CONFERENCE GUIDE

IKO

INNOVATIONS
IN KNOWLEDGE
ORGANISATION

Building Capabilities
and Overcoming
Challenges.

INNOVATIONS IN KNOWLEDGE
ORGANISATION CONFERENCE
2016

20 - 22 July 2016
e2i Campus, 80 Jurong East St 21,
Singapore 609607

www.ikoconference.org

ORGANISERS

This conference is curated by three international thought leaders and practitioners in knowledge organisation, supported by a distinguished Advisory Board:

synaptica®
knowledge organization systems

Dave Clarke
Dave is co-founder and CEO of the Synaptica® group of companies (www.synaptica.com), providers of enterprise software solutions for taxonomy and ontology management. David leads R&D at Synaptica, and is currently developing a range of Linked Data software solutions for ontology management, semantic indexing and content annotation.

Straits Knowledge
Redefining corporate knowledge

Patrick Lambe
Patrick is Principal Consultant of Straits Knowledge (www.straitsknowledge.com), and the author of *Organising Knowledge: Taxonomies, Knowledge and Organisational Effectiveness (Oxford 2007)*, one of the leading books in knowledge organisation. He consults, teaches and trains on taxonomy development and knowledge organisation around the world.

PEBBLEROAD

Maish Nichani
Maish is the founder of PebbleRoad (www.pebbleroad.com), an innovative user experience design consultancy that helps organisations turn complex, challenging problems into elegant, innovative designs. He has curated learning events on designing the search experience, building search based applications, using pattern libraries, service design, and usability.

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We've got some smart people working on this at Pingar with PhD after their names. Our staff are trained using Stanford NLP materials. Meanwhile, our research roots go back to leading institutions in this area including the University of Waikato in New Zealand, one of the pioneers in Natural Language Processing.

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milkk
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Milkk Consulting is named after a simple idea that a strong knowledge foundation can transform organisational health. In simple terms Milkk Consulting focuses on bringing you experienced consultancy to improve organisational process, leverage your people's strengths as well as ensure that knowledge, critical to your organisation is easily accessible.

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- · Process Improvement
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Contact enquiry@milkkconsulting.com for more information.

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ISKO Singapore is a regional chapter of ISKO, the International Society for Knowledge Organization. We are a not-for-profit scientific/professional association dedicated to promoting the theory and practice of Knowledge Organization through the pursuit of four key objectives:

- · to establish an active membership of people with an interest in Knowledge Organization (KO), whatever their background or qualifications
- · to explore the scope and role of KO and its value to society, to publicize the results and to spread the understanding that emerges
- · to enable members to develop a community of interest and to build bridges between those working in different sectors, particularly between researchers and practitioners
- · to encourage and support the next generation of KO researchers and practitioners

www.iskosg.org

SUPPORTING ORGANISATIONS

CONFERENCE PROGRAMME

Day 1 (21 July 2016)

9:00am	**Welcome Address**	*Welcome to the conference from the Conference Curators*
9:15am	**Opening Keynote** – Robert Glushko "The Discipline of Organizing: A Framework for Achieving {Organizational Benefits, the Benefits of Organizing}"	
	Organizing is a fundamental issue in many disciplines, most notably library and information science, computer science, systems analysis, informatics, law, economics, and business. However, these disciplines have only limited agreement in how they approach problems of organizing and what they seek as their solutions. This talk presents a higher level framework for issues and problems of organizing that emphasizes the common concepts and goals of the disciplines that study them. The framework proposes that every "Organizing System" involves a collection of resources, and we can treat physical things, digital things, information about such things, and even the people who use them as resources. Every Organizing System involves a choice of properties or principles used to describe and arrange the resources, and ways of supporting interactions with the resources. By comparing and contrasting how these activities take place in different contexts and domains, we can identify patterns of organizing and see that Organizing Systems often follow a common life cycle.	
10:00am	Table reflections and Q&A	*15 minutes table discussions and 15 minutes plenary Q&A*
10:30am	Tea Break & Networking Session	
11:00am	**Challenge Session** – Why are we here? What issues and challenges in knowledge organization are we facing?	*Get a sense of the driving needs among conference participants*
11:30am	**Fishbowl (Expert Panel) 1** – The Role of the User in Knowledge Organization: Involvement, Methods and Metrics – Robert Glushko, James Robertson, Shaharudin Mohd Ishak	*30 minutes panel discussion; 30 minutes Q&A*
12.30pm	LUNCH – Book Signings – Robert Glushko, Tom Reamy, Patrick Lambe, Agnes Molnar, James Robertson	

1.30pm	**Case Study Café (1)** – Case pitches	*Case presenters for our first 8 case studies will give a short pitch introducing their case study to the plenary audience.*
2:25pm	Break out into case study table discussions (a) Each case presenter will host an in-depth table discussion on their case study	*Decide which case study in-depth discussions you want to explore*
2.50pm	(b) Move to another case study table discussion to explore a second case of interest to you	
3.15pm	(c) Move to a third case study table discussion to explore a third case of interest to you	

1. Agnes Molnar 'Scoping an Enterprise Search Implementation for a Global Pharmaceutical Company'
2. Shaharudin Mohd Ishak 'Using a Knowledge Audit to Develop a Shared Knowledge Base'
3. Barry Byrne 'The Irish Defence Forces' Multi Award Winning Information and Knowledge Online (IKON) Programme'
4. Robert Glushko 'Organizing Single-Source Content for a User-Configurable Transdisciplinary Textbook'
5. Cor Beetsma 'Knowledge Drives Co-Innovation: The Role of Management Support in a Successful KM Portal Implementation at Yokogawa Electric'
6. Maish Nichani 'Getting to an Enterprise Search Pilot in Three Weeks'
7. Foo Chek Nam 'Implementing Open Source Search Technology at the Ministry of Manpower'
8. Neo Kim Hai 'Implementing a KM Portal at Singapore Power'

3:40pm	Tea Break & Networking Session	

THEME: CHALLENGES

4:00pm	**Fishbowl (Expert Panel) 2** - Governance for Knowledge Organization: Challenges and Opportunities – Ahren Lehnert, Dave Clarke, Maish Nichani, Neo Kim Hai	*30 minutes panel discussion; 15 minutes Q&A*
4.45pm	Capturing key questions for Day 2	*Major questions captured on cards for consideration on Day 2*
5.00pm	**Day 1 Close**	

Day 2 (22 July 2016)

THEME: EXPLORE

9:00am	**Review of Day 1**	*Key themes and questions from Day 1*
9:15am	**Day 2 Keynote** – Tom Reamy – "Deep Text: Using New Approaches in Text Analytics and Knowledge Organization to Make both Humans and Computers Smarter" Tom Reamy will introduce the key ideas from his new book on text analytics: • Why text analytics matters • Building a new text analytics model for deeper knowledge organization • Using contextual rules, based on how humans learn, to create smarter human-hybrid KM solutions • What is Deep Text and why should you care?	
10:00am	Table reflections and Q&A	*15 minutes table discussions and 15 minutes plenary Q&A*
10:30am	Tea Break & Networking Session	

THEME: CHALLENGES

11.00am	**Fishbowl (Expert Panel) 3** – Developing a Business Case for KM/KO Projects: Experience from the Field – Barry Byrne, Cor Beetsma, Tom Reamy	*30 minutes panel discussion; 15 minutes table discussion; 15 minutes Q&A*
12:00pm	LUNCH – Book Signings – Robert Glushko, Patrick Lambe, Agnes Molnar, Tom Reamy, James Robertson	

THEME: EXPLORE

1:00pm	**Case Study Café (2)** – Case pitches	*Case presenters for our second 8 case studies will give a short pitch introducing their case study to the plenary audience.*
1:50pm	Break out into case study table discussions (a) Each case presenter will host an in-depth table discussion on their case study	*Decide which case study in-depth discussions you want to explore*
2.15pm	(b) Move to another case study table discussion to explore a second case of interest to you	
2.40pm	(c) Move to a third case study table discussion to explore a third case of interest to you	

9. Christopher Khoo 'Applying Multi-Document Summarization Tools in the Singapore Memory Portal'
10. Duc Nghia Pham 'Knowledge Modelling and Data Mining to Develop High Risk Passenger Profiles for border control'
11. James Robertson 'Innovative Intranets With Taxonomies'
12. Dave Clarke 'Using a Taxonomy Management System to Achieve Distributed Governance for Taxonomy and Metadata in a Global Enterprise'
13. Matt Moore 'Building Taskonomies and Delivering Information in Context with Panviva SupportPoint'
14. Patrick Lambe 'Developing Faceted Taxonomies from Knowledge Maps'
15. Ahren Lehnert 'Establishing Governance for Taxonomy and Metadata: Trade-offs and decisions'
16. Tom Reamy 'Using Content Analytics on Telco Customer Call Enquiries to Extract Meaning and Insight'

3:05pm	Tea Break & Networking Session	

THEME: APPLY

3:30pm	**Plenary** - Matt Moore "Building Organizational Capabilities in Knowledge Organization"	
4:05pm	**Table Action Planning** – Working with the experts on taking practical steps on building KO capabilities	*Participants will work with expert panelists at their table to identify concrete actions they can undertake to build KO capabilities in their organization*
4:40pm	Plenary feedback	
4:50pm	**Conference Summary and Review**	*Close to the conference by Conference Curators*
5.00pm	**Conference Close**	

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OUR SPEAKERS

Cor Beetsma
Head of Engineering Marketing & Technical Solutions
Yokogawa Electric, Singapore

Cor has worked for a Japanese MNC in the Industrial Automation domain for the last 30 years in various countries and project and management functions covering marketing, sales, project execution and lifecycle services. 10 years ago he initiated Knowledge Management covering initially project execution and has pioneered work processes and organizational structures like Lessons Learned, Best Practices, Engineering Principal and Subject Matter Expert networks. Recently he has been assigned to lead the implementation of a global cross functional Knowledge Management Portal covering Industrial knowledge with the aim to generate new value during sales pursuit and execution of projects.

