“Rebuilding India Initiatives – Post-COVID”

Berkeley Innovation Forum India Fall 2020
Center for Growth Markets, UC Berkeley

Purpose of the Report:
This report is prepared for NITI Aayog for evaluation and input to create a roadmap in collaboration with participating firms that will be implemented by the government of India.

This is a White Paper based on:
1. Discussions between the senior executives from industry, academia, and government.
2. Presentations by CEOs about their firms': a) value propositions, b) collaboration opportunities with other BIF India participants c) support requests from the government to move this initiative forward.

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Senior Executives of the following elite global firms & governments participated in this event:

1. Adobe
2. Amazon
3. Apollo Hospitals
4. Applied Materials
5. Autodesk
6. Avery Dennison
7. Dell
8. Enel
9. Ericsson
10. HDFC securities
11. Hero Cycles
12. Hero Enterprises
13. IBM
14. Indian Embassy of US
15. Infosys
16. Intel
17. Johnson Controls
18. Kirloskar
20. Manipal Hospitals
21. Microsoft
22. NITI Aayog
23. NPCI
24. NVidia
25. Oracle
26. Reddy Labs
27. Reliance Industries
28. Reliance Jio
29. Salesforce
30. SAP
31. Smart Village Movement
32. TATA Chemicals
33. TATA Power
34. TechMahindra
35. Thyssenkrupp
36. UC Berkeley
37. US Embassy of India
38. VMware
39. Wipro
40. Xerox
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Executive Summary

A Vision for the Future

The Power of Collaboration & Ecosystem Approach

Solomon Darwin
Executive Director, Center for Growth Markets
Haas School of Business,
University of California, Berkeley

Over 40 global corporate leaders spent together 3 days from August 5th-7th, 2020 at a first virtual Berkeley Innovation Forum dedicated to the topic “Rebuilding India Post COVID”. This meeting with the global leaders was called by Carol Christ, Chancellor of the University of California at Berkeley to move India forward. The event was chaired by Amitabh Kant, CEO of NITI Aayog (the Governing Council for Economic development chaired by Prime Minister Modi) and co-chaired by Sunil Munjal to represent the Indian Industries. The discussions were anchored and moderated by Solomon Darwin from UC Berkeley with opening remarks from Dean Ann Harrison of the Haas School of Business. The objective of this meeting was to sign-off on working together “offline” in preparing a road map that will be presented to this group at our next meeting on February 22, 23, & 24, 2021.

As noted by Mr. Amitabh Kant, it was the first time that so many large firms joined a single event to move India forward through collaboration. The participants represented a good cross-section of all industries that drive the Indian economy. In my opening remarks, I had articulated the importance of the government, universities, and industry collaboratively working together with commitment as equal stakeholders – all joining forces and pulling in the same direction with singleness of aim and oneness in the effort. The objective of the meeting was to set the stage for “offline meetings” for participating firms to identify opportunities that will enhance existing value chains and identify future ecosystems to be developed as scalable and sustainable collaboration initiatives. That process includes jointly exploring prospects for a) cost elimination, b) risk-sharing, c) relieving of bottlenecks, d) tightening weakest links and e) resource sharing among and between participating firms.

The purpose of the meeting is to start a conversation with key stakeholders including the government to formulate collaborative activities across industries to move India forward. The three specific initiatives listed on the agenda.

Initiative #1: Establish India as the Second Manufacturing Hub for Diversified Global Supply Chains
- Expand hub-diversification strategies
- Develop efficient supply chains for consumables

Initiative #2: Develop Digital Infrastructure for Early Education and Skill Development for Job Creation
- Leverage digital platforms to deliver holistic early education to build a talent pipeline
- Accelerate digitally-enabled certified corporate training for job creation among aspirational youth

Initiative #3: Build Ecosystems in Key Sectors to Mitigate Pandemic Risk
- Create digital healthcare solutions for efficient last-mile access
- Create transparent agriculture platforms for frictionless farm-to-plate channels
- Deepen financial inclusion and risk management in underserved sectors and regions

The sections that follow summarize the message of the keynote speakers and the presentations of the participants of each session. Also, we provide a summary of the presentations and discussions that took place among the participants.
Critical success factors to move India forward were identified; however, further dialogue is needed to develop action plans specific to key industries. They fall into five categories:

1. **Speed up the digital transformation** – a necessity in our globalized-interconnected world.
2. **Stimulate internal and external creativity** through open innovation
3. **Build ecosystems** - Build bridges to share risks and costs and resources
4. **Be flexible** – Internal transformation and mindset to adapt to the changing landscape
5. **Diversify smartly** (through Minimum Viable Ecosystems)

This report articulates each participating firm’s contribution to the initiatives outlined as it applies to them. The collected notes were summarized and offered as a white paper in preparation of a roadmap for ecosystems design, which will be presented in 2021. Ecosystem formation is important to shape the overall roadmap to create value and win-win for all stakeholders. In other words, different firms playing as actors in an ecosystem can create more value together as opposed to the value that each of them can create on their own. During this event, the attendees were able to join the open discussion and formulate collaborative activities across industries to move India forward on three specific initiatives listed on the agenda. It is worth noting that this white paper does not represent the full set of solutions, but rather suggestions and visions that enable different sectors to respond to the emerging challenges in the light of post-COVID setback.

**Conclusion & Main Takeaways**

The organizations present at the BIFI India Fall 2020 belong to different sectors and backgrounds, come from different countries, and are tackling different challenges. Nonetheless, it is interesting to notice that some elements emerging from the discussions were recurrent in more than one discussant presentation. Here we summarize common takeaways that can be relevant for any company.

1. **Move Beyond Balance Sheets**
   The balance sheet is no longer as essential as it once was. The sharing economy has resulted in the use of other peoples’ assets to ensure optimal use of resources within the ecosystem. There is no need to reinvent the wheel or duplicate value chains and distribution channels. The success of an organization has migrated to the talent and capabilities of people within the firm enabled by digital tools and infrastructure. in the new landscape, the key activity is orchestration and rapid deployment assisted by soft assets knowledge resources.

2. **Equitable Partnership between Governments, Universities & Business Enterprises**
   Universities are knowledge creators that provide a competitive edge through first-mover advantage to dominate the market segments. To develop solutions, the government, universities, and businesses must participate equally; this is also known as the Triple Helix Model developed at by Prof. Etzkowitz at Sanford University. These three partner types need to stand together, for the knowledge ecosystem model to work. The government is responsible to develop policy and make the right things happen via support and partnerships with universities. The universities can partner up and do research together on both managerial and technical problems. The knowledge generated at universities gives birth to new startups and empowers existing businesses. New jobs are created as businesses, and start-ups, innovate and turn knowledge into money. The government benefits through the growth of new taxpayers.

3. **The Power of Ecosystems**
   Ecosystems are essential for creating a scalable and sustainable economy; they eliminate costs by sharing risks, resources, supply chains, and distribution channels to deliver the value. However, ecosystems can fail if they stop innovating in response to a changing environment. Ecosystems need to be Smart (S=Simple, Scalable, Sustainable, M=Maintenance Friendly, A=Affordable, R=Reliable, T=Time Saving) and minimally viable. The minimal viable ecosystem consumes the least amount of resources possible to sustain itself while creating value for all its participants.

