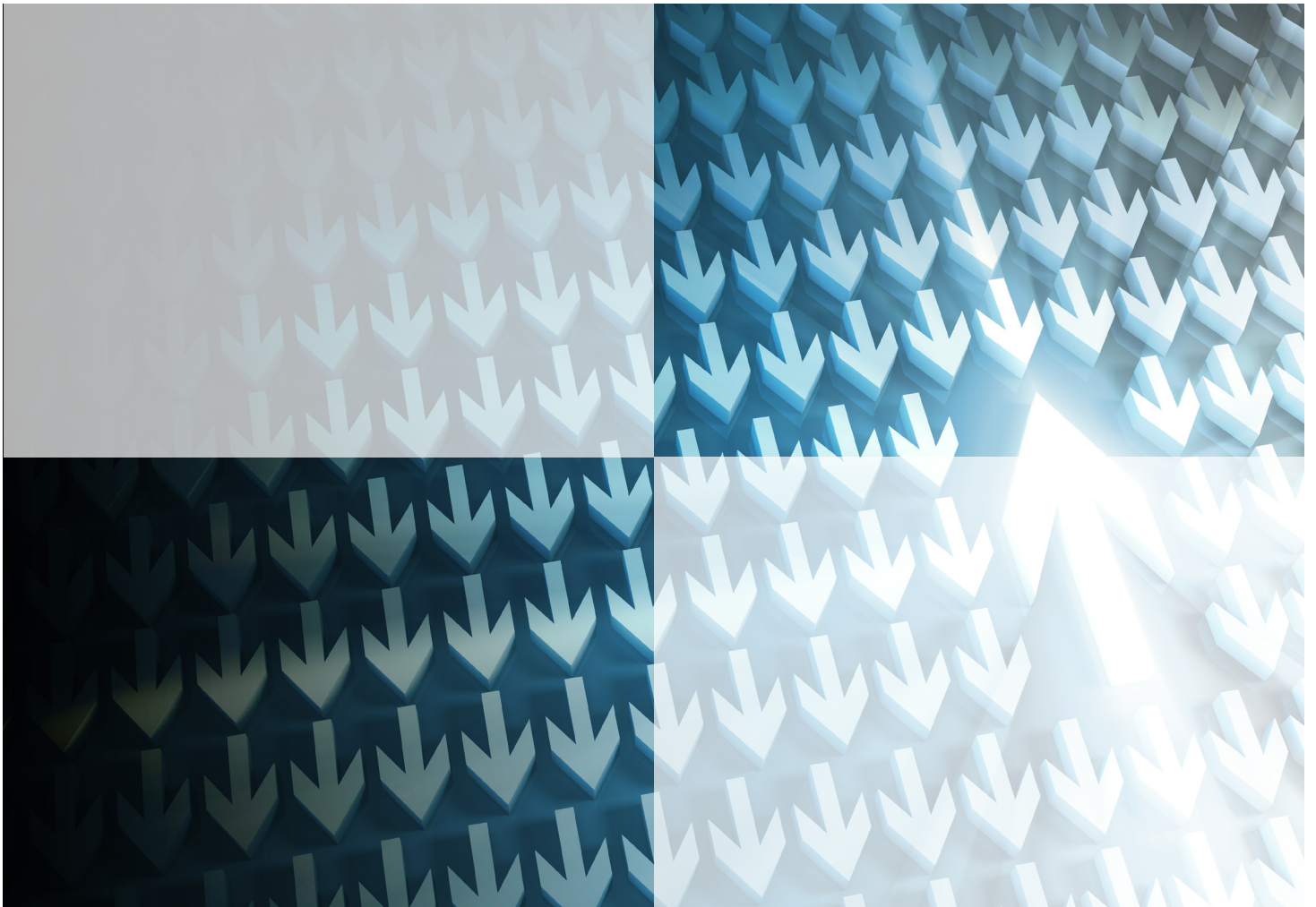


Industry Agenda

Innovation and Entrepreneuring Boston Summary Report

Boston, Massachusetts, USA, 14 May 2015

June 2015



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Introduction

In a changing business environment, the concepts of collaborative innovation and entrepreneurship are taking on new meaning and importance. Innovations are increasingly coming from sources other than large corporations, particularly from academia and the start-up community. Marrying the discovery of innovative solutions with important global challenges, along with the organizational knowledge and infrastructure needed to scale these solutions, will require greater emphasis on collaboration between players across the public and private sectors. As such, the World Economic Forum convened industry partners to discuss the essential elements of success for innovation in emerging technologies. This second annual gathering brought together large multinational companies and strategic partners of the Forum with entrepreneurs, experts from industry and academia, and civil servants from around the globe.