Major Barry Byrne
Communications and Information Services
Irish Defence Forces, Dublin, Ireland

Major Barry Byrne is a Communications and Information Services officer in Irish Defence Forces Headquarters, Dublin. He was an assistant professor in the Computer Science Department of Trinity College Dublin. Barry is leading an internationally acclaimed programme developing policies, procedures and technological solutions to improve Information and Knowledge Management in the Irish Defence Forces. This programme grew out of years of academic and empirical research conducted for his master's thesis and has won numerous international awards. The technical platform, delivered through SharePoint 2013, provides full EDRM capabilities, enterprise social, innovative knowledge management solutions, and has been recognised by international military and corporate organisations. Barry has served in a variety of roles overseas with the United Nations; Logistics in Liberia in 2006, chief ICT officer in 2007 in Lebanon and civil-military coordination and operations officer in the Democratic Republic of the Congo in 2011.

David Clarke
CEO and Head R&D
Synaptica®, UK

Dave is co-founder and CEO of the Synaptica® group of companies, providers of enterprise software solutions for taxonomy and ontology management. His previous roles include CTO of Synapse Corporation and Global Taxonomy Director at Dow Jones. He served on the NISO committee responsible for authoring the 2005 version of the US national standard for controlled vocabularies, ANSI/NISO Z39.19, and

is a Fellow of the Royal Society of Arts. Dave leads R&D at Synaptica®, and is currently developing a range of Linked Data software solutions for ontology management, semantic indexing and content annotation.

Foo Chek Nam
Deputy Director, Service Delivery Management
Ministry of Manpower, Singapore

Foo Chek Nam has held various portfolios during his 17 years of service with the Ministry of Manpower. He is currently Deputy Director (Service Delivery Management), and responsible for the management of MOM's key service delivery touchpoints such as the MOM's website, services and contact centres. Over the past few years, he has led efforts to pilot and implement several new systems and processes to help MOM improve its service delivery and manage service challenges. One of these was the fundamental redesign of how MOM positions and delivers services through the MOM website.

Robert J. Glushko
Professor
University of California, Berkeley

Robert J. Glushko is an Adjunct Full Professor at the University of California, Berkeley in the School of Information. Before moving to Berkeley in 2002, he spent a decade in Silicon Valley, where he founded or co-founded four companies in the areas of electronic publishing and e-business that pioneered the use of XML. In 2005, with co-author Tim McGrath, he wrote *Document Engineering: Analyzing and Designing Documents for Business Informatics and Web Services*. More recently he is the primary author and editor of *The Discipline of Organizing*, chosen as the information science book of the year in 2014.

Christopher Khoo
Associate Professor
Nanyang Technological University, Singapore

Chris Khoo is an associate professor in the Wee Kim Wee School of Communication & Information, Division of Information Studies at the Nanyang Technological University, Singapore, where he teaches courses in knowledge organisation, information architecture, data mining and Web-based information systems. He obtained his PhD at Syracuse University in 1997, his MSc in Library & Information Science at the University of Illinois, Urbana-Champaign in 1987, and a BA from Harvard University. He has also worked for several years as a science reference librarian, cataloguer and online information searcher at the National University of Singapore Libraries. His main research interests are in knowledge organization, ontologies, automatic sentiment categorization, human categorization behavior, natural language processing, information extraction, multidocument summarization, and clinical decision support systems.

Patrick Lambe
Principal Consultant
Straits Knowledge, Singapore

Patrick is the author of *Organising Knowledge: Taxonomies, Knowledge and Organisational Effectiveness* (Oxford 2007), one of the leading books in knowledge organisation. He is co-founder and Principal Consultant of Straits Knowledge, Visiting Professor in the KIM PhD programme at Bangkok University, President of the International Society for Knowledge Organization Singapore Chapter and a member of the editorial advisory board of the *Journal of Knowledge Management, Knowledge Management For Development Journal, and Journal of Entrepreneurship, Management and Innovation.* He consults, teaches and trains on taxonomy development and knowledge organisation around the world. His new book, co-authored with Nick Milton, is *The Knowledge Manager's Handbook*, published by Kogan Page.

Ahren E. Lehnert
Manager, Data Taxonomy & Governance
The Clorox Company, Oakland, California

Ahren E. Lehnert is an information management professional with over ten years' experience in taxonomy, search, and content and records management. He has developed enterprise and eCommerce taxonomies in a consulting capacity for clients in a broad range of industries. Ahren is now Manager, Data Taxonomy & Governance at The Clorox Company, a multinational manufacturer and marketer of consumer and professional products based in Oakland, California. He is currently responsible for taxonomy development and management in the Marketing and Analytics departments which will expand to the enterprise and include related capabilities such as auto-categorization, search, text analytics, and digital asset and content management.

Shaharudin Mohd Ishak
Division Director, Knowledge Management Division
International Enterprise (IE) Singapore

Shaharudin Mohd Ishak is a Division Director in the Knowledge Management Division at International Enterprise (IE) Singapore. He is responsible for various key KM initiatives, including the organisation-wide Knowledge audit, Knowledge transfers and retention programme, Knowledge sharing and awareness program and the award-winning IEX intranet (IBF). He has a Bachelor of Science in Computing with Management and a passion for social media and content marketing. Shah's experience includes 7 years in the area of Intranets and KM.

Agnes Molnar
CEO
Search Explained, Hungary

Agnes is the CEO and Managing Consultant of Search Explained and a recognized Information Architecture and Search Expert. She has worked for various companies throughout the world, architecting and executing dozens of Enterprise Search implementations for both commercial and government organizations. Since 2008, Agnes has been annually awarded the Microsoft Most Valuable Professional (MVP) Award for actively sharing her technical expertise. She has also been awarded as one of the Top 25 Influencers in SharePoint and Office 365 every year since 2013, both in Europe and Globally. Agnes is a regular speaker at technical and business conferences and workshops around the globe. She also has authored and co-authored several books and white papers, most recently *"SharePoint 2016 Search Explained"* and *"Google Search Appliance Retirement Explained: What's Next?"* Agnes maintains her passion and dedication through the Search Explained blog, where she shares guidance, best practices, and other useful resources in Information Architecture and Enterprise Search with a light and clean approach.

Matt Moore
Senior Consultant
Panviva, Australia

Matt Moore is Senior Consultant with Panviva in Australia and previously Manager, Market Operations at PwC Australia. Matt has spent 15 years working in knowledge and information management, learning, marketing, sales operations and communications with organisations such as PwC, IBM, Oracle and the Australian Securities and Investment Commission. He lectures at the University of Technology Sydney, writes for Online Currents and is a former chair of the New South Wales Knowledge Management Forum.

Neo Kim Hai
Head, Knowledge Management
Singapore Power

Neo Kim Hai is Head of the Knowledge Management Centre at Singapore Power. He has more than 30 years experience in knowledge management, programme management and change management with a balanced approach in managing systems, people, processes and technologies. Prior to Singapore Power he led the Knowledge Management Solution Centre at DSTA (Defence Science & Technology Agency), and the Knowledge Management Office at Mindef (Ministry of Defence). His passion is in adopting an intrapreneur mindset in transforming the workplace, enabling knowledge worker in learning to learn and learning through doing.

Maish Nichani
Founder of PebbleRoad,
Singapore

Maish is a highly respected thought leader and practitioner in the field of user experience design with over 10 years of experience in designing complex information environments. His projects cover user needs analysis, technology selection, usability design, information architecture, search interface design and intranet design. He is the founder and Principal of PebbleRoad, an innovative user experience design consultancy that helps organisations turn complex, challenging problems into elegant, innovative designs. He is Vice President of the Internatioal Society for Knowledge Organization Singapore Chapter and has been an active member of the design community since 2000, having spoken at international conferences, held workshops, written articles and two books on information design. Maish has curated and led learning events on designing the search experience, the art of persuasive design, building search based applications, using pattern libraries and content modelling, service design, and usability. Maish is the organiser of the 2016 World Information Architecture Day Singapore.

Duc Nghia Pham
Senior Staff Researcher
MIMOS Berhad, Malaysia

Dr. Duc Nghia Pham is a Senior Staff Researcher in Artificial Intelligence (AI) applied research at MIMOS Berhad, where he heads the Data Science (Prescriptive Analytics) research team. He received his PhD in Computer Science (specialization in Artificial Intelligence) from Griffith University, Australia. Before joining MIMOS, he spent several years as Senior Researcher at NICTA Ltd. and Griffith University. He has authored several research publications and won several international prizes and awards. His main research topics are semantic technologies, knowledge representation and reasoning, planning, search and optimization.

Tom Reamy
Chief Knowledge Architect and Founder
KAPS Group

Tom Reamy is currently the Chief Knowledge Architect and founder of KAPS Group, a group of knowledge architecture, taxonomy, and text analytics consultants. He has 20 years of experience in information architecture, enterprise search, intranet management and consulting, education software, and text analytics consulting. Tom's academic background includes a Master's in the History of Ideas, research in artificial intelligence and cognitive science, and a strong background in philosophy, particularly epistemology. He is a widely published author, Program Chair of Text Analytics World, a frequent speaker at information and knowledge management conferences, and is the author of an upcoming book on text analytics.