4. **Industry Advisory Council to provide a monthly briefing to NITI Aayog**
   An advisory council was formed to shepherd the process and represent the challenges of the participating firms through monthly briefings. The council members include 1) Sanjay Poonan, COO, VMware, 2) Dr. Malik Tatipamula, CTO, Ericsson; 3) Dr. Santokh Badesha, Chief Scientist, Xerox; 4) Dr. Piyush Modi, Chief AI Strategist/Industrial IOT, Nvidia; 5) Dr. Deepru Rathi, Ex-Director, Worldwide Cloud, Cisco; 6) Dr. Arding Hsu, Ex-President and CEO of Technology, Siemens; 7) Srinivas Satya, President, Applied Materials; and 8) Sri Mukundan, CEO of Tata Chemicals.
Thoughts and reflections on the initiatives following the meeting

Day 1: Preparedness for a boom in the services sector:

Establishing India as a strong manufacturing hub has many benefits, besides, job creation and improving exports. The new manufacturing sector will give birth to an enormous number of service businesses that may generate even a greater impact than manufacturing itself on the Indian economy.

Indian manufacturing should not become the victim of a commodity trap. Firms that focus on developing better products should not face the risk of failing to differentiate their offerings. Otherwise, they become commoditized by innovative entrants from the emerging parts of the world.

In preparing for this boom, we must understand three things 1) Services are intangible, so customers play an even more central role in service innovation, to identify the real needs that customers will really pay for, 2) Companies cannot provide by themselves all the things that customers need, yet customers want a complete solution to their needs. Therefore, collaborating with others is vital in services innovation, 3) Doing this well requires frictionless and transparent platforms to connect to your customers and other platforms to build upon to sustain services innovation over time.

“Firms that focus exclusively on developing better products and technologies run the real risk of failing to differentiate their offerings sufficiently, and instead become commoditized by innovative entrants from the emerging parts of the world”

- Prof. Henry Chesbrough, Father of Open Innovation, UC Berkeley

Product sales provide one-time income while services generate a continual income stream over the life of the product. Service income should be conceived first even before the product is introduced into the market, as it is more sustainable.

“Services are actually profit centers and solve real customer problems that keep those revenue streams flowing. They are often close to the innovation engine of the firm....”

- Prof. Henry Chesbrough, Father of Open Innovation, UC Berkeley

Day 2: Developing the world’s largest talent pool:

India continues to remain the fastest-growing major economy in the world and offers an opportunity for all industry sectors to prosper in its business-friendly landscape. Growth comes at the cost of investing in developing talent to create scalable and sustainable models. It is refreshing to note that many participating firms recognized this need and are stepping up their offerings to aspirational youth on mobile and digital devices to leap-frog traditional education in accelerating talent development to accommodate economic growth. We believe that the three initiatives outlined will get us there and benefit all stakeholders.

Day 3: Providing Basic Services to the Rural Majority:

On Day 3, we had focused on healthcare, agriculture, and financial inclusion to promote the well-being and empowerment of people especially those in rural areas where almost 70% of India’s population resides - all of which are most dependent on the internet connectivity. There was a general agreement to collaborate but will need future discussions to develop use cases to formulate effective solutions.

We look forward to developing the roadmap in collaboration with each one of you that will be executed by the government of India with our support.
Summary of Key Takeaways by Day

Initiative 1: Establish India as the Second Manufacturing Hub for Diversified Global Supply Chains

1. **Benefiting from the application of technology**: the positive impacts of the application of technology within the manufacturing sector were extensively discussed by participants. In fact, the benefits of using technology in smart manufacturing can impact the remaining takeaways including the importance of sustainability, the role of trust, engagement with academic institutions, and facilitating legislation, as stated below.

2. **Importance of sustainability**: All companies highlighted the vital importance of sustainability particularly within the manufacturing and energy sectors. In line with the government initiatives, major players within the Indian economy expressed their desire to engage in different activities of the sustainable value chain.

3. **Role of trust within the global ecosystem**: Considering the global concerns and opportunities including the impact of COVID-19 on corporates and SMEs across different sectors, the growing presence of China, and the close relationship between India and leading economies including the US, all participants highlighted the rising opportunity for India to achieve a higher share of the global market share as a leading manufacturer and reliable supplier.

4. **Engagement and partnership with leading academic institutions**: To accelerate solutions and knowledge creation through evidenced-based and implementable use cases.

5. **Facilitating the legislative and law-making process**: India has long been an interesting market for corporate firms as well as SMEs, looking to improve their market position. In order to improve India’s position in the global value chain and facilitate the entrance of multiple firms into different sectors, a reevaluation of the legislative process, particularly for new firms aiming to expand into the Indian market, remains of high importance.

Initiative 2: Develop Digital Infrastructure for Early Education and Skill Development for Job Creation

1. **Government support for utilizing early education**: includes a clear plan for infrastructure development, particularly in rural areas. To that aim, providing electricity, ease of access to the Internet at a low cost, and cellular support such as 3G and 4G remain necessary. Doing so will enable early educators to have access to high-quality materials.

2. **Government support for utilizing higher education**: calls for a clear strategic plan to partner with leading technology firms, including IBM, Microsoft, Adobe, Salesforce, SAP, etc. as an approach to provide IT training for higher education as well as recent graduates looking for recruitment. Doing so will enable future talents to develop their skills in cutting edge technologies including AI, machine learning, blockchain, cloud computing, and application programming.

3. **Government support for NGOs**: calls for a clear strategic plan that enables NGOs, charitable institutes, and non-profit funding bodies to have access to technological platforms in order to facilitate educational support for early and higher education.

4. **Partnership with research entities**: includes collaboration with leading institutions to conduct high-quality research that offers managerial and academic impact.

Initiative 3: Build Ecosystems in Key Sectors to Mitigate Pandemic Risk

1. **Solutions must be future proof in terms of health, economy, and society**: Pandemics such as the COVID-19 pandemic do not only influence the health of people but can also result in social and economic pandemics. Solutions that are designed should be aware of this and should make sure that they also contribute to social and economic welfare.

2. **The power of accessibility, affordability, and scale**: To bridge the gap between the rural and urban areas, healthcare, food, and financial systems need to be accessible, affordable, and scalable. These three aspects are related and should be considered together when developing new innovations for rural Indian citizens. Many examples can be found that it is possible to combine the three elements, but collaboration is key to realize this. Public-private partnerships are critical for these elements because it is impossible to realize the complex requirements for innovation in rural areas by only one company.
3. **Education is important at individual, organization, and ecosystem level:** Education needs to take place at different levels, to enable the realization of value co-creation. Individual members need the required (vocational) training to be able to do their jobs, but organizations also need to learn. Within organizations, it is important that the required knowledge of structures and processes be in place to enable efficient learning processes to capture value. Education is also important to create awareness in rural areas of the opportunities that being connected can offer them in terms of quality of life.

4. **Digitalization can create the quality of life for people in rural areas:** Digital technologies can improve the lives of many people living in rural areas because technology can reduce the costs and can enhance the scale of technologies and services. Farmers need to be connected to the market, to get good prices. Rural citizens need to be connected to access affordable healthcare, and to be financially included. The microlevel has to integrate technology to improve the quality of life of the rural people and to bridge the gap between the urban and rural areas.

