IRAHSS 2010

International Risk Assessment And Horizon Scanning Symposium 2010

STRATEGIC ANTICIPATION: DEVELOPING EFFECTIVE STRATEGIES FOR THE FUTURE

SYMPOSIUM REPORT

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Raffles City Convention Centre, Singapore

International Risk Assessment and Horizon Scanning Symposium 2010

REPORT ON A SYMPOSIUM ORGANIZED BY
THE NATIONAL SECURITY COORDINATION SECRETARIAT
THE DEFENCE SCIENCE & TECHNOLOGY AGENCY AND
THE CENTRE OF EXCELLENCE FOR NATIONAL SECURITY

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This report summarizes the proceedings of the conference as interpreted by the assigned rapporteurs and editor of the S. Rajaratnam School of International Studies. Participants neither reviewed nor approved this report.

The conference adheres to a variation of the Chatham House rules. Accordingly, beyond the points expressed in the prepared papers, no attributions have been included in this conference report.

EXECUTIVE SUMMARY

The Third International Risk Assessment and Horizon Scanning Symposium (IRAHSS) was held from 15-16 March 2010 at The Raffles City Convention Centre. Jointly organized by the National Security Coordination Secretariat (NSCS) of Singapore's Prime Minister's Office, the Defence Science and Technology Agency (DSTA) of Singapore and the Centre of Excellence for National Security (CENS), a research unit of the S. Rajaratnam School of International Studies, the Symposium sought to further explore the concept of strategic anticipation and how it might translate into effective strategies for the future.

Events in the last 18 months saw the near collapse of the global financial system and witnessed the spread of life-threatening pandemics. These events underline, firstly, the importance of foresight or early warning systems. Secondly, in order to cope with fast moving complex situations and crises, governments need to enhance their existing strategic anticipatory processes and techniques. Thirdly, the trans-national nature of recent catastrophes highlights for governments and private agencies the criticality of multi-level collaborations. To this end, the symposium brought together an international cast of experts from both public and private institutions to deliberate on a wide range of security issues that either affects the way decision-makers engage in strategic anticipation or accentuates existing human cognitive biases. In a departure from traditional conference setup, delegates had the opportunity to test and challenge existing and emerging strategic foresight principles and models in open forum debates with speakers and fellow participants.

The symposium opened with a stock take on current strategic anticipation programmes adopted by international organizations. **Michael Oborne** highlighted for the audience the strategic foresight function of the **Organization for Economic Cooperation and Development (OECD)** and how it has tried to balance a growing appetite for long-term thinking with the need for international foresight to remain robust in order to deal with current-day complexities. Indeed, **Kristel Van Der Elst** mentioned in her presentation that scenario planning is essentially an intricate process and for the **World Economic Forum**, it is conducted in several phases that usually take a year to complete. She added that such a process ensures that a variety of scenarios and strategic options are studied and considered in depth. In a similar effort made to understand the global security landscape, **Mark Boden** noted that the **European Commission Institute for Prospective Technological Studies** together with the **Bureau of Economic Policy Advisers** had recently conducted a study to identify current, emerging and possible "wild card" trends/events. The results of the study were submitted to the European Commission (EC) as inputs for its policy agenda for 2010 and beyond. The focus on strategic foresight, however, does not suggest a purely technical approach. **Paul Ormond-James** stressed that for the **International Finance Cooperation** and through its experience with strategic anticipation, the great challenge was getting people to think about things differently. He opined that technology is not a solution but only an enabler.

The business community has a more circumspect view of strategic anticipation. Panel Two speakers were, in particular, concerned over the "illusion of control" that strategic anticipatory processes seem to offer decision-makers. **Rafael Ramirez** examined, for instance, the manner in which disabusing decision-makers of the "myth of rationality" might be a better way to

incorporate uncertainty and ambiguity into strategic planning. He was of the opinion that rational choice theory, which underpins conventional decision-making theories, denies the existence of any action other than the purely rational and calculative. Since complex contexts cannot be predicted or modelled with accuracy, he argued that rational models only provide "a false sense of precision" at best. Following from this, rather than perpetuating the rationality myth, better decision-making could be achieved through leveraging on plausibility rather than accuracy—as the latter has been shown empirically to not be a prerequisite for effective action.

Similarly, **Gerard P. Hodgkinson** demonstrated some of the psychological pitfalls that frequently lead to blind spots, cognitive biases and inertia in human reasoning, judgement and decision-making. Hodgkinson argued for a more nuanced approach to the design of such interventions that take account of the less conscious and more emotive forms of cognition and the psychological make-up of the individuals and teams who undertake horizon-scanning activities. By drawing on inter-disciplinary perspectives from the neurosciences to shed light on strategic decision-making, **Ianna Contardo** presented her concept of "Neuro-Strategy". She contended that although uncertainty is irreducible, what counts in strategic decision-making is a way of generating an understanding of the underlying factors that constitute either uncertainty or certainty. In contrast, **Anil Gaba** made the case for giving up the illusion of control and embracing uncertainty freely. He argued that by accepting the role of chance and trying to take advantage of the opportunities it creates, it is possible to attain more beneficial outcomes, a phenomena he termed "the paradox of control".

Strategic anticipation as both a concept and operational tactic took to the geo-political stage in Panel Three where speakers and participants explored possible future regional developmental and political challenges and threats. **Ian Bremmer** commenced the session by explaining the rise of state capitalism and its threat to global free markets. He expounded on his research concerning the rise of state-owned firms in China, Russia, Arab States and the Persian Gulf, and briefly examined how the growth in consumption by states like China and India would impact global affairs. **Richard O'Brien** continued the morning discussion by examining what he has identified as the critical uncertainties of the future directions of the global economy. It was opined that highly indebted governments, inflation, imbalances and structural flaws in the global financial system will persist as problems and influence both current and future economic scenario planning. **William Halal** explored possible areas of economic development further by considering the use of micro-forecasting and the advances being made in information technology (IT) and artificial intelligence (AI). He speculated that as globalization continues to increase, doubling world GDP by 2020, that there will be a magnification of threats or what he termed as a "global crisis of maturity".

Clement Bezold spoke on "Cyber-Democracy" and its implications for equity and sustainable development. He discussed, in particular, the "Aspirational Futures" method, which is an approach that combines learning about the future and its uncertainty with a vision that aims to consciously create preferred futures. It was also articulated that foresight work is not value neutral and very often does not consider measures that would alleviate poverty. **Sundeep Waslekar** similarly called for greater attention to be paid to communities living in poverty. In his opinion, recent climate change and terrorism-related issues are indications of a general failure to directly address chronic poverty and inequity. He stressed that poverty levels or the number of people living in peripheral areas has remained unchanged at 3.3 billion. From his perspective, this suggests a widening disparity between the rich and the poor.

In Panel Four, speakers spoke on innovative ways which strategic anticipation can be put into practice. **Michael Marien** led the discussion with a comparative study on old and new principles of foresight. He also explored ways to enhance current scanning methods. The work of figuring what is happening in the world is largely known as *anticipation* nowadays but Marien opined that this does not mean that horizon scanning is no longer useful. It is still an excellent sense-making method. **Barry Hughes** made a similar case for quantitative analysis. He noted, for example, that the International Futures (IFs) system combines 1700 data series from 183 countries, with the help of a combination of analytical models, to examine long-term and interacting global development issues. It was stressed that alternative scenarios could be attained through a broad integration and scan of a variety of data. With references to social projects conducted in South Africa, **Adam Kahane** explained the ways complex social problems could be handled and how the idea of a "change lab" could be applied to address various types of complexities. In contrast, **Riel Miller** argued that to better deal with complexities, it is necessary to change existing philosophies and methods of approaching the future. Specifically, he emphasized the need to accept that the world is random and complex, and as such, it is crucial to not be overwhelmed by the "delusion of control".

The possibility of using gaming applications for policy analysis and planning purposes were also explored during the symposium. **Igor Mayer** highlighted how "serious" gaming and simulation technologies could be utilized to generate possible outcomes or scenarios of, for instance, urban planning decisions (e.g. road and flood dyke layouts). **Larry Levy** had a different take on how anticipatory methods could be enhanced or innovated. He introduced the concept of "sentiment analysis" and explained how it can be used to track individual opinion holders employing different forms of media. While sentiment analysis is not a technology primarily aimed at risk assessment and horizon scanning, it was clarified that its use can be broadly applied to wide areas of interest. Levy stated that the purpose of sentiment analysis is not to provide answers, but to iteratively move us closer to the answers.

Finally, in closing, **David Snowden** provided a review of the ideas and lessons presented during the symposium. A key take away was that failure is a societal norm. He stressed that for too long societies have been taught to avoid failing. To which extent and in our control-based thinking, we have been trained or want to believe that super intelligent computers could control the complexities of the world. However, failures or errors are part and parcel of development and what makes societies dynamic. Hence, Snowden opined that it is better to understand our present and its evolution than to constantly prepare for a future that we can never know for certain.

