## The Future of IKM

Information and Knowledge Management faces interesting times. The internet and social media were just the start; many more changes - technological, economic, social and political lie ahead, and will affect the future of IKM to a greater or lesser extent. At the end of 2015, Metataxis and Realising Your Future ran 3 workshops and a small survey among participants at the IDIMC conference in Loughborough. The aim was to explore a range of the trends and issues facing IKM. About 30 people attended the workshop and 20 people filled in the survey.

As a stimulus for discussion at the first workshop we distributed a briefing document highlighting a number of trends, which could potentially affect IKM directly, but also the business context in which IKM will be operating in coming years. These trends are highlighted in figure 1 below.

Figure 1: Trends affecting the future of IKM
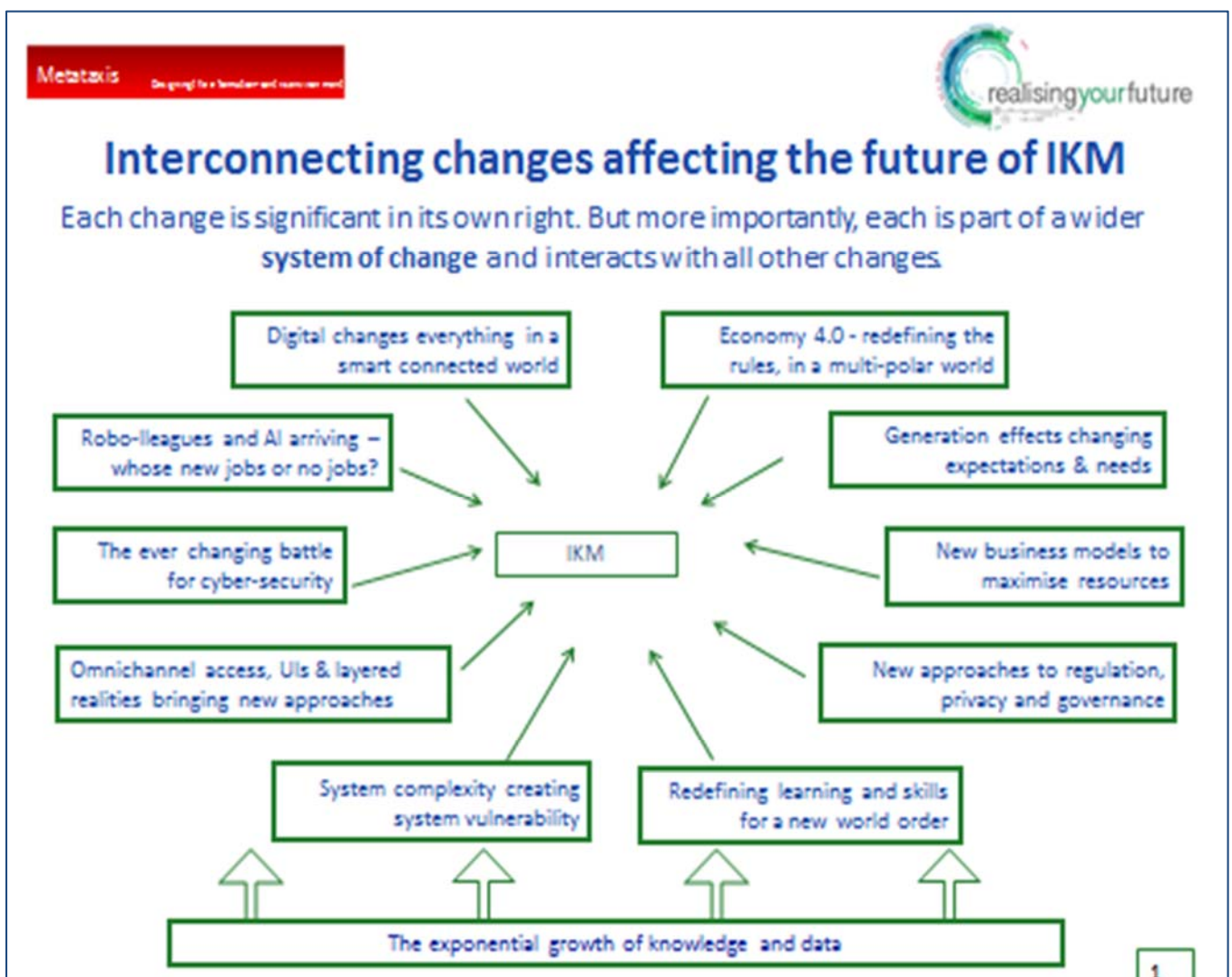
Open ended discussions at the first workshop, which we ran twice, highlighted a number of key issues, impacts and possible implications. From these we distilled a 'framework' for thinking about different contexts and circumstances in which IKM might be operating in the future. The north south axis indicated the locus of control- people versus organisations; the east west axis highlighted the power of algorithms as a dominant force versus people.