James Robertson
Founder and Managing Director
Step Two, Sydney, Australia

James Robertson is recognised as one of the global thought-leaders on intranets. He is the author of *Essential intranets: inspiring sites that deliver value, Designing intranets: creating sites that work* and *What every intranet team should know*, the key books for all intranet professionals. As Founder and Managing Director of Step Two (headquartered in Sydney, Australia), James has worked with many high-profile organisations in the public and private sectors, and founded the annual Intranet Innovation Awards. James has keynoted conferences and led workshops across the globe, including in the USA, UK, Denmark, the Netherlands, Switzerland, Singapore, Malaysia, Brunei, Australia and New Zealand.

CASE STUDY CAFÉ

DAY 1

You will be able to attend in-depth table discussions on three of these cases on Day 1. The case outlines are provided to help you decide which case discussions you would like to attend.

1) AGNES MOLNAR

Scoping an Enterprise Search Implementation for a Global Pharmaceutical Company

The organization involved

This is a global pharmaceutical company headquartered in Western Europe with approximately 100,000 employees around the globe.

Case background and intent

The organization has data centers in various locations on four continents. They store hundreds of thousands of documents there, as well as on the cloud. The biggest challenges are to find and share relevant content and the right information. Several attempts were made to implement Enterprise Search before, but they were not unified and hence did not provide enough help for knowledge discovery and findability.

The work done

The organization had identified two main phases to be done. Firstly, they needed a strategy for normalization and optimization of their content management systems, and a detailed migration plan. Secondly, they required an enterprise search strategy, and a feasibility study of what's possible with existing and upcoming technologies.

My task was to define their enterprise search strategy and analyze the options. As they have had a strong partnership with Microsoft for a long time, they preferred to use Microsoft technologies wherever possible (SharePoint, Office 365, Azure Search, etc.). I also had to do a research and study for the third-party solutions to be used, and identify the best vendors to work with.

Challenges and lessons learnt

Since the strategic planning happened next year, the timing itself was challenging: Microsoft released SharePoint 2016 earlier this year, therefore this product was in pre-beta phase during the project. I had to assess its new capabilities to support hybrid search (cloud + on-premise) and analyze its feasibility based on pre-beta documentation and product.

In addition, content readiness was an issue. Since content migration was still in progress and content was not in its final designated location, I had to refer to the Content and Migration Plan in many cases during my work. As a side-effect, I also had to make sure that the implementation fit into a "Search First Migration" approach.

Impact and benefits

The project impact will be measurable in a few months' time, when the implementation reaches the first major milestone. The most significant benefits will be a unified search experience as well as global availability for every content via search and discovery tools. Last but not least, the search performance will be significantly improved compared to their current search applications.

Next steps

The new infrastructure will be deployed and the new features implemented. The current and new content sources have to be added to the new search index in order to provide a unified search experience. As the content migration process moves forward, the search content sources have to be maintained regularly. As a consultant and search expert of this project, I'm following up and helping them to align the plans as needed.

2) SHAHARUDIN MOHD ISHAK

Using a Knowledge Audit to Develop a Shared Knowledge Base

The organization involved

International Enterprise (IE) Singapore is the government agency driving Singapore's external economy. It spearheads the overseas growth of Singapore-based companies and promotes international trade. Its vision is a thriving business hub in Singapore with Globally Competitive Companies (GCCs) and leading international traders.

Case background and intent

IE Singapore faces two key challenges. Firstly, employees face difficulties in finding or obtaining information pertaining to their work due to the silo-effects of the way information is kept. Secondly, request for information from employees from another department might take a longer time due to the different levels of approval required.

The work done

The Knowledge Management (KM) team conducted a knowledge audit to identify KM-related issues (gaps) and formulate solutions to address the gaps. In the course of mapping the knowledge assets, the KM team also identified the common desired knowledge documents across all user groups – this refers to the knowledge documents that each group is interested from the other. After consolidating all the findings, an analysis was made to identify the gaps and opportunities to address knowledge sharing issues and one of it was to implement a knowledge base. The KM team followed up by designing a knowledge base and a plan to sustain the ecosystem of knowledge contribution and consumption was formulated.

Knowing the importance of positive experience when using the knowledge base, the KM team ensured the usability and intuitiveness of the knowledge base met the users' requirements. In terms of innovativeness, features such as tagging, taxonomy and the use of social elements such as like, share, bookmark and comment were used in the knowledge base. On top of that, a personalization feature was also implemented to ensure users were able to receive notification of the latest relevant knowledge documents uploaded by their colleagues.

Challenges and lessons learnt

When formulating a detailed plan for the knowledge base, a usability point of view had to be considered with regards to its functionality. We had to understand how the documents were created, how they should be uploaded, accessed and shared with everyone when determining the lifecycle of the knowledge documents. A cost-benefit analysis had to be conducted to decide if the knowledge base should be implemented. In addition, we had to obtain customer input for the identification of potential issues related to the knowledge base such as the uploading and accessing of the knowledge documents.

Next, we needed to obtain buy-in from management. This was done by sharing the detailed plan with management. Thereafter, we leveraged the management's name to get participants to attend activities or even to simply just give their response – peer pressure helped a lot. We also updated management on the progress made.

Furthermore, we conducted usability testing with users using a wireframe. This helped to determine the user adoption rate when the knowledge base went live.

In order to ensure knowledge document contribution, we conducted training on how to upload the knowledge documents. We also increased awareness of the types of knowledge documents that needed to be uploaded. Yearly reviews for new knowledge documents were conducted.

Impact and benefits

Users from other groups are now able to search and access the desired knowledge documents at their convenience – anytime and anywhere. With the personalised feature in place, employees are notified when the latest relevant knowledge documents are uploaded into the knowledge base.

Next steps

Currently, the KM team is trying to further simplify the uploading process and also to implement a new feature that will allow real-time notification on the relevant knowledge documents that have been uploaded into the knowledge base.

3) BARRY BYRNE

The Irish Defence Forces – Multi-Award Winning Information and Knowledge Online (IKON) Programme

The organization involved

The Irish Defence Forces (DF) has an approved strength of 9,500 people. It is organised on conventional military lines. It is structured with Defence Forces Headquarters (DFHQ), two infantry brigades, a DF Training Centre, Air Corps and Naval Service distributed across 16 installations nationwide and on two major peacekeeping missions overseas in Lebanon and Syria (UNIFIL and UNDOF). The Communications Information Services (CIS) corps, headquartered in DFHQ, is responsible for all matters relating to Information and Communications Technology (ICT), both on island and on any overseas deployment.

Case background and intent

Today, the DF operates in an environment in which knowledge is a primary resource and therefore a key enabler for the conduct of operations. The DF recognised the need to address Information and Knowledge management in response to the rapidly changing information requirements which impact on a modern professional military organisation.

Due to geographic separation at home and overseas, members of the DF could experience difficulty in accessing corporate knowledge and information. The legacy system consisted of internal file shares on a closed network. Emerging technologies and the transition from a paper-based to a digital working environment resulted in an exponential increase in information available at all levels and therefore a very real risk of information overload. The DF had a wealth of information that could be identified and classified as corporate knowledge. This information and knowledge needed to be made readily available to all decision makers within the organisation. Key business tasks required rapid access to accurate records, documents and other information of all types and formats. The challenging financial environment prevalent in Ireland placed a significant responsibility on DF management to ensure the successful, cost effective delivery of military capability as well as DF business and support functions.

Due to the high volume of information within the DF, a new system was needed to improve document management and records management throughout the organisation. The high turnover rate of personnel also meant that intellectual capital needed to be harnessed and preserved so that valuable knowledge did not walk out the door when personnel did. In delivering transformation, the DF embraced a holistic approach to the management of information. The DF improved their Information and Knowledge Management capability in order to provide the right information to the right person, at the right time, to facilitate optimum decision making.

This is the largest knowledge management project of its type in Europe this year; it is based on Internationally recognised academic and empirical research. The Implementation was conducted using cutting edge technology and the project has yielded significant Return on Investment (RoI) and cost saving efficiencies to date; Return on Investment of over €750,000 per annum.

In 2008 the DF began its multi-year, multi-phase project to address knowledge management in the organisation. A major part of this project was the implementation of an online system which would connect users across the organisation with ease and also provide Electronic Document and Records Management (EDRM) capability.

The Irish DF has implemented a Knowledge Management System based on SharePoint 2013. The new system, Information and Knowledge Online (IKON), has improved internal communication, increased productivity and enhanced decision making across all sections of the DF.

The project was also accompanied by a major change management programme aimed at changing the culture of the organisation to a knowledge sharing organisation.

The work done

The DF established an Information and Knowledge Management (IKM) section of five personnel in DFHQ, Dublin. The IKM section, started out by writing the policies and procedures necessary for the culture change to ensure the DF became a knowledge sharing organisation. Together with DF IT Operations, the IKM section then set about creating an IKM portal, entitled DF IKON, where the DF's information is created and stored once but is utilised continuously, facilitating extensive sharing and collaboration of information using the Microsoft SharePoint 2013 technology.

This portal provides complete management for the full lifecycle of information and knowledge from creation to archiving or deletion. The solution includes enterprise search, digital records management, enhanced collaboration, internal web content management, document management and enhanced security policy management.

