

Proposing a Next Generation of Knowledge Management Systems for Creative Collaborations in Support of Individuals and Institutions

Featuring a Novel Approach for Meme-based Personal Knowledge Management

Ulrich Schmitt

Business School, University of Stellenbosch, PO Box 610, Bellville 7535, South Africa

Keywords: Personal Knowledge Management, Organizational KM, Knowledge Worker, Memes, Knowcations.

Abstract: Just like the personal computer revolution, it is possible that Knowledge Management (KM) will in the 21st century experience a decentralizing revolution that gives more power and autonomy to individuals and self-organized groups. Seven decades after Vannevar Bush's still unfulfilled vision of the Memex. Levy's scenario stresses the dire need to provide overdue support tools for knowledge workers in our Knowledge Societies, not at the expense of Organizational KM Systems, but rather as the means to foster a fruitful co-evolution. With a prototype system addressing these issues about to be converted into a viable Personal KM system (PKMS), the author follows up on recent publications and considers the impact and potential of a novel meme-based approach aiming to aid individuals throughout their academic and professional life and as contributors and beneficiaries of organizational performance and in light of the anticipated next generation of KM systems.

1 A NEXT GENERATION OF KM

The first generation of Knowledge Management (KM) has been described as the capturing, storing, and reusing of existing knowledge including “systems of managing knowledge like company yellow pages, experts outlining processes they are involved in, creating learning communities where employees/customers share their knowledge, creating information systems for documenting and storing knowledge, and so on. These first-generation KM initiatives were about viewing knowledge as the foremost strategic asset, measuring it, capturing it, storing it, and protecting it. They were about treating knowledge as an asset, recognizing how it influences strategy, and wanting to make the most of it by managing it properly” (Pasher and Ronen, 2011).

The second KM generation needs to focus on creating new knowledge and innovation, a process which starts with the “reuse or new use of existing knowledge, adding an invention, and then creating a new product or service that exploits this invention.” This process requires creativity and the awareness that old knowledge becomes obsolete. For reaping the appropriate rewards, it is essential to systematically exploit the knowledge captured and

created (Pasher and Ronen, 2011).

In reviewing a wider range of features for the ‘Next KM Generation’ (suggested by Sveiby, Wiig, Snowdon, McElroy, Ponzi, Miles, St Onge, Allee), the identified seven key themes prioritize confirm this need, but also strongly emphasize the personal and social nature of knowledge (Grant, 2008).

1.1 The Personal KM Agenda

Despite these accentuations and in contrast to Organizational KM (OKM), Personal KM (PKM) has been placed historically in a narrow individualistic confinement (Cheong and Tsui, 2011b).

In limiting its scope, PKM has been labelled as sophisticated career and life management with a core focus on personal enquiry (Pauleen and Gorman, 2011) or as a means to improve some skills or capabilities of individuals (Davenport, 2011), negating its importance relating to group member performance, business processes, or new technologies.

This state surprises in light of prominent past suggestions to develop a ‘Memex’ for making one’s “intellectual excursions more enjoyable” (Bush,

1945), to offer assistance in allocating one's "attention efficiently among the [emerging] overabundance of information sources" (Simon, 1971), or to provide adequate organizational leadership for building, connecting, and energizing dynamic knowledge-creating environments and their expansion (Nonaka, 2000). As a result, PKM remains "a real and pressing problem", and Bush's dream of a 'Memex' has yet to be fully realized on a wide scale (Davies 2011).

Appropriately, Wiig argues for shifting the focus of KM toward strengthening the ability of people for enabling them to act in the best interest of their enterprise and its desired strategies and performance (Wiig 2004). In this context, PKM needs - more appropriately - to be regarded as a bottom-up approach to KM (Pollard, 2008), as opposed to the more traditional, top-down Organizational KM. As such, PKM also "goes beyond Personal Information Management" (PIM) which focusses predominantly on information processing without the emphasis on creating new knowledge (Cheong and Tsui, 2011a).