For more information on the symposium's contents other than this report, speakers' presentations can be accessed at www.hsc.gov.sg

WELCOME ADDRESS

Professor S. Jayakumar, Senior Minister and Coordinating Minister for National Security, welcomed delegates to the Third IRAHSS, which is jointly organized by the NSCS, DSTA, and CENS. He stated that IRAHSS was organized to promote useful conversations about risk assessment and horizon scanning and provide a platform where an international audience can meet and hold in-depth discussions on the topic together. He emphasized that the importance of IRAHSS lies in providing the impetus for developing a common language and sense of purpose to futures thinking and strategic anticipation.

As today's environment is increasingly marked by complexity and uncertainty, Professor Jayakumar noted that the challenges posed are becoming more diverse and complex. Thus, its consequences are more difficult to anticipate. He added that today's challenges also have a larger geographical impact, have diverse natures and transcend national boundaries. He emphasized that the theme of this year's IRAHSS, i.e. "Strategic Anticipation: Developing Effective Strategies for the Future", does not only pertain to the current security concerns but also aims to address the complex challenges that a fast-changing international environment could give rise to.

Professor Jayakumar said that Singapore has realized the need to build up its strategic anticipation capability promptly and has successfully implemented scenario planning. Since its inauguration in 2004, the Risk Analysis and Horizon Scanning (RAHS) programme has expanded its focus to include a wider range of traditional and non-traditional security trends and concerns. The RAHS programme was also designed with strategic networking in mind. To this end, the RAHS programme has been utilized by and contained the contributions of analysts from the academia and beyond Singapore. The key objective of such an integrative approach is to bring partner agencies together to work collaboratively on issues of interest and towards a unique solution to the problems at hand. To this end, delegates were invited to deliberate on the symposium's theme and provide fresh perspective on strategic foresight.

In closing, Professor Jayakumar expressed his hope that delegates would make use of the opportunities presented by the symposium to learn and network.

WELCOME DINNER
SPEECH BY HEAD OF CIVIL SERVICE, MR. PETER HO

Mr. Peter Ho, Head of the Singapore Civil Service and Permanent Secretary for National Security and Intelligence Coordination, gave participants a brief historical perspective of Singapore's "accidental status" as a nation-state. It was also mentioned that past and recently encountered events—for example, the 2003 SARS Outbreak and the 2008 Financial Crisis—have highlighted the importance for states and organizations to be prepared for shocks.

The focus of the first IRAHSS was mainly on the tools that might help one think about the future better. The event was held in tandem with the initial development of the Risk Assessment and Horizon Scanning (RAHS) programme and system in Singapore. The challenge now is to have governments act on the outputs of scenario planning. It was opined that this would require the making of difficult decisions, and the re-diversion of resources, which governments tend not to do especially when elections are due. The symposium, therefore, is an opportunity to learn and understand the difficulties faced by other states and organisations in conducting foresight and horizon scanning.

Mr. Ho stressed that it is through networking and the sharing of insights that approaches and systems on thinking about the future could be better developed and improved. On this note, he thanked delegates for attending the symposium and emphasized the need to learn new ideas and approaches towards foresight and horizon scanning.

COCKTAIL RECEPTION REMARKS

Paul Saffo, a technology forecaster and consulting professor at Stanford University, gave delegates an overview of the challenges faced by futurists and in conducting foresight.

Saffo drew parallels with plate tectonic movements and stated in particular that we are living on a fault line or suspect terrain where a mix of old and new events, concepts and ideas coexist together. He opined that terminologies used by geologists such as fault lines, suspect terrain and underlying tectonic forces are useful metaphors that place the discipline of future studies into perspective. The 21st century contains echoes of the 20th century with events of the last decade yet to be fully comprehended and given a name.

Similar to understanding the underlying tectonic forces that give rise to earthquakes, the job of forecasters is to look in depth at existing conditions to determine how best to anticipate forces that are not in motion yet. Saffo stressed that it is crucial to focus on ways to improve existing foresight methods and utilise the opportunities presented by the conference to think about emerging forces and beyond that might affect our future. As such, he put forth several questions regarding the way the future could be perceived for consideration during the conference.

Firstly, Saffo mentioned that it appears that we have entered an age where no one uses the word *capitalism* by itself anymore—capitalism is always hyphenated or compounded with another term (e.g. Islamic-Capitalism and Entrepreneurial-Capitalism). It seems as if capitalism is going through a species radiation and, as a result, is morphing into multiple different orbs. Therefore, he questioned if we are witnessing the expansion of *capitalism*, or if *capitalism* is about to convert into something else. Next, it was highlighted that conflict in the Southeast Asian region seems to be winding down with the Indonesian authorities' counter-terrorism efforts. It is thus apt to think what is in store in the future after the war on terror ends. On the political front, Saffo also speculated that it is likely that Ukraine is going to be part of Russia within the next five years.

Finally, Saffo would like delegates to ponder over the negativity that has been attached to wildcards. They are often viewed with a large degree of pessimism. Saffo observed that it seems like pessimism is the "new black" and that it is fashionable to be pessimistic about wildcards. It would be ideal if there is a change in the way wildcards are perceived and the plausibility and influence of 'positive' wildcards are considered in the coming two decades. It was ventured that possible wildcards could take the form of: a) the middle-class citizens of India and Pakistan reuniting like they tried in 2007 and convincing their respective governments that it is time to settle the dispute once and for all; b) Mexico winning the drug war; and c) the successful large-scale storage of energy resources. On this note, Saffo urged both delegates and participants to actively seek answers, collect questions and deliberate on their future implications.

PANEL ONE
INTERNATIONAL ORGANIZATIONS: A SURVEY OF STRATEGIC ANTICIPATION PROGRAMMES

FORESIGHT AND DESIGNING POLICY: THE EXPERIENCE OF THE OECD

Michael Oborne, Director (Strategic Foresight), from the OECD presented on the shift in public perception and how it has favoured long-term thinking. In his opinion, this was a forced change that occurred in the late 70s and early 80s due largely to the energy crisis that marked the first serious efforts to think beyond the political mandates. This growing appetite for longer-term foresight was thereafter further accelerated by climate change issues.

Furthermore, the need for an international perspective is also due to the fact that policy considerations were now being cast as long-term issues such as the ones surrounding food security, pensions and health care. Economic systems are now so networked and interlocked that more than a national view is required. However, attempting to have an international perspective is a complex exercise; questions such as what to include in the analysis, time frames and other variables must be carefully considered.

As for the conditions that are crucial for success in long-term thinking, Oborne noted that it is important to firstly have a successful and credible track record. Secondly, substantial resources are required and therefore active networked and multicultural sources are necessary. Thirdly, it is necessary to have a senior person as a sponsor and to encourage stakeholder involvement in all aspects of the process. Last but not least, the results generated must be linked to and have some relationship to an action plan.

Oborne highlighted that the OECD rarely has the general public as its target audience; rather, it focuses more on governments and industries. He suggested that an understanding of the different needs of clients is crucial as what may be required may just be the restating of something already well known in a new context or the framing of an issue in an international rather than a national perspective.

Oborne concluded with a listing of the problems faced in this exercise. A difficulty that is commonly faced is the fact that there are multiple ubiquitous information sources. Hence, care is needed in analyzing the information. There is also a need to have a valuation of the foresight analysis conducted and he suggested that it may be useful to consider offering some sort of an evaluation tool to sponsors.

SCENARIO PLANNING AND STRATEGIC FORESIGHT ACTIVITIES OF THE WORLD ECONOMIC FORUM

Kristel Van der Elst, Director and Head (Scenario Planning Team), elaborated in her presentation on the scenario planning work done at the World Economic Forum (The Forum). She began by explaining that the World Economic Forum is a multi-stakeholder organization that brings together businesses and other constituents such as non-government organizations (NGOs). The Forum acts to bring together different industries with their stakeholders through annual meetings and is also involved in knowledge generating interactions such as the development of thought leadership. The Forum also works closely with universities and a large part of their work is in strategic insight, which involves looking at issues of competitiveness, risk and scenario planning.

In considering the rationale of being involved in doing scenario planning, Van der Elst noted that:

(a) Scenario planning is a good method or tool in situations where there is a combination of objectives in a project. Particularly when the issue has a high sense of complexity and uncertainty, it is useful in generating insight and making sense of complex issues;

(b) Scenario planning can be further used to build communities around issues. Many issues dealt with by the Forum are in need of multi-stakeholder reflections and action. Through scenario planning, the Forum is able to get people to discuss new ways of considering issues, obtain mutual if not common understanding and increase trust; and

(c) Scenario planning can be used to identify collaborative strategic options of how to deal with issues.

These rationales are used as a gauge in considering whether scenario planning is the right tool to use.

With regards to the approach taken in scenario planning, Van der Elst explained that leading experts in the field are brought together to ensure the relevancy of projects. The Forum adopts scenario planning as a tool to facilitate strategic discussions between stakeholders in a constructive way.