Held in Boston, Massachusetts (USA) in May 2015, the meeting focused on collaboration and emerging technologies across industries, with a particular focus on biotechnology and healthcare, bringing together cross-industry stakeholders from chemicals, healthcare and life sciences, venture capital and leading research institutions such as the Massachusetts Institute of Technology (MIT). The meeting's outcomes will help generate input for continued dialogue at upcoming events, including biotechnology ecosphere meetings in Montreal, Canada and São Paulo, Brazil, and the Annual Meeting of the New Champions 2015 in Dalian, China.



01: Steven Hamburg, Environment Defense Fund, USA

02: Ian Waitz, Dean, MIT School of Engineering, USA

03: Duane Dickson, Deloitte Consulting LLP, USA; Sebastian Titz, 3M, USA; Pieter Wolters, Royal DSM, USA; Sridaran Nateson, Sanofi, USA; Andrey J. Zarur, GreenLight Biosciences, Inc., USA

04: Participants collaborate on "Addressing Global Challenges through Emerging Technology-Enabled Solutions"

Highlights

- The entrepreneurial ecosphere in the Boston area has grown significantly in recent years, particularly in biotechnology. The ecosphere’s success can be understood through the “six Cs”: confidence, courage, capital, capacity, collaboration and critical mass (see “Setting the Stage”).
- Participants were encouraged to describe their activities as “entrepreneuring” rather than as entrepreneurship, as the former implies actively “doing it” instead of passively “being it” (see “Setting the Stage”).
- Successful institutions and ecosystems often result from the quality of their people, which creates a virtuous cycle that continues to attract new talent and ideas. Creating the initial “brain magnet” is crucial (see “Education and the Future Outlook for Innovation”)
- Support from civil society plays a significant role in ensuring that technology-enabled solutions are developed and implemented sustainably, and that they are being used to address societal challenges (see “Global Challenges and Opportunities”).
- A variety of emerging technologies, including exascale computing, genomics, 3D and 4D printing, nanotechnology and microbial therapeutics, are being applied in new and exciting ways to solve global challenges (see “Emerging Technologies: Recent Developments, Opportunities and Risks”).
- Ensuring adequate and reasonable application of intellectual property (IP) protections will be essential for facilitating innovation; properly managing IP can be a challenge, particularly within the context of partnerships (see “Barriers to Innovation and Commercialization”).
- Time horizons are often radically different between small and large companies. Recognizing and understanding this divergence will be crucial for successful collaboration between different types of companies (see “Barriers to Innovation and Commercialization”).
- Collaborative business models between industry, start-ups and academic researchers will serve an increasingly important role in developing and commercializing innovation (see “Applying Collaborative Business Models”).
- Public and private partnerships will play a vital role in overcoming barriers to innovation and commercialization, and will help to direct resources and efforts towards the most urgent global challenges (see “Applying Collaborative Business Models”).
- Institutions looking to form partnerships have traditionally focused on developing bilateral agreements; however, multilateral collaboration between partners from various backgrounds can be more sustainable and hold significant promise for facilitating innovation (see “Breakout Sessions – Reports from the Groups”).



Discussion Summary

Setting the Stage

Several participants set the stage for subsequent discussions. They highlighted takeaways from previous innovation and entrepreneuring sessions, the unique characteristics of the Boston entrepreneurial ecosphere, and the shifts in attitudes that will be required to solve complex global challenges.

As already noted at previous meetings, holding these gatherings in new and diverse geographies is essential for bringing vital ideas to entrepreneurs and innovators in other parts of the world. It also highlights the unique challenges hampering innovation in these ecospheres. For example, the August 2014 Biotechnology Ecosphere meeting in São Paulo, Brazil was particularly relevant given the country's regulatory environment that makes it impossible for academic researchers to capture the value generated by their innovations. This leads to poor outcomes for society; a participant noted that "Boston start-ups generate 2 trillion dollars a year, while in Brazil this is zero."

Another important theme was the need to connect global challenges to emerging technologies, which will be instrumental in solving these problems. Historically, the World Economic Forum and its partner organizations have done an excellent job of identifying the major challenges facing societies around the world, as well as the unmet commercial and social demands often stemming from them. This thinking fell short in the past, however, by failing to clearly articulate specific ways that technology could help solve these issues. For the group, an important takeaway was to embrace this new way of thinking and discuss how emerging technologies could be applied to pressing challenges. Similarly, this discussion would help to identify the channels through which public-private partnerships could support the implementation of these solutions.