But, although there are many PKM tools available, "they are not integrated with each other", and the "currently available PKM systems can provide only a partial support to knowledge workers" (Osis, 2011). "While today we have many powerful applications for locating vast amounts of digital information, we lack effective tools for selecting, structuring, personalizing, and making sense of the digital resources available to us" (Kahle, 2009).

Meanwhile, the organizational, commercial, social and legal innovations driven by technological progress and economic pressures continue to have profound impacts. Work has suffered from a process of fragmentation which will continue to accelerate. Its implications include one's slipping control over constant interruptions, the loss of time for real concentration, and less learning by observation and reflection (Gratton, 2011). With specializations and domain-specific knowledge on the rise, peoples' identification has shifted from their company to their profession, and vertical hierarchies and traditional career ladders have been replaced by sideways career moves between companies and a horizontal labour market (Florida, 2012). The 'Future of Employment' study estimates 47% of the current US employment to be still at risk due to recent technological breakthroughs able to turn previously non-routine tasks into well-defined problems susceptible to computerization (Frey and Osborne, 2013).

What is overdue is - in the opinion of the author -

an innovative PKM technology to provide the means for life-long-learning, resourcefulness, creative authorship and teamwork throughout an individual's academic and professional life and for his/her role as contributor and beneficiary of organizational and societal performance. It needs to support the notion that knowledge and skills of knowledge workers are portable and mobile and with it their options on where, how, and for whom they will put their knowledge to work.

1.2 Intents and Barriers to Overcome

In Wiig's opinion (2011), individuals need to be highly knowledgeable not only to function competently as part of the workforce, but also in their daily lives and as public citizens: "In a society with broad personal competences, decision-making everywhere will maximize personal goals, provide effective public agencies and governance, make commerce and industry competitive, and ensure that personal and family decisions and actions will improve societal functions and Quality of Life." But, "for better performance, people must [also] be provided with resources and opportunities to do their best. They need knowledge and understanding as well as motivation and supportive attitudes."

Such resources may well be autonomous PKM capacities, networked in continuous feedback loops, where individuals are able to determine how their expertise will be used or exchanged with people, communities, or organizations close to them. Levy (2011) expects such systems - nourished by the creative conversation of the many networked PKM devices - to assume an elementary role that enables the emergence of the distributed processes of collective intelligence, which in turn feed them.

Accordingly, he sketches a scenario which stresses the vital role of future education "to encourage in students the sustainable growth of autonomous capacities in PKM" and which envisages KM to experience "a decentralizing revolution that gives more power and autonomy to individuals and self-organized groups" (Levy, 2011).

Although the author concurs that PKM Systems (PKMS) are destined to become potent drivers of human development (Schmitt, 2014b), an enabling technological environment benefitting such a novel solution is presently facing severe barriers wasting individuals' time and efforts (Schmitt, 2014f). The remedies have been summed up into five provisions: 1. Digital personal and personalized knowledge is always in the possession and at the personal disposal of its owner or eligible co-worker, residing in

- personal hardware or personalized cloud-databases.
2. Contents are kept in a standardized, consistent, transparent, flexible, and secure format for easy retrieval, expansion, sharing, pooling, re-use and authoring, or migration.
 3. Information and functionalities can continually be used without disruption independent of changing one's social, educational, professional, or technological environment.
 4. Collaboration capabilities have to be mutually beneficial to facilitate consolidated team and enterprise actions that convert individual into organizational performances.
 5. The PKM system designs and complex operations are based on a concept, functionalities, and interventions which are clearly understood and are painlessly applied in practice.

“These provisions are aiming to strengthen individual sovereignty by employing grass roots, bottoms-up, lightweight, affordable, personal applications rather than today's top-down, heavyweight, prohibitive, institutional approaches and centralized developments - not at the expense of Organizational KM Systems, but rather as the means to foster a fruitful co-evolution” (Schmitt, 2014f).