In general, the projects undertaken would generally take about a year to complete. The projects begin with the process of scoping, which is a stage where issues that a project is dealing with are identified. It then proceeds to a stage where issue prioritization is considered. Thereafter, scenarios are developed and attempts are made to ensure they are relevant through a significant amount of workshop-meetings. The completed studies are then published through the Forum's websites.

To date, the Forum has started a second scenario-planning phase where attempts have been made to translate options into actions. Beyond that, Van der Elst concluded that the Forum also has other foresight-related workshops and also hosts the Global Agenda Council of Strategic Foresight.

BUILDING STRATEGIC INTELLIGENCE TO ANTICIPATE GLOBAL CHANGES

Mark Boden, Head of Research Policy Mixes and Foresight Sector of the European Commission's Joint Research Centre, spoke on the centre's work on strategic anticipation. As an illustration of the work done by the Centre, which is primarily in the area of building strategic intelligence, Boden highlighted as a case study the key learning of a recent study commissioned by the Bureau of Economic Policy Advisers. This study was a follow up on a trajectory to bring qualitative and quantitative methods into foresight, unify the views of experts and underpin it with more robust strategic anticipatory methods.

(a) He noted that the study marked a concerted effort to enhance an understanding of the likely state of the world in the next 10 to 20 years and to provide input to the policy agenda of the European Commission (EC). It was also mentioned that the study was also conducted in part to provide for forward-looking approaches in policy. The underlying rationale includes the need to respond and adapt to new situations before they occur;
(b) the need to shape the future and to build on common understanding;
(c) the need for the ability to anticipate change and for this to be built into policy-making processes;
(d) the need for policy responses to current global challenges; and
(e) the need to anticipate future challenges and to transform them into opportunities.

As to the question of how the study was done, an extensive review of available literature was first undertaken. This involved the combing through of 150 recent foresight studies to identify current, emerging and rare trends/events. The authors of these studies were given a framework of six main areas, with 400 or so key issues; these issues were specific statements of what was occurring and covered specific emerging trends. The 400 issues were then subjected to an assessment where experts were asked to rank them according to their relevancy to the European Union and which were thought to be the most likely to occur by 2025. An opportunity was also given for issues to be added. From these responses, a complex set of data was extrapolated and analysed using the Robust Portfolio Modelling tool.

Once the analysis was completed, experts and policymakers were brought together in a workshop to further examine the challenges identified. The challenges were then grouped according to their level of urgency, actions required by the EC and the possible results that solutions to the challenges would reap. While the report is still going through revisions, Boden shared with the audience the three main challenges that report had acknowledged were:

(a) the issue of sustainable resources and the need to change resource consumption patterns;
(b) the need to adapt to changing demographics; and
(c) the need for more effective and transparent government.

Boden noted in conclusion that considerations are now in the pipeline for the EC to align and translate the sets of challenges into policies.

STRATEGIC ANTICIPATION—HARNESSING PEOPLE POWER

Paul Ormonde-James, Head of Global Intelligence, presented on the role of the International Finance Corporation (IFC) and the challenges the organization faces in harnessing human resource.

Ormonde-James began his presentation by providing a brief introduction of the role of the IFC. Being a global multi-lateral organization focusing on the private sector, the IFC's core vision is to assist and provide people with the opportunity to escape poverty and to improve their lives. With offices in 100 countries, Ormonde-James noted that while the IFC is well represented, it faces the obstacle of having to act locally whilst being a global organization. Turning to the topic of strategic anticipation, Ormonde-James stated that the main challenge which he faces every day is in getting people to think about things in different ways. Drawing on the parable that a fool with a tool is still a fool, Ormonde-James emphasized that technology is not the solution but only an enabler. As such, it is more important instead to encourage people to use tools to complement strategic anticipation and further on, to be able to get such information up the chain of hierarchies.

Ormonde-James highlighted that the added difficulty for most global organizations is dealing with people of different cultures, trainings and behaviours—all of which affect the way things and issues are perceived. He shared that the IFC tries to overcome this by keeping its focus on the individual in a particular market and in a particular region—collecting information and making decisions locally—while always bearing in mind that he/she is part of a larger structure.

As for decision-making, Ormonde-James noted that as matters progress up the hierarchy, they tend to become filtered. This becomes a problem when it is not known who is doing the filtering and this could result in a relevant piece of information disappearing from the system. In conclusion, it was opined that if organizations were able to successfully get their decisions right, it would have an impact and make a difference to the world.

DISCUSSION

A participant questioned the panel on whether they agree that in the area of risk assessment and horizon scanning, there is more focus on issues surrounding risk and threats rather than on opportunities. A panellist replied that during the recent financial crises, the appetite for looking at risk and systemic risk has become stronger. It was added that *opportunity* is something which those involved with foresight would have to learn to focus on so as not to be overly concerned with negativity.

Another participant queried on how one would generate interest and draw attention to work on problems that had not been commissioned by clients or sponsors. A panellist responded that there was indeed difficulty in

selling new ideas and the fastest way would probably be to do an interview with the Financial Times. Another panellist remarked that this was an interesting area to explore and that there was a need to structure a business model to deal with this issue.

It was also asked if the OECD had considered a situation where the two of the most powerful countries in the world, the United States and China, no longer believe in the validity of international institutions. A panellist confirmed that indeed a section of the OECD is looking at the viability of the organization, which at present has 31 member countries and 70 associate countries. At present the G20 is deemed candidly as "the flavour of the month" with countries such as China and India indicating an interest in regional institutions.

Finally, the panel was asked to comment on how they and their organizations deal with situations where their stakeholders have raised queries to assessments and conclusions that have unpleasantly identified mistakes in the actions of the very stakeholders. A panellist commented that all that can be done is to take a detailed look at the information at hand and from a partnership perspective, attempts should be made to share appropriate amount of information without overwhelming the partners.

LUNCH TALK
(SERIOUS) GAMING AND SIMULATION FOR POLICY ANALYSIS AND PLANNING

Igor Mayer, Director of the Delfit Centre for Process Management and Simulation, explored in his presentation and started discussions on the possibility of using gaming applications for policy analysis and planning purposes. He highlighted how "serious" gaming and simulation technologies could be utilized to generate possible outcomes or scenarios of, for instance, urban planning decisions and be applied to policy making at the strategic, technical and operational level.

Mayer stated that the concept of Serious Gaming is not something new, and that it has been used broadly in warfare and business management in the past. Over time, Serious Gaming has been applied and its function expanded to cover a wider area that included policy analysis. He cautioned that Serious Gaming should not be mistaken for game theory. He explained that Serious Gaming involves the utilization of computer games or its related techniques for specific purposes other than entertainment, such as emergency management, education and professional training. The importance of Serious Gaming lies in its capability to create a realistic picture of the world and provides users opportunities to learn through trial, error and interaction.

Mayer demonstrated how Serious Gaming can be used for construction and maintenance, and how it enables risk assessment and strategic anticipation. In the Netherlands' case, Serious Gaming is useful in mapping areas that are prone to floods and how water or drainage systems could be better managed to prevent flooding. Serious Gaming helped the Netherlands to plan ahead of a major water disaster and take into account different contingency plans. Likewise, during the construction of the Port of Rotterdam, Serious Gaming was used to train levy patrollers to handle and assess possible operational faults, and essentially prevent disasters. It was learnt through the application of Serious Gaming in both instances that Serious Gaming allows for manoeuvrability as users or stakeholders could plan their moves based on their own strategic orientations and intuitions. This marks a departure from normal computer games or simulation models programmed to function on a fixed set of algorithm or rules.

In closing, Mayer provided the following observations: a) vital and strategic infrastructures are crucial for the prosperity of modern society; b) infrastructure is a complex multi-actor system that requires strategic management and therefore, there must be a tool that can address this complexity in an integrated and holistic manner; c) Serious Gaming is ideal for the infrastructure management; d) Serious Gaming can help develop strategic thinking, tactical planning, and operational training; and e) modern technologies and virtual reality has a powerful potential in the field of public policy and decision-making.

DISCUSSION

A participant questioned the utility of Serious Gaming for training and operational activities, especially in a situation that requires agility. He elaborated that in a more strategic level, it is important to think quickly, change the movement, and adapt to a sudden change of environment. He asked whether there is a computerized template that you can instantly set up in short notice and tackle the contingencies in a flexible manner. Mayer replied that it is possible to use existing simulation models to perform such immediate function but added that in the case of military training, some companies may simply provide standard platforms that do not require sophisticated technology to generate standard scenarios in a short period of time.

Another participant challenged the validity of the results that Serious Gaming produces and how accurately it reflects the contingencies of reality. Mayer commented that Serious Gaming allows for interaction between people and takes into account counter-intuitive effects. Hence, over and above the generation of scenarios, we are able to create and understand new and emerging complexities through Serious Gaming.

Lastly, a participant sought the speaker's opinion on how people might be motivated to use and participate in Serious Gaming. In response, Mayer proposed that this could be done through invitation. He added, however, that there must also be some urgency in dealing with the situations at all times and that an authoritative figure could help to provide the motivation to engage in Serious Gaming.