Finally, our white paper concludes with an analysis and executive summary of the following survey questions answered by most of the participating firms. Both the executive summary and individual survey results are attached in the appendix.

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**Survey Sheet - Rebuilding India Post Covid-19**

*The Picture of Your Future*

*(The Survey Package with explanations and definition is attached the back of the appendix)*

**Name of your firm:** ____________________________ Circle the initiative in which you are participating:  #1  #2  #3

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision
2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative?
3. How can the “Ecosystem Approach” help achieve your firm’s objectives?
4. How do you plan to utilize “Open Innovation” as a part of your growth strategy?
5. Who are your current ecosystem members - critical to your success?
6. In the Industry 4.0 world, who would be your prospective ecosystem members - critical to your success?
7. What new use cases would you need to enhance your level of confidence to develop your strategy?
8. In addition to the digital infrastructure & technologies listed by GOI, what else may you need?
9. How do you measure success in the new landscape – list at least four KPI’s
10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”?
Day 1, August 5th

Initiative 1: Establish India as the 2nd Manufacturing Hub for Global Supply Chains

CEOs of top companies who offer a portfolio of products and services across India and different continents gathered together on this initiative to discuss the importance of collaborating together as part of a bigger ecosystem to make India a central focus for manufacturing in Asia first, and globally second. Three particular questions were asked to take these initiatives forward:

1. As a player, what will you do to help India become the second-largest manufacturer globally?
2. How do you plan to implement your strategy effectively?
3. Given the limited window of opportunity that India has to stand out, how to do it in a timeframe, which allows you to take advantage of the emergent opportunities?

Welcome: Ann Harrison

Anne Harrison
Dean of the Haas School of Business,
University of California, Berkeley

Ann Harrison’s welcome for this first initiative could express the deep connection from UC Berkeley with India. She mentioned the importance of the recently established Center for Growth Markets at UC Berkeley in 2019 run by Professor Solomon Darwin to recognize the economic importance and growth potential of South Asia. Harrison emphasized that all mankind is in line with the central challenge faced by India and that those need to be overcome collaboratively.

Over the past 16 years, the Garwood Center for Corporate Innovation at her Business School could establish a strong connection with Indian firms. She stated that the value proposition of these overseas partnerships has significantly benefited key industrial partners of the Berkeley Innovation Forum. This forum in return has a proven track record of partnerships with firms in Silicon Valley. The two countries of India and the US have had a very good relationship across universities and different sectors for years, she stated.

UC Berkeley has long been recognized for producing cutting edge research and formulating technological and business solutions, she mentioned. Indeed, the current pandemic situation would be a perfect time to strengthen the relationship between the two entities for solving grand challenges impacting both. The knowledge generated at Berkeley would have high potential to solve the scientific, technological, and business challenges that the world is facing.

Ann Harrison emphasized that UC Berkeley’s world-class research at UC Berkeley is known as the home of Nobel laureates with more Nobel laureates than any other university in the US. UC Berkeley had also played a critical role in the evolution and development of Silicon Valley. Historically speaking, UC Berkeley had awarded more PhDs than any other institution in the world, more than Stanford, Harvard, and MIT. Harrison concluded that the Center for Growth Market would serve as a world-class platform that provides intellectual leadership and creating actionable research and knowledge to solve the grand challenges related to business and economic development – specifically in India.
Nikhil Meswani emphasized that India is on a fast track to reopen to the world during these demanding times. Although the Indian supply chain would be working at a fast pace to cope with the demands of the market from manufacturers of textiles to polyester to chemicals to refining, demands from mainstream communication and retail remain historically low. He urged to achieve broad manufacturing objectives across India in a sustainable, export-oriented way to reestablish and advance demand from various sectors.

Meswani emphasized that RIL is now the largest recycling manufacturer across India. It highly benefits from its long-term experience of cleaning urban areas, he explained. Additionally, as part of several Indian government initiatives, the company would aim to become the largest exporter of textiles in India. RIL would be also able to provide medical kits and masks at a national level apart from general welfare, he concluded.

Nikhil argued that India needs to shift from being a major importer to becoming a major exporter. India had currently reversed its model from 80% focus on the Indian market and 20% focus on exports to 80% focus on exports. The Indian Government is requested to execute this shift cooperating closely with the private sector, he emphasized.

Amitabh Kant started his keynote by highlighting the importance of innovative practices as key pillars of sustainable economic development. He emphasized that today’s discussion should be focused on how to make India the second manufacturing hub for diversified global supply chains.

During the pandemic situation for COVID-19, Indian startups have shown an extraordinary degree of adaptability resilience, and engagement in innovative practices, he argued. These companies would be highly capable of manufacturing urgently needed ventilators. It is this aspect that made India now become one of the leading manufacturers for exporting health kits and ventilators, Kant stated. And, Indian companies offering a variety of telemedicine services through mobile apps already before the pandemic are facilitating contactless data-driven consultation aligning now with COVID-19. Amitabh Kant highlighted that downloads of those applications are reaching already more than 140 million globally.

Kant stated that India’s desire has been always to grow in both areas of products and services to lift people from poverty and agriculture. This development philosophy would accelerate India’s transition towards an upper-middle-income and eventually a high-income country. While the world’s FDI (foreign direct investment) has fallen by 16%, India’s FDI has grown by close to 30%, he argued. In fact, India’s prime minister had been trying to offer easy solutions to global firms that aim to
engage in partnership with India. Doing so, he emphasized, that the government has removed more than 1,400 rules and legislative barriers to make India a more attractive market for foreign investment.

Just during the past few months and as a result of COVID-19, India has received around 22 billion US dollars’ worth of investment, Kant explained. Big high-tech companies, the likes of Apple and Foxconn, had moved into India now. Adding Samsung to this group, about 100 billion US dollars’ worth of investment would be coming to India. Furthermore, India now would own more than a billion biometrics for identification purposes. Eventually, Kant emphasized that the country had become the only nation in the world with more than billion-plus mobile phones building the most promising innovation infrastructure of the 21st century.

Keynote #3: Sunil Munjal
Making India a Global Powerhouse Supplying International Markets

Sunil Munjal
Chairman, Hero Enterprises
Co-Chair BIF India

Sunil Kant Munjal’s set the foundation for the first initiative by highlighting the importance of collaborative activities across a wide array of industries, fields, and nations. Inherent to the All India Management Association AIMA that serves as a platform to connect Indian corporations are strong international partners such as the University of California, Berkeley, he argued.

He emphasized that of the 19 trillion international trade globally, over 13% can be accounted to China whereas India’s share is solely about 2%. With the growing counterparts between China and the US as well as the increasing global concern about China’s expansion, many countries including Vietnam, Indonesia, Thailand, Bangladesh, Brazil, and eventually India, would finally see a unique opportunity to improve their global footprint. Particularly, their market share within the manufacturing sector.