2 A PKM PROTOTYPE SYSTEM

To facilitate such a co-evolution, a number of recent papers have explored the related issues. The first paper identifies challenges for individuals managing their knowledge at the acquisition, preservation, collaborative, capacity development, and conceptual level and looks at approaches to address them (Schmitt, 2012). Subsequently, these challenges were attended to in more detail. Two papers introduce an extension of the ignorance matrix and discuss the role of PKM systems in making citizens highly knowledgeable (Schmitt, 2013e 2014c). Four papers look at the workplace and careers of knowledge workers in the business, educational, and developmental context (Schmitt, 2013f 2014a) and examine PKM's role in Higher Education (Schmitt and Butchart, 2013a 2014g). Two papers demonstrate the close proximity of the PKM concept and functionalities with renowned KM models and established organizational KM practices (Schmitt, 2013c 2013g). A poster and paper integrate the models and practices in the PKMS concept and map the resulting process cycles in a three-dimensional information-space (Schmitt, 2013d 2014e).

Based on the current state of needs and uninspiring solutions, two papers advocate the ‘Five

PKMS Provisions’ discussed by questioning the current logics and logistics of centralized institutional approaches and by suggesting remedies to overcome persisting market barriers (Schmitt, 2013b 2014f). These papers concentrate on the realities encountered and the opportunities for change and were concluded with a paper positioning PKM systems in the context of human development (Schmitt, 2014b).

The papers follow-up on and set the stage for further developing a PKM prototype used personally for career support as a management consultant, scholar, professor, and academic manager. With the development platforms and cloud-based services available now, an innovation opportunity has presented itself for converting and advancing the prototype into a viable PKM system across platforms.

2.1 A Novel Meme-based Approach

As alluded to, a PKMS is supposed to serve its master over a lifetime of educational and professional careers and to allow his/her knowledge to continuously evolve in the process. Thus, a meme-based rather than document-centric design typifies the prototype and also acts on the fifth provision; what one has to refer to and what one needs to store at the same time, is much smaller and more distinct than documents.

Memes are basic building blocks of knowledge (in the eyes of the beholder), originally described by Dawkins (1976) as units of cultural transmission or imitation. To live on, a meme has to be able to survive in the medium it occupies and the medium itself has to survive. Memes can either be encoded in durable vectors (e.g. storage devices, books, great art, major myths, or artefacts) spreading almost unchanged for millennia (Bjarneskans et al., 1999), or they succeed in competing for a host's limited attention span to be memorized (internalization) until they are forgotten, codified (externalization), or spread by the spoken word to other hosts' brains (socialization) with the potential to mutate into new variants. To gain an advantage in competing for attention and survival, it pays to form symbiotic relationships (combination) with other memes (memplexes) to mutually support each other's fitness and to replicate together.

The PKMS explores and exploits its accessible ‘Meme or Knowledge Base’ by supporting a user's cognitive capacity to identify, save, recall, and utilize the meme structures of interest. The tasks consists of reliably storing and retrieving textual,

visual, audio, or video input with their relevant frames of references (e.g. origins, titles, formats, licenses), embedded in a more-dimensional classification system for easy access and as original, pre-edited, and/or already re-combined versions according to users' individual preferences and objectives. Easy accessibility ensures that memes captured are able to further evolve during learning processes and to form the symbiotic relationships alluded to.

By digitally capturing, referencing, and visualizing these basic information units, the system allows the user to recall, sequence and combine stored memes with his/her own new meme creations ('nemes') for integration in any type of authoring and sharing activity he/she would like to pursue. As a result, the user obtains the means to retain and build upon knowledge acquired in order to sustain personal growth and facilitate productive contributions and collaborations between fellow learners and/or professional acquaintances.

A description of the detailed processes and learning cycles has been provided in an earlier paper (Schmitt, 2014e) and visualized in a 3x A0-poster to complement this paper during its presentation (see appendix). A further paper "How this Paper has been created by leveraging a PKM System" (Schmitt 2014d) adds the corresponding hands-on user perspective and reports how the prototype's concept is applied by utilizing the prototype for its creation.

Thus, as enablers of personal development and people empowerment, decentralized autonomous PKMS capacities will give individuals a better chance of navigating today's abundance of information and changing career patterns. However, an even larger potential lies in the creative conversations to be prompted by them, their contribution to the world's knowledge base, and their synergies with organizational KM.