The project team liaised with over 30 organisations who implemented similar projects. The project team linked up with information management, lessons learned and training institutions in NATO, the UN and the EU. The project scope included: the establishment of the IKM section, the drafting of the DF IKM Policy and Strategy documents, the preparation and approval at Academic Council of the IKM course syllabi. It also included the procurement upgrade and commissioning of all supporting infrastructure (SAN, server farm, SQL cluster, load balancers, etc.) and software necessary to deliver the project. It further included the training of personnel (over 2000 personnel in 2014 alone) and the continual benchmarking and improvement of the portal and processes that support it against international standards and best practices.

The change management programme that accompanied the arrival of IKON was essential in bedding in the idea of knowledge sharing in the DF community. An extensive awareness campaign was conducted throughout the DF, at home and overseas. Over 250 'train the trainer' week-long courses were conducted in knowledge management and a further 2,500+ personnel were trained on a one-day KM course.

This KM programme differed from others in the following ways:

Study the problem you are trying to solve
The DF did not jump into deploying knowledge management solutions but conducted an in-depth study of their internal situation and their KM maturity when benchmarked against other nations. This was done in a comprehensive and academic manner; the research into this study forming the basis for a Master's thesis. Over three hundred personnel were surveyed and interviewed and their responses were compared and contrasted against international respondents. Once this baseline was established, key areas were targeted for improvement and strategies were formed for the cultural change programme and technological platform design.

Start with policies and culture change, not technology
The KM programme started with policies and cultural change, not technology. Before any technology platform was selected, a significant amount of time was spent writing a policy document and a strategy statement for Information and Knowledge Management in the DF. The policy defined what should be done, and who was responsible, the strategy and plan outline detailing how it would be done.

When using technology, customisation is not always necessary
Many organisations fall into the trap of trying to design their own solution, or almost as bad, buying a Commercial Off the Shelf Solution (COTS) but then customising it to such an extent that costs and timelines rapidly spiral out of control. One of the key success factors of the IKM programme in the DF and IKON, the platform that was built, is that a clear policy of configuration of the platform as opposed to customisation was employed. Based on our own experience, we advise that you spend time selecting the tool you will use and understanding the problem you wish to solve, what is in and what is out of scope, then work with the capabilities of the platform you have selected; do not customise at every turn. The second you start writing code, you should be worried. Your implementation partner will be delighted, but you should be worried.

Gamify engagement
While roiling out the platform to different brigades of the Irish DF, we gamified engagement with the platform by offering prizes for the best new user in that brigade. Users seen to be utilising the social aspects such as newsfeeds, forums and wikis were rewarded with prizes such as a Microsoft Surface or Xbox. There were also criteria such as using the correct naming convention on documents, not having a folder structure deeper that three, embedding a knowledge sharing culture in the organisation by sharing documents you were working on and 'working out loud' to encourage collaboration. By gamifying engagement, you make adoption of new cultural practices and procedures fun and competitive. Towards the end of the gamification campaign, prizes changed from devices to one-day SharePoint courses in an external company; this was a win-win as users loved going to a tech company for a day in Dublin's vibrant grand canal dock area and gaining a new skill, and the organisation upskilled another end user and created another evangelist for the project.

Challenges and lessons learnt
Challenges and lessons learnt included senior leadership engagement, securing a project champion, building a prototype and not underestimating the project before you.

A new lessons learned submission and dissemination system, DFKO (Defence Forces Knowledge Online) was built on IKON

to specifically focus on the 'K' or Knowledge within IKON. Users required a greater degree of trust to establish documents as corporate knowledge, so a submission and validation system tracked all lessons identified as they passed through the lessons learned cycle. Subject matter experts validated all items submitted before they became visible to the broader community. The system built after years of studying similar systems in the civilian world and organisations, such as NATO JALLC (Joint Analysis and Lessons Learned Centre), could track contributions to knowledge sharing wikis and sharing knowledge through short 'how-to' video clips.

Impact and benefits

This project has changed the Irish Defence Forces. Knowledge flows, business processes and expertise and people location have improved. The benefits are innumerable. The project has received numerous international awards: 1st place in the European Intellectual Capital and Knowledge Management awards (Italy), 1st place in the Irish Technology Excellence awards and 2nd place in best SharePoint solution category at the European SharePoint awards (Sweden).

Next steps

Moving forward, work is in progress for the use of video to facilitate tacit knowledge sharing. Efforts have also been devoted to drive a major knowledge café initiative. The IKON portal will be further leveraged to perform business intelligence work.

4) ROBERT GLUSHKO

Organising Single-Source Content for a User-Configurable Transdisciplinary Textbook

The organization involved

Starting in 2011, an ad-hoc group of about twenty authors, including professors from different universities and their current and former students, was organized and led by the author of this case study to enable the collaborative authoring of a transdisciplinary textbook called The Discipline of Organizing (TDO). (disciplineoforganizing.org)

Case background and intent

Almost by definition, a transdisciplinary book requires multiple authors to write it because it can only be written if experts in different disciplines can identify and communicate about the gaps and overlaps between disciplinary concepts. Once the collaboration got underway, a different challenge emerged. Many of the collaborators were solicited because they had backgrounds and biases that were complementary to those of the author, making them well suited to filling in disciplinary gaps that make the book more balanced and comprehensive. But a book that is both broad and deep can devolve into an encyclopedia rather than evolve into a tightly integrated textbook.

The work done

The collaborating authors were unanimous in wanting to publish the work in both print and e-book formats because they expected it would need frequent revisions to stay current. Using O'Reilly Media's Atlas single-source publishing environment enabled us to deliver print-ready copy, epub, and mobi versions of TDO from the same XML source files. Our innovations in ebook design ultimately required us to customize the source file mark-up and publishing software to an extent that we had to leave Atlas for our own publishing environment.

By mid-2012 the collaborators had produced a first draft, but the goal of multidisciplinary comprehensiveness was undermining the coherence and comprehensibility of the manuscript. We restructured the book to emphasize the transdisciplinary core of the new discipline of organizing, while preserving the disciplinary identity of the concepts, methods, technology, and people that contributed to it. The author of this case study edited each chapter to more tightly focus on transdisciplinary content, extracting discipline-specific content into paragraph-size chunks, most of which became end-of-chapter notes identified by discipline.

TDO's supplemental content was classified in eleven disciplines. We revised the production and presentation programs to filter the text according to these disciplinary attributes in the XML mark-up. The selected text was transformed into HTML, arranged and styled as required, and then zipped into the EPUB archive format used by ebook reading devices and applications. The TDO "family of books" created by selecting any number from zero to eleven of them thus contains 2048 members.

But no publisher was going to publish 2048 nearly identical editions, so in 2014 we published the two editions at the "endpoints" – one with all of the supplemental content, and one with none of it. These "professional" and "core concepts" editions have each found a niche, primarily in graduate and undergraduate courses, respectively.

Challenges and lessons learnt

Nevertheless, it was dissatisfying to constrain TDO's powerful publishing production line to produce just two fixed-configuration editions because this did not fully exploit the multidisciplinary contributions of the authoring team, nor did it align well with the diversity of contexts in which TDO was being used as a textbook. Even more frustrating was that limiting TDO to just two editions ignored the facts that not all students in a particular course have the same disciplinary backgrounds and interests, that some students prefer to focus on core content and read little or none of the supplementary content, and that these preferences are not fixed; a student reading a book for the first time might focus on the core content, but might read both core and supplemental content more closely while studying for an exam (or vice versa).

Taken together, this set of facts argued for some way to give readers a mix of core and supplemental content that was personalized to their disciplinary preferences. The most straightforward way to enable readers to personalize TDO's disciplinary mix was to run essentially the same configuration and transformation machinery in the publishing production line as in the design time case, but to defer the disciplinary filtering step as a choice made by the reader.

To enable readers to make informed choices, we modified the build process to record, for each section of the book, the number of endnotes and total word count of the endnotes for each discipline. We used JavaScript to insert a list of check boxes before each section, annotated with this information about the endnote distribution, and have also developed a variety of bar chart visualizations that convey the same information more efficiently and elegantly. After the reader makes their selections, the ebook dynamically reformats itself by modifying CSS properties for the affected paragraphs.

This active personalization mechanism allows the TDO Professional Edition, which contains all the supplemental content, to dynamically morph itself into any of the 2048 members of the "book family." Unfortunately, because active personalization depends on the reader platform's support for JavaScript and other capabilities, we cannot deploy it to every TDO reading context.

Impact and benefits

TDO's transdisciplinary core with integrated multidisciplinary content has enabled it to be adopted quickly as a primary or secondary textbook in a diverse set of university courses in Information Organization, Knowledge Management, Cataloguing, Digital Collections, Information Architecture, and Information Systems Design. Just three years after the publication of the first edition in 2013, it is now used in over 70 courses in about 25 countries. TDO's novel ideas and design led it to be named an "Information Science Book of the Year" in 2014.

Next steps

The potential value in creating a larger and more open community of contributors has inspired us to think about how to implement a distributed authoring and publishing system in which new content could be dynamically discovered and logically included in the family of books. An instructor should be able to teach from a customized edition with local supplemental content, but this local repository would be part of a federated "network textbook" in which content marked as discoverable could be incorporated in any other local edition.

NOTE: Some of the text in this case study comes from: Glushko, Robert J. "Collaborative authoring, evolution, and personalization for a transdisciplinary texbook." In Companion to the Proceedings of the 11th International Symposium on Open Collaboration, p. 10. ACM, 2015.