Several pervasive attitudes that pose challenges to innovation were also covered. The most prominent viewpoint, common in many parts of the world outside the United States, is that failure is considered a catastrophe when it should be seen as an essential precursor to success. Many of the brightest people are so accustomed to succeeding in an academic setting that they are unprepared to deal with the failure often associated with entrepreneurship. Institutions, including universities, start-ups and large corporations, will need to think about how to change this mindset, a crucial step for entrepreneurial cultures to flourish in different parts of the world. Terminology is also critical; participants shared a preference for the term "entrepreneuring" rather than "entrepreneurship", since the former implies that people are "doing it rather than just being it".

The Boston metropolitan area's growing entrepreneurial ecosphere was also discussed. In recent years, the number of exciting start-up companies and innovative ideas originating in this area has grown exponentially.

The increased vibrancy of entrepreneurial activity can be understood by the discussion of the "six Cs": confidence, courage, capital, capacity, collaboration and critical mass. While Boston's success certainly provides lessons for other burgeoning entrepreneurial ecospheres, a leading venture capitalist noted that the Boston environment was "not created by anyone – it just emerged".

Education and the Future Outlook for Innovation

MIT is a major centre for innovations developed through academic research and in partnership with start-ups and large companies. A number of other universities and cities have attempted to replicate the MIT and Boston model but have failed, as this ecosphere's success is easy to describe but difficult to reproduce. By using MIT as an example and source of inspiration, however, many other universities can strive towards creating a modern ecosphere that advances the frontiers of innovation to help improve society.

The concentration of exceptional people at MIT is the result of a virtuous cycle: a core group of brilliant individuals attract others who are very talented, who in turn attract additional gifted people. These individuals share common traits – among them, a strong aptitude for science and technology, a desire to change the world, a predisposition for collaboration and a deep commitment to education. MIT has recognized the value of attracting and retaining the best and most motivated students and faculty. By attracting such people from a variety of socio-economic backgrounds and focusing, according to one participant, on "world class over first class", MIT is able to bring the right people together in the right environment to spur collaborative innovation.

Along with having the right people and environment, the culture within MIT is equally important. From the moment of enrolling at the university, people are directed towards solving the world's problems within the context of research. This is designed to ignite a passion for pushing the boundaries of conventional science and limitations of engineering. While this culture leads to numerous innovative discoveries, a historical and current challenge for the university's leadership is to find ways to tie groundbreaking research to real market needs.

Similar to the Forum's use of a Transformation Map to visualize impacts throughout their endeavours, MIT demonstrates their culture of collaboration through a map that shows the connections between different research projects. A physical map indicating where patents have been developed reveals areas of high ideation and development, while a publication map (one showing relationships and related content between publications of different people at the university) shows where collaboration is most active among the global challenges being tackled.

As a growing number MIT graduates join small start-up companies, university leadership has identified the need to prepare them for this environment. A defining trait of a start-up culture is the ability to live with failure. Traditionally, MIT has not encouraged students to take risks and experience failure, but it is making changes to support this. Specifically, the university is creating programmes to help connect highly skilled postdoctoral students having no experience in entrepreneurship with innovative start-ups in the area. Stronger linkages to industry through innovation nodes help students better understand innovation and support the deployment of the right people, places and programmes necessary for success.

MIT is also making many investments to better facilitate and understand the science of innovation. MIT.nano is a \$500 million investment dedicated to fostering innovation; the structure is projected to be used by 20% of students and faculty to explore the ways nanoscience and nanotechnology will impact urgent global challenges. Another example is the MIT phone app, which informs students of research-tool locations and stores their credentials so they can easily access equipment on which they've already been trained.

Global Challenges and Opportunities

The next session highlighted the importance of collaborating to solve pressing global challenges, and the need for a robust civil society to support the solutions developed in response.

Partnerships need to support the development and implementation of new solutions. "You can have innovation, you can have success, but it doesn't mean that you are effectively solving a problem for society," according to one participant with an extensive background in supporting collaboration across scientific disciplines. In particular, civil society plays an important role by serving as an "entrepreneuring facilitator" and ensuring that solutions are implemented in an economically and environmentally sustainable way. These partnerships must be in place from the very beginning to maximize the positive impact to both society and the bottom line. For example, while the sensor industry has made astounding technological advancements, it is currently "chaotic" given the lack of supporting civil society partnerships.



