forum for the future

THE ROCKEFELLER FOUNDATION

Horizon scanning to improve social impact

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The Rockefeller Foundation recognizes that we live in a world of increased dynamism and volatility, where global drivers such as climate change and increasing demand for limited resources will have significant impact on poor or vulnerable communities. Shocks such as food and water shortages, energy volatility, financial uncertainties, and more, demonstrate that crises are becoming more complex and globally interdependent, across sectors and geographies.

In this environment, understanding the dynamics between social, political, cultural, technological and environmental change will become a central determinant of effective intervention design. As such, the Foundation commissioned Forum for the Future to research the development of a global scanning function. This report presents insights and recommendations for building a scanning function based on our research.

Acknowledgements

The research for this paper has benefited from experts across a range of disciplines. We are especially grateful to consultants Dr. Wendy Schultz and Dr. Noah Raford, who provided insight from their experience designing global foresight programs. Dr. Schultz is an internationally recognized futurist and Fellow of the World Futures Studies Federation; she recently advised on the design improvement for Futurium, European Union's on-line foresight platform. Dr. Raford is a scenario planner, strategist, and policy adviser. He currently works as an advisor to the United Arab Emirates Prime Minister's Office, where he provides policy and strategy advice on a range of special projects. He helped design, develop, and manage the nation's first foresight and scenario planning unit.

For further insight into emerging data strategies in the development context, we spoke to Anoush Rima Tatevossian of Global Pulse, Sarah Telford of the United Nations, Office for the Coordination of Humanitarian Affairs. Sarah Farmer, formerly of Global Pulse, shared her work investigating the inadvertent and multiple re-use of data without traceability in development. We interviewed Rockefeller Foundation Searchlight, Shree Ravindranath, Mario Bazan, Fernando Prada Mendoza, and Tanja Hichert to learn about "in the field" scanning needs and experiences. For expertise in data technologies, we worked with Fran Bennet and Bruce Durling of Mastodon C, an organization which brings cutting edge analysis skills in data science, as well as Chris Van der Walt of Change Assembly, a non-profit with a mission to help organizations to understand and solve complex human problems through data, technology and community.

We interviewed a number of people who have used or have been involved in designing on-line horizon scanning services within the private and public sector, including Cornelia Daheim of Z_punkt in Germany; Fiona Lickorish, Head of Cranfield University's Institute for Environment, Health, Risks and Futures; and Jerome Glenn of the Millennium Project. To learn more about private sector and governmental approaches to scanning and knowledge management, we spoke with Dr. John Bordeaux, who is part of IBM's global team developing and providing solutions in the areas of social knowledge management and open government.

Finally, although we didn't have the opportunity to interview him, we drew upon the work of Dave Snowden, a consultant and researcher in the field of knowledge management and the founder and chief of Cognitive Edge, a research network focusing on complexity theory and sensemaking.

Foreword

In our rapidly-changing and complex world, humanity faces a significant number of pressing challenges worthy of philanthropic intervention and investment. Yet philanthropy's finite resources leave us with difficult decisions about what work we can and should pursue. This requires funders not only to assess what problems we have the capacity to solve, but also to understand the complexities and dynamism surrounding each to ensure our investments are maximized to solve problems at their roots.

This isn't necessarily unique to 21st century problems – shifting the understanding of a problem and its causes always has had the power to bring together new sets of actors and unleash innovative capacity to think beyond traditional and conventional approaches to achieve transformative change. One early example is the Foundation's work on improving education throughout the United States. The Rockefeller Foundation realized that to achieve better educational outcomes it wouldn't be enough to address the challenges of overcrowded and dilapidated schoolhouses and underpaid teachers. Transformative and sustainable impact required raising the income of poor rural farmers so that they could send their children to school instead of relying on them for farm labor. It also required eradicating disabling diseases, such as hookworm, that prevented regular school attendance.