2.2 Conversations and Collaborations

Collaboratively interlinking the knowledge bases available to collectively harvest, employ and grow accumulated knowledge subsets based on shared contents and relationships will improve the productivity of information seekers and suppliers alike. Any newly gathered data, information, and experience can be more easily assimilated due to robust shared PKM frames of individual knowledge. One's attention can be focused on the creative or innovative objectives set and the networking required to sustain continuous feedback loops (supported by cloud computing), instead of dealing

with redundant findings and mundane tasks of recovering, sorting, and referencing. Moreover, the opportunities for PKMSs to enhance learning and knowledge acquisition are extensive, for example:

- Theoretical knowledge and professional practices can be supplied by lecturers and trainers in meme format to add to the stock of students' personal knowledge bases.
- Researching and Sensemaking can be eased and accelerated by authors, publishers, and other external parties who not only add their resources to the world's knowledge base in traditional formats but also complement them with memes and links.
- Group and teamwork can benefit from the creative conversations taking place which can be logged and linked to specific memes' contents under scrutiny or consideration.
- Writing academic project papers, theses, and dissertations or professional reports can benefit from the regular feedback of supervisors, mentors, or superiors who are able to base their progressing recommendations on well documented modifications.
- E-learning course contents can link to meme-based contents hosted either externally or better already disseminated to the attendees' individual PKM devices for stimulating and furthering their learning progress and growing their PKMS repositories.
- For fostering mutually beneficial relationships, Institutions (e.g. Universities, Agencies, NGOs) can provide their alumni, staff and clients with relevant contents compatible with their PKM devices (news, updates, guides, contacts, policies, standards, advice).
- Capacity building in the development context can be enhanced by not only providing beneficiaries with an effective low-cost PKM application (accessibility easiness), but by also facilitating the authorship and contribution of own ideas based on one's background (expressive creativity), alone or in collaborative environments with other users/owners (relational interactivity), and with the opportunity to add productively to the world's records (ecological reciprocity). The terms in brackets refer to Johri's and Pal's (2012) four primary design characteristics for 'ICT for Development (ICT4D)' ventures. A paper currently under review extends these four ICT4D criteria into twelve 'PKM4D' essentials by correlating them to the levels of Maslow's Extended Hierarchy of Needs (Koltko-Rivera, 2006) with the term 'development' and the dozen features firmly geared towards future PKM education.

2.3 Training and Education

Accordingly, all of the author's papers and presentations are currently captured in the form of memes and relationships in the prototype's knowledge bases. To paraphrase Bush: "As an added benefit of the trails captured, the [content provided by the developer] becomes not only his additions to the world's record, but entails for his [customers] the entire scaffolding by which they [have been] erected" (Bush, 1945).

This representation offers not only flexible assistance and help functionalities for the user in the deployment phase but also provides a road map together with - as Bush put it - "an extensive mesh of associative multi-disciplinary trails already built-in of alternative pathways" which can be handily tracked by a learner (Bush, 1945). These structures will conveniently accommodate the establishment and navigation of the PKMS eLearning courses, planned after the completion of the face-to-face course design.

A prior paper has already demonstrated, how the innovative PKMS technology and its application in academia are supportive of Academic Value Chains and the Applied Competence Categories of Qualification Frameworks (Schmitt and Butchart, 2014g).

2.4 Synergies with OKMS

An assuring outcome of the design and development process has been that a considerable number of renowned knowledge management philosophies and methodologies can be neatly integrated in the overall PKM concept proposed, including:

- Eight Building Blocks of KM (Probst 1998, Schmitt 2012),
- Domains of Ignorance Matrix, Extensions, Wastes (Kerwin 1993, Armour 2000, Schmitt 2013e),
- Agent and the World Model (Boisot 2004, Schmitt 2013c),
- Concept of Extelligence (Stewart and Cohen 1999, Schmitt 2013c),
- Sensemaking Model for Intelligence Analysis (Pirolli and Card 2005, Schmitt 2013c),
- SECI Loop Model (Nonaka and Takeuchi 1995, Schmitt 2013g),
- Concept of 'Ba' (Nonaka et al. 2000, Schmitt 2013g),
- JAIST Nanatsudaki or Seven Waterfalls Model (Wierzbicki, and Nakamori 2007, Schmitt 2013g),
- Three Sources of Human Capital or Resources (Gratton 2011, Schmitt 2012),