Munjal argued that India’s current political stance and legislations put the country in a good position to become a global player. India’s key sectors such as pharmaceuticals, automotive, chemicals, and electronic hardware manufacturing would be widely recognized as part of international supply chains while serving as attractive international investment opportunities. The responses from the Indian government and the industrial complex would express eagerness for further growth. Munjal referred hereby to a recently announced government scheme around self-reliance that is aimed to stimulate global engagement to become a key player in global supply chains. India’s intention would be mostly for benefitting from its own gradually increasing capacities and capabilities in different areas. First results, such as approaching more than 1,000 pre-identified companies, that either currently operate in China or are looking for alternatives, would show India’s strong commitment to become a significant powerhouse supplying the international market.
Discussant Presentations Initiative 1

**Discussant #1  Pankaj Munjal, Chairman, Hero Cycles**

*Enabling Make-in-India Green Transportation*

Pankaj claimed that countries such as Vietnam and Indonesia, despite their strong presence, do not have the capabilities and infrastructure to compete with India in the long run. However, Munjal looked globally from the perspective of the manufacturing sector identifying key trends that need to be adopted across India.

**Offered Value Propositions**: Enabling Make-in-India green transportation. Pankaj stated that Hero Cycles holds 5% of the bicycle market that is a $55 billion market globally, which is growing 10% per year due to growing concerns over urban conditions. However, this market is still dominated by China. 120 million bikes are manufactured globally with China’s market share over 80 million while India’s market share is only 15 million, he explained. Hero Cycles would aim to double its capacity and increase its market share. Also, Hero Cycles has over 7.5 thousand people working on the shop floor to learn the best practices while supplying transmissions to BMW, Harley Davidson, McLaren, Mercedes, and Toyota. In this sense he argued, it is worth noting that the added value is not only in manufacturing but also on the shop floor and through promoting customer experience. He also emphasized on the importance of trust between manufacturers and suppliers as a growing concern in the global manufacturing value chain.

**Proposed Partnerships**: Pankaj Munjal argued that for increasing Hero’s market share, access to markets, customers, and technologies are invaluable. Already, Hero has started acquiring some of the leading brands in the market to access their capacity and distribution channels, he stated.

**Requested Government Support**: Pankaj Munjal emphasized on the officially determined objectives regarding clean energies and cycling, mainly to avoid traffic, rather than simply manufacturing cars only. Declared by the prime minister of India and top managers of leading manufacturers such as Mercedes Benz and BMW about the future of urban mobility, he requested close collaboration with the Indian government to reach those defined objectives while growing Hero’s global presence.

**Discussant #2  Praveer Sinha, CEO, Tata Power, India**

*Providing Smart, Green, and Inclusive Energy*

Praveer Sinha highlighted the power sector as the backbone of any industrial activity. This sector consists of mature Indian and international firms that bring technological advancements together. The sector has hugely benefited from the advances of data science and digital transformation being able to unlock new innovation and impact, he explained.

**Offered Value Propositions**: Smart, green, and inclusive energy. At the moment, Tata Power is focused on smart cities and bringing electricity to people in rural areas, Sinha explained. The company also would see and seize the importance of renewable power as a huge opportunity for growth.

**Proposed Partnerships**: Sinha explained that partnerships had been crucial for Tata Power’s success in the past and would be even more important for its future. He explains that a result of a recent partnership between UC Laurence Berkeley
National Lab (LBNL) and Tata Power, a report was published highlighting relevant focus fields backed by high-quality research. Thus, an additional area of focus for Tata Powers was defined: energy decentralization through smart microgrids aimed at empowering consumers, particularly in rural areas. As a result, along with Tata Trust and the Department of Science and Technology, Government of India, a clean energy international incubation hub has been set up, Sinha explained. He stated that another area of focus for Tata Power would be universal access, in partnership in Sub-Saharan Africa. There are still about 0.6 billion people globally who do not have access to electricity, with also another 0.6 billion with partial access, Sinha argued. Lastly, he expressed that his company has engaged with the Rockefeller Foundation and MIT to develop global access to electricity. Their objective is to provide electricity for 10,000 villages where 25 million people will have access to power.

**Requested Government Support:** After the prime minister announcement, that by 2022 India should have 175 gigawatts of renewable energy, the country is on track to achieve this objective, Sinha emphasized. Right now, this number would be about 90 gigawatts but on track to reach its ultimate objective. However, this objective had now turned into 450 gigawatts by 2030. Sinha expressed that it is particularly important to have agile policy innovation alongside such transformational programs to reach given objectives. He concluded that India has over 300 days of sunshine, which brings a huge potential for solar energy.

**Discussant #3**  
**Dr. Mallik Tatipamula, CTO, Ericsson**  
**Providing IT Platforms for the Manufacturing Sector**  

Dr. Mallik Tatipamula briefly highlighted his three decades of experience in telecommunications and engaging in open innovation strategies alongside a close partnership with UC Berkeley. He mentioned that Ericsson has a significant presence in India and is highly interested in engaging with these initiatives, particularly those focused on sustainability.

**Offered Value Propositions:** As a way of contributing to India’s technological development over the years, Ericsson has established a global AI center working on 5G AI excellence, Tatipamula emphasized. Also, the company’s global network operations center, headquartered in India, manages 49 mobile networks globally, he stated. Ericsson also has a manufacturing plant in India for 4G wireless networking equipment for India and South East Asia. It is the leading advocate of Technology for Good in India, and offers several programs including Ericsson Digital Labs, he explained.

**Proposed Partnerships:** On the academic front, Tatipamula notes, Ericsson collaborates with many Indian Institutes on various research areas and established a 5G Innovation center at IIT Delhi. Ericsson has also established different fellowship programs to support bright students across India.

**Requested Government Support:** The company is involved in the usage of drones for disaster management. Tatipamula emphasized the importance of commercial deployment as a governmental responsibility and expressed willingness for further collaboration.
Discussant #4  Ravi Kirpalani, CEO, Thyssenkrupp India

Working collaboratively to provide technologies for Sustainable Solutions in Mining, Carbon Capture, biomass boilers, e-mobility and Green Hydrogen Production

Ravi Kirpalani underlined the significant transformation that is currently underway for many firms, including his. He explained that for example, the elevator business, one of the biggest divisions of Thyssenkrupp and its most visible brand, had recently been sold. The continuing businesses now include Auto Components and Industrial Components, as a leading supplier to major OEMs; a strong EPC player in the Plant Technologies business; Marine systems, with both surface and submarine technologies; a leading digitally-enabled Materials Trading business and continuing thyssenkrupp’s long history in steel, a strong #2 position among steel producers in Europe.

Offered Value Propositions: Sustainable technologies for continuous mining, for Carbon Capture & Utilization and Green Hydrogen, for e-mobility, and for biomass-to-energy conversion. The current priority for India in mining is to bring in efficiencies, safety, and sustainability in a commercially viable manner. This is evident in the privatization and liberalization of coal mining, recently announced. Thyssenkrupp offers automated excavation and bulk handling systems that take away the need for shovels and trucks, and enable continuous mining, from pit to port, Kirpalani explained. Additionally, technologies that enable companies to reduce their greenhouse gas emissions are offered, he stated. Ravi Kirpalani mentioned the Carbon-to-Chem project in Germany, where off-gases from blast furnaces are processed with the help of green hydrogen to supply carbon molecules for a variety of useful chemicals including fuels, fertilizers, and plastics. Thyssenkrupp, with its rich experience in large scale electrolysis technologies, having supplied over 10 gigawatts of electromechanical plants worldwide, can also support customers in green Hydrogen production. They also have specially developed boiler technologies for the conversion of biomass to energy, which could potentially address the stubble-burning issues in North India. Finally, he stated that Thyssenkrupp is a leading provider of electric power steering and has several technologies relevant to e-mobility.