But today, our problems are even more complex and tangled – and change is happening at a much faster pace than it once did. As a result, the answers that we have today may not apply to the questions we need ask tomorrow. In response to these realities, The Rockefeller Foundation continues to investigate and pursue novel approaches that could guide philanthropic and social impact investments towards those opportunities with the highest impact potential. Applied foresight and horizon scanning methods are such tools. While still new to many development actors, these tools allow us to detect where trends, such as rapid advancements of technology, social movements or changing private sector sourcing models, might come together in often unexpected ways and open up windows of opportunity to understand and address previously intractable problems in completely new ways.

Horizon scanning also allows us to draw on a collective intelligence base beyond the voice of traditional experts and include practitioners, entrepreneurs, and, last but not least, those people who cope with the problem on a daily basis. It creates a safe space to venture early weak signals and minority opinions and thus creates

fertile ground for thinking that “connects the dots” and/or changes the way how we look at the world’s most pressing problems.

The report “Horizon Scanning to Improve Social Impact” shares ways to design and implement trend monitoring approaches in the social sector. Ariel Muller, the Acting Director of Forum for the Future’s Centre in Singapore, and my colleague Rebekkah Hogan, deserve much praise and thanks for putting together a truly thought-provoking document – an invitation to all actors that work on challenges that affect poor or vulnerable populations to investigate whether foresight tools could provide a structured framework for their organization to identify high impact investments and activities.

- Claudia Juech

Introduction

There is a general consensus that we are entering a period of recurrent volatility and uncertainty. Financial and climatic shocks in an era of increasing interconnectivity ripple across the world in unpredictable ways with grave consequences for the most poor and vulnerable. During the last five years we have witnessed the effects of a global financial meltdown, political upheaval in the Middle East and North Africa, the first declared pandemic in over 40 years, as well as an increasing number of climate related weather events, including Tropical Cyclone Mahasan and Typhoon Haiyan.

Global volatility will most likely increase. According to the OECD, "Disruptive shocks to the global economy are likely to become more frequent and cause greater economic and societal hardship. The spiller effect of events like the financial crisis or a potential pandemic will amplify due to the increasing interconnectivity of the global economy, people, goods and data."[1] The number of cell phone subscribers globally has grown from 1 billion in 2000 to over 6 billion today, of which nearly 5 billion are in developing countries.[2] By 2016, the Cisco Network Forecast estimates there will be nearly 18.9 billion network connections— almost 2.5 connections for each person on earth— compared with 10.3 billion in 2011.[3]

On the environmental front, rising global temperatures and extreme weather events are likely to become more frequent and severe. Climate change forces are complex – impacts can interact with other factors in unpredictable and uncertain ways. As an example, drought-induced wildfires that destroyed a fifth of Russia's wheat crop in 2010, coupled with floods in Canada and Australia, led to price spikes in global food markets, which eventually triggered social unrest in the Middle East.[4] Price volatility can cause disproportionate hardships for people living in poverty in developing countries, including higher malnutrition rates. Malnutrition increases individuals' vulnerability to disease, and compromises their ability to work. Women are at a greater risk, as they are more likely than men to work in low-paying and informal occupations before a shock happens.[5] Malnutrition among children can limit children's cognitive development, reduce their ability to learn and have "a devastating impact on a child's future potential."[6]

Impacts such as these, at the level of individuals, families, and communities, can occur below the radar of current monitoring and knowledge gathering practices. White papers, reports and briefing papers, while a resource for understanding on-going trends, risk