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Figure 2: Axes for vignettes
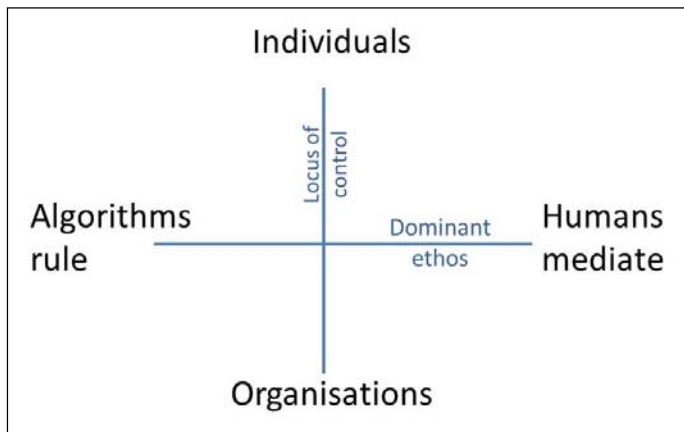
We then characterised each of the quadrants to reflect a context in which IKM might operate. The process reflected some of the principles of scenario development, but these were more 'vignettes' than scenarios. We then used the quadrants to stimulate discussions in the second workshop, which focussed on several questions:

- How will information and knowledge be generated and captured?
- What will the organisation of information and knowledge look like – i.e. how will we structure our information and data?
- What will information and knowledge sharing and access look like; how open will it be?
- What will information and knowledge governance look like – i.e. ownership, legislation, IP etc.?
- What skills will information and knowledge workers need?

Vignette summaries and discussions: Workshop 2 Future of IKM

Vignette A: Integrated identities

This is a context of radical transparency, with nowhere to hide for citizens or consumers, because of the all-encompassing and integrated nature of the ID^2. Service algorithms have become increasingly

sophisticated and big data analytics are enabling ever more finely tuned analysis of the growing mountains of data from the IOT, social media, online activity in general, app use and communications.
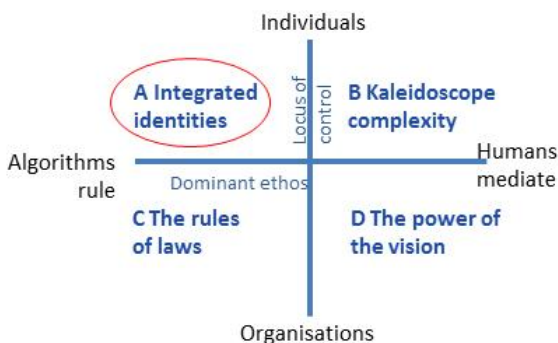
The centrality of ID^2 means that services are highly personalised and often targeted very locally as well. With high levels of personalisation have also come higher expectations and increased service standards, with the likes of Amazon all but anticipating needs. Me.org has become popular with consumers, as a result.

Companies are very much in the driving seat, setting the rules and standards with governments left trailing behind. And those standards are not consistent with different models in operation among different providers. Standardisation as an issue is not owned by anyone, and receives little real attention – competitive advantage being more important. Consumers meanwhile operate in blissful ignorance, presuming that all will be fine because convenience and personalisation are so good at meeting their needs

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The value of ID^2 and personal data is not disputed. Although technically consumers can opt in or out, they have very little real power to use or access that data, the systems are not open or transparent in that sense. Making the most of your data, understanding how to maximise services and access are, however, a major trait among canny consumers. As a result, there are widening gaps between the haves and the have nots, to the benefit of those who have the right digital literacy skills.

Opportunities abound to provide training and services in the relevant digital literacy skills to support companies and individuals.