Proposed Partnerships: Kirpalani mentioned that many of the technologies provided would offer benefits to players across the value chain and as such would benefit from a collaborative approach among players in the ecosystem. As an example of a collaborative approach, he mentioned the Carbon-to-Chem project in Germany, which was done jointly with 17 industry and institutional leaders. In mining, for instance, there could be a joint approach taken by mine owners, developers, operators, and authorities. In the case of green hydrogen, because it can be used for both storage and transportation of energy from renewable sources, wide involvement of stakeholders across the ecosystem will provide the necessary scale for viability. In biomass boilers, the involvement of farmers, power producers, and OEMs would be essential to create a Minimum Viable Ecosystem. Finally, in e-mobility, a combination of government policy and private entrepreneurship would lead to faster adoption.

Requested Government Support: A critical suggestion from Kirpalani is the need for a single point of contact for firms looking to tap into and operate in India. There is also a need for stability in policymaking, in particular, no retrospective changes to policies, he argues. Greater transparency in the area of land acquisition would be urgently required. Given that there are more than 58,000 compliance orders that companies need to go through aiming to operate in India, there is clearly an opportunity to rationalize and improve the ease of doing business in India, Kirpalani concluded.
Discussant #5  R Mukundan, CEO, Tata Chemicals

*Leading in Digitization, Sustainability, Technology, and Inclusivity*

R Mukundan highlighted that Tata Chemical is increasingly investing to become the world leader in the chemical sector. However, challenges from many sides need to be addressed through progressive strategies, he stated.

**Offered Value Propositions:** Tata Chemicals leverages four main drivers of growth in making India a global leading manufacturer, Mukundan explained. First, the growing importance of digitalization. Second, the importance of sustainability. Third, the power of technological advancements. And fourth, the importance of Inclusivity to ensure benefits are accessible to all.

**Proposed Partnerships:** Given the size of the industry, Mukundan highlighted their desire to attract more foreign investment to India. New capital is being used for piloting new areas of growth including farm technologies like Aeroponics and Hydroponics, and battery technologies beyond Lithium for a sustainable energy transition, he argued. Tata Chemicals had also developed diverse capabilities for recycling lithium batteries. Mukundan concluded that investments in chemical intermediates are an important objective for firms in this sector to compete with China and making India a leading manufacturing hub.

**Requested Government Support:** Mukundan accentuated the need for transparency in the policymaking process and the support to access land for the chemical sector in existing chemical zones. Environmental rules that provide world-class standards must also ensure operational flexibility.

Discussant #6  Sandy Khera, CEO, Enel Green Power

*Providing Renewable Energy Globally*

Sandy Khera highlighted the fact that manufacturing is among the top multiplying sectors in terms of adding value, creating jobs, and generating export revenue. Renewable energy would be considered a more sustainable source of energy, which is of critical importance to developing countries and is an increasingly important factor in determining global manufacturing competitiveness across all sectors of the economy.

**Offered Value Propositions:** Providing renewable energy globally. Enel Green Power is one of the largest providers of renewable energy globally with close to 50 gigawatts of installed capacity, Khera accentuates. Sustainability would also be an area of growing importance for Enel in general as it enables the firm to lower its operating costs and access loans at lower interest rates thereby generating value.

**Proposed Partnerships:** Sandy Khera underlined the importance of partnerships as Enel has worked with many international firms, such as Amazon and Adobe, Anheuser-Busch - as an energy provider. Yet, partnerships go beyond the core business he explained. Enel has an interest in engaging with battery, cable, and inverter manufacturers – particularly in India, to create an efficient supply chain and ecosystem of partnerships to support its growth plans.

**Requested Government Support:** Despite the Indian government planning to introduce safeguard and customs duties to promote local manufacturing, Khera expressed that these instruments are still short-term initiatives. There still remains a need for a more comprehensive policy on manufacturing, such as financial assistance on capital expenditure, interest
subvention and export incentives, which would enable manufacturers to undertake the necessary investments required to set up facilities for the long term, he argues.

**Discussant #7  Rajeev Mittal, Managing director, Autodesk**

*Offering Tools for Adopting Automation and Digital Technologies in India*

Autodesk makes software for people who make things, Mittal explained. Customers around the world, across industries, use Autodesk automation software to design and make everything – from skyscrapers and smart cars to bridges and movie blockbusters for architecture, engineering, construction, media & entertainment, and manufacturing industries.

**Offered Value Propositions:** Mittal emphasized the adoption of automation and digital technologies as crucial for India. In that respect, Autodesk can help Indian companies with an integrated set of desktop and cloud-based software tools that help companies with design, engineering, simulation, collaboration, and computer-aided manufacturing (Design & Make Convergence), he explained. And, in the age of More, Better, Less; Autodesk strives to provide tools to allow producing more with better performance and less waste, Mittal emphasized. The company had also invested heavily in optimizing product innovation cycles by using intelligent problem-solving techniques such as Generative Design. Mittal concludes that Autodesk helps Manufacturing companies in the digital journey by offering them a digital assessment tool which can help them in simplifying their digital journey. It offers a “digital strategy template” which includes five digital capabilities namely mass customization, collaboration, customer experience, flexible manufacturing and smart services. Lastly, the company would provide support for remote learning opportunities..

**Proposed Partnerships:** Autodesk has a large range of partners for initiatives such as sustainable manufacturing by reducing waste and improving the carbon footprint of companies, Mittal accentuated. For these reasons, Autodesk is willing to work closely with manufacturers, suppliers, and R&D firms across India, he concluded.

**Requested Government Support:** Mittal emphasized the strong willingness to engage with Indian governmental programs that are particularly focused on training and education.

**Discussant #8  K R Sanjiv, CTO, Wipro Global IT Business**

*Providing IT Platforms for the Manufacturing Sector*

Sanjiv highlighted WIPRO’s objective to have a national impact throughout India, which is focused on coordination and collaborative efforts to create platforms.

**Offered Value Propositions:** Creating digital platforms around standards, sources of data, privacy, and technological advancements. Regardless of the sector, the core source of achieving sustainable competitive advantage are platforms, Sanjiv explained. WIPRO can contribute to these emerging platforms by offering IT technologies, particularly within manufacturing processes. Sanjiv emphasized WIPRO’s capabilities to provide digital technologies around smart factories, smart warehouses, and for the supply chain management. The company also has expertise in offering change management to make a transition from traditional to technologically advanced processes, he concluded.
**Discussant #9**  Santokh Badesha, OL Manager, Xerox

**Services for Digital Citizen**

**Offered value proposition:** Xerox will be keen to partner in the delivery of the vision by bringing in the below services for a Digital Citizen. Xerox Services for Digital Citizen is a platform of services tailor-made for government initiatives.

1) *Engaging the Digital Citizen* by a) Enable omnichannel communication campaign capabilities b) Maximize citizen engagement efficiency through personalized messaging, c) Reduce public services communication costs through the acceleration of digital media usage d) Optimize official Census projects and other survey services through effective form design, multi-channel outbound communication & inbound capture.

