



SMART QUARRYING: *from the knowledge era to the conceptual era*

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One of the key tasks of the ***IQA's SMART QUARRYING Research and Development Project*** is to explore the transition from the knowledge era to the conceptual era. Where knowledge was once essential for leaders, IBM's 2010 Global CEO study cited 'creativity' as the most important leadership quality for the future. This is one of many signals that the business world is evolving out of the 'Information Age,' where left-brain technical skills, knowledge analytics and expertise were king.

With the rapid development of information technology, access to its powerful processing speeds / capacity, and the resultant abundance of business data, the stage was set for probably the most disruptive revolution in the history of commerce. The Knowledge Era was born in the late-20th century and changed the rules of the global business game. Not only was it a fertile platform for developing enabling new technologies, but it managed to double knowledge processing capabilities every 18 months (Moore's Law). Moore's Law is no longer applicable as processing power enhancement now significantly exceeds 100% every 18 months. Researchers and leaders are increasingly making the observation that it is no longer the speed,

accuracy and organization of processed information that is most important, but rather how we interpret it, what we do with it and how we make decisions based on it. This has re-focused business attention on the workforce skills required to creatively and effectively interpret and use knowledge. This has given rise to the notion in the early 21st century humanity entered into the Conceptual Era.

In the Conceptual Era human capacity to interpret, use and manipulate knowledge is key. The technology is no longer the key determination of progress but rather the primary enabler, and human capabilities will differentiate business performance. Given the speed of change and the complexity that results from this, we need to go beyond just knowledge or expertise. Hence, the birth of Big Data and the importance of analytics in businesses. By leveraging on the processing power of technology, analytics can be applied to the significant amount of data which resides in the IT systems of organisations to convert the disorganised data into meaningful information which provides useful insights into businesses. The use of analytics in business will be the norm and continue to provide the foundations for sound business decision making. The best employees of the future will excel at creative problem solving, open-mindedness, self-awareness and different ways of thinking. In my opinion, this shift refocuses on human intellectual capabilities as central to synthesizing seemingly diverse things together for better solutions amidst complexity.

The business world is at a critical point and to compete in tomorrow's market, today's companies must demonstrate more than knowledge or technical expertise: they must cultivate new skill sets that are more capable than machines. The valued leaders and successful employees of the Conceptual Age will be firing on all cylinders – and many will involve right-brain functions. To avoid extinction, employees must embody the kind of daily conceptual thinking that will enable their teams and organizations to conceptualize – and handle – the blessings and burdens of a new era.

Steve Jobs had much the same idea when he spoke about creativity. He stated that creativity was the ability to connect things. When you ask creative people how they did something, they feel a little guilty because they didn't really do it, they just conceptualised the 'coming together' of something. It seemed obvious to them after a while and that's because they were able to connect experiences and synthesize

new things. I think this indicates two things: first, in the midst of increasing complexity our human capacity to naturally adapt is being confirmed by developing 'new ways of thinking', and second, the measure of highly capable people is no longer the volume of what they know but rather how they create solutions and synthesize information.

Information work entailed following instructions and procedures, and logical analysis. Today's conceptual work improvises, synthesizes and is by its very nature creative. Conceptual work relies on pattern recognition, tacit knowledge and the wisdom developed from experience. This represents a big shift in not only the way we think, but more importantly the way we educate.

Many observers now agree that the nature of work and workforce capabilities are changing dramatically. Increasingly we are witnessing "workplace learning." This has been brought about largely as a result of the heightened awareness that the greater part of education takes place, not so much through traditional education, but as a result of experience, practice, conversations and reflection in the workplace. People learn mainly through doing rather than through knowing.

"I am enough of an artist to draw freely upon my imagination. Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world." Albert Einstein.

Lifelong learning as an all purposeful learning activity undertaken in an ongoing way with the aim of improving knowledge skills and competence is critical in meeting the demands of the Conceptual Era. My own experience of this strongly affirms the need for forward looking companies to embrace and encourage the notion of disciplined and reflective learning in the workplace. Traditional, one-off or sporadic formal education interventions no longer meet the need of corporate or are sufficient to develop a differentiating talent core competence. Lifelong learning is an imperative, a purpose, of modern life rather than just education received at school or later based on proficiency levels.

Certainly the majority of people do not embrace learning for the 'pure pleasure' of gaining knowledge. It is acknowledged that for most, the need to embrace lifelong learning is closely associated with our career advancement. However, if this could be

extended to apply to how employees 'choose' their preferred future, they would be far more focused on consistently upskilling themselves.

I am concerned, about the problem of the scarcity of talent in particular professions. For many it seems a contradiction in terms and something which is difficult to comprehend in a world saturated with readily accessible knowledge, unemployment and growing populations. In a recent study conducted by Oxford Economics and global HR consulting firm, Towers Watson, it was found that there are 40 million people in the economically developed world who are unemployed. This finding is confirmed by the International Labor Organization (ILO). However, senior managers commissioned to recruit staff frequently complain that they are unable to locate the most appropriate staff with the necessary expertise to occupy the vacant positions.

With the shift toward automation, artificial and increased workforce intellectual capabilities as represented by the Conceptual Era, it is incumbent that national governments encourage broader multi-national collaboration that spans geographic borders. Viewed in this 'conceptual' way, the ***IQA's SMART QUARRYING Research and Development Project*** will meet the challenges faced in this era, meet workforce demands and prosper. However, in order for this to happen the leaders of the Australian Quarrying Industry will need to enable environments conducive to thinking creatively, challenging long-held assumptions and most especially promote innovation.