Vignette B: Kaleidoscope complexity

This is a context of organised, or not so organised, chaos verging on anarchy. Suspicion, among citizens and consumers, of algorithms has led to the implementation of personal overrides, fine-tuning, and opt outs. Managing personal profiles and individual accounts has become a challenge for many people, with the onus on them to take the lead.
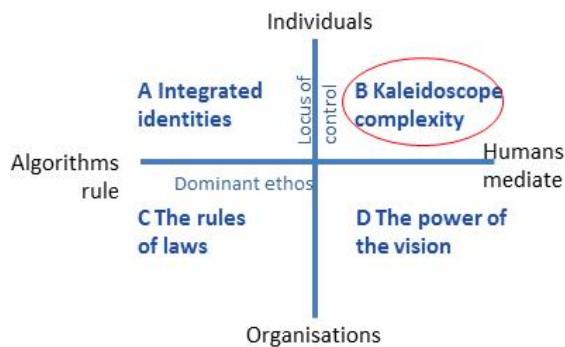
This suspicion has led to significant investment in security for systems and networks, so that consumers are willing to commit. The blockchain has become the prime element in those processes. As a result, personal / social networking is the dominant mechanism for organising and conducting transactions, with the trust based processes of the sharing economy at the heart of that, but backed up by the 'insurance' of the blockchain.

With responsibility on the consumer to self-organise, there is high demand for third party advice and services to manage those processes.

Vignette C: The rules of laws

Business is digital; digital is business. The growing capabilities of analytics and algorithms and the self-learning capabilities of those systems are creating the equivalent of a dark net, where data is power, and the big corporations are in control of that data and have developed competing systems and models. Efficiency is the name of the game.
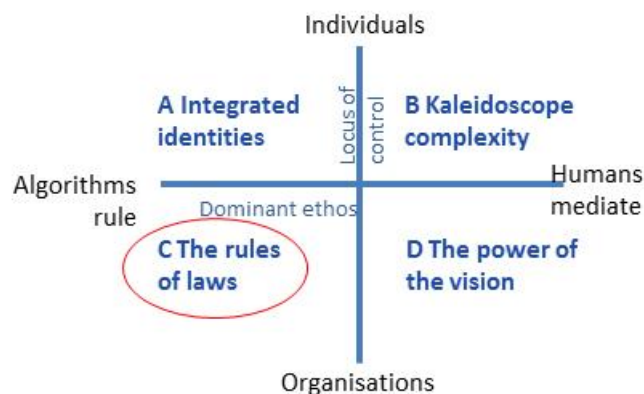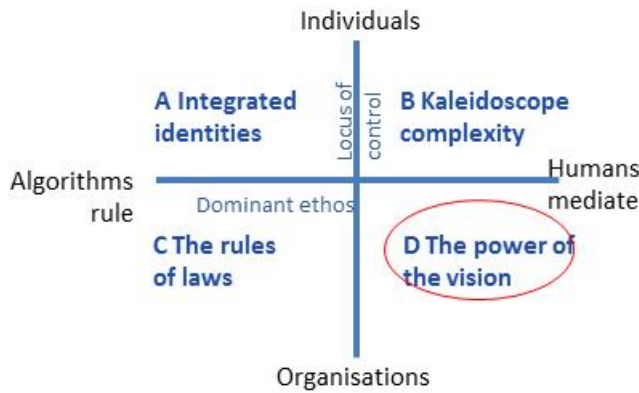
It is a very codified world, where soft skills and trust are in short supply and logic and systems drive decision-making dominates. Organisation are in danger of losing sight of the big picture because of over-reliance on and over-confidence in those systems, which despite the advances can still lack subtlety.

While it appears to be a stable efficient world, it may in fact be vulnerable, because of the lack of generalists and high levels of risk aversion leading to loss of judgement. The levels of complexity in the systems also mean that it is increasingly difficult to 'check the decisions' and follow the logic; the few who can and design the systems lack the real world experience to set their decisions in context. There is an additional danger that self-learning elements could also build in corrupted decision making processes.