2) *Serving the Digital Citizen* by a) Improve citizen experience with public services access and usage b) Reduce information processing costs by digitizing, standardizing, and automating document transactions c) Improve the effectiveness and quality of citizen correspondence

3) *Improving Citizen Experience* by a) Further improve the responsiveness of local public services, by empowering the use of pre-approved catalog materials — e.g., vehicle registration form, unemployment benefits rules & regulations, new business registration forms b) Use machine learning and analytics to automatically identify relevant next best actions and gain insight from the services that citizens are using the most, to improve citizen satisfaction and direct decision making for future investment, c) Improve the submission of important, high value or cherished documents, and a deliver a “tell us once” experience by providing a Digital Vault submission services that capture and deliver documents to multiple departments with digital signatures, time-stamp, and tamper-proofing.

**Offered partnerships:** Xerox will require close collaboration with specific applications and integration players for the delivery of the services. Leveraging our legacy and heritage as innovators, we can help to reimagine citizen experience at the intersection of physical and digital along with our collaborative approach.

**Requested government support:** Xerox is looking at below five specific areas where we can work closely with Central and State Government stakeholders to deliver the outcomes of the various government initiatives.

1) Citizen Engagement for mission-critical Central and State government programs: a combination of physical & digital channels, to deliver the highest awareness and response rates from individuals and organizations.

2) Multi-channel Census Document Management Services: Enabling Xerox to showcase the Full Census documentation service

3) Records Management Services: Xerox Citizen Records Management Services transforms paper-based record management processes and archives files/records into a digital archive. Records are kept under version and record management control ensuring they are retained for the required time (under legal and/or procedural rules), and are then destroyed in line with Data Protection / Document Retention laws.

4) Optimization of Correspondence Management: Involves Departmental, Call Centre, Inter-departmental correspondence. Workflow automation routes captured documents and data to the relevant staff within and across departments.

5) Transforming Applications for Government Services: Xerox Digital Citizen Application Processing Services addresses the capture and submission of data into the application process and digitizes/automates the downstream process steps through workflow automation and content management. The efficiency gains enable an increase in capacity to then handle increased applications volumes and/or to shorten application processing times.
Discussant #10  Pankaj Bhardwaj, Vice President, Avery Dennison

Providing a physical appeal and a unique digital identity for every item

Offered value proposition: Providing a physical appeal and a unique digital identity for every item. New age labeling solutions combined with Radio Frequency Identification offer the most cost-effective wireless digital ID technology. The technology is capable of broadening the scope of the IoT to trillions of simple everyday items, enabling businesses, organizations, and consumers to identify, authenticate, track, sense, and engage with each item seamlessly. Avery Dennison is a global material science and manufacturing company with solutions encompassing functional label materials, graphics and reflective films, tapes and adhesive solutions and tags, and tickets, which are integral to a wide variety of consumer product decoration, information display, and identification.

Proposed partnerships: Work with logistics, warehousing, transportation industry to reduce wastage, improve fill ratio, and improve inventory track and trace. Simultaneously work with the automatic data capturing and identification industry to optimize the hardware and software solutions. A collaboration with consumer brands shall help to improve transparency, compliance, and consumer engagement.

Requested government support: Emphasis on comprehensive manufacturing policy and simplified compliance framework to enable ‘Make In India’ competitiveness. Leaning forward from the government on technology adoption shall create successful case studies.

Discussant #11  Santhosh Muzumdar, Head of BD, Johnson Controls India

Offering modern software technology and leveraging the latest digital capabilities

Offered value proposition: Johnson Controls has transformed itself into a company that offers modern software technology and leverages the latest digital capabilities to deliver differentiated outcomes and experiences to its customers. Johnson Controls has added new Digital Solutions to further digitally transform buildings and help customers significantly improve productivity, operational efficiency, comfort, security, and sustainability.

Proposed partnership: One company can’t do everything. Johnson Controls needs medium and small-scale companies to provide parts to realize the vision. Bigger companies are also required such as the Software companies (cloud, advanced analytics) to jointly create solutions that not only address the current needs but offer a platform for the future. The ecosystem requires complementing solutions partners, strong policies and government support, and to show incentives to reach to the citizens.

Requested government support: Create a business environment where private companies can work without too many limitations: public-private partnerships are an important tool to create an economy of scale.
Discussant #12  Srinivas Satya, President, Applied Materials India

*Increasing AMATs footprint in India for R&D and Manufacturing*

Applied Materials is the world leader in precision materials engineering serving deep tech sectors like semiconductors, display, energy with Capital Equipment, Tools and Technology for high-volume manufacturing at nano-tech scale. It has leveraged Indian talent in the last decade to build a world-class Global Engineering Centre with over 3800 people and has contributed 6 advanced labs and proto-typing center to India. It is also IIT Bombay’s largest industry partner - and its AMAT Exploration Center in IIT Bombay is a DSIR approved lab doing cutting edge materials research.

**Offered value proposition:** Applied Materials India is keen to expand its Global Engineering Centre in India and increase its India staffing to 5,500 people with an increased service footprint in the next 5 years. Additionally, there is a keen interest to build a manufacturing plant for select, specialized semiconductor equipment and components out of India, Satya stated. Moreover, Applied Materials sources approx. $3 billion of inputs from Asia-Pacific region for its manufacturing operations world-wide. These are specialized, semiconductor sector grade components and Applied Materials are open to reviewing the supplier base from India where it can deliver the required quality and cost.

Applied Materials is also actively engaged with the Indian R&D Ecosystem and has contributed over Rs.80 crores as grants to various academic institutes (IITs) over the last decade. They look forward to working with Indian talent and R&D ecosystem on joint projects and are also engaged with Electronics Sector Skill Council and provide thought leadership/subject matter expertise on skill relating to related sectors.

**Proposed partnership:** AMAT are looking at 100% export-oriented services and manufacturing operations at an expanded facility at Bangalore. This can set a pace to the discussion with the Indian vendors looking at participating in such outsourced procurement programs, Satya explained. Also, they are open to expand engagement with Indian R&D ecosystem and contribute to appropriate support for expanding the talent / skill base in India in AMATs sectors.

**Requested government support:** Satya stated that AMAT is looking for government support in various matters:

1. Fast regulatory clearances for land for the Bangalore Campus expansion project.
2. Competitive and fast Government support to enable India to be a viable alternate to other established, Asian countries and destination options for strategic projects.
3. Expand ease-of-business initiatives (situation has improved but benchmark is higher) to enable competitive and fast turnaround time of imports/re-exports for export-oriented projects.
4. Create focused support for enabling prospective Indian vendors to the semiconductor equipment supply-chain.
5. Need to develop an air-bubble of assured R&D project partnerships – leveraging global rules of IP sharing and shared funding arrangements- and build on that success.
**Key Takeaways Initiative 1**

1. **Benefiting from the application of technology**

   Benefiting from the application of technology: the positive impacts of the application of technology within the manufacturing sector were extensively discussed by participants. The benefits of using technology in smart manufacturing can impact the remaining takeaways including the importance of sustainability, the role of trust, engagement with academic institutions, and facilitating legislation, as stated below.