- Academic Value Chain with Ten Commitments (Schmitt 2014g),
- Ten Applied Competencies of a Qualification Framework (SAQA 2012, Schmitt 2013c 2014g),
- ICTD Criteria of Capable and Convivial Design Framework (Johri and Pal 2012, Schmitt 2014f),
- Three-dimensional Information Space Model (I-Space) (Boisot 2004, Schmitt 2013bdg 2014d).

Figure 1 shows the result of this integration process as visualized in the triple A0-sized conference poster accompanying the paper presentation. The poster visualizes the relevant processes and learning cycles within an Information-Space Model and demonstrates how the PKM system's features and functionalities tie in with a range of the KM models and practices listed.

- The left-hand poster introduces the concepts of applied competences, intellectual, social, and emotional capital and the respective system support to develop, maintain, and monitor the skills and capitals (Extended Ignorance Matrix, P.R.O.F.I.L.E.S. Relationship Chart, Personal Planning Portfolio, and Qualification Framework).
- The right-hand poster references further integrated KM models supported by the prototype (Concept of 'ba', Building Blocks of KM, Sensemaking and Waterfall Model, Knowledge Types/Assets).
- The proposed PKM concept's unique meme-based approach is based on an amalgamation of these methodologies and its learning cycles are transparently mapped using Boisot's three-dimensional information-space model (Diffusion or Ownership, Application, and Codification) as depicted in the centre poster.

It is obvious, that the complexity, management and resource requirements (technology and overheads) of an Organizational KMS far exceed those of a Personal KMS. Nevertheless, this shared base of methodologies and concepts, the common resource of the world's record, and the joint aim to stay competitive and innovate provide strong arguments for OKM and PKM to exploit synergies for mutual benefit and to engage in a fruitful co-evolution.

As Hamel (2012) pointed out, "what matters today is how fast a company can create new insights and build new knowledge, of the sort that enhances customer value. [...] Engagement [of employees] may have been irrelevant in the industrial economy and optional in the knowledge economy, but [in the creative economy] it's pretty much the whole game now".

Proposing a Next Generation of Knowledge Management Systems for Creative Collaborations in Support of Individuals and Institutions - Featuring a Novel Approach for Meme-based Personal Knowledge Management