1 OECD Reviews of Risk Management Policies, Future Global Shocks, Improving Risk Governance, 2012. http://www.oecd.org/governance/48329024.pdf
2 Espen Beer Prydz, Knowing in time: How technology innovations in statistical data collection can make a difference in Development, 2013 OECD Global Forum on Development, Paris. http://www.oecd.org/site/oecdgfd/Session%203.2%20-%20GFD%20Background%20Paper%20-%20DRAFT.pdf, April 4, 5, 2013.
3 Cisco Visual Networking Index: Forecast and Methodology, 2012–2017
4 OECD Reviews of Risk Management Policies, Future Global Shocks, Improving Risk Governance, 2012. http://www.oecd.org/governance/48329024.pdf
5 Estruch, Elisenda, Grandelis, Ileana. Promoting economic diversification and decent rural employment towards greater resilience to food price volatility* Food Agriculture Organization, 2013. www.fao.org/fileadmin/user_upload/fao_ilo/pdf/Papers/DRE_Food_Price_Volatility.pdf
6 Agricultural and Applied Economics Association, 2013 Annual Meeting, Washington, D.C. August 4-6, 2013.

becoming outdated due to the increased pace of change or being too single-issue focused and missing the systemic implications of change. These liabilities are perhaps even greater in the development world due to the information and geographical gap between decision-makers and those with on-the-ground contextual knowledge – thus increasing the risk that solutions are less successful because decision-making was not based on an accurate understanding of current conditions.

In these environments organizational capacity to understand how change is happening is becoming a central determinant of effective intervention design. Horizon scanning, or environmental scanning, is a means by which to develop intelligence about the nature of change through a systematic examination of on-going trends and emerging signals. Traditionally, horizon scanning is based on desk research such as the Internet, international organizations, academia, etc., however, continual innovation in digital technologies are providing new and cost effective ways to collaborate and share knowledge across diverse groups of people for better sensemaking.

The aim of this report is to share insights and recommendations for the development of a design of a future horizon scanning function. It should be noted that while we acknowledge that mobile technologies are providing unprecedented opportunities for real-time trend analysis, particularly in the developing world – this report doesn't focus on "big data" as a core component of a horizon scanning function. Instead, it explores the principles and activities of building a horizon-scanning program as an organizational capacity. Within this context, big-data analysis is a tool, among many, to augment analysts' sensemaking capacity, but does not replace it.

The report is divided into four sections:

- Design principles for a horizon scanning function
- Approaches to leveraging collective intelligence
- Key activities of a horizon scanning practice
- Horizon scanning as organizational learning

Design principles for a horizon scanning function

"Practice without theory will not scale."
- Dave Snowden

The problems development organizations strive to solve are inherently complex. Successful interventions must address multiple interdependent variables, navigate both preexisting intractable conditions and disruptive shifts, as well as engage stakeholders across an incredibly vast range of cultural contexts, including age, gender, race, religion, and economic class. The problem spaces are made up of diverse and autonomous parts, which are interdependent and interconnected; in other words, a complex adaptive system. Neural networks, economies, ecologies, the stock market, manufacturing businesses and any human social group-based endeavor in a cultural and social system are all examples of complex adaptive systems. Complex adaptive science – a science that focuses on the interaction and interconnectivity of elements within a system, and between a system and its environment – provides a basis for design principles to better understanding how change happens.

Change is unpredictable
Complex problems are made up of interconnected elements that have the capacity to change and learn from experience. Stakeholders or actors within the system can self-organize and learn, and as they learn, their behaviors may change. It is difficult to know exactly which inputs contribute to an observed output. Cause and effect is non-linear and only becomes coherent in hindsight. As such, a horizon scanning function does not seek to predict events, but to identify emerging patterns and trends.

A system to identify dynamism should be dynamic
A mature horizon scanning function will allow for multiple parallel experiments in data gathering and use a variety of interdisciplinary approaches, so as not to be reliant on one system and risk being blindsided by one view of the future.

The future of foresight is networked
In a complex system problems manifest themselves in different ways at different levels within the system and knowledge is distributed across a range of stakeholders. Individuals tend to interpret the dynamics of a problem from their point of view – which is inherently limited. Therefore, the capacity to understand how change is happening around complex problems, particularly in the development context, is determined in part by the ability to engage multiple points of view. Engaging others in the contribution, analysis and sensemaking of the same data is means to disrupt conditioned preconception and identify new insights.