PANEL TWO
BUSINESS SCHOOLS: DECISION-MAKING IN A COMPLEX WORLD

WHAT MIGHT "DECISION-MAKING" BECOME IN A MORE COMPLEX WORLD?

Presenting his co-written project with Jerry Ravetz, Trudi Lang and Angela Wilkinson, **Rafael Ramirez**, Fellow in Strategic Management, Saïd Business School, Oxford University, examined the manner in which freeing decision-making from the myth of rationality might be a better way to incorporate uncertainty and ambiguity. He was of the opinion that rational choice theory, which underpins conventional decision-making theories, denies the existence of any action other than the purely rational and calculative. Since complex contexts cannot be predicted or modelled with accuracy, he argued that rational models only provide 'a false sense of precision' at best.

Following from this, rather than perpetuating the rationality myth, decision-making could be achieved through leveraging on plausibility rather than accuracy as the latter has been shown empirically not to be a prerequisite for effective action. Deciding on plausibility would put greater emphasis on conversation and interpretation, asking questions more than seeking solutions, and attending less to "solvable" problems and more to seemingly "unsolvable" ones. With plausible decision-making, sense-making would be situated in loosely coupled, rather than tightly coupled, systems to better pool insights. In this way, change would be seen as the norm and decision-making would no longer be episodic and event-based, but an interactive design inquiry where ignorance and knowledge co-evolve and are tested and contested with scenarios.

Ramirez outlined two current ways forward. The first—"rationality extended"—focuses on improved risk assessment, probability and rationality. This involves relying on more data, memory, access to data, computing power, mathematical solutions, algorithms, and more modelling to inform decisions. The second—"meta-rationality"—focuses on plausibility, conversation, multi-framing, experimentation and sense-making.

Ramirez concluded that the method of risk assessment and horizon scanning has become too narrow in a complex world. He proposed the following ways forward for Singapore. Firstly, locate Singaporean research on futures around the world. Secondly, assemble a "*salon des futures refusés*", akin to the exhibition of art works rejected by a juried art show that eventually gave rise to the Impressionists. Thirdly, seek outliers and disagreements.

MENTAL MODELS OF RISK AND UNCERTAINTY: HOW THEY AFFECT AND ARE AFFECTED BY DECISION-MAKING

Gerard P. Hodgkinson, Professor of Organizational Behaviour and Strategic Management and Director of the Centre for Organizational Strategy, Learning and Change at the Leeds University of Business School, shared insights from his work on the nature and role of mental models and related cognitive processes in strategy formation, horizon scanning and the management of risk. Drawing on a range of examples from competitive strategy formulation, business decision-making, the assessment of risk in information technology and information security and multi-agency decision-making in major incidences, he demonstrated some of the psychological pitfalls that frequently lead to blind spots, cognitive biases and inertia in human reasoning, judgement and decision-making. Citing the example of coordination among the various branches of US security agencies, he noted that under acute pressure, multi-agency decision-making is likely to be undermined by the tendency for biased processing of strategically important information offered by "outgroup" members as a result of over-identification with "ingroup" members.

Drawing from the latest insights from social cognitive neuroscience and personality and social psychology, Hodgkinson argued for a more nuanced approach to the design of such interventions that take account of the less conscious and more emotive forms of cognition and the psychological make up of the individuals and teams who undertake horizon scanning activities. Firstly, on interventions for overcoming the dangers of cognitive bias and cognitive inertia, he noted that individuals must not only register the nature and significance of new events but also ensure that the strategic capabilities of the organization are re-aligned accordingly. Secondly, as moving from automatic to controlled, effortful processing is a vital prerequisite for cognitive change, techniques such as cognitive mapping and scenario planning can help by fostering multiple frame awareness. Thirdly, to address the unresolved issue of accuracy, intuition may be more useful for generating hypotheses to be validated with further testing.

In conclusion, Hodgkinson reiterated the following three points. Firstly, strategizing is more than an exercise in thinking; it is both an inherently cognitive and affective process. Secondly, cold cognition approaches to exploring mental models and de-biasing, predicated upon the computational perspective, are insufficient for sensing and adapting to change. Thirdly, individuals must be given time and space to surface and explore intuitive hunches and reconcile underlying differences of interpretation.

NEURO-STRATEGY®: DECISION-MAKING IN UNCERTAIN TIMES

By drawing on inter-disciplinary perspectives from the neurosciences to shed light on strategic decision-making, **Ianna Contardo**, Strategy Professor of the Institute de Empresa Business School, Spain, presented her concept of "Neuro-Strategy". She contended that a critical factor in the success and survival of humans lies in their ability to make effective strategic decisions. In order to achieve this in uncertain systems—whether economic, social organizational or psychological—desires and intentions of the agents involved in the decisional process need to be surfaced.

To this end, Contardo's Neuro-Strategy is a projective technique based on the fundamental premise that the human mind runs on valuation functions. As such, Neuro-Strategy offers the means to tap into the constructs that are building blocks of these functions and also the unconscious assumptions and values.

Each of these functions is a negotiating intermediary between the "outer world" and our "conscious-un-conscious minds". The intermediary produces abstract concepts like ideas, and also linguistic constructs and visual images.

As such, Neuro-Strategy seeks to project what is at the level of awareness and unawareness; synthesize the individual map of desires and strategic intentions; compare the maps between different agents to sort the differences and deep similarities that will produce a collective landscape; investigate the relevance of clusters of constructs with respect to the goal; surface the cognitive biases and contradictions that may run counter to the pre-established goal; and aid the creation of a sustainable method to prevent generalizations, deletions and distortions of information while addressing strategic decision-making.

The tools of Neuro-Strategy were summarized as follows. Firstly, observe and study all perspectives. Secondly, let people tell you what they do not even know. Thirdly, let stories emerge without priming. Fourthly, link ideas from the transcripts and prepare cognitive maps that outline the key constructs of the value function.

In conclusion, although uncertainty is irreducible, what counts in strategic decision-making is a way of generating an understanding of the underlying factors that constitute either uncertainty or certainty.

DECISION-MAKING WITH RISK AND UNCERTAINTY

Anil Gaba, Director of the Centre for Decision Making and Risk Analysis, Asia Pacific Institute of Finance, INSEAD, Singapore, made the case for giving up the illusion of control and embracing uncertainty. He argued that by accepting the role of chance and trying to take advantage of the opportunities it creates, it is possible to attain more beneficial outcomes, a phenomena he termed "the paradox of control".

Gaba noted that in the course of our daily lives, we are always looking to develop "models" to accurately predict future outcomes in most domains of our lives such as business, investments and even personal pursuits. The conventional wisdom underpinning socio-economic models is that the more mathematically sophisticated the model, the better we can predict and hence better control risk. However, studies have shown that simple models cannot predict with accuracy. Hence, we tend to fall prey to the "illusion of control" when we underestimate uncertainty believing that we can influence chance events by our actions by over-estimating predictability. He then claims that more could be gained by giving up control, resulting in the "paradox of control".

Gaba outlined two types of uncertainty. The first, referred to as "subway uncertainty", can be modelled and quantified. Examples include a coin toss and casino games. The second, referred to as "coconut uncertainty", is difficult, if not impossible to model and quantify. Examples include identifying which industry and when it will be considered a "disruptive technology" and also asset bubbles. He then contends that real life situations involve both kinds of uncertainty.

Two traditional approaches to thinking about judgements, risks and uncertainty were identified by Gaba. The first is the "normative approach" which focuses on how decisions should be made in line with the tradition of the disciplines of economics and statistics. The second is the descriptive approach which focuses on how people actually make decisions in line with the tradition of the discipline of psychology. He offered a third approach which he termed as the "prescriptive approach". This approach, he concluded, focuses on easy-to use and practitioner-oriented rules for better decision-making.

DISCUSSION

The panel was asked to comment on the adequacy of the profit-centred model for corporations advocated by most business schools in view of the recent global financial crises. While Gaba pointed out that business school curriculum has been evolving to include programmes beyond the profit-centred model, such as governance and social enterprises, he noted a tendency to focus on the strengths of the various models, not the conditions under

which they fail. Hodgkinson added that the emphasis of the profit-centred model in business school curriculum was also shaped by external factors. Of note is the ranking of schools for which the component of finance in the curriculum is given more weight than the others.

Given the strengths and limitations of each method of strategic foresight, the panel was asked to comment on strategies for synthesizing them for the purpose of policy making. On which model of research to employ, Ramirez suggested an iterative design inquiry where ignorance and knowledge co-evolve and are tested and contested with scenarios. Noting the need to recognize the limits to predicting the future, Gaba suggested augmenting current rational methods of foresight with human judgement. Moreover, he also cautioned against narrowly focusing on an ideal model but to apply the best of different models. Hodgkinson added that policymakers and social scientists collaborating on solving "wicked problems" together should be encouraged.