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Vignette D: The power of the vision

Charismatic leadership is the order of the day, which has also created celebrity status for some. Groups and networks akin to tribes with partisan loyalty to the brand or organisation have proliferated. As a result, there are many levels and sources of vociferous vested interests, powerful cultures and ideologies within groups and organisations, but rising distrust between groups. That loss of trust in groups and systems, as a result of oversharing of information, and indeed system failures, has resulted in fragmentation and branded systems rather than the traditional, unified internet of the past. Organisations are a bit like city states and dominate how information is generated, shared and managed within the boundaries of their own systems; often resulting in high levels of transparency.

Quality assurance is also within their grasp, making consumers not only potentially vulnerable but bombarded by high volumes of data and information. There is a need for new forms of filters and controls, to manage and prioritise content, including sentiment analysis.

Cost structures in the wider economy have changed and employment has fallen radically, leaving people to find ways to survive and occupy themselves.

IDIMC conference outputs

The survey was based on a set of statements drawn from the input slides and the discussions from the three future of IKM workshops People were asked to rate the statements for impact and likelihood on a scale of 1-5, where 1= very low, and 5 = very high.

Figure 3: Impact and likelihood compared – high + very high only

High+ Very high impact and likelihood
Ranked on Impact
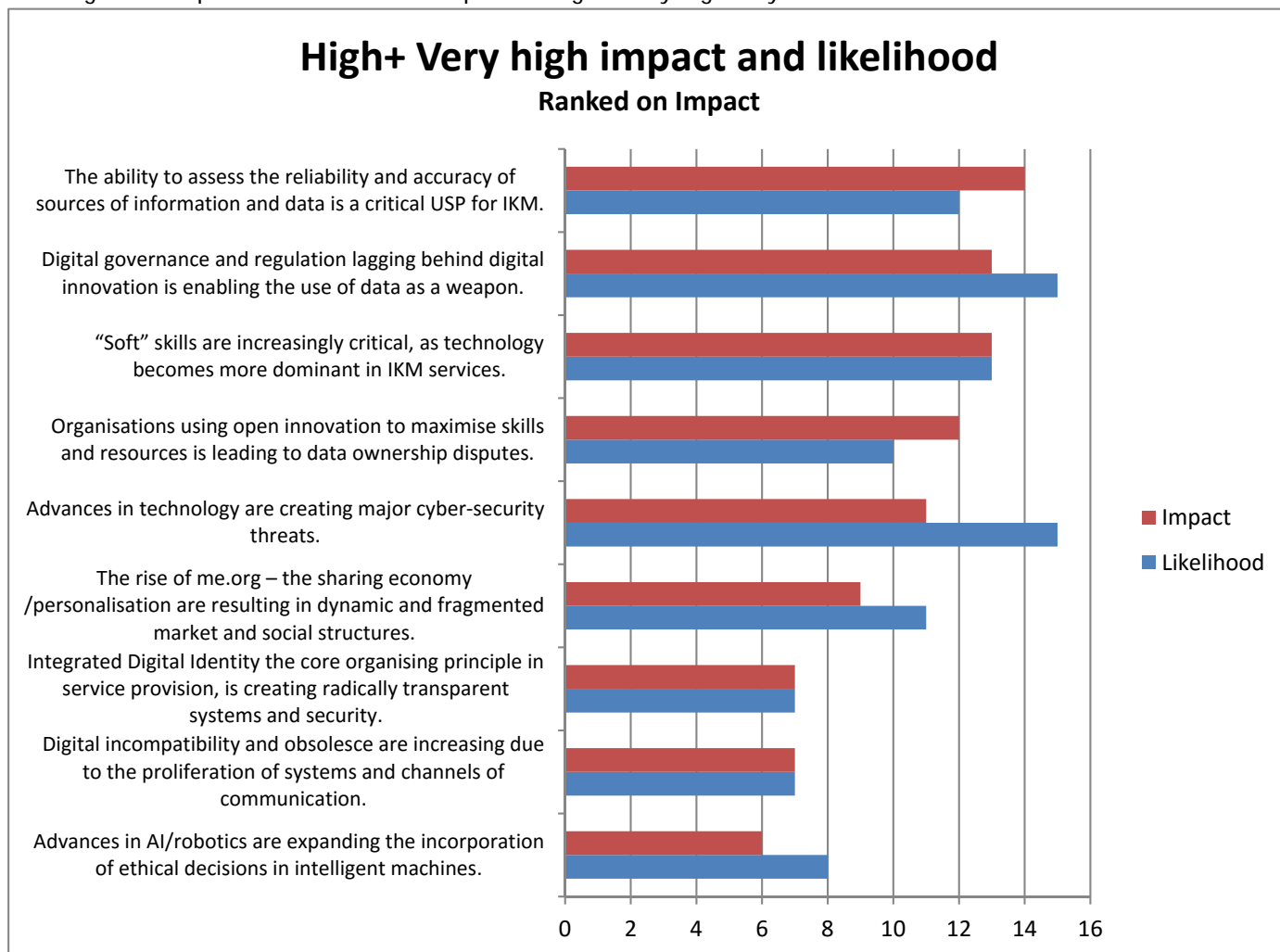
Participants discussed one of the trends and considered the impacts on: IKM in the workplace; IKM skills; IKM research; other.