Hydraulic fracturing (or fracking), used to extract previously inaccessible shale gas deposits, is another example of a promising technology that has faced setbacks because of an initial lack of civil society involvement. While fracking has grown significantly and with commercial success, the failure to consider its indirect impacts, particularly those to the environment, have led to a backlash against its use. Operating licences are often unclear, and several US states have banned fracking in response to these concerns, limiting its potential impact. Supporting technologies needed to address these indirect impacts, such as equipment to measure fracking's environmental impact, are now being deployed. Partnerships are also being established between the industry, academia and impacted communities to study the effects of these operations. While such partnerships bode well for the technology's sustainability, establishing them from the start would have allowed for greater impact in a shorter time frame.

Participants also raised questions about how society can deal with competing concerns as it looks to implement new technologies in response to global and local challenges. For instance, ways to promote the use of cleaner-burning natural gas in the short term without neglecting more impactful long-term investments in renewable energy sources are required. Maintaining flexibility will be necessary to achieve this, such as in building natural gas infrastructure that is not "locked in" and can be modified in the future to accommodate increased use of renewables. This also applies to using genetic engineering technologies in agriculture. While large population segments are opposed to using genetically modified crops for environmental and health reasons, these same techniques are being used to generate positive environmental impacts, such as through replanting chestnut trees in American forests.

Emerging Technologies: Recent Developments, Opportunities and Risks

Technology may be the greatest agent of change in the modern world, as breakthroughs promise innovative solutions to the most urgent global challenges. The World Economic Forum's Meta-Council on Emerging Technologies has identified 10 technologies that offer a glimpse into the power of innovation. Identifying and promoting these emerging technologies are intended to raise awareness of their potential and contribute to closing the gaps in investment, regulation and public understanding that so often thwart progress.

A panel of industry, academic and government research leadership gathered to present and discuss recent trends, developments and breakthroughs in emerging technologies. They also identified examples of how these technologies are converging to address a market opportunity and/or societal need, particularly as the physical and digital elements of these technologies converge. Finally, they examined the risks that need to be considered and mitigated as these technologies evolve.

Innovations in 3D printing are changing the consumer products industry; in fact, advancements in 3D printing have only recently occurred since the technology was founded about 30 years ago, as developments in computing capabilities and materials have spurred a recent innovation boom. For example, Continuous Liquid Interface Production (CLIP) technology can print up to 100 times faster than current methods, which prompted a participant to suggest that while "current 3D printing has failed in its ability to change manufacturing, ... CLIP technology will be a serious game changer". 3D printing is entering more industries and disrupting traditional supply chain functions every day by enabling distributed manufacturing solutions that can produce more functional parts locally.

It is a very exciting time in the biosciences ecosphere. Nanotechnologies are under development that can emulate viruses with "mastered nano-capabilities", according to one participant. Companies are now developing treatments that mimic the behaviour of viruses for targeted therapy. Ocular melanoma, a disease difficult to treat with current methods, can be treated with nanotechnology; in previously untreatable cases, this allows for therapy that can save someone's sight. Almost all current applications of nanotechnology are in therapeutics, but diagnostics is an area with promising applications. While invasive biopsy is used to identify most cancers, nanotechnology may allow for a passive identification system. This technology has the potential to save and improve countless lives, a powerful motivator for many entrepreneurs who are seeking to measure "success based on years of lives saved instead of on financial return", according to a panellist.

Microbial therapeutics is a new area of focus in biosciences. Society at large still believes that microbes harm people, according to the germ theory of disease advanced in the 1870s. However, the human body actually lives in a symbiotic relationship with microbes, using them to govern and define the immune system. By understanding those diseases caused by a microbial imbalance, doctors will be better positioned to diagnose and fix what is absent or out of balance through the use of microbial therapy. One participant believed that this could be the "holy grail of medicine" because natural organisms from the body are being used. A traditional drug is limited in that it typically does only one thing, while microbes allow for a more natural approach and can do numerous things by leveraging multiple facets of biology.

In pharmaceuticals, the rate of discovery of new chemical entities is a current concern, having been flat or down over the past 60 years. Furthermore, while genomics is very promising, it has disappointed expectations so far because of the long timeline to develop practical applications. However, the pharmaceutical community is optimistic because increased knowledge about genetics has led to great insight into the molecular nature of disease and the development of game changers such as biomarkers. To tackle today's challenges, more collaboration between academia, large companies and government is required. For example, a transformation from the linear process of licensing drugs to an adaptive model will enable researchers, manufacturers and distributors to bring iterative advancements to patients more quickly. As a panellist noted, this will help to shift the industry's mindset for defining a blockbuster as "reaching a billion patients, not just making a billion dollars".