PANEL THREE
IN CONVERSATION: NEW CHALLENGES AND FUTURE GLOBAL ISSUES

TOP RISKS: EMERGING LONG-TERM POLITICAL TRENDS

Ian Bremmer, President of the Eurasia Group, United States, explained the rise of state capitalism and its threat to global free markets. He suggested that this does not mean that every country is going to be a state capitalist. Rather, we will see, as a result of the rise of state capitalism, an increasing non-polarity throughout the world. Subsequently, we will see an absence of international cooperation on issues like climate change and nuclear proliferation, or in areas of collective security like in Iraq and Afghanistan. There will then be less economic growth as a consequence of this and we will see more regionalization of capital flows and political integration. As an example of what is to come, Bremmer pointed to the problems that Exxon Mobil faced when OPEC was created, where Exxon Mobil had to shift away from being an exploration company to become a technology/management company. Bremmer argued that what has happened in the oil sector is going to happen across many sectors, and that in order to survive, flexibility will be essential.

Overall, the focus of Bremmer's talk was based on his forthcoming book *The End of the Free Market* in which he explains the international politics of the global economy in an increasingly non-polar world. The title of the book, he explained, came about as a result of a meeting in New York he had a couple of months back with the Vice-Foreign Minister of China. During this meeting Bremmer was asked: "Now that the free market has failed, what do you believe the appropriate role of the state in the economy should be?" Bremmer replied that just because there was an absence of regulation for banks in the United States, it was not necessarily the best idea for running an economy. It also did not necessarily mean that having the state act as the principal actor in the economy was a better way to run the economy.

In conclusion, Bremmer discussed the politics of global energy and geopolitics, examining the growth in consumption of states like China and India and what should be expected from such changes. He argued that politics are becoming increasingly important, particularly in that as long as energy remains a principal driver of our economies, and that this energy is increasingly coming from places that are politically unstable. Until we are able to find new sources of energy that are scalable and efficient and have a cost which is reasonable, politics in the above-mentioned regions will increasingly become of greater importance to the world. With this in mind, he spoke about the sea-change in the U.S.-China relationship in 2008, citing how during the most recent U.S. presidential election between Obama and McCain, voters did not know or

care about what these candidates' views on China were. This is a situation that Bremmer argued would never happen again, saying that the relationship between the United States and China is going to become seriously politicized in the coming years. Bremmer pointed to the last 18 months stating that the balance between China and the United States is shifting in that the Chinese now recognize that the United States cannot consume enough over the long term to sustain its export driven economy; while at the same time, recognizing that they need to develop their own strong domestic consumption. Therefore, the mutual indispensability that had been perceived by these two countries is changing dramatically and, in Bremmer's opinion, is by far the single most important trend to pay attention to when looking forward.

THE GLOBAL ECONOMY IN 2010

Richard O'Brien, partner at Outsights and a leading global futurist, presented on future economic scenarios by beginning his discussion with an examination of the critical uncertainties of the future directions of the global economy. From 2008-09 O'Brien worked with a number of clients in the business and government sectors, utilizing scenarios to help them think about what to do next with the changes taking place on the economic front. During this time, O'Brien relayed that he had clients literally telling him that given the uncertainty they were facing night now, they were going to "leave thinking about the future for a time when things are clearer".

O'Brien then proceeded to describe a three-scenario model which Outsights developed to help clients in this time of uncertainty. The three scenarios consisted of a high, low, and in-between scenario, which helped people think more clearly about the future. Termed another way, O'Brien called these scenarios "the best of all worlds, the worst of all worlds, and the ones in the middle". In O'Brien's opinion, the ones in the middle were the most difficult to deal with in that the landscape was volatile and as a result there was uncertainty over the future. An example of this he pointed to was the "Y2K problem". He explained that the problem of not having certainty, with mixed signals all the time, makes it difficult for decision-makers to implement policy.

During his presentation O'Brien discussed the monitoring of financial stability and the flows of globalization. He pointed out that if you were looking for a time to make money over the last couple of years, you were in the right place and time to do just that. He also noted that the stock market was currently experiencing a bounce back. However, he cautioned that some people were calling this the "dead cat bounce" in that if you drop something from high enough it will bounce as a result of the speed and height from which it fell. On the economic front, O'Brien argued that it was essential for policymakers to read the situation correctly so that they could send the right signals to the market at a time when people are looking to them for confidence. However, he stressed that when

policymakers change policies to fix an underlying problem within the economy there are always unexpected consequences. O'Brien opined that "solutions" often lead to problems somewhere else, with the problems and difficulties not really getting solved, but rather they were just pushed down and that they would eventually return somewhere else.

O'Brien rounded out his talk by addressing some of the big questions that we are facing right now, which include: imbalances in the financial system; questions facing highly indebted governments; the fear of higher interest rates and inflation; and the problems associated with the risk/reward structure of the financial system. On a final note, he opined that in the future, resources pressure will continue to grow and that security remains a major worry for the world along with issues like pandemics and climate change. O'Brien stated that all of these factors are things to consider when looking toward the future and trying to determine who the winners and losers would be.

CYBERDEMOCRACY, EQUITY AND SUSTAINABLE DEVELOPMENT

Clement Bezold, Chairman and Founder of the Institute for Alternative Futures, spoke on the topic of Cyberdemocracy, Equity & Sustainable Development. He commenced his talk discussing what he termed as "Aspirational Futures". Aspirational Futures, according to Bezold, is an approach that combines learning about the future and its uncertainty with a vision that aims to consciously create preferred futures. Such an approach is supposed to lead to enhanced focus on vision, with visionary success available to those who use it. He raised the example of the health equity movement in the United States where there is an effort to move beyond just using alternate futures, but rather to work towards consciously creating the future you want. He argued in his talk that such scenarios are an incredibly powerful format in the future studies arena and that that power should not be lost by only looking at plausible scenarios which do not take into consideration "pro-poor" foresight.

Bezold stressed that foresight work is not value neutral and that foresight must be more consciously pro-poor in its analysis. By pursuing pro-poor foresight or analysis, which would be focused on marginalized people, we are working to bring about a more resilient society. By increasing our consciousness about poverty and about what we do in terms of health equity, societal resilience is enhanced. Another avenue of concern that Bezold highlighted is the implementation of Cyberdemocracy, where we can involve communities and the public in making policy, thereby creating a wiser and more anticipatory democracy.

In conclusion, Bezold emphasized that equitable health and avoidable health disparities will be the next big issues and that as more attention is paid to cyberdemocracy, where communities will have the ability to make choices, foresight must include opportunities for the exploration of "visionary space".

FORECASTING THE TECHNOLOGY REVOLUTION: HISTORIC BREAKTHROUGHS, 2015 ECONOMIC BOOM AND GLOBAL CRISIS OF MATURITY

In his talk **William Halal**, Professor Emeritus of Science, Technology and Innovation, George Washington University, discussed the use of micro-forecasting and the advances being made in information technology (IT) and artificial intelligence (AI). Halal explained that he had been studying the future of technology because once the subject was understood it would enable individuals to anticipate big social changes. His company was able to reduce uncertainty in their area of study to an error rate of plus or minus 3% by expert examination of organized information obtained from wide and thorough scanning. In terms of IT, Halal explained that it is the main source of creativity and productivity and that is why he is concerned with tracking its advancement. Over the next 10 years, Halal believes this period of time will be pivotal in the realm of IT, during which we will see the initiation of the next phase of social revolution towards global consciousness. In terms of AI, Halal explained that we should begin to see robots in homes and offices in about 10 years with about a 30% adoption rate. On top of this, we should expect to have cars driving themselves in the near future.

Some of the upcoming driving forces of a new economic boom that should take hold around 2015 include green technologies and global e-commerce. Halal has identified two scenarios where IT and e-commerce will be the major forces pulling us out of this global recession. Over the next 10 years, in the case of e-commerce, we can expect to see an adoption rate of 30% by consumers moving onto the web to make their purchases; a rate which is well above the 10-15% of consumers who now engage in utilizing the web for their purchases. Halal also suggested that as globalization continues to increase, doubling world GDP by 2020, there will be a magnification of threats which he termed a "global crisis of maturity". This crisis of maturity coincides with a period of time in which we will also have reached a mastery over life and which we will have moved beyond intelligence and evolved toward a global consciousness. However, in order to get to this point, we will need to overcome the challenges of today and this will require big shifts in the way we currently think. Halal concluded his talk by reiterating his argument that the acceleration of IT and AI will be game changers for the world, in that they will drive social evolution at a time when the crisis of maturity will demand a higher consciousness to survive.

GLOBAL SECURITY AND ECONOMY 2011–2025

Sundeep Waslekar, President of the Strategic Foresight Group based in India, focused his presentation on the disparity between the rich and the poor.

According to Waslekar, the number of people living in poverty or what he termed as the "peripheries" has not reduced despite two decades of technological advances and economic prosperity. The number of people living in the peripheries remained at 3.3 billion since the 1990s. It was speculated that 20 years from now, 3.3 billion people will still have no purchasing power and access to basic necessities. While efforts have been made to contain such issues as climate change and terrorism, little attention has been paid to address chronic poverty and inequity.