The human brain is still the best tool for horizon scanning

The combination of humans and technologies provide far better predictive and sensemaking results than either alone.[7] However, despite the rapid advances in new technologies, human sensemaking remains central to effective horizon scanning. Therefore the litmus by which to evaluate the use of new technologies is whether they allow more time for sensemaking activities (either individually or collectively) and demand less time in collecting data. They should not replace the analyst.

> *"No text analytics, no computer software--in my opinion--can beat the human brain yet. I'm not saying it won't, but at the moment, the human brain still is the best tool for horizon scanning."*
> *- Cornelia Daheim*

Monitor for emerging patterns

The key to monitoring for change within a complex system is to establish a loose understanding, or hypothesis, of the patterns or conditions shaping the problem space. If we establish a baseline understanding of the conditions influencing a problem space, we can begin to monitor how the pattern is changing over time. If we are early enough in detecting a changing pattern, we can potentially intervene to boost positive patterns that, for example, build resiliency, or dampen patterns that undermine resiliency. Decision making within complex systems therefore asks decision makers to identify existing patterns that are occurring that can be amplified or dampened for an improved outcome.

Use sensemaking tools over categorization frameworks

Change within complex adaptive systems is emergent and co-evolutionary. Categorization models, such as a 2x2 metric, presuppose the nature of change and risk shoehorning collected data into a limited construct. In a categorization practice, the framework precedes the data. This works well for quick categorization, but the danger is that a researcher with a strong categorization mind-set won't see the weak signals of an emerging trend. In contrast, in a sensemaking model the data precedes the framework – i.e., we detect patterns from the data as the patterns emerge. Continual innovation in data technologies is providing new ways to make sense of quantitative and qualitative data without presupposing a preconceived framework.

[7] Lyle Ungar, Barb Mellors, Ville Satopää, Jon Baron, Phil Tetlock, Jaime Ramos, Sam Swift. The Good Judgement Project: A Large Scale Test of Different Methods of Combining Expert Predictions. University of Pennsylvania, Philadelphia. Association for the Advancement of Artificial Intelligence 2012,

Approaches to leveraging collective intelligence

"[We] are in a very complex environment with regard to value and culture, not only multiple generations, but multiple cultures. Addressing blind spots is going to be trickier, but it will be easier to do that if you have a network of people."
- Tanja Hichert

The risk of cognitive bias

A researcher, or a team of researchers, begins scanning with an inherent hypothesis about how change is happening and begins to test it through their research; however there are risks to this approach. If they focus only on detecting change within a certain pattern, they may not recognize significant outlier events because of their own cognitive bias – they need to design in opportunities to benefit from multiple points of view.

Example of the risk of cognitive bias from interview:

> *"…One week ago, the last McDonald's store closed in Bolivia, all the media is saying that this is the response of Bolivia to imperialism and capitalism, but generally it's something deeper, it's about the people. It was not a political pressure from the Bolivian government to let McDonald's go away, like they did with USAID 2 or 3 weeks ago. It was a corporate decision because they cannot sell burgers in Bolivia. So, those things could probably be small news in the Financial Times or BBC, but I think we have trained ourselves to see a little more from these types of news…"*
> *- Fernando Prada Mendoza*

A novice researcher may make a correlation between the closing of USAID and McDonald's and concludes the causes are the same – another indication of the Bolivian response to imperialism and capitalism. An experienced researcher, however, will recognize that the correlations are a hypothesis based on an individual perspective that needs to be verified – preferably with those on the ground in Bolivia. Horizon scanning programs need to design in opportunities to benefit from collective intelligence in order to understand what is really happening.