National government laboratories are an invaluable resource to universities and companies because they are often able to invest in cost-prohibitive technologies, such as analytical supercomputers. Data growth is currently outpacing computing growth, as today's "amount of data is beyond our capacity to use it", according to one panellist. National laboratories provide advanced computing power to solve data-intensive problems that are beyond the capacity of traditional computing, such as fraud and threat analysis, healthcare cost reduction and treatment efficacy, and electric grid reliability. By 2022, exascale computing (computing systems capable of at least one exaFLOPS, or a billion billion calculations per second) will be a reality and should enable an exponential increase in the rate of innovation.

Barriers to Innovation and Commercialization

Panellists with backgrounds in academia, start-ups and industry discussed various barriers to innovation and commercialization, as well as some promising ideas for overcoming these barriers. The focus was on the challenges of collaboration between large and small companies, the important role that academia and start-ups will need to play in creating innovation, and the importance of intellectual property (IP).

Given the decline in innovation from large companies, partnerships with start-ups and academia will play an increasingly vital role in producing and commercializing innovation. While a variety of challenges make it difficult to realize the value of partnerships between large and small companies, their importance was underscored by a panellist from the start-up community who noted that "[they] need to do a better job of working together". Differing time horizons can play a role, as big firms have little urgency while small companies frequently need to establish a partnership immediately or they will eventually perish. Furthermore, academic researchers and entrepreneurs can often become frustrated when witnessing an unsuccessful commercial deployment of a promising solution. Allocating value derived from partnerships can also lead to disagreements because partners often have differing attitudes and perspectives on value. Small companies frequently lack the organizational knowledge needed to collaborate with large companies, it was noted, and coaching is needed from large companies to improve these partnerships.

The importance of IP in promoting innovation that originates from universities and start-ups was also highlighted. Technology-enabled solutions will be much more attractive to investors if their ideas are patent protected, since a patent assures investors that they will be able to capture the value. This is particularly vital for early-stage technologies, which pose a significant risk for investors as cash flows related to the investment will only begin to be realized later on. A patent protecting an early-stage solution thus provides time for the solution to mature and become commercially viable and socially impactful. Panellists worried that potential changes in patent law could hamper promising early-stage solutions; weaker patent protections would discourage investors by turning the related start-ups into even riskier investment opportunities.

Interesting strategies for mitigating and overcoming these barriers were suggested. With challenges facing start-ups and academia in commercializing new technologies, room exists for a model in which large companies can provide support outside of traditional avenues of mergers and acquisitions or venture capital funding to get promising ideas off the ground. This could be seed capital or some sort of incubator to support the development of ideas. Panellists also suggested a type of service functioning as an "Uber for scientific equipment". The large, upfront capital investment needed to purchase required equipment is often a daunting challenge for start-ups, so a solution that allows these companies to effectively rent the equipment could help them overcome this hurdle.



Applying Collaborative Business Models

Panellists with backgrounds from small start-ups to large corporations discussed how collaborative business models can foster innovation. Factors that can lead to the success or failure of collaborations, the role of business models in the panellists' work, and potential areas for partnerships and cooperation between the public and private sectors were covered.

While a business model's definition will vary depending on whom is asked, it was agreed that any model's focus should be on getting a particular solution to its end users as efficiently as possible. For start-up companies, the business model should focus on advancing a particular technology to the point where the start-up is no longer best positioned to move the idea forward. At such point, it can be advanced in cooperation with larger companies. For example, business models for large pharmaceutical companies should focus on how a drug's development can be accelerated so that it reaches patients as quickly as possible. Large companies looking to develop business models involving new ventures should seek ways of commercializing innovative technologies through their pre-established sales channels, thus helping existing customers address new challenges.

Insights were offered into the factors that often lead to the success or failure of a collaborative model. The consensus was that a fair and balanced governance structure between participants is essential for creating sustainable partnerships. Importantly, the partnership should fit strategically with the long-term goals of all parties, whereby each also has a deep understanding of the others' objectives. The value generated from the partnerships should be allocated equitably between the parties to maintain fairness and provide an incentive for future collaboration. Finally, sometimes "you have to be willing to be reckless" to build successful partnerships, according to a panellist who has founded several start-ups, by boldly emphasizing the potential big-picture impact in response to setbacks and hurdles.