From 2001 to 2010, approximately 100 million people have died from malnutrition and a lack of access to basic healthcare. Waslekar noted that this is more than the number of casualties from the two World Wars and recent terrorist attacks. In his opinion, global policies have both neglected and failed to include basic humanity concerns and social consciousness in its priority list. Similarly, the media has not covered the plight of poverty-stricken communities as much as such catastrophes as the collapse of the financial system and the 9/11 attacks.

Waslekar opined that the root of most of the world's problems today is poverty. He asserted that climate change, terrorism, organized crimes and pandemics are different expressions and efforts by people living in the peripheries to encroach on the urbanites and draw attention to their plight.

Global responses to crises are not integrated and very often are managed on the basis of power enforcement rather than a real attempt at problem/conflict resolution. Thus, Waslekar questioned in conclusion, if we can move from a system of global governance where one dominant power rules, to a system where governments can learn to work collaboratively. Unless governments can consolidate their efforts and take real steps to address the problems of chronic poverty, climate change and terrorism, for example, these problems might continue to plague global development and growth.

OPEN FORUM DISCUSSION

The forum panellists and delegates discussed a variety of issues that might have immediate and future implications on the global geopolitics and relations. The first concern raised was that of China's ageing population. It was speculated that the spike in China's ageing population would cause regional demographic imbalance and affect global resource demand and supply. There were also fears that it would drive internal or inter-state migration and cause overcrowding in major cities. In the European context, inter-state migration or displacement has created ethnic-related tensions. It was commented that migrant communities either do not integrate or have high barriers to enter into their host societies.

The role of non-government organizations (NGOs) in geopolitics was also considered by the panel. There is no consensus on the importance of NGOs acting on behalf of communities where state or governmental responses are severely lacking. A panellist even questioned the true motives of NGOs. It was opined that some NGOs are mere extension of governments and financially motivated private organizations that do not contribute to the overall well-being of societies. However, several panellists and delegates disagreed and asserted that in places where resources or energy-saving technology, for instance, are not available, NGOs have been known to help emerging and developing markets build their basic energy-conserving infrastructure and capacity.

The concern over the role of NGOs unearthed worries that it is a signal that local and regional governance is either absent or getting more complex. It was speculated that multi-polar geopolitics will dominate global affairs in the coming years. A panellist suggested that there is also the threat of nuclear proliferation and how it might further drive bloc formation— causing greater polarization. Hypothetically, Iran might even seek new alliances and this would create new sets of problems.

Finally, delegates questioned the panel on the potential of technological advances to either bind or pull apart societies. On the potential impact of cyber technology in driving democracy, a panellist stressed that while the Internet, for example, could be a destabilizing force, it could also speed up social development and cause people to prize their unique culture. The crucial question to ask is, therefore, how online processes might be used to build confidence and prevent an illusion or delusion of control. Bio-technology and biochemistry are identified as areas of potential political disagreement. In the coming 5-10 years, a panellist anticipates that synthetic biological advances (e.g. bio-fuel production) would, for instance, change the way energy is consumed and how industrial processes are planned and managed. To this end, the forum closed on the note that there are no ready solutions to the issues discussed but this is where the mere thinking of the challenges of the world or strategic anticipation could provide a better understanding of the possible alternative scenarios on which decisions could be based.

LUNCH TALK
APPLICATIONS OF SENTIMENT ANALYSIS

Larry Levy, Co-Founder, Chairman and CEO of Jodange, United States, delivered a presentation on sentiment analysis. He stated that the modern world is marked by an ever-increasing amount of information, especially on the web and the analysis of sentiments around certain topics of interest has also gained increasing importance. However, he placed the caveat that there are a few issues to be dealt with during sentiment analysis. First of all, he stated that on the whole it is difficult to accurately measure the overall sentiment of opinion holders because of the discrepancy between the human mind and the computer. Levy added that different methods of sentiment analysis must be used at different levels according to what you are trying to analyse and the type of result that you intend to acquire.

It was stated that sentiments around a particular topic could be analysed by examining "mentions" in an online social platform such as Twitter. Levy said that sentiment analysis technology has enabled companies to open its eyes not only to its internal but also external opinions of the public. For example, one British bank has started to use this technology to evaluate customers' level of trust through analyzing customers' overall sentiment towards the bank. Sentiment analysis can act as a helpful warning signal for companies to intervene when a negativity is spotted in people's sentiment.

Following the "mentions" analysis, Levy introduced "Burst/Decay analysis" which is another form of sentiment analysis that tracks the sudden change or "burst" of sentiments towards a certain topic. The concerned companies may take this as a warning signal and intervene to "decay" the sentiment back to a normal level. Levy stated that "Burst/Decay analysis" could be useful in a competitive market because this enables you to observe the sudden "burst" of sentiment and focus on its treatment which enables you to gain advantage over your competitors in advance.

"Polling and Surveys" is another form of sentiment analysis and Levy said that this is especially useful for various governmental initiatives. For example, in order to find out the overall sentiment towards a certain government initiative, a concerned authority can either solicit citizen comments on potential new rules or actively search for a wide range of opinions available on the web. Sentiment analysis is also useful in advertising because it helps one to avoid placing an advertisement next to any derogatory contents and, instead, place it near contents that speak in favour of the advertised product. Following the use of sentiment analysis in advertising, Levy introduced in-line sentiment analysis and how it can be used for cross-analyzing the opinions of various publications around the world in relation to a certain topic of interest. He opined that in-line sentiment analysis could identify not

only the top opinion holders and top opinion publishers, but also the geographical distribution of sentiments. Levy emphasized that while sentiment analysis does not provide you with ultimate answers, it helps to iteratively move us closer to the answers by facilitating decision-making.

While acknowledging that traditional media and social media both provide useful platforms for sentiment analysis, Levy admitted that social media generally is a better platform to analyze sentiments due to its openness to public participation. In conclusion, there are various methods of sentiment analysis that have broad applications and Levy stressed that our task is to use it as a proper tool that would help achieve our purpose and decide on the appropriate action to be taken based on the results of sentiment analysis.

DISCUSSION

A participant asked whether sentiment analysis has been used in politics and how it has been used. Levy answered that it has been used in polls and surveys as a way to analyse the group identity of opinion holders and to find out whether: a) the cluster is being formed by a group that is representative; b) the group is carrying a voice; and c) the vocal groups are adding to existing bias.

Another participant questioned whether there are any examples of sentiment analysis being used for scenario planning. Levy admitted that currently there are not many examples but added that there is a huge potential of sentiment analysis for scenario planning. He added that the more you use sentiment analysis and accumulate its results, the more it can become a useful tool for decision-making. Furthermore, by looking at what people say today, we may be able to predict and anticipate the future to a certain extent.

In closing, a participant commented that sentiment analysis should be treated with caution as sentiments tend to fluctuate according to the environment. Levy agreed that the results of sentiment analysis should be treated as an indicator and not an ultimate answer.

PANEL FOUR
NEW APPROACHES FOR STRATEGIC ANTICIPATION

BETTER SCANNING AND BEYOND: OLD IDEAS AND NEW "RIGHT BALANCE" FRONTIERS FOR FORESIGHT

Michael Marien, Founder and Editor of *Future Survey*, delivered a presentation on lessons learnt from his 40 years spent working in horizon scanning and strategic anticipation. He obtained his PhD in Interdisciplinary Social Science and National Planning Studies from the Maxwell School of Citizenship and Public Affairs at Syracuse University. During this period, some of the lessons which Marien learnt were that (a) what is happening is closely intertwined with two futures-oriented questions: what is likely to happen or may happen and the normative question, what ought to happen or what should we do; (b) social sciences provides a large amount of insight into what is happening but the question cannot be fully and reasonably explored without understanding what has happened in the past, the recent and anticipated impacts of new technologies and thinking in the various professions; and (c) national planning could be a valuable focus for studies especially combined with global studies or global planning studies.

Marien spent the next four years at the Educational Policy Research Centre at Syracuse. There he was commissioned to complete an annotative bibliography of futures literature in general and education reform in particular. Since then Marien has been doing various literature surveys.

In 1979, Marien founded *Future Survey* with the World Future Society, which lasted for 30 years, publishing more than 21,000 abstracts of futures-relevant books, reports and articles. He states that lessons re-learnt during this time included the fact that: (a) there was a lot of futures-relevant literature in existence; (b) the literature is more disconnected and fragmented than ever; and (c) the conception and management of the knowledge society appears to be seriously flawed. He put forth to the audience that if there is so much knowledge at our disposal, why is society still in such a mess and why is global mega crises an entirely appropriate description of the present condition.

After ending *Future Survey*, Marien began to write mini-abstracts of new and forth-coming futures books published in a new website. Some lessons learnt and reinforced during this period includes the fact that: (i) roughly 1000 futures-relevant books are being published each year and issues are increasingly global in nature; (ii) although books are by no means the only source of information that one must consider for horizon scanning, they should be the major source; and (iii) in a rapidly changing world, it is important to stay on top of what is published but on the other hand, some futures-relevant information retains value for many years if not decades.