5) COR BEETSMA

Knowledge Drives Co-Innovation - The role of management support in a successful KM portal implementation at Yokogawa Electric

The organization involved

Yokogawa has its headquarters in Tokyo, Japan. With 18,000+ employees, it operates in 59 countries. KM covers the Industrial Automation & Control Business segment, solutions and services.

Case background and intent

The objective of this KM initiative was to deliver business results within 8 months by maximizing the utilization of existing know-how within and across Yokogawa global operations, and removing any barrier to support frontline (sales & projects) with up-to-date reference collateral.

The work done

We defined all risks and stakeholders and requested sponsor intervention when required which was granted. Next we created a mock-up of the portal and defined needs of four main user groups.

The portal design was confirmed using the Strategy On A Page (SOAP) approach. This SOAP was only used by the PM, and not shared with the stakeholders. It increased confidence tremendously that all design issues and lessons learnt were covered adequately.

In order to reduce risk and complexity to define deliverables, the Proof of Concept was done involving only 2 user groups with strong interdependencies. The user interface of the new portal was reviewed and revised many times. This iterative approach was critical to success.

In order to drive content creation by operations in a sustainable manner, simple work processes were defined and agreed with all stakeholders. This proved critical to assure content upload after deployment of the portal.

Challenges and lessons learnt

As the objective of the KM project was to create new value, ROI calculations were based on efficiency improvement. Access rights were provided to all staff and access guaranteed in all locations. This was a first in the company and required a new technology approach by MIS. In order to overcome any resistance to change in the field, we drafted a KM policy.

We would like to present the following success factors and advice. It is important to get it right the second time. This reduces the risk of implementation and allows the project to be broken down into pieces. Secondly, it is vital to engage with all frontline staff, give them value and resolve their problems. The KM initiative should be a project only in the first year; it should be operationalized after that (budgets by each division). Lastly, cover all bases by asking sponsors to help convince the frontline and develop a KM policy to assure sustainability.

Impact and benefits

The portal contents are growing as planned. Each newly secured project has a summary uploaded within a month, providing valuable information to other countries when promoting systems, products, services and solutions in the same segment of the industry. In the past, this was achieved using personal networks. Now, every newly hired sales manager can access this information and contact the responsible person directly (e-mail provided) without having to spend time building his internal network.

Next steps

We plan to expand the coverage of the content to all product development and partners. Access rights will be reviewed based on needs and content ROT will be monitored carefully based on analysis scorecards and utilization reports.

6) MAISH NICHANI

Getting to an Enterprise Search Pilot in Three Weeks

The organization involved

A big bank in Asia.

Case background and intent

The search experience on this bank's website was messy and ineffective. People stopped using search and resorted instead to calling the hotline or just giving up altogether.

The work done

We looked at the search logs and listed down the top gaps in the search experience. We then gathered the content that would answer those queries and re-modelled them to improve their search relevance. We then indexed the new content using Solr, an open source search engine. We also designed custom interfaces to reflect the search task. Instead of waiting for the bank to redo or redesign the content, we just scraped the content off the server directly and wrote scripts to remodel it. This way we could show the management what an effective search experience looks like.

Challenges and lessons learnt

Because search has always been a problem in the enterprise, it is tough to sell a search project. Most people think that search is a tech thing and that it costs too much to fix. What we learnt is that the best way to change this mindset is to do a quick demo using their content. The problem then is to get the right content. Enterprise content is usually locked down and requires many levels of approval to get. A way to bypass this is to use published content. We scraped the content off the website and used it for the demo. The bit that surprised us was how the organisation reacted when it realised that search can be beautiful and effective – they then want it all and they want it fast. Herein lies another challenge – to convince the client that search takes time and effort to scale it right. You can demo it fast, but you need time to scale it effectively.

Impact and benefits

The bank, now convinced, is planning to use the new way of designing and building search across its different country websites. The bank's management realised that search could improve the overall customer perception and digital experience—key elements of competitive advantage.

Next steps

The next step is to work on search governance. Implementing a good search experience is good, but it will decay very quickly if it is not tuned regularly. Tuning means developing a habit of looking at the search performance, finding gaps and making improvements. For example, boosting the name of a new credit card during a campaign.

7) FOO CHEK NAM

Implementing Open-Source Search Technology at the Ministry of Manpower

The organization involved

The Ministry of Manpower (MOM)'s website serves more than a million visitors every month, with an average of about 7 million page views. As part of its plans to develop more customer-centric, consistent and easy-to-use digital services across the organisation, MOM transformed its website to become a service delivery channel which is the default/main channel for customers to look for information and answers related to commonly encountered processes, legislations and rules.

Case background and intent

The redesign of the MOM website is part of its plans to develop customer-centric, consistent and easy-to-use digital services across MOM.

This project involved a significant shift in the transformation of the MOM website to become a service delivery channel where customers can first look for information and obtain answers relating to commonly encountered processes, legislations and rules. Anchored on a simple design objective (Speed of getting things done = Easy to find + Easy to understand + Easy to act upon), the web content was fundamentally redesigned based on actual user needs, and transformed to become more customer centric, simple to understand and use. The content now incorporates situations commonly encountered/asked at MOM's manned touchpoints, and makes use of appropriate apps such as calculators and tables to help customers translate information into answers.

The team focused on customers' needs, with strong attention to clarity, comprehension and context. Extensive efforts were made to understand customers' needs and preferences, harness perspectives and co-create solutions. For example, the website was built on a "test, learn and adapt model", with user testing and multiple beta releases to gather customers' feedback. It leveraged analytical and feedback tools to monitor, track and measure qualitative and quantitative results real-time, and enhancements are made to improve the website frequently.

Aside from making content more customer-centric, we had to understand what customers were looking for and direct them to the relevant information. The 'Search' was critical in this aspect. Without a good 'Search', customers would be spending time navigating the site, increasing the time to complete their task.

The work done

The decision was made to go with an open source search built on the Solr platform. An open source search would allow us to track the search patterns of our customers with the flexibility to integrate with Google Analytics to understand the complete picture of our customers' journey on our website.

The flexibility of configuring an open source search allowed us to create rich features to delight and assist our customers

in their information search on our website. This was new technology to the MOM and required the team managing the website to grasp what the search can do.   We invested significant efforts in understanding the quantitative and qualitative feedback received, and to make use of them to enhance the search.   In so doing, the web team had to be up to speed in terms of what to monitor and make sense of, such as the search terms used by customers, their search patterns and behavioral flows on the website.

Challenges and lessons learnt

By using an open source technology on the website, the challenge was to integrate the product into a content management system (in our case, Sitecore) and the hosting environment we were on, that is, Government Cloud (G-Cloud).

<u>Indexing and Search Parameters</u>

Content was stored in the content management system and search had to index the content to retrieve the results for the customers. The search parameter(s) or condition(s) were something that we had to play around with. The structure of the content (i.e. information describing a particular page) had to be determined and accorded weightage, so that the search could 'fish' out the relevant pages to the customers. Based on what the customers keyed in the search bar, the topmost search results should be what the customers were actually looking for. We had to constantly monitor the search terms used by the customers and the results they clicked on i.e. the page they chose. Tweaking of the search formula was done constantly arising from the statistics obtained.

<u>Search Analytics</u>

When we implemented the open source search, we wanted to ensure that search terms and search patterns were tracked accurately.   We tried customising Google Analytics to capture such results, but it did not work well. Only in Nov 2015, with the successful implementation of the Google Tag Manager (GTM), were we able to collect information seamlessly, abandoning the customisation in GA. The lesson was that along with technological advancement, we needed to be able to identify the best solution in the market that met our needs.

Open source search, when initially implemented, had a vocabulary that was defined by the content that it indexed. These were usually terms used within the organisation, as we wrote and described from our perspectives. Customers, on the other hand, might not be using the organisation's lingo and would likely use terms not in our vocabulary. From the start, we had to educate the search to recognise such terms and associate them either as synonyms or additional keywords with the content pages so that it returned the relevant pages. This was a daily activity that we had to do so that our own search could provide 'answers' to what customers were looking for.

Impact and benefits

Since the launch of the redesigned website, there have been significant improvements in the user experience and use of the website. The number of website users has doubled, with them spending significantly less time getting the answers they need. Onsite use of the search has also gone up to 4.3% since launch, which we understand is a respectable norm amongst sites that use their own search. Customers have lauded the website for being responsive, intuitive and customer-centric.

The redesigned MOM website has contributed significantly to MOM's efforts to improve our digital service delivery, enhance customer experience and help customers help themselves.

Next steps

MOM is now exploring the personalization and contextualization of the search function, and the development of a consistent search experience across their various interfaces such as the website, eservices and mobile interfaces.

8) NEO KIM HAI

Implementing a KM Portal at Singapore Power

The organization involved

Singapore Power (SP) Group, a leading energy utility company in the Asia Pacific, embarked on a knowledge transformation journey, to have their own online company-wide community for about 3800 employees to share and learn from each other.

Case background and intent

Utilities companies face a challenge of retaining the expertise of their mature workforce. To be a professional engineer with deep expertise in a particular field of electricity and gas requires more than 10 years of experience. As these professional engineers retire from the workforce in the next 5 years, there is a need to capture, retain and transfer the knowledge to the next generation of young engineers.

Knowledge from these professional engineers on the ground was previously not captured in any form, but passed on verbally to the younger engineers. As such, there was no form of repository or database that engineers could refer to for any situation, but they relied on phone calls or seeking help through peers.