Several challenges can limit the success of partnerships. A lack of alignment on the partnership's objectives, both within individual companies and between the various parties involved, can prove problematic. Researchers working on a technology, and legal or compliance teams concerned with risk, often disagree on a partnership's merits, which can derail a promising initiative. The focus should be on the broader goals of financial arrangements rather than on their minutiae, and "over-negotiation can ruin trust at the start", said one panellist. Start-ups involved in partnerships should maintain a broad customer base, since a smaller partner can become overdependent on a larger one if it is the smaller partner's only customer. Finally, securing the right people for a partnership is important, as people with skill sets suited to a specific type of working environment and company culture may not be able to adapt to a partnership's new business requirements.

Despite misgivings that companies may have about working with competitors, value can frequently be derived from collaboration. Competitors within an industry experiencing radical change from new technology would benefit by collaborating on research efforts. This will not only help avoid duplicating effort, but also allow for more efficient discovery of impactful technologies that benefit all industry participants; "a rising tide lifts all boats," added one panellist. Companies will also need to be realistic about the dynamic forces shaping their industry, and think about whether they should be proactive and, according to a panellist, "disrupt themselves rather than being disrupted by a competitor".

Finally, exciting public-private partnerships were discussed and suggestions provided for avenues of increased public-private cooperation. Groundbreaking work is being done through the Innovative Medicines Initiative in Europe, a collaboration between the European Union and major pharmaceutical industry players. A partnership with the Israeli government sought to build an electric vehicle system; while it was not commercially successful, the technologies created are now being widely used to develop alternative vehicles. Finally, the public sector can increase innovation in the private sector by streamlining regulation and removing uncertainty for businesses. Noting that "uncertainty is a killer for entrepreneurs and innovation", panellists discussed how clearer regulations would benefit innovation in areas like drug development and alternative fuels.



01: Participants discuss "Applying Collaborative Business Models to Commercialize Solutions"

Breakout Sessions

Addressing Global Challenges through Emerging Technology-Enabled Solutions

Participants broke out into smaller groups to begin thinking about how technologies and partnerships can be applied in new and innovative ways to solve several crucial challenges facing society.

Each group answered a series of questions related to these topics. First, the groups each identified a global challenge that offers promise for technology-enabled solutions and thought about how emerging technologies identified by the World Economic Forum could be applied to solving the challenge. Group members brought unique perspectives for proposing new and unexpected solutions. For example, concerning resource security, the challenge in this area is not necessarily a lack of resources on a global scale, but rather an abundance or scarcity of different resources in different geographies. A technology-enabled solution should thus focus on allocating and managing resources at a local level by using technologies such as energy capture, storage, distribution and advanced information analytics.

Technological hurdles to implementing these technologies, and potential societal risks posed by them, were also covered. These included innovative applications of new technologies, including screenless displays and artificial intelligence to improve the quality of education. Implementing such solutions would present technical hurdles, however, as different types of skill sets would be required in developed and developing countries to use these technologies effectively. Using enhanced educational technology risks reducing employment in education in order to achieve enhanced efficiency; these competing concerns would need to be thought through and balanced appropriately.

Applying Collaborative Business Models to Commercialize Solutions

Discussion on proposed technological solutions focused on barriers to commercialization and how partnerships and collaborations could prove helpful in mitigating them.

The use of emerging technologies (e.g. genetic engineering, distributed manufacturing) can improve distribution of nutritious food in emerging urban markets. Several critical barriers that could affect this solution include public trust in the use of new technologies for such an integral and personal part of life, the amount of upfront investment required, and a disconnect in incentives between various members of the supply chain. Several promising avenues of collaboration could mitigate these concerns: the public sector would have a significant incentive to play a role in this solution, as governments and healthcare authorities have an interest in improving health and nutrition; producers and distributors could collaborate to share information and align incentives; and, finally, the marketing of food products could be conducted collaboratively to fully educate the public about the benefits of these technologies.

Reports from the Groups

A member from each group presented their team's solution by discussing the challenge they addressed, the emerging technologies that would be employed, how barriers would be overcome through the use of partnerships, and the ultimate impact of implementing that idea.

Emerging technologies offer a breadth of possibilities, as shown by how certain groups thought about addressing the same challenge through different combinations of technologies. Two groups covered the challenge of skills and human capital, but arrived at different ideas for technology-enabled solutions: one focused purely on improvements in the quality of education, while the other covered the implementation of new educational technologies in developed and developing countries.