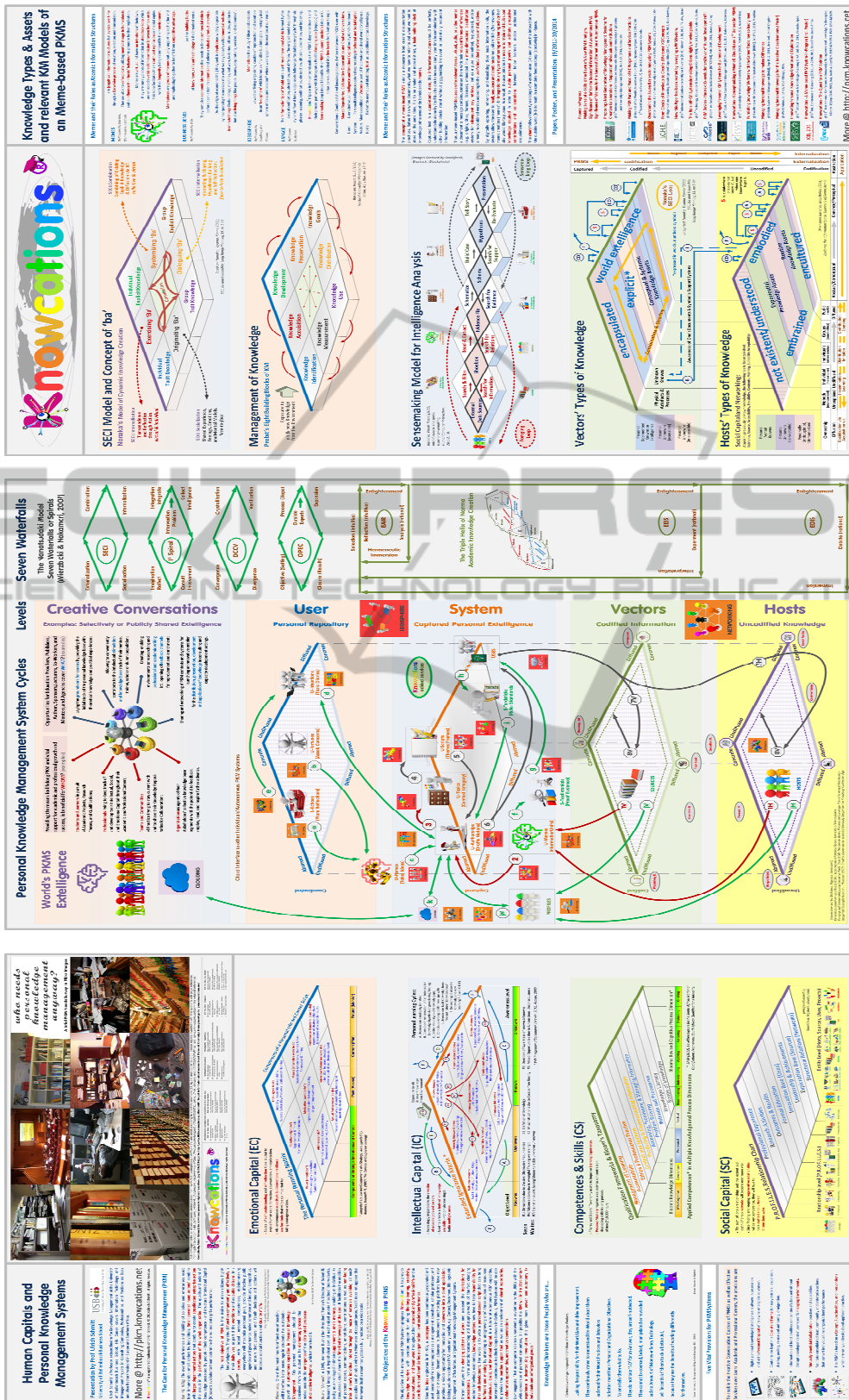


Figure 1: Poster Presentation of PKMS Concept. (Schmitt, 2014d updated).

3 THE ROAD AHEAD

After the final touches to the prototype system, it is planned to transform the prototype into a viable PKM software application within a year by using a mobile application development platform.

The concerns to be further elaborated in future papers are the potential effects of PKMS's creative conversations on our citation-based Academic Reputation Systems and, as pointed out, an appropriate Training and Service Concept for Personal Knowledge Management aimed at Higher Education and Professional Training.