The capacity for collective intelligence develops from the collaboration and, occasionally, competition, of many individuals working together. It is an exciting emergent property from the synergies of data-information technologies and people. It can include collaborative games, competitions, a series of events, or a shared on-line knowledge sharing platform. In Wikipedia, for example, thousands of contributors from across the globe have collectively created the world's largest encyclopaedia. Wikipedia has been developed with almost no centralized editorial control – instead, it has organically evolved a community culture of

editorial standards. Anyone who wants to can change almost anything, and decisions about what changes to keep are made by a loose consensus of those who care.[8]

The challenges of maintaining a platform

We interviewed several people who have participated, and in some cases even designed, on-line network platforms intended to harness the benefits of collective intelligence for the purpose of horizon scanning. The most frequently mentioned off-the-shelf platforms included *iKnow,* a Blue Sky foresight research project commissioned by the European Commission's Seventh Framework Programme for Research and Technology Development; *Parmenides Eidos*™, an innovative software-based approach to complex decision-making that enables strategic clarity by helping executives and experts define the key elements in complex situations, develop flexible and focused strategies to address them, test the robustness of these strategies against several different scenarios, and then assess the potential risks involved in implementing them;[9] In addition we reviewed *The Millennium Project* which was founded in 1996 after a three-year feasibility study with the United Nations University, Smithsonian Institution, Futures Group International, and the American Council for the UNU. *The Millennium Project* is now an independent non-profit global participatory futures research think tank of futurists, scholars, business planners, and policy makers who work for international organizations, governments, corporations, NGOs, and universities; *Shaping Tomorrow* is a free membership based organization—members are engaged in strategic and future thinking, trends intelligence and consumer research, business development, design, marketing, media planning, knowledge and change management. Researchers simplify complexity by scanning and analysing trends worldwide, and uploading relevant articles and studies about the future to the service. It is based in the UK with a global team of researchers, each with a subject specialization.

Consistent challenges emerged about limitations of on line network platforms.

- **Keeping data fresh and therefore relevant as the rate of change increases**
  "…unless people are constantly feeding things into the system…as part of their day-to-day work it's very difficult to keep that system up-to-speed and up-to-date with the emerging issues that are happening now."

- **Too much data – and not enough sensemaking**
  "The problem with a lot of these programs is they generate a lot of data – but not a lot of sensemaking. We don't need more data. We need ways to make better sense of the data we have."

[8] Thomas W. Malone, Robert Laubacher and Chyrsanthos Dellarocas, MIT Center for Collective Intelligence, Massachusetts Institute of Technology, Cambridge, MA. Cambridge, MA 2009
[9] http://www.parmenides-foundation.org/application/parmenides-eidos/

- **Not adequately incentivized**
  "Basically, the problem is that once the funding stops, people tend to fall away, because they've got something else to do. And that's not anybody trying to be selfish; it's just that funds come to do something else, so you get on with doing that. So I don't know how often the current platform is updated."

- **Maintenance costs**
  "The platform has been updated twice since it was originally done. It costs a considerable amount of money to do that each time, and unfortunately as government budgets have contracted, I think the ability for them to actually keep that up-to-date has been more difficult."

- **Too broad for a specific organizational need – particularly development**
  "So the things that are in the scan are very broad--very interesting, but very broad--and they're probably good for UK government as a whole, to look at the kinds of trends that they need to take notice of, but it's not what you would call continuous horizon scanning. It's a snapshot of the things that were around. They're too broad for the people that we work with, [people within development] generally."

Recommendations to counter platform risks

In most cases, development organizations are not in position to build a new platform, and even if they are, there are considerable challenges regarding incentive structures to drive people to the platform and operational costs for maintaining the data. In addition, many of the current platforms may not be fit for the individual needs of the organization. As such, we recommend the following practices for integrating collective intelligence into a horizon scanning function.

- **Develop a portfolio approach to engaging networks in lieu of a platform**
  The primary function of a scanning network platform is to test, verify and share hunches with the benefit of a globally diverse community; however, there are other ways to benefit from global collective intelligence that do not involve a sustained social platform. Dr. Raford describes this approach as a "call and response" - short contained events designed to elicit the benefit of a crowd. The advantage of this type of structure is that it is bounded by time and tends to put enough pressure on participants to drive a high level of engagement. A call and response could be an online scenario game, a focused virtual debate, or even an exchange via mobile technologies to people in more remote locations.