Thus, understanding requires one to speed up and look forward and also pay more attention to the past futures-relevant information which remains highly fragmented. It was also added that book reviewing tends to lead one to consider one book at a time in isolation rather than gaining broader and more sophisticated perspective by reviewing a cluster of related books. Finally, he opined that there is definitely the condition of *infoglut* in today's world

Marien noted that all of the above leads to the fact that knowledge society needs serious rethinking in a number of ways and as a general guideline, the Taoist concept of right balance between yin and yang should be applied. He referred to a quote by Singapore's Minister Mentor Lee in his autobiography *From Third World to First* where there was an explicit description of the need for balance between individual competition and group solidarity, in trying to strike the right balance between yang competitiveness and yin solidarity.

Marien concluded by stating that this was useful to keep in mind and apply to our burgeoning world of information with regards to three gross imbalances, namely: (i) the growing imbalance between useful knowledge and information that is merely entertaining; (ii) the imbalance caused by emphasizing "hard sciences" and not enough on "soft sciences"; and (iii) that there is far too much emphasis on pieces of knowledge and not enough effort on weaving these pieces into systemic wholes.

THE CHANGE LAB APPROACH TO ADDRESSING HIGHLY COMPLEX SOCIAL CHALLENGES

Adam Kahane, a partner in Reos Partners, spoke on a radically different approach to dealing with complex problems. He began with the observation that in approaching the question of futures and horizon scanning, there seems to be a basic assumption of the presence of uncontrollability, unpredictability and vulnerability. In his approach, Kahane noted that there is a method to reduce the uncontrollability, unpredictability and vulnerability present. He elaborated that the method involves working creatively and collaboratively in a team that is composed of leaders and decision-makers across all parts of the problem system.

Kahane referred to three categorizations in explaining his approach—three distinct dimensions in a complex problem. The first is dynamic complexity, which means that cause and effect are far apart in space. While problems of low dynamic complexity can be dealt with piece by piece, those of high dynamic complexity cannot be successfully addressed except by looking at the system as a whole. The second type of complexity is when dealing with situations where the actors have fundamentally different perspectives and interests—this is also known as social complexity. Situations where the actors have essentially the same perspective and interests can be dealt with successfully by turning the problem over to experts; for problems with high social complexity what is needed is a method that

involves the stakeholders themselves. Finally, the most challenging dimension is generative complexity. A problem of high generative complexity is one where the future is fundamentally unfamiliar and undetermined. As such, when dealing with problems of high dynamic, social and generative complexity, an approach that is simultaneously systemic, participative and emergent is needed.

To illustrate, Kahane related a project that he worked on called the Sustainable Food Laboratory, with the aim of addressing the problem of the global food system. To solve the problem, a team was formed comprising of people who were already of the opinion that the system was not working and they were also unable to change things on their own. The team has now been working together for the past seven years on developing a shared understanding of the problem, a shared understanding of what was needed to be done separately and collaboratively and to work on small-and-large- scale projects to address the problem. Known as the Change Lab Approach, this method was a way that could be used to bring together people who were not used to working together and may not see things the same way, but who will work creatively and cooperatively when brought together in such a situation.

A final illustration of the Change Lab Approach at work mentioned by Kahane was a project undertaken in Israel in 2006. He revealed that through his experiences there he became aware that when dealing with complex situations, there is a need to be able to work with two fundamental drives: love and power. Referring to definitions provided by Paul Tillich, Kahane states that in this case "power" is the drive of everything living to realize itself, whereas "love" is the drive to unify the separated. He noted that while it is conceptually simple to reconcile the two, in practice it is difficult and dangerous as both these elements have two sides, a generative and a de-generative side. Kahane opined that the challenge of steering between the two is the essence of the challenge of working with complex social problems and to find a way to keep a dynamic balance between them.

Reiterating that the key point that he was trying to put forth is that it is more than possible to work creatively and cooperatively to address a given complex problem and that although the results are uneven, they are nevertheless promising. He concluded that the goal is not to eliminate but to reduce uncontrollability, unpredictability and vulnerability.

FORECASTING THROUGH SIMULATION: THE INTERNATIONAL FUTURES (IFS) WAY

Barry B. Hughes, John Evans Professor at the Josef Korbel School of International Studies, University of Denver, spoke on "The International Futures (IFs) Way" to forecasting. The IFs system is both a data repository and a collection of analytical models that could be used to examine long-term and interacting global development issues. It was stressed that alternative scenarios could be attained through a broad integration and scan of a variety of data.

While the IFs system does not provide predictions, it is capable of churning out and offering users comparative analyses on a variety of issues or security concerns. This is possible as the IFs is made up of 1,700 data series compiled from 183 countries over 30 years and an extensive collection of analytical models. Hughes mentioned, for instance, that IFs-system-produced results have indicated that the population of China would likely be as well-educated as those in 27 European Union countries by 2030. In comparison, the same set of results also estimated that Sub-Saharan Africa would encounter a less-educated population.

It was opined that such analyses are useful in providing decision-makers a broad spectrum of possible future outcomes or alternative scenarios. On top of this, Hughes added that the IFs system has to date looked into ways to reduce global poverty, advance global education and improve global health. It was stressed that forecasting, data and scenario analysis of this level represents the "IFs' mission" to "create and make available the best possible quantitatively-based system for analyzing long-term, interacting global issues concerning sustainable human development".

Hughes mentioned that most analyses of political and global risk rely on contemporary data assessments. He opined that such analyses might fail to identify or address dynamism and changes in challenges and opportunities. He argued that the breadth and sophistication of the IFs system, on the other hand, facilitates flexible and interactive exploration of underlying drivers. The results are rich and consistent forecasts that could complement or provide the foundation for analysis and decision-making.

Finally, in conclusion, it was stressed that decision-makers should consider the use of IFs system to support their long-term analysis of human development and country risk. While the IFs system may not provide predictions of the future, through its integration of wide range data series and analysis models, it is possible to attain comparative studies, forecast and, in particular, scenario analysis of interrelated issues that have far-reaching and future implications.

CHANGING PHILOSOPHY, CHANGING METHODS: BUILDING FUTURES LITERACY FOR POLICYMAKING AND AS POLICY

Riel Miller, Founder of xperidox: futures consulting, focused on the necessity of change as a means to building futures literacy for policymaking purposes. He argued that to deal with complexities, it is important to change existing philosophies and methods of approaching the future or risk being misled by a delusion of control. Specifically, he emphasized the need to accept that the world is random and complex.

Miller opined that we have transited into a time when complexity prevails over certainty. Ilya Prigogine, as Miller has quoted, stated that "mankind is at a turning point, the beginning of a new rationality in which science is no longer identified with certitude and probability with ignorance. Science is no longer limited to idealized and simplified situations but reflects the complexity of the real world, a science that views us and our creativity as part of a fundamental trend present at all levels of nature". The increasing prominence of probability concepts or theories in physics serves as a case in point that even a "certain" discipline like science has to grapple with uncertainties. It was thus argued that future could no longer be determined by past or present events.

There are three main types of "futures" and Miller listed them as: a) Contingency Futures; b) Optimization Futures; and c) Exploratory Futures. Contingency Futures are likened to exogenous forces that have a foreseeable impact on the way we cope and survive. It was mentioned that tsunami warning systems or measures taken to contain possible tsunami-caused damages are some examples of contingency futures planning. In contrast, Optimization Futures is like a game of chess where goals, rules and resources govern the way forward. In a societal setting, it involves setting the parameters that communities should move and develop in the future. The cost of non-compliance is societal exclusion where individuals risk being "expelled" from the communities they are in. The third form of futures deals with creativity and imagination. Miller explained that in exploratory futures planning, existing signals are given new meanings as a way to imagine what the futures might be like or could entail. Exploratory Futures are thus a linear projection of the past and present loaded with newly invented potentials. Miller stressed that a key element of Exploratory Futures is ambiguity. It occurs in an environment that is marked by changes and uncertainties.

Miller noted that most discussions on Anticipatory Systems (AS) focus on ways to perfect and improve existing anticipatory technologies. It is more crucial, in his opinion, to develop AS that could differentiate between "determinacy" and "indeterminacy". It was also added that *creativity* should be a key element in foresight and as we think about the future. Miller pointed out the irony that as we attempt to improve risk assessment and horizon scanning methods, we create more problems and situations that are less predictable. This underlines the need to come to terms that current foresight philosophies

and way of building futures literacy has to change to allow for greater spontaneity and experimentation in futures planning.

Hence, Miller concluded that one AS or one way of approaching the future is not adequate. It was stressed that creative ways of imagining changes or seeing the future potential of the present should be encouraged. It would, ideally, create the necessary future literacy to better deal with and understand the complexities and indeterminacies of the present and future.