The work done

The Knowledge Management Centre embarked on the effort to capture this knowledge through interviews, workshops, and on-job-training with professional engineers. The knowledge captured is written into knowledge artefacts as well as videos which are stored into the KM system for all engineers to access.

With the launch of the KM system, SP employees have an online platform to enable relevant knowledge to be retained and made easily accessible, through mobile devices and anytime, anywhere. Within the system, employees are also able to network, discuss work-related issues and share best practices in different communities of expertise. The system also enables engineers to do searches to locate asset documentation and operating procedures, which previously was in disparate systems or local drives.

Challenges and lessons learnt

The challenge was the barriers of engagement of our pioneer engineers. While many were willing to share, there was a number who were uncertain about the process.

Impact and benefits

One unified system to store all process and procedural document ensures that engineers comply and follow checklists and guidelines during ground work. This ensures that process guidelines are followed and employees' safety are put at the highest priority when following these steps.

Engineers have also seen benefits through the process of capturing explicit and tacit knowledge from professional engineers, who are their seniors. They have gained competency in interview skills as well as obtaining first-hand experience learning from engineers who have been through tough times or challenging incident cases.

Next steps

So far, we have only covered one of the key business units of Electricity and Gas Operations and we would be planning to start with the other business units. Meanwhile, we will be looking at the larger scope of how to further leverage the platform for digitizing our workplace.

CASE STUDY CAFÉ

DAY 2

You will be able to attend in-depth table discussions on three of these cases on Day 2. The case outlines are provided to help you decide which case discussions you would like to attend.

9) CHRISTOPHER KHOO

Applying Multi-Document Summarization Tools in the Singapore Memory Portal

The organization involved

The focus of the case is on knowledge organization, summarization and visualization of content in the Singapore Memory Portal (SMP) to support user learning of cultural heritage topics. The SMP is a crowd-sourced online heritage portal set up and maintained by the Singapore National Library.

Case background and intent

Current online heritage portals are organized based on records, collections and internal knowledge organization schemes that do not support user browsing and learning. Consequently, online heritage portals are not much used by the public and a major concern is how to engage public users. It is not known what kinds of knowledge organization, information processing and interface design can support user learning in a heritage portal.

This also raises the question of what is user learning and what can users learn from a heritage portal? From a knowledge organization perspective, the question is how to derive a user-oriented knowledge organization scheme to support user learning.

These issues of learning, knowledge organization and interface design apply also to other kinds of social media content (e.g., product reviews and drug reviews), as well as to document repositories (e.g., digital repository of research reports).

The work done

A group of students was asked to write essays and draw mindmaps on a number of heritage topics, based on records retrieved from the Singapore Memory Portal, to find out how users structure the content to synthesize a coherent understanding of each heritage topic. From these essays and mindmaps, a set of ontology relations was derived, which was used to produce a mindmap of the related information available on a heritage topic.

A simple text categorization program was implemented to categorize sentences from records retrieved from SMP on a topic, into the ontology relation categories. This sentence categorization was based on cue words that were associated with the ontology relations. A prototype Web application was implemented to display a mindmap of extracted and categorized sentences on a heritage topic, using a data visualization javascript library, D3.js, that can run on a Web browser.

Challenges and lessons learnt

The study found that useful knowledge structures can be derived from performing content analysis and discourse analysis of user essays and mindmaps. These knowledge structures reflect the mental structures users impose on the available information to construct a coherent understanding (i.e. make sense) of information retrieved from a portal.

The biggest challenge was implementing the knowledge structure in the portal system, especially when developing a program to perform automatic sentence categorization into the categories. The existing method of using simple cue words was inadequate. It was also not known what was the best way to present the summarized/categorized information to the user, whether in a graphical presentation or text summary. User studies were needed to find out to what extent these visualizations or summaries helped the user to learn from the portal content. It was clear that such a project needed a multidisciplinary development team, including programmers, KO specialists domain experts, and user experience designers.

Impact and benefits

Currently, online heritage portals are not well-used by the public. It is hoped that this project will result in a Web application that will encourage the public to explore and learn from the Singapore Memory Portal. If successful, this approach can be extended to other types of heritage portals, and social media content.

Next steps

The work that we are doing now is focused on improving the automatic sentence categorization, developing a clustering program to cluster sentences with similar content and investigating different ways of presenting the summarized information graphically as well as in a text summary.

Future evaluation of the application will involve experiments to find out whether it supports user learning, and helps students to write essays on heritage topics.

10) DUC NGHIA PHAM

Knowledge Modelling and Data Mining to Develop High-Risk Passenger Profiles for Border Control

The organization involved

The Artificial Intelligence Lab in MIMOS Berhad is focused on research, development and commercialisation of AI technology developed in-house. We have 30 people in the lab, comprising of applied researchers, knowledge engineers, software engineers and business analysts. The objective of the Enforcement Division of Malaysian Royal Customs is to combat all forms of smuggling and fraud in an efficient and effective manner to ensure that all laws and regulations administered by the Department are fully complied with. With this, the revenue of the country and its security are protected without disrupting legitimate commercial transactions.

Case background and intent

The objective of the system is to enable the Customs Intelligence Department (Enforcement Division) to use the information they already have, together with information from social media as well as other sources to identify high-risk passengers in relation to drug smuggling. Before the implementation of the system, trained officers identified passengers for secondary inspection via observation of their body language. Also, at times they get leads from their counterparts from other countries on these high-risk passengers, as well as targeting specific flights. This is an ongoing project jointly funded by MIMOS, KASTAM and the Ministry of Science, Technology and Innovation Malaysia. For the first phase, we are implementing it in KL International Airport. Subsequently, there are discussions for rollout to all entry and exit points in Malaysia.

The work done

We implemented a data and knowledge harvesting engine to gather data from social media, databases and linked open data. Our natural language processing engine would transform these unstructured data into a knowledge graph. Our rule-based engine would then utilise the information to infer relationships between entities in the harvested data, and we developed a Visual Social Network Analytics system to enable the Customs Intelligence officers to conduct investigations based on all these collected data, information and knowledge.

We used Java framework for the application server, semantic technology and semantic graph database for managing the metadata. The knowledge base was compliant with W3C standards. This project was innovative because we used knowledge harmonisation and knowledge fusion, parallel processing of large-scale knowledge graphs for visual social network analytics and data mining to identify common patterns of high-risk passengers.

Challenges and lessons learnt

A key challenge was the handling of sensitive data on individuals. We utilised data encryption technology to hide the personal information, while still enabling us to utilise them for data mining activities. Also, we placed our staff onsite, since some of these data could not be taken out of the premise.

It was essential to understand clearly how the stakeholders wanted to utilise the system, and build the system to fulfil their requirements - make it simple to use and automate as much as possible.

Impact and benefits
We were able to understand the patterns of high-risk passengers, automate the collection of publicly-available information about entities of interest, and harmonise and fuse all this information into a single connected knowledge graph that could be used for further analysis. Without combining the harvesting, harmonisation and semantification of all these data from social media, linked open data and other databases, together with technologies intelligent inferencing, as well as data mining technologies for pattern recognition, it would have been difficult to achieve what we have demonstrated.

The key success factors were stakeholder engagement prior to the start of the project, during the business analysis phase and when evaluating the functionalities of the system, and continuous improvement based on stakeholder feedback.

Next steps
This is an ongoing project. It will be completed end of 2017. Upon completion of this phase in Kuala Lumpur, the plan is to roll the system out to all entry/exit points in Malaysia. This will be beyond 2018.

11) JAMES ROBERTSON

Innovative Intranets with Taxonomies

The organization involved
The Intranet Innovation Awards are now in their tenth year, and they have uncovered remarkable workforce-oriented solutions from around the globe, from organisations of every type and size.

Case background and intent
While there is a basic challenge of managing and maintaining information within organisations, taxonomies are best used to address more visible challenges including:
  • How do we make the most of the information we already have?
  • How do we get business value out of enterprise information?
  • How do we connect information with the people who need it?

The work done
Many organisations have attempted a purely user-led approach to taxonomies, such as enabling tagging on content (folksonomies) and then waiting for 'order to emerge'. These entirely organic approaches have almost universally failed.

Instead, successful approaches to taxonomies in intranets have targeted business value, and have harnessed user motivations. They make information visible, and use delightful user experiences to empower participation.

This case will share screenshots from four winners, including one entry from this year's Awards (shared here for the first time):
  • IMF (International Monetary Fund)
  • Bennett Jones (mid-sized Canadian law firm)
  • IDEO (global design thinking consultancy)
  • Accenture (global consultancy & technology firm)

Challenges and lessons learnt
Ten years of the Intranet Innovation Awards has surfaced a number of key lessons learned for the use of taxonomies within the enterprise:

Make Information Visible
There is power in surfacing data and content that are usually hidden away within databases and systems. Not only does it allow the information to be used, but it demonstrates its value, and gives people a real reason to contribute and maintain the information.

Embed Taxonomies in the Business
 Make information management an integral part of how the organisation works, enabling a real business case to be developed, and encouraging sufficient investment.

<u>Harness Culture and User Motivation</u>
Go beyond the usual organisational drivers to harness the real 'what's in it for me' factors for users. Make cunning use of cultural drivers and idiosyncrasies.

Despite the successes, taxonomies still need to gain much wider use across organisations. There is also a significant up-front investment required, which is a barrier for many teams and projects.

Impact and benefits
In each of the four examples shared from the Intranet Innovation Awards, there have been significant benefits:
- In the IMF, the 'All About a Country' solution underpinned rapid cultural change at the height of the global financial crisis.
- Bennett Jones used their taxonomy-driven precedents solution to enable real knowledge reuse, something that's eluded most legal firms.
- As the recognised leaders in innovation, IDEO needed to bake knowledge into the daily working practices of staff, which their solution did.
- The 'Collections' social-bookmarking solution at Accenture has already curated 170,000+ items from users in 46 countries.

Next steps
The IMF built upon their early successes to substantially revamp how they create, review and publish their key 'knowledge exchange' documents, which are a central part of the 'All About a Country' solution.

Accenture is still in an era of rapid innovation of their 'Collections' solution, and they are finding new uses and benefits every month. They are also continuing to refine their solution, and the dynamics of user adoption.

Every year brings new entries to the Awards, and more examples of taxonomies in action!

12) DAVE CLARKE

Using a Taxonomy Management System to Achieve Distributed Governance for Taxonomy and Metadata in a Global Enterprise

The organization involved
Synaptica has developed federated taxonomy management and governance methodologies and systems on behalf of a number of global corporations in both the product and professional service sectors.

Case background and intent
A number of our clients approached us with a common challenge: at the global level the enterprise wants to unify and harmonize its use of taxonomy, but at the level of national and regional operations, individual business units produced valid reasons why a universal enterprise wide vocabulary would not meet their needs. Before our solution, individual businesses developed their taxonomies autonomously. To achieve knowledge sharing, these independently-managed schemes needed to be mapped, which was both time consuming and costly.

The work done
Synaptica proposed a methodology and developed prototype systems which were tested by our clients. The systems have been refined for over a decade, and are currently in use by a small number of large corporations who require a federated approach to taxonomy management and governance.

After developing the methodologies and workflows in conjunction with our clients, we then created data models which resulted in the need for new semantic relationship classes that could support the federated model. This was developed within the Synaptica enterprise taxonomy management system. The federated taxonomy system was specifically designed to minimize the time and cost of taxonomy construction and maintenance, as well as to produce outputs that would conform to controlled vocabulary standards and the specifications of the business unit stakeholders.

The high-level design involved four solution components: (i) create a common taxonomy that would serve the needs of the global enterprise; (ii) allow operational business units to adopt this system 'as is' where it meets their needs; (iii) provide

operational business units with the means to customize the enterprise taxonomy by storing their organization's exceptions and extensions in the form of alternative preferred terms, alternative hierarchical structures and concept extensions; (iv) provide a mechanism for merging the common enterprise taxonomy with a specific operational business unit's exceptions and extensions.

The federated solution involved substantial innovation in methods and systems because the business needs of our clients could not be satisfied by standard knowledge organization systems models. While the way that the constituent components of the federated taxonomies were constructed was not supported by industry standards, the actual output delivered to consuming systems did comply with traditional controlled vocabulary management standards, such as ISO 25964.

Challenges and lessons learnt
From the technical perspective, the primary challenge was to design a data model and functional requirements that would support a separately maintained common taxonomy scheme along with business unit specific extensions and exceptions, and then to handle the merging of these components to create a compiled business unit taxonomy. This challenge was resolved over a few weeks through close collaboration with client organizations, including the review and approval of data models and prototypes.

From the human perspective, the primary challenges were to train taxonomists to use the federated taxonomy management model, and to train stakeholders within the enterprise to adopt first and adapt second. This adopt first principle helps the enterprise to reduce time and costs by leveraging the global enterprise taxonomy. The adapt second principle allows each business unit the freedom to describe their content using the terminology and browsable structures that each business unit feels best reflects the language and organizational structures that are familiar to their stakeholders.

The general advice we would offer to any enterprise is to try to create a common enterprise wide taxonomy through broad engagement and consensus. However, where an enterprise has a federated organizational structure with heterogeneous content and user communities, then it is appropriate to reflect that diversity within the knowledge organization schemes.

Impact and benefits
The solution enabled users to search and retrieve content with consistency across an entire enterprise even though different business units used different terminology to describe their content. It also reduced the taxonomy development and maintenance costs in comparison with alternative models such as the maintenance of fully independent taxonomies mapped together by crosswalks.

Next steps
This year, Synaptica will review how our data model fits with emerging standards and we may promote the general principles of the model for adoption by selected standards organizations.

13) MATT MOORE

Building Taskonomies and Delivering Information in Context with Panviva SupportPoint

The organization involved
The offshore hub (back and middle office) of a large bank that manages all high-value commercial and institutional transactions, deposits and lending.

Case background and intent
The bank's central repository, used to store and share all collateral and operational process documentation, had limited search functionality and users often took an excessive amount of time to locate what they were looking for. Employees, especially those unfamiliar with their search subject, or from a different team, had to rely on guesswork and trial and error to find the right process document and all the information they needed to know. This limited content search functionality reduced employee productivity and the errors the lack of information created increased cost and business risk.

The offshore hub has a diverse team of over 750 people located in several countries working on complex multi-currency transactions, using more than 50 system platforms. More generally, the smallest implementation of SupportPoint is a 10-person contact centre and the largest is 20,000 people in a financial services firm.

The work done

We mapped out the processes and reviewed the existing documentation. The systems were reviewed to identify connection points with context sensitive help (CSH). We also employed a range of methods such as process mapping, participant observation and staff interviews. These inputs were used to create customer journeys i.e. the tasks a company needs to perform in order for the customer's requirement to be met, provides a different context for tasks.

The customer journeys provided immediate visibility of which tasks contributed to the customer's journey, and which didn't. This helped to reveal and re-classify the tasks which had critical path importance for the customer. The customer journeys also highlighted additional tasks that were required but not captured in the business process flows such as enquiries, communications and reporting. The handover points between teams were also made obvious. For instance, when a procedure is triggered by the completion of procedure by another team and notification is not automatic, delays were happening.

The technology implemented was SupportPoint. CSH keywords were linked to specific applications and processes – ensuring that the content was raised at the right point! The use of CSH to link particular activities to specific documents was innovative.

Challenges and lessons learnt

A key hurdle was the sheer volume of source documentation. There were over 900 Word documents, some stretching to hundreds of pages. A script was used to automate the ingestion of content.

We learnt that it was important to drill down to the procedure level and identify each required task. We ran whiteboard sessions to identify the required procedures in a new business process. We identified a number of additional procedures that had not been identified previously and needed to be added. At a process level, this simply would not have been identified until their absence was discovered, live.

The other key advice we would offer others is early engagement. End users should be involved at key stages in the development cycle. This ensured that our understanding of the procedures and their context was correct. Next, those who would be undertaking document authoring activities once the system was live should be involved in content development. In addition, IT should be engaged early to ensure the screen metadata needed to make CSH work was identified and included in the content development process.

Impact and benefits

Within weeks we had converted long, complex documents with hundreds of thousands of words into succinct and precise banking procedures in SupportPoint. The easy navigation and consistent structure of the SupportPoint content also enabled newly hired staff to easily 'self-serve' and learn on-the-job, reducing the need for lengthy, often expensive, training and significantly reducing the time to competency. This also meant that management could easily move staff into new roles to meet business cycles and unexpected customer demands – or to provide fresh career opportunities to senior staff.

We knew that the project made a difference because a baseline of performance was taken before the project started and the results of the project compared to the results. Care was taken to map the benefits to the project itself.

The project achieved success because there were lots of internal demos to ensure all stakeholders understood the approach and were behind it. We tried to work smarter, not harder through the use of script-based automated content loading. And we stuck to the 'keep it simple' principle. The SupportPoint approach included a granular approach to tasks, so the user only had to read the information they required for that business activity. This did not necessarily require duplication of procedural information, merely separation. Separate tasks were clearly identified, often within a single procedure, so the user could easily navigate to just the steps they required, without scanning and ignoring content unnecessary for the business activity.

Next steps

Our focus is increasingly on API integration where we surface our content in other systems or use those actions in those systems to trigger events in SupportPoint. This will increase the connectivity between staff and the information that they need and broaden the audience that can use this information to achieve their goals.

14) PATRICK LAMBE

Developing Faceted Taxonomies from Knowledge Maps

The organization involved

This was an international property development company.

Case background and intent

The company wanted to improve the way that its different teams collaborated and shared knowledge around major programmes and projects. Teams were used to working with shared folders with restricted access rights, and inconsistent or non-existent naming conventions for folders and files. Some had moved to SharePoint, but had simply transferred their shared folder structures to SharePoint document libraries. The lack of visibility into resources available in other departments meant that staff spent a lot of unnecessary time tracking down resources through colleagues they knew in other departments, or in reconstructing resources from scratch.

The work done

We conducted a knowledge audit for the client, building knowledge asset maps around the key activities of all the departments. This provided a "current state" set of descriptions of key knowledge and information assets across the whole company, associated with their key activities.

We used a framework for describing knowledge assets that made it easy to decompose the knowledge maps into taxonomy facets describing activities, document types, project types, property types. The maps were created in an online system that made it easy for the departments to browse one another's maps and indicate which knowledge assets would be useful to have access to. We built the taxonomy around the knowledge assets that were identified for sharing, which (a) helped to focus the taxonomy on truly sharable assets and (b) did not have to describe the entire universe of information content.

The innovative component of this project was the use of online knowledge maps to help focus the taxonomy on a shared knowledge base.

Challenges and lessons learnt

There was some resistance at the beginning to participating in the knowledge mapping workshops because of the attitude that each department was different, and had little potential to share. Once they were able to review their peers' knowledge maps, however, they realised that the potential for sharing was much greater than they had expected.