REFERENCES

- Armour, PG 2000, 'The Five Orders of Ignorance', in *Communications of the ACM 2000*, Vol. 43, No. 10, pp. 17-20.
- Bjarneskans, HGB, Grønnevik, B and Sandberg, A 1999, *The lifecycle of memes*. Available from: <<http://www.aleph.se/Trans/Cultural/Memetics/memecycle.html>> [22 June 2014]
- Boisot, M 2004, 'Exploring the information space: a strategic perspective on information systems', in *Working Paper Series WP04-003*. University of Pennsylvania.
- Bush, V 1945, As we may think, in *The Atlantic Monthly*, Issue 176.1, pp. 101-108.
- Cheong, RK and Tsui, E 2011b, 'From Skills and Competencies to Outcome-based Collaborative Work', in *Knowledge and Process Management*, 18(3), pp. 175-193.
- Cheong, RK and Tsui, E 2011a, 'Exploring the Linkages between Personal Knowledge Management and Organizational Learning', in *Personal Knowledge Management*, eds DJ Pauleen and GE Gorman, Gower, pp. 189-228.
- Davenport, TH 2011, 'Personal Knowledge Management and Knowledge Worker Capabilities', in *Personal Knowledge Management*, eds DJ Pauleen and GE Gorman, Gower, pp. 167-188.
- Davies, S 2011, 'Still Building the Memex', in *Communications of the ACM*, 53(2), pp. 80-88.
- Florida, R 2012, *The Rise of the Creative Class – Revisited*, Basic Books.
- Dawkins, R 1976, *The Selfish Gene*, Paw Prints.
- Frey, CB and Osborne, MA 2013, *The Future of Employment: How susceptible are Jobs to Computerisation?* Oxford Martin.
- Gorman, GE and Pauleen, DJ 2011, 'The Nature and Value of Personal Knowledge Management', in *Personal Knowledge Management*, eds DJ Pauleen and GE Gorman, Gower, pp. 1-16.
- Grant, KA and Grant, CT 2008, 'Developing a model of next generation knowledge management' in *Issues in Informing Science and Information Technology* 5.2, pp. 571-590.
- Gratton, L 2011, *The Shift - The Future of Work is Already Here*, HarperCollins UK.
- Hamel, G 2012, *What matters now*, Jossey-Bass.
- Johri, A and Pal, J 2012, 'Capable and convivial design (CCD): a framework for designing ICT for human development', in *Information Technology for Development*, 18(1), pp. 61-75.
- Kahle, D 2009, 'Designing Open Educational Technology', in *Opening up Education*, eds T Iiyoshi and MS Vijay Kumar, MIT Press, pp. 27-46.
- Kerwin, A 1993, 'None Too Solid Medical Ignorance', in *Science Communication* 15.2.1993, pp. 166-185.
- Koltko-Rivera, ME 2006, Rediscovering the later version of Maslow's hierarchy of needs: Self-transcendence and opportunities for theory, research, and unification, in *Review of General Psychology*, 10(4), 302.
- Levy, P 2011, *The Semantic Sphere 1*, Wiley.
- Nonaka, I, Toyama, R and Konno, N 2000, 'SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation', in *Long Range Planning* 33, pp. 5-34.
- Nonaka, I and Takeuchi, H 1995, *The Knowledge-Creating Company*, Oxford University Press.
- Osis, K and Gainspenkis, J 2011, 'Modular personal knowledge management system and mobile technology cross-platform solution towards learning environment support', in *Proceedings of the Annual International Conference on Virtual and Augmented Reality in Education (VARE)*, pp. 114-124.
- Pasher, E and Ronen, T 2011, *The Complete Guide to Knowledge Management*, Wiley.
- Pirolli, P and Card, S 2005, 'The Sensemaking Process and Leverage Points for Analyst Technology', in *Proceedings of International Conference on Intelligence Analysis*.
- Pollard, D 2008, PKM: A bottom-up approach to knowledge management, in *Knowledge management in practice: connections and context*, 95-114.
- Probst, GJB 1998, 'Practical Knowledge Management', in *Prism, A.D. Little*, pp. 17-29.
- SAQA 2012, *Level Descriptors for the South African National Qualification Framework (NQF)*, South African Qualification Authority.
- Schmitt, U and Butchart, B 2014g, 'Making Personal Knowledge Management Part and Parcel of Higher Education Programme and Services Portfolios', in *Journal of the World Universities Forum*. Vol. 6(4) pp. 87-103, 1835-2030.
- Schmitt, U 2014f, 'Overcoming the Seven Barriers to Innovating Personal Knowledge Management Systems', in *Proceedings of the International Forum on Knowledge Asset Dynamics (IFKAD)*, June 11-13, 2014, Matera, Italy, 978-88-96687-04-8, pp. 3662-3681.
- Schmitt, U 2014e, 'From Circuits of Knowledge to Circuits of Personal Knowledge Management Concepts', paper presented at *Conference on Organizational Learning, Knowledge and Capabilities (OLKC)*, Apr 22-24, 2014, Oslo, Norway.