DISCUSSION

A participant was concerned over futures literacy and pondered if it is possible for senior government and management officers to double as futurists. The participant also argued that futures literacy is generally limited to a select group of experts. Another member of the audience added that no ministers would want to build scenario planning processes into their administration that would undermine their decisions or highlight flaws in their policies. Moreover, it was also articulated that most images of the future are just simple extrapolations of the past. As such, what could be done to produce better and alternative future projections that are not merely extensions of previous events?

In general, all four panelists shared differing views on futures literacy and were split on the groups that should be taught or possess this cognitive skill. A panelist opined that while futures literacy is crucial to the understanding of the environment that societies operate in, not everyone should be taught this cognitive function especially if it equips selected elites with a false sense of power and control. Another panelist agreed and spoke from experience on the ability of citizens, small and mid-level organisations to give accurate assessments of the future based on a firm and clear understanding of ground-level operations, needs and requirements. It was also added that assertions made by experts are usually limited in their scope and lack direct contact with "what is going on around the world". Hence, having everyone act like foresight experts may neither result in better futures anticipatory processes nor yield better foresights. However, one panelist disagreed and argued that elected leaders have the capacity to become established futurists. It was noted, for instance, that former U.S. president candidate Al Gore has written a highly acclaimed book on *futures*. He has also developed an impeccable method to think about and approach the future.

As for projections of the future, a panelist remarked that it is very difficult to create models or systems that are capable of producing non extrapolative images of the future. It was also noted candidly and anecdotally that to date, most models are only able to produce "bigger 'caterpillars' out of smaller 'caterpillars' and not able to produce butterflies". The transformational elements of models and quantitative systems are generally still limited. That said, this shortfall could be made up by creating as many and as rich a set of intervention points or scenarios as possible. This varied collection of data could then be used to understand the implications of previous actions on the future and, ideally, reshape the world.

PANEL REVIEW AND CLOSING REMARKS

David Snowden, Founder and Chief Scientific Officer of Cognitive Edge, provided a review of the ideas and lessons put forth during the 2 days' panel presentation.

Snowden posited that for too long, and especially in western control-based thinking, we have been taught to avoid failing. To which extent we have been trained, or want to believe, that super intelligent computers could control the complexities of the world. However, failures or errors are part and parcel of development and what makes societies dynamic. Indeed, he opined that reality and history have proven that "people who don't fail, don't live".

Snowden placed the symposium presentations into perspective by providing delegates an insight into the three key life cycles of foresight. Firstly, there was Management orientation or paradigm, which aimed to control functions directly. It was built on physical argumentation, followed deductive reasoning and it was dominantly used by the military. The second cycle focused on Systems Thinking Orientation, which aims to control information. Systems Thinking Orientation works on the basis of structural and categorization argumentation and follows an inductive course to reasoning which is a core characteristic of an engineering type or line of thought. Snowden suggested that the next cycle, which he has termed as "Complexity and Cognition Orientation" would be one that is based on cognitive argumentation and that provides reasoning on an adductive premise.

Finally, on the key symposium takeaways, Snowden noted among other points that it has been shown in the presentations that scenario planning remains the dominant tool of foresight; the idea of rational decision-making might give rise to an "illusion of control"; and failure is inevitable and necessary for societal development. In conclusion, he argued that we should instead consider evolutionary possibilities and not a range of outcomes. Snowden stressed that we should consider the use of more dialectics than dichotomies, and paradoxes instead of dilemmas. This is especially since the paradox method would help us to think in a very different way. At times, simulation could even be confused for prediction. Snowden warned and asserted that hindsight almost never leads to foresight. Hence, Snowden opined that it is better to understand our present and its evolution than to constantly prepare for a future that we can never know for certain.

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PROGRAMME

DAY ONE
15 MARCH 2010 (MONDAY)

09:00	Overview of Symposium Overview of Technology Showcase
09:10	Welcome Address by **Professor S. Jayakumar** *Senior Minister and Coordinating Minister for National Security*
09:30	**Morning Break**
Panel One	**International Organisations: A survey of Strategic Anticipation Programmes**
10:15	Introduction by **Adrian Taylor** *(Consultant, 4Sing: Foresight and Strategy for Security and Sustainability in Governance, Germany)*
10:25	**Michael Orborne** *(Director, Strategic Foresight, Organisation for Economic Cooperation and Development)* *Foresight and Designing Policy: The Experience of the OECD*
10:50	**Kristel Van der Elst** *(Director, Head of Scenario Planning, World Economic Forum)* *Scenario Planning and Strategic Foresight Activities of the World Economic Forum*
11:15	**Mark Boden** *(Head, Research Policy Mixes and Foresight Sector, Knowledge for Growth Unit, European Commission Joint Research Centre)* *Building Strategic Intelligence to Anticipate Global Challenges*
11:40	**Paul Ormonde-James** *(Head of Global Intelligence, International Finance Corporation, World Bank Group)* *Strategic Anticipation — Harnessing People Power*
	Summary by Moderator
12:05	Q&A Chaired by Moderator
12:15	**Break for Lunch**
12:35	Lunch Address (Canning Room)

	Igor S. Mayer *(Director, Delft Centre for Process Management and Simulation, Delft University of Technology, The Netherlands)* *(Serious) Gaming and Simulation for Policy Analysis and Planning* Moderator: **Dawn Yip** *(Director, Soulbreath Consulting, Singapore)*
Panel Two	**Business Schools: Decision Making in a Complex World**
14:50	Introduction by **Gary Klein** *(Chief Scientist, Klein Associates Division, Applied Research Associates, Inc., United States*
15:00	**Rafael Ramirez** *(Fellow in Strategic Management, Said Business School, Oxford University, United Kingdom)* *What Might "Decision Making" Become in a More Complex World?*
15:25	**Gerald P. Hodgkinson** *(Director, Centre for Organisational Strategy, Learning and Change, Leeds University Business School, United Kingdom)* *Mental Models of Risk and Uncertainty: How they Affect and are Affected by Decision Making*
15:50	**Afternoon Break**
16:15	**Ianna Contardo** *(Strategy Professor, Institute de Empresa Business School, Spain)* *Neuro-Strategy®: Decision Making in Uncertain Times*
16:40	**Anil Gaba** *(Director, Centre for Decision Making and Risk Analysis (CDMRA), Asia Pacific Institute of Finance, INSEAD, Singapore)* *Decision Making with Risk and Uncertainty*
17:05	Summary by Moderator
17:15	Q&A Chaired by Moderator
17:35	**End of Day One**

DAY TWO
16 MARCH 2010 (TUESDAY)

Panel Three	In Conversation: New Challenges and Future Global Issues
09:00	Introduction by **Paul Saffro** *(Consulting Associate Professor, Stanford University, United States*
09:10	**Ian Bremmer** *(President, Eurasia Group, United States)* *Top Risks: Emerging Long Term Political Trends*
09:25	**Richard O'Brien** *(Partner, Outsights, United Kingdom)* *The Global Economy in 2010*
09:40	**Clement Bezold** *(Chairman and Founder, Institute for Alternative Futures, United States)* *Cyberdemocracy, Equity and Sustainable Development*
09:55	**William E. Halal** *(Professor Emeritus of Science, Technology and Innovation, George Washington University, United States)* *Forecasting the Technology Revolution: Historic Breakthroughs, 2015 Economic Boom, and Global Crisis of Maturity*
10:10	**Sundeep Waslekar** *(President, Strategic Foresight Group, India)* *Global Security and Economy 2011-2025*
10:25	Summary of Presentations by Moderator
10:50	**Morning Break**
11:15	Discussion led by Moderator
12:15	Summary of Discussion by Moderator
12:30	**Break for Lunch**
	Lunch Address (Canning Room)
	Larry Levy *(Co-Founder, Chairman and CEO, Jodange, United States)* *Applications of Sentiment Analysis*
	Moderator: **Dawn Yip** *(Director, Soulbreath Consulting, Singapore)*

Panel Four	New Approaches for Strategic Anticipation
14:45	Introduction by **Dawn Yip** *(Director, Soulbreath Consulting, Singapore)*
14:55	**Michael Marien** *(Founder and Editor, Future Survey (1979-2009), United States)* *Better Scanning and Beyond: Old Ideas and New "Right Balance" Frontiers for Foresight*
15:20	**Adam Kahane** *(Partner, Reos Partners, United States)* *The Change Lab Approach to Addressing Highly Complex Social Challenges*
15:45	**Afternoon Break**
16:10	**Barry B. Hughes** *(Director, Frederick S. Pardee Centre for International Futures, University of Denver, United States)* *Forecasting Through Simulation: The International Futures (IFs) Way*
16:35	**Riel Miller** *(Founder, xperidox: futures consulting, France)* *Changing Philosophy, Changing Methods: Building Futures Literacy for Policy Making and as Policy*
17:00	Summary by Moderator
17:10	Q&A Chaired by Moderator
17:30	**David Snowden** *(Founder and Chief Scientific Officer, Cognitive Edge, United Kingdom)* *IRAHSS 2010 Closing Remarks*
18:00	IRAHSS 2010 Closing Video
18:10	**End of Symposium**

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