 25, No. 1, pp.39–53, DOI: 10.1016/j.ijinfomgt.2004.10.006.

Lin, W.T. (2009) 'The business value of information technology as measured by technical efficiency: evidence from country-level data', *Decision Support Systems*, Vol. 46, No. 4, pp.865–874, DOI: 10.1016/j.dss.2008.11.017.

Loveman, G. (1994) 'An Assessment of the productivity impact of information technologies', in Allen, T.J. and Morton, M.S.S. (Eds.): *Information Technology and The Corporation of the 1990s: Research Studies*, pp.84–110, Oxford University Press, Cambridge.

McKenney, J. and McFarlan, F.W. (1982) 'The information archipelago – maps and bridges', *Harvard Business Review*, Vol. 60, No. 5, pp.109–119.

Melville, N., Kraemer, K. and Gurbaxani, V. (2004) 'Review: information technology and organizational performance: an integrative model of IT business value', *MIS Quarterly*, Vol. 28, No. 2, pp.283–322.

Mittal, N. and Nault, B.R. (2009) 'Investments in information technology: indirect effects and information technology intensity', *Information Systems Research*, Vol. 20, No. 1, pp.140–154, DOI: 10.1287/isre.1080.0186.

Oh, W. and Pinsonneault, A. (2007) 'On the assessment of the strategic value of information technologies: conceptual and analytical approaches', *MIS Quarterly*, Vol. 31, No. 2, pp.239–265.

Scheepers, H. and Scheepers, R. (2008) 'A process-focused decision framework for analyzing the business value potential of IT investments', *Information Systems Frontiers*, Vol. 10, No. 3, pp.321–330, DOI: 10.1007/s10796-008-9076-5.

Tallon, P.P., Kraemer, K.L. and Gurbaxani, V. (2001) *Executives' Perceptions of the Business Value of Information Technology: A Process-Oriented Approach*, Working Paper No. #ITR-148, University of California, Irvine, CA, USA.

Trice, H. and Bayer, J. (1993) *The Cultures of Work Organizations*, Prentice-Hall, E-Cliff, NJ.