- **Develop a small core research team with access to a diversity of networks and data sources.**
  Train a core scanning team, proficient in the priorities of the organization and connected to a broader network to both broaden the breadth of scanning ability and, or, provide a means to tap into specific expertise when needed. One interviewee

stated it well, “What I would like is, as well as having the scanners, to have [the ability for] expert elicitation. Talking to experts in particular areas to say, ‘What's in the back of your mind that nobody's really talking about, but you see as a growing trend that might be an issue, or where do you see the opportunities that, at the moment, nobody's really capitalizing on?’"

- **Design in opportunities for anonymity for experts, particularly academics.** Experts may feel uncomfortable sharing information that is not yet validated by peers. As a solution, design ways to engage them that allow for anonymity. One interviewee stated, “… *these guys know their stuff, and they know what's emerging, but they're often quite high-level academics, so they tend not to--unless they've got real underpinning evidence—not put their heads above the parapet and say, ‘I see this thing emerging and this could be a real problem.’"*

Key activities of a horizon scanning practice

"We don't need more data. We need ways to make better sense of the data we have."
- Fiona Lickorish

A scanning function needs to strike a balance between two tensions – the need to use a sensemaking framework that transforms data into knowledge to inform better decision-making, and the need to consistently disrupt conditional thinking in order to gather better intelligence about the problem.

The solution is to think of horizon scanning activities as a consistent, but dynamic, practice that continually evolves. The suggested process below is not intended to be prescriptive, but adaptable to a variety of contexts.

On-going dynamic process

	1. Map the landscape	2. Monitor for change	3. Analysis, synthesis, and sensemaking	4. Verify results
Purpose	Understand the current conditions.	Monitor for change within the landscape.	Organize data, analyse patterns and explore possibilities and implications.	Test hypothesis and generate evidence to support analysis, test again
Suggested methods	Causal loop analysis to surface the conditions shaping the problem space Influence map of key stakeholders within the problem space Historical analysis of rate and type of change within the sector On-going trend monitoring	Identify diversity of data sources - from fringe to traditional sources using Google alerts, blogs, journals, etc. Conduct both directed and non-directive scanning Use collective intelligence to question and challenge existing hypothesis	Organize and analyze data Prioritize patterns of data that are occurring more frequently Apply futures techniques such as scenarios development, forecasting and visioning to explore potential implications Use causal layered analysis, focus groups, futures wheels, systems models to further expand implications	Analyze for multiple citations over time, converging consensus or pulse a network to test cultural assumptions
Opportunity to benefit from collective intelligence is possible at each stage of the process.				

1. Map the landscape to assess and understand current patterns

Establish a baseline understanding of the landscape. New data, from wherever it flows, should be compared against an existing hypothesis about how change happens within the selected problem space. If we loosely understand the dynamic patterns affecting the problem space we can then detect signals of how the pattern is beginning to change.

Potential Methods: Causal loop analysis to articulate the conditions shaping the problem space. Causal loop analysis is a means by which to visualize how different actors or agents within in a system are interrelated. It can help clarify what conditions shape the problem space. It's important to note that actors may include stories or cultural shifts within a community – and are not limited to individuals or organizations. A new narrative or myth can sometimes be one of the strongest actors shaping the system.