- Schmitt, U 2014d, 'How this Paper has been created by leveraging a Personal Knowledge Management System', in *8th International Conference on Higher Education (ICHE)*, Mar 16-18, 2014, Tel Aviv, Israel.
- Schmitt, U 2014c, 'The Role of Personal Knowledge Management Systems in making Citizens highly knowledgeable', in *8th International Technology, Education and Development Conference (INTED)*, Mar 10-12, 2014, Valencia, Spain. 978-84-616-8412-0.
- Schmitt, U. 2014b, 'PKM Devices - the next Co-evolutionary Driver of Human Development?!', in *International Conference on Education and Social Sciences (INTCESS14)*, Feb 03-05, 2014, Istanbul, Turkey, 978-605-64453-0-9.
- Schmitt, U 2014a, 'Leveraging Personal Knowledge Management Systems for Business and Development' paper presented at *2nd Conference of the Africa Academy of Management (AFAM)*, Gaborone, Botswana, Jan 9-11, 2014.
- Schmitt, U 2013g, 'Knowcations - Conceptualizing a Personal Second Generation Knowledge Management System' in *Looking into the Future of Creativity and Decision Support Systems*, Proceedings of the 8th Conference on Knowledge, Information and Creativity Support Systems (KICSS), ed AMJ Skulimowski, Nov 07-09, 2013, Krakow, Poland, 978-83-912831-6-5.
- Schmitt, U 2013f, 'Furnishing Knowledge Workers with the Career Tools they so badly need', in *International HRD Conference*, Oct 17-18, 2013, Mauritius, 1694-2140.
- Schmitt, U 2013e, 'Managing Personal Knowledge to make a Difference', in *27th British Academy of Management Conference Proceedings (BAM)*, Sep 10-12, 2013, Liverpool, UK. 978-0-9549608-6-5.
- Schmitt, U 2013d, 'Managing Personal Knowledge for the Creative Class Economy', poster presented at *WorldFuture 2013 - Exploring the Next Horizon*, Jul 19-21, 2013, Chicago, U.S.A.
- Schmitt, U 2013c, 'Innovating Personal Knowledge Creation and Exploitation', in *2nd Global Innovation and Knowledge Academy (GIKA)*, Jul 9-11, 2013, Valencia, Spain. 978-1-909507-26-5.
- Schmitt, U 2013b, 'Knowcations - A Meme-based Personal Knowledge Management System-in-Progress', Proceedings of the *8th International Conference on e-Learning (ICEL)*, Jun 27-28, 2013, Cape Town, South Africa, ACPI, 978-1-909507-26-5, pp. 523-527.
- Schmitt, U. 2013a, 'Making Personal Knowledge Management Part and Parcel of Higher Education Programme and Services Portfolios', paper presented *6th World Universities Forum (WUF)*, Jan 10-11, 2013, Vancouver, Canada (published: Schmitt 2014g).
- Schmitt, U 2012, 'Knowcations - The Quest for a Personal Knowledge Management Solution', in *12th International Conference on Knowledge Management and Knowledge Technologies (i-Know)*, Sep 05-07 2012, Graz, Austria. Copyright 2012 ACM 978-1-4503-1242-4/12/09. Graz: ACM, 2012.
- Simon, HA 1971, 'Designing Organizations for an Information-Rich World', in *Computers, Communication, and the Public Interest*, ed M Greenberger, Baltimore, Johns Hopkins Press.
- Stewart, I and Cohen, J 1999, *Figments of Reality - The Evolution of the Curious Mind*, Cambridge University Press.
- Wiig, KM 2011, The Importance of Personal Knowledge Management in the Knowledge Society. in *Personal Knowledge Management*, eds DJ Pauleen and GE Gorman, Gower, pp. 229-262.
- Wiig, KM 2004, *People-Focused Knowledge Management*, Butterworth Heinemann, 2004.
- Wierzbicki, AP and Nakamori, Y 2007, *Creative Environments: Issues of Creativity Support for the Knowledge Civilization Age*. Springer Publishing.