2. **Importance of sustainability**

   All companies highlighted the vital importance of sustainability particularly within the manufacturing and energy sectors. In line with the government initiatives, major players within the Indian economy expressed their desire to engage in different activities of the sustainable value chain.

3. **Role of trust within the global ecosystem**

   Considering the global concerns and opportunities including the impact of COVID-19 on corporates and SMEs across different sectors, the growing presence of China, and the close relationship between India and leading economies including the US, all participants highlighted the rising opportunity for India to achieve a higher share of the global market share as a leading manufacturer and reliable supplier.

4. **Engagement and partnership with leading academic institutions**

   To accelerate solutions and knowledge creation through evidenced-based and implementable use cases.

5. **Facilitating the legislative and law-making process**

   India has long been an interesting market for corporate firms as well as SMEs, looking to improve their market position. In order to improve India’s position in the global value chain and facilitate the entrance of multiple firms into different sectors, a reevaluation of the legislative process, particularly for new firms aiming to expand into the Indian market, remains of high importance.

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**Implications and Recommendations for Initiative 1**

Dr. Amir Homayounfard  
*Professor of innovation and marketing strategy*  
*Essex Business School*  
*University of Essex, UK*

Two key recommendations retain of critical importance based on Initiative#1. The first one emphasizes on the importance of services and designing a service ecosystem. The second one reiterates the vital impact of technologies and having a simple, yet clear, technology-driven strategy.

1. **Design and development of a service ecosystem for manufacturing firms**

   More and more corporations throughout the world are adding value to their core corporate offerings through services. The trend is pervading almost all industries, highlights the vital importance of demand-driven customer value, and enables small, medium, and large enterprises to achieve and maintain their competitive advantage. Modern corporations are increasingly offering bundles of customer-focused combinations of goods, services, support, self-service, and knowledge. However, services have begun to dominate here.

   To further highlight the impact of services on the country’s global position, according to CIA Factbook (2020), service
industries contribute to more than 61% of India’s GDP. However, only 31% of the labor market is employed in different service sectors. The 30% gap between labor employment and the contribution of service sectors, reiterates the missing opportunity that services can bring to India’s global market position. To better explain, the same study published in cia.gov mentions that service industries in China, as the first global manufacturing hub, contribute to 51% of China’s GDP while 41% of the labor market is employed in the different service sectors. This shows a 10% gap between the contribution and employment of the service sectors. Different studies (e.g., Employment Projection by U.S. Bureau of Labor Statistics) highlight that a lesser gap in this sense has a direct impact on the country’s global position. As of 2020, the above gap for the United States stands at 9%, Japan at 0%, Germany at 0%, the United Kingdom 0%, and France at 1.5%.

Part of the surge in services is a more holistic approach by global leading firms to address the requirements of their customers and maintain their market position. It is no longer valid for either the industries or individual corporations to draw simplistic distinctions between goods and services or simply assume that services are limited to customer encounter services or justified to support products only. Much of this is due to managers looking at their customers’ needs as a whole, moving from the old focus on goods, where services are in support of products only, to integrated “bundles” or systems where services have a primary or firms aim to build a service ecosystem around their products. For instance, a deeper look at the global computer technology highlights its transition from hardware to software as a growth strategy for corporates to add value and maintain their competitive advantage. Leading global manufacturers such as Apple, Tesla, Boeing, and BMW have maintained their competitive advantage not only through improving their manufacturing value chain but through building an entire ecosystem of services around their products. Doing so will result in added brand value and sustainable competitive advantage. To this aim, firms can also benefit from practices of open innovation, which is highlighted by the government of India as an executive strategy for smart manufacturing, in different service sectors.

Companies interested in moving toward open service innovation can try techniques such as working closely with customers to develop new solutions for them; focusing offerings on utility for customers, rather than on products; and embedding the company in a customer’s organization. Benefiting from open service innovation can help companies to achieve sustainable competitive advantage, particularly in the long run.

2. Design and development of a technology-driven strategy for manufacturers

Considering the 5 key takeaways, particularly the vital role of technology and how it can impact different takeaways, as stated above, the design and development of a technology-driven strategy for manufacturers remain of high importance. Doing so will better explain how different firms can benefit from various forms of the application of technology. To that aim and based on the diversity of impacts of technology, a technology-driven positioning map can better help firms to design their technology-driven strategy (see following illustration). Considering the firm’s strategic objectives to achieve sustainable competitive advantage, the below positioning map is developed based on two key dimensions. The horizontal axis, which is focused on the degree to which a manufacturer can differentiate the customer population concerning their needs. Doing so should rationalize the firm’s strategic plan to aim at the market majority or different market segments. The vertical axis, which is focused on the degree to which a manufacturer can attract new customers or maintain its relationship with existing customers. Doing so should justify the firm’s strategic plan to impact customer value by attracting new customer segments or improving its relationship with existing customer segments.
Relational Objectives
(aimed at improving the relationships and keeping existing customer segments loyal to the firm)

Database or customer relationship management (CRM) technologies

Learning technologies including AI and machine learning

Personalized Objectives
(aimed at separate market segments while offering high level of customization)

Big data analytics

Transactional Objectives
(aimed at improving repeated transactions and purchases)

Automated technologies

Standardized Objectives
(aimed at economies of scale and developing one product that fits most of targeted customer population)
Day 2, August 6th

Initiative 2: Develop Digital Infrastructure for Education & Skill Development

During this second session of the Berkeley Innovation Forum, the CEOs gathered to give their inputs about early education and skill development. The CEOs were asked to talk about two main points: 1) leverage digital platforms to deliver holistic early education to build a talent pipeline, and 2) accelerate digitally-enabled certified corporate training for job creation among aspirational youth.

Welcome: Catherine Wolfram & Rekha Sethi

Catherine Wolfram, Professor for Business Administration and leading expert on energy and environmental economics has been affiliated with the Center for Growth Markets at the Haas School of Business from the beginning. Wolfram commenced day 2 of the Berkeley Innovation Forum India laying out how academia can support initiative #2’s objectives. As a strong advocate of knowledge flows across fields and entities, she emphasized the role of UC Berkeley serving as an orchestrator to help business leaders academics, and government officials learn from one another to accelerate the development of needed solutions. Yet, particularly world-class research is crucial to thoroughly identify today’s grand challenges laying the foundation for further problem finding, she argues. The University of California, Berkeley could fill this role given the renowned research capabilities and capacities.

Wolfram set the stage for the future when announcing to establish a physical research center in India. This would allow a close relationship with the ecosystem in India to conduct research projects on-site. Generated knowledge could be directly accelerated and leveraged to improve the Indian economy when working in close partnerships with the Indian government, Indian businesses, and prominent universities in India. Wolfram concluded that Berkeley can additionally serve as a gateway to Silicon Valley for the Indian ecosystem adding further value and efficacy.

Rekha Sethi, Director General of AIMA, added to Wolfram’s introduction the perspective from Indian businesses and people during difficult times as of today. She argued that the COVID-19 crisis highlighted the need for the use of technology to ensure uninterrupted education and skill development. It would also be essential for lowering the costs for both students and educators.