Influence map of key stakeholders within the problem space

Historical analysis of rate and type of change in terms of technological innovation, scientific discovery, economics, environmental and political change within the sector

Identify and monitor the macro trends shaping the problem space

2. Monitor for change within the landscape

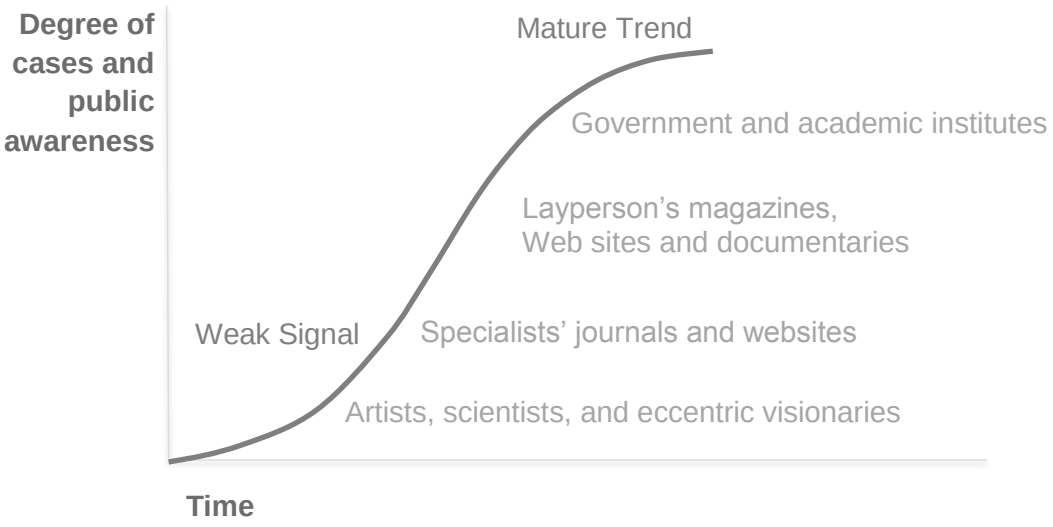
A key element to developing foresight capacity is to spot signals of change – or weak signals. After establishing a baseline we can begin to set up multiple "trip-wires" for potential terms and develop human attention to discern weak signals of interest based on our baseline analysis – these are not passive but probing questions about the nature of change within the space. The risk in this process is being too attached to the initial analysis and not responding to new information – thus the importance of framing research as probing questions and people with multiple points of view in the process.

Monitoring for weak signals can be done by observing publications and activities of specialists, blogs, conferences, and mainstream media, as well as fringe publications. Weak signals indicating potential future change may occur as outlier behaviour, discontinuities, unconventional wisdom, or disruptive technologies. These could be represented with a photograph, a story, or an on-the-ground observation. Generally, there is not substantial evidence or data to support a weak signal as evidence of a major shift within the landscape, however as the signal matures, evidence will build.

The maturation of a weak signal into a trend may occur over a five-to-ten year horizon, or disrupt a system very quickly. Understanding the difference depends on the life cycle of change (emergence, development, maturity and decay) within the specific sector or system. Some agents within a system, such as technology, can be quite disruptive and accelerate change rapidly, e.g., the development of Twitter and then the use of Twitter as a tool in political protest worldwide. Therefore, researchers in the scanning function will need some knowledge of the sector (or system) in order to understand the full implication of a weak

signal. If researchers lack expertise in the given domain they may host a discussion with experts to collectively surface the full implications of the signal.

The figure below depicts the life cycle of a change[10], from a weak signal to a trend, both in terms of number of observable cases, and in terms of public awareness. The growth of an emerging issue of change into a full-blown trend follows a typical life cycle S-curve whether the dependent axis is the degree of public awareness of the change, or the number of observable instances (cases) of the change.