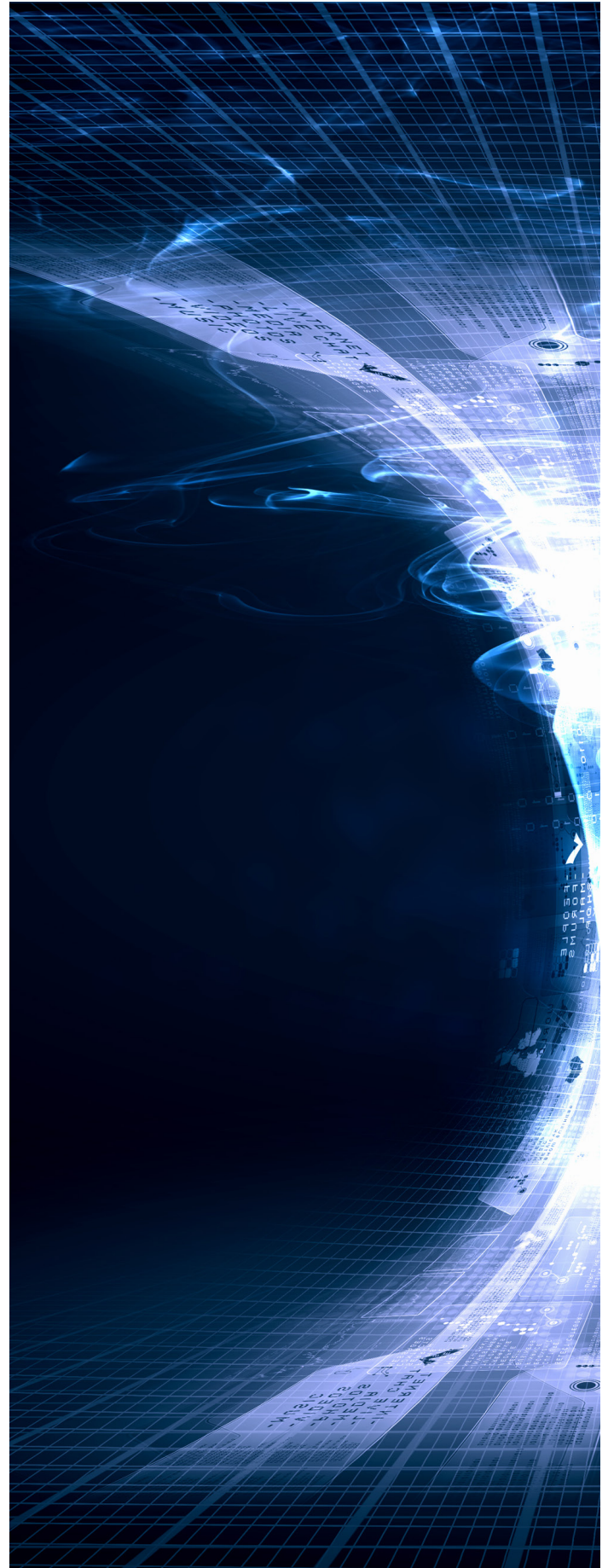
Solutions designed to address a particular challenge may present unexpected benefits in addressing other challenges. In one developing country, a new school had the only refrigerator in its local, rural area. By storing vaccines and serving as a sort of clinic, the school became an important centre of education and public health in the area. The broad variety of both global challenges and emerging technologies means that a multitude of potential ways to address these challenges exists. It is essential to think about combining these technologies in new ways.

Such innovative solutions spurred further interesting discussions, including one on the relative efficacy of bilateral versus multilateral collaborations. Traditionally, players in entrepreneurial ecosystems have pursued primarily bilateral collaboration, as has been discussed in previous sessions. While these types of partnerships have some value, the true value seems to be in multilateral cooperation involving multiple stakeholders across the ecosystem. In the long run, these multilateral partnerships often prove more sustainable, as it can be easier to balance the competing interests of various parties.

This aspect ties in with the importance of prioritizing ecosystem management at the early stages of any new partnership or collaborative solution. As covered earlier in the session, developing the supporting partnerships and securing civil society's involvement from the start are crucial when developing a new technological solution – to ensure that a societal problem is being addressed and that stakeholders throughout the ecosystem are aligned. Furthermore, developing multilateral partnerships as soon as possible is critical to begin engaging with the entire ecosystem from the start. If a particular technology is being developed solely through a bilateral partnership, other players in that ecosystem may be more sceptical of the technology and may suspect collusion. Engaging in multilateral collaboration early on can help assuage these concerns, ensure that all relevant stakeholders in the ecosystem are on board, and bring additional resources to support the technology's development and commercialization.

Participants from different countries also shared their unique perspectives on collaboration and the way that culture can impact how companies, the public sector and academia work together. In the United States, the onus is typically on individual companies to proactively seek out partnerships and create specific business models for conducting collaboration. In contrast, Japan's culture of collaboration reflects a standard practice for the private sector, governments and universities to cooperate on developing technologies. Each group focuses on the particular area of the value chain in which it has the most expertise and relies on the other groups to carry out their roles by achieving progress in the other areas of the chain.