Inherent for shifting to online education is adequate training and easy-to-use digital technologies, Sethi emphasized. AIMA could already provide online tests like management aptitude tests for students aiming to enter a Business School. She accentuated that most of their digital initiatives will allow saving time, effort, travel, and money. Sethi concludes that those efforts were to align with policies made by the government. India would be very progressive in this field has already provided the necessary regulatory framework to integrate digital learning platforms with mainstream education.
Keynote #1: Nandan Nilekani
Bringing Digital Bridges to Future of Education

Nandan Nilekani
Co-founder and non-executive Chairman, Infosys

Nandan Nilekani could bring insights into how to connect the future with the past through digital initiatives in his keynote. He emphasized that existing assets such as textbooks would need to be connected to digital content. Thanks to the eVidya program recently launched by the Indian government, a comprehensive platform for early education would be accessible across the country. All textbooks in India would include now with QR codes and topic IDs providing the bridge between digital and analog. However, he explained that usage of this bridge remains different across states in India ranging from assessment, content expansion, training to teacher development.

Nilekani underlined the need to adapt to the COVID-19 situation. He emphasized government efforts to avoid creating digital divides. There would be a huge effort to determine the learning gaps and how to use digital capabilities such as AI to overcome potential divides, he explained.

Nilekani concluded to acclaim the progress with the skills certificate architecture in India being digital, digitally signed, machine-readable with QR codes, and delivered by phone. It would become a national standard, he highlighted.

Keynote #2: Amitabh Kant & Sunil Munjal
Early Education is Inevitable for Positive and Sustainable Change in India

Amitabh Kant
CEO of NITI Aayog,
ThinkTank Chaired by Prime Minister Modi

Sunil Munjal
Chairman AIMA,
Chairman of Hero Enterprises

This year’s chairman of the Berkeley Innovation Forum India, Amitabh Kant, put children’s education in the center of the objective for the second initiate. He argued that effective early education accelerates literacy among India’s population helping to attain important sustainable development goals – determined by the United Nations. The ambitious goal would need to comprise providing high-quality education to all of India’s citizens.

Kant explained that 85% of a child’s brain is developed by the age of 6 and when quality education is not available early it would lead to severe drawbacks – mostly for children from disadvantaged backgrounds. Early education would need to consist of a flexible program with activity-based learnings. The lockdown exposed the benefits of online education, but the challenge is to spread this online education and not to create more inequities - online education should be available to all, Kant concluded.

Sunil Munjal built on Amitabh Kant’s emphasis on early education and added that it would be the only option for a positive and sustainable change in India. Munjal addressed other participants from this forum acknowledging their participation in
creating a new education policy, that India recently announced. Yet, the challenge remains for its implementation, he admonished. How? How quickly? What resources? How to retrain and reskill faculty, teacher, professors, researchers to realign towards India’s education? – are questions that are yet to be answered, Munjal argues. He concluded to adhere to Indian culture for transforming the education system when not neglecting India’s rich arts and culture. It would be of no question to him since India had the chance to become the richest country in terms of arts and culture.

Discussant Presentations Initiative 2

Discussant #1  Mohandas Pai, Manipal Global

Facilitating a Coalition of Education Startups to Unlock Full Potential

Mohandas Pai emphasized that the biggest issue in the educational sector is the framework for skill development alongside missing devices among rural residents. Many great companies would be participating in the development of skills, but it would be utmost important to group all these assets together to connect the trainees with the employers.

Offered Value Propositions: Facilitating a coalition of startups in the educational sector. Mohandas Pai explained that the goal is to create a national platform for all across India. But this platform would need to be managed as a whole program where the companies work together along with the government. His very own platform EduNxt, could heavily contribute to this effort having 21,000+ certified learners that have 24/7 access to Information Technology, Finance, and Management courses, among other valuable content, he underlines.

Proposed Partnerships: Mohandas Pai laid out his plan to get the currently 200 startups across India that are operating well in the educational sector to come together, create a coalition, and unlock value collectively. It would comprise skill development, providing jobs, university test preparation, and connecting people to employers, he outlined.

Requested Government Support: The government has made sure that the people at the bottom of the pyramid have still access at a very low cost, using radio, television, to educate children in a part of the country where infrastructure is very poor. Already 95% of India has wireless and the cost of near-unlimited data has come down to $1.5 a month, Pai explained. However, digital devices are missing to a large extent. From the $80 billion spent by the government for school education and $30 billion for college, Pai argued that a significant part should be also used for the digital devices in rural areas to close the digital gap. Tablets would improve scholastic achievements by 30%. The new education policy from India is very transformational, and it will be necessary to get all the children connected to the digital world within 4 years, he concluded.

Discussant #2  Anant Maheshwari, President, Microsoft India

Democratizing Skills Through Digital Transformation

COVID-19 has intensified the focus on the skills gap. One of the keys to a genuinely inclusive economic recovery is providing access to digital skills, especially for people hit hardest by job losses, including those from lower-income groups and under-represented minorities. Creating a digital skills ecosystem that prepares India’s workforce for jobs of the future will be crucial to enabling every segment of the country to succeed in a digital economy.
Offered Value Propositions: Democratizing skills through digital transformation. To build a holistic approach towards skilling the entire ecosystem, we need to think about three aspects: first, the different needs of various target groups, second, the technology and programs needed to enable skilling, and finally the ecosystem required to address these needs. Ensuring that no group is left behind, whether it is skilling students and educators or frontline workers or white collared and knowledge workers, will be critical to truly bridge the digital divide. One of the key factors to drive success will be the agility in making it happen. Leverage the existing learning platforms available basis the needs of the users and adapt and build the content as required. Anant Maheshwari particularly emphasized that there is an opportunity to improve education outcomes and accessibility with AI. As an example, AI can be used to identify potential dropouts and avoid actual dropouts based on specific parameters such as gender, socioeconomic, demographics, academic performance, school infrastructure, and teaching skills, etc. Microsoft India offers its global cloud services from local data centers to accelerate digital transformation across Indian startups, businesses, and government agencies, Maheshwari accentuated. He outlined that their digital transformation capacities and capabilities could be used for various applications.

Proposed Partnerships and Requested Government Support: Technology will be at the heart of driving this change. A strong skilling ecosystem will require deep collaboration between the public and private sectors, civil society, and technology companies like ours to ensure skilling benefits everyone in the ecosystem. Microsoft would be very eager to work in close partnership with the ecosystem.

Discussant #3  Arundhati Bhattacharya, CEO, Salesforce India

Channelizing Salesforce’s Resources to India’s Most Needed

Arundhati Bhattacharya emphasized to stop working in silos across private and public sectors to unlock urgently needed value. With the lockdown, it would be also about the time that every child has access to a digital device, otherwise, the digital gap would continue to widen.

Offered Value Propositions: Channelizing Salesforce’s resources to India’s most needed. Salesforce believes that business is a platform for change, Arundhati Bhattacharya highlighted. 1% of the profits, 1% of the employees’ time, and 1% of the products would be donated to non-profits. Alone in India, over 300,000 volunteer hours were provided, over 450 non-profits were supported, and $1,100,000 in grants were donated. Skilled people volunteering allows teaching many others, including the non-profits who receive a license from Salesforce, Arundhati Bhattacharya emphasized. Arundhati Bhattacharya also accentuated their learning platform Trailhead providing training, opportunity, and access to mentorship and job placement. The platform would skill people regardless of gender, ethnicity, socioeconomic background, and would be able