Potential Methods: Use a diverse data sources from fringe to traditional sources, e.g., Google alerts, blogs, journals, etc.
Conduct both directed and non-directive scanning
Use collective intelligence to question and challenge existing hypothesis

3. Analysis, synthesis and exploration of implications of data through futures techniques

Having gathered data from a variety of sources, organize the data for easy retrieval and sensemaking. A variety of taxonomic systems are in common use: social, technological, economic, environmental, and political (STEEP); political, economic, social, technological, legal, environmental (PESTLE); and political, economic, social, technological, legal, environmental, cultural (PESTLEC).[11] The limitation of these frameworks is that they risk

[10] Schultz, Wendy. The cultural contradictions of managing change: using horizon scanning in an evidence-based policy context. Vol. 8 No 4 2006, pp. 3-12, Q Emerald Group Publishing Limited, ISSN 1463-6689 Foresight
[11] Schultz, Wendy. The cultural contradictions of managing change: using horizon scanning in an evidence-based policy context. Vol. 8 No 4 2006, pp. 3-12, Q Emerald Group Publishing Limited, ISSN 1463-6689 Foresight

being categorization frameworks based on an “outside” point of view. It is worth monitoring new data technologies that enable people to self-index their own data. (For example, the self-organizing taxonomies created by large groups of people individually assigning hash tags to their entries.)

Use of futures techniques to explore implications

Futures analysis is intended not to predict but to systemically reflect on a range of possible futures in order to better understand implications of trends and weak signals of change. Future techniques such as scenarios development, forecasting and visioning, are ways to disrupt conditional thinking, as they allow us to see the same data in a new way.

Potential Methods: Organize and analyse data using STEEP, etc., or, if possible, using sensemaking technologies such as Futurescaper or Sensemaker
Prioritize patterns of data that are occurring more frequently
Apply futures techniques such as scenarios development, causal layered analysis, forecasting and visioning to explore potential future directions

4. Verify

Dr. Wendy Shultz provides three methods for evaluating the nature of weak signals.

- Confirmation or accruing multiple citations – accruing evidence from a variety of sources of multiple occurrences validates the existence of a change, and indicates the direction of the emerging trend.

- Convergence or emerging consensus – transformational weak signals will challenge current scientific paradigms. As more data is available, researchers will begin to discard some of the explanations the challenge provoked, and come to agree on a new paradigm.

- Parallax or testing the hypothesis or weak signal of change by collecting views from multiple perspectives, e.g., through processes that leverage collective intelligence

Potential Methods: Analyze for multiple citations over time and converging consensus
Conduct a ‘call and response’ with individuals within the system to test cognitive bias

Horizon scanning capacity as organizational learning

Developing knowledge about how change is happening is not just about gathering external data; it's also about building a cognitive agility within an organization about the nature of change. It's important that key decision makers, the ultimate users of the function, are involved throughout the process of gathering and analyzing data. As one interviewee said, "*We can have the most beautiful scanning in the world – but without involving those that make strategic decisions based on the information, we won't succeed."*[12] Taking this into consideration, developing a horizon scanning function follows some of the principles of organizational change strategies, e.g. the story telling about the process of gathering data, and what has been learned during that process, is as important to increasing the uptake of the practices as the analysis itself.

It may take a few years for a scanning function to mature within the decision making process of an organization. It not only takes time to develop the knowledge base – i.e. the expertise and experience to recognize patterns from unstructured information and to analyse the implications to the organizations choices vis-à-vis their mission, it also takes time to build the internal cognitive agility of key internal decision makers. Learning can be accelerated through parallel experiments. The experiments should be safe-to-fail, which at the risk of stating the obvious means that if they should fail recovery is easy. In fact, a percentage should fail; if not, the initiative is not stretching the boundaries enough and the scanning range is reduced.[13]

We know the next fifty years will look nothing like the last fifty years – meeting the challenge of the combined forces of climate change and the increased demand for limited resources will require new ways of problem solving and organizing resources. For organizations with a mission to serve those who are at risk of experiencing increased hardship because of the increased volatility, investment in a horizon scanning function and a foresight strategy will be essential to effective intervention design. Development organizations that hone an agile learning program about how change is happening outside their organization boundaries will be better positioned to benefit poor or vulnerable communities in the future.

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[12] Cornelia Daheim, interview
[13] Based on Dave Snowden's Seven principles of intervention in complex systems. Accessed December 2012.