The role of governments and the public sector in supporting innovation, outside of the traditional role of providing funding for research, was covered. With the shift away from developing centralized, "top-down" solutions towards those that are customized and "bottom-up", local governments will play an increasingly vital role in shaping strategic policy agendas, given their understanding of their constituencies' needs and characteristics. The public sector will be crucial for communicating with the population at large, both in conveying the benefits of new and unfamiliar technologies and in engaging in public dialogue to ensure that society's needs are met. Finally, a major theme was how government can support the private sector by streamlining regulations and removing uncertainty. Public-sector initiatives to eliminate inefficient or outdated regulation were discussed, such as the "one in, two out" policy in the United Kingdom mandating that for each new regulation introduced, two existing regulations must be removed.



Synthesis and Next Steps

The global challenges facing society today will increasingly require collaborative innovation from multiple sources. Large corporations, entrepreneurial start-ups, academia and civil servants will have to work together to fully realize the potential of emerging technologies in solving these global issues. Several crucial actions and next steps to unlock this promise were identified:

- Share outcomes and insights at upcoming meetings, such as those in Brazil, China and Switzerland
- Investigate the feasibility of piloting small-scale programmes to test exciting solutions, gather data and promote the growth of collaborative innovation
- Expand these meetings' locations to other parts of the world and North America that have exciting and diverse entrepreneurial ecospheres (e.g. Spain; Austin, Texas; Silicon Valley, California)
- Establish desired outcomes as the platform continues to expand – determining what stakeholders want to deliver and developing action plans to accelerate progress towards these goals
- Share contact information among conference participants to create opportunities for additional networking and continued exchange of ideas
- Create additional opportunities for feedback and follow up to further explore the ideas and potential solutions discussed during breakout sessions

The World Economic Forum will play a vital role in promoting innovation and entrepreuneuring among large multinational companies and strategic partners with entrepreneurs, experts from industry and academia, and civil servants from around the globe. The platform will continue to explore expansion to other regions while promoting the sharing of ideas across them. Both the Forum and platform participants will continually evaluate who should participate at these meetings to ensure the right stakeholders are involved.

01



01: Example Report from Breakout Sessions

List of Participants

Landon Downs	President and Co-Founder	1QBit	USA
Sebastian Titz	Manager, New Ventures	3M	USA
Upma Sharma	Director, Material Science and Engineering	Arsenal Medical	USA
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Jeffrey Carbeck	Specialist Leader, Advanced Materials and Manufacturing, DC Innovations	Deloitte	USA
Duane Dickson	Principal and Leader, Global Chemicals Sector	Deloitte	USA
Tim Hanley	Principal and Global Leader, Manufacturing	Deloitte	USA
Steven Hamburg	Chief Scientist	Environmental Defense Fund	USA
Noubar Afeyan	Managing Partner and Chief Executive Officer	Flagship Ventures	USA
Brian Baynes	Partner	Flagship Ventures	USA
David Berry	General Partner	Flagship Ventures	USA
Andrey J. Zarur	Chairman and Chief Executive Officer	GreenLight Biosciences	USA
Eric Norman	Director, Communications	Madrid-MIT M+Visión Consortium	USA
Charles Cooney	Professor of Chemical Engineering	Massachusetts Institute of Technology	USA
Ian Waitz	Dean of the School of Engineering	Massachusetts Institute of Technology	USA
Lita Nelson	Director of Technology	Massachusetts Institute of Technology	USA
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Jim Mahoney	Chief Executive Officer	Novomer	USA
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Mark Smith	Co-Founder and Director, Research	OpenBiome	USA
Amir Nashat	Managing Partner	Polaris Partners	USA
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Gary Rabinovitz	Manager, Rapid Prototyping Lab	Reebok International	USA
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Andrew Hagan	Director, Head of Chemistry and Advanced Materials	World Economic Forum	Switzerland
Kevin Lang	Project Manager, Collaborative Innovation	World Economic Forum	Switzerland
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The World Economic Forum is an international institution committed to improving the state of the world through public-private cooperation in the spirit of global citizenship. It engages with business, political, academic and other leaders of society to shape global, regional and industry agendas.

Incorporated as a not-for-profit foundation in 1971 and headquartered in Geneva, Switzerland, the Forum is independent, impartial and not tied to any interests. It cooperates closely with all leading international organizations.

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