Lack of initial widespread buy-in meant that participation was incomplete, and it took longer than expected to show the value from a shared taxonomy. We might have completed the project in a quicker period if we had targeted one division that saw the value of the project and used that as a demonstration project to show the value to other divisions.

Impact and benefits

The organisation now has a taxonomy that allows them to describe the information and knowledge resources they require to perform their work in a coordinated and effective way across divisions. An unanticipated benefit from the knowledge mapping activity was the discovery that several divisions had a strong dependence on tacit knowledge embedded in the experience and historical knowledge of their staff. This meant that the taxonomy was able to describe areas of expertise for an expertise-finder system, and did not just describe information resources. The project was ultimately successful due to persistence and patience in the face of initial passive resistance from some parts of the organisation.

Next steps

The organisation is now working on setting up a governance system to be able to maintain the taxonomy and network of experts in a sustainable fashion over time.

15) AHREN LEHNERT

Establishing Governance for Taxonomy and Metadata - Trade-offs and decisions

The organization involved

The case study derives from experiences at multiple organizations in multiple industries. Generally, the organizations are large (5000+) and located in many regions.

Case background and intent

The example organizations typically operated in silos and were often fragmented. Multiple glossaries, term lists, and wiki entries had proliferated throughout each of these organizations, creating multiple and outdated versions of the truth. There was no single vocabulary and no central tool for implementing and managing this terminology.

The common objectives across these organizations were to provide authoritative terms and definitions and a single source for common terminology supported by a full taxonomy governance process, as well as to align business units and functions across the organization through a common vocabulary and shared content.

The work done

We implemented a global taxonomy for applying metadata to internal and external assets, and a taxonomy governance process for managing the taxonomy use across the organization. The technologies used varied across organizations and ranged from existing, internal technology applications to making specialized taxonomy management system purchases. Regardless of what technology was used to build and implement the taxonomy, governance principles and processes were put into effect.

Attempting to align business units and functions across the organization through a common vocabulary and shared content had not been done before. As the example organizations were typically siloed and often fragmented, developing a common taxonomy and governance across these groups was very challenging.

Challenges and lessons learnt

The challenge was adopting a single taxonomy approach, since there were competing methodologies for creating an "official" source for terminology, including a wiki. Advocates for the wiki noted that it was quickly built because it was crowd-sourced, but it was this very openness that made the terms list scattered and un-curated. Advocates for using search noted the speed to which you could get to a term, but changes to acronyms and definitions could only be made by the taxonomist, impacting agility. Competing agendas still remain, impacting the adoption of taxonomy by all groups.

Being too rigid with the taxonomy governance proved a stumbling block for adoption as users would rather develop a localized and rapidly deployed solution than engage in an enterprise-level effort impacting their speed to delivery. The resources needed to fully govern an enterprise taxonomy were lacking, leading to the taxonomist becoming a bottleneck for business processes. While taxonomy governance should be rigid to maintain taxonomy integrity and to deliver full benefits of term re-use, additional resources and more flexibility in the term addition process would help to make the solution more acceptable.

We would advise others embarking on the same journey to provide adequate resources to establish and govern the taxonomy. They should also push for projects which can show a quicker access to information through taxonomy use and provide a "quick win" to bolster support. Additionally, the project team should make sure upper management supports your taxonomy strategy and communicates this strategy and its benefits to management across functions and silos.

Impact and benefits

By implementing a global taxonomy and a corresponding taxonomy governance process within an organization, users can get to definitions faster than they were able to before and find content tagged with those terms. The application of common terminology allowed for the creation and reuse of assets to become a streamlined, governed process.

It is possible that users became better at managing their content by virtue of learning about the advantages of using taxonomy, but independent and disparate tagging efforts decreased with increased adoption of the taxonomy.

People in the organization like to see innovative solutions to challenges, and they like to see their concerns addressed. Information and knowledge management had been a chronic problem and the use of taxonomy provided improvements in content findability.

Next steps

The next steps include expanding the use of the taxonomy across the organization and functions. In addition, improving search with enhanced functionality highlighting the efforts to standardize terminology and bring content together with common terms. These efforts will provide improved search results and the ability to start personalizing and recommending content.

16) TOM REAMY

Using Content Analytics on Telco Customer Call Enquiries to Extract Meaning and Insight

The organization involved

This project was for a large global company that provides multiple services and products to the telecommunications industry and has added a variety of other industries. They have over 24,000 employees and made over $3B in revenue last year.

Case background and intent

The overall project objectives were to add new abilities to analyse customer support notes to provide insight into a wide range of issues that impacted the customers including why they were unhappy, what they were likely to do about it, and any system issues that impacted their customers. They also wanted an evaluation of the best text analytics software available.

The work done

We designed a proof-of-concept (POC) that gathered their complete requirements, researched the current set of 20 text analytics development vendors and selected the top two for a bake-off.   This was followed by an analysis of the content and user information needs. We then developed a set of taxonomies for call motivation and subsequent actions and then developed categorization rules for each node in the taxonomies. The POC then compared the results of the top two vendors and selected one as the winner. We looked at a variety of capabilities: auto-categorization, clustering, summarization, entity extraction, and sentiment analysis. We also evaluated the usability of the software. Text analytics software is uniquely dependent on the ability to model complex semantics and only a multi-criteria evaluation of accuracy in action and a measurement of effort levels to achieve that accuracy can produce a decision that is better than random chance.

Challenges and lessons learnt

The two biggest challenges were the size of the corpus (50,000 notes a day) and the incredibly poor quality of the text – multiple misspellings, creative syntax, and cryptic and chaotic "acronyms". The solution was to strongly separate the chaotic text from the stable logic of the rules. We did this by aggregating text variations such as the 40 different spellings of the word "transfer" into variables that could be manipulated by templated rules. Another challenge was the variety of vendor capabilities (no one did it all) and determining which features were truly important. The single biggest lesson was that text analytics required significant upfront research into both the content and users and that the best solution was finding the right balance of automatic and human effort which varied with the application and the text analytics feature.

Impact and benefits

The immediate benefit was to develop the foundation for a new product and process for the client that they could offer to their customers. The solution was to create a semi-automatic process that combined the automation of the software with the expertise of the support staff. The secondary benefit was to pick a text analytics vendor that was the best fit for their multiple needs and which supported the development of new capabilities.

Next steps

Following the POC, the client productized the solution and began shipping it to their clients. In addition, a second part of the project did an evaluation of the sentiment analysis capabilities of the selected vendor that looked at telecommunications customer forums that used the capture of negative sentiments to proactively uncover issues with different features of phones.

KNOWLEDGE ORGANISATION COMPETENCY FRAMEWORK

This competency framework was developed by Matt Moore in consultation with Patrick Lambe. It is intended to provide a simple self-assessment tool for practitioners working with Knowledge Organisation Systems (KOS) to identify their areas of strength and opportunities for improvement. It is indicative rather than exhaustive and we expect it to be developed further over time.

Rate yourself on the form overleaf, using the scale below:

- **No Experience** = I have no prior knowledge of this activity.
- **Basic Understanding** = I have an understanding of the concepts at work here (e.g. academic study or peripheral involvement in a project) but I have not successfully undertaken this activity.
- **Undertaken Successfully** = I have successfully undertaken this activity at least once.
- **Undertaken Repeatedly** = I have successfully undertaken this activity multiple (more than 3) times. I may coach others in how to undertake this activity.
- **Innovating** = I regularly undertake this activity and have developed new tools and techniques to improve its efficacy.

Once you have completed your self-assessment, we suggest that you identify the areas of greatest weakness **and** of most interest to your current role, and develop a simple action plan. Feel free to contact Matt Moore or the conference organisers for suggestions on self-development opportunities!

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After the conference, we will send a link to this self assessment as an electronic survey, and if you have rated yourself **Undertaken Repeatedly** or **Innovating**, and would like to volunteer to help others, you'll have an opportunity to do so there!

My area of greatest interest are:

My action plan to develop these areas is:

	No Experience	Basic Understanding	Undertaken Successfully	Undertaken Repeatedly	Innovating
1 KNOWLEDGE ORGANISATION SYSTEM (KOS) PROJECTS					
1.1 KOS business case creation					
1.2 KOS project management					
1.3 KOS stakeholder mapping and engagement					
2 USER ANALYSIS					
2.1 Developing user segments and personas					
2.2 Conducting user observation and interviews					
2.3 Facilitating user workshops and focus groups					
2.4 Developing and testing prototypes					
3 CONTENT ANALYSIS					
3.1 Conducting content inventories					
3.2 Conducting knowledge audits					
3.3 Modelling data structures					
3.4 Analysing content semantics					
3.5 Running statistical tests					
4 MANAGING SYSTEMS					
4.1 Managing Content Management Systems (CMS)					
4.2 Managing Relational Database Management Systems (RDBMS)					
4.3 Creating SQL queries					
4.4 Working with graph databases					
4.5 Managing Hadoop installations					
4.6 Using data visualisation tools					
5 DEVELOPING KNOWLEDGE ORGANISATION STRUCTURES AND FRAMEWORKS					
5.1 Developing and implementing taxonomies, thesauri or controlled vocabularies					
5.2 Developing and implementing ontologies					
5.3 Developing and implementing metadata schemas and standards					
5.4 Working with text analytics and autoclassification					
5.5 Working with enterprise taxonomy management systems					
5.6 Working with Linked Data					
5.7 Integrating taxonomies and metadata with search tools					
5.8 Building search based applications					

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