Changes in governance needed

Governance and legislation are lagging behind the digital economy and technology development. The emerging gap could damage innovation. A range of pressures for change are building.

- Greater awareness, training and investment in relevant skills and procedures are needed at the organisational level. Every company should have a clear information strategy.

- With the growing reliance on technology and artificial agents, the wider ethical framework, human judgement and responsibility for quality and ethics becomes more critical.

- The increasing capabilities of data analytics will require greater data literacy as systems move from curation – i.e. what is, to what should I do which will require more management skills as well as knowledge skills.

- There needs to be more agility in the research process, in order to adapt to the expectations, greater competitive pressures and shortening timeframes in the economy. A 3-year PhD may be a thing of the past. Speed and quality will be critical.

- The web is like the wild-west, we need a social contract. The use of data, even if you want to keep it private it gets given to others especially the US government. Are companies or governments in control of the rules?

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- Guiding principles rather than rigid rules may be needed in order to enable more cross sector collaboration.

Cyber security issues could be disruptive

Customers implicitly expect all organisations to keep personal data secure, and rarely think about it till there is a problem. More security breaches could change those perceptions, as well as the prevailing governance frameworks

- Quality of cyber-security could become a major factor in customer choice of supplier, such that cyber security becomes an element of brand values.

- Companies may be required to reveal/ report data breaches. The question will be when – immediately before full scale is known, nor the potential impacts; or later, once it has been resolved, so that it becomes a 'good news' story to retain confidence.

- The growing levels of connectivity, especially the migration of data to the cloud and the development of the IoT, will be a huge potential threat to companies and individuals. The nature of those threats could change: rather than denial of service attacks, we could see attempts to distort the data, adapt it for other uses. Responses among the different players may vary.

- Disconnection could increase as people and systems go off line completely

- Organisations may resort to the deep web to be 'out of sight', with hackers being hired to run IT departments.

- We may see more training in memory development with special exercises (e.g. learning poems by heart as in the past) and the return of the typewriter, to enable the development of parallel, freestanding systems.

- Openness and sharing could reduce as a way to protect data, which in turn could damage research and innovation.

Interplay between soft skills and technology

The increasing sophistication of technology, AI, analytics etc., is reducing the perceived need for soft skills. And yet, at the same time it increases the need for them as a counter-balance, safeguard and because human soft skills are still not replicable in machines.

- Human soft skills needed include: enhanced design skills, problem solving, creativity, subtle understanding e.g. for effective, more complex translation, collaboration for remote / team working. Humans can understand context- how, and can we, get machines to understand context?

- Research into the use of soft skills in systems is needed. E.g. in system design what proxies can be designed into systems to reflect and replicate these capabilities? What, if any, are the ethical issues around the development of soft skills in systems?

- Soft skills affect how people perform, how effective processes and systems are. The paradox is that technology reduces the need for those abilities, but research indicates we need more. Training and recruitment procedures will need to focus on such skills more effectively.

- Human judgement remains a critical capability to avoid rigid thinking and outmoded mental models. E.g. with greater reliance on AI/ intelligent systems, could we see more backward looking inventions solving yesterday's problem; a Hadrian's wall of 'do it like this, resulting in gates that lead nowhere'. The knowledge we don't have is as important as the knowledge we

have. But recognising where the gaps are is difficult. (The unknown unknowns are a common concept in futures research, but got a bad reputation after Donald Rumsfeld's use of the idea in connection with the Iraq war.)

- Soft skills in open innovation. Data and systems will need to be more secure. It appears that the skills that are needed are vagueness and subterfuge to say something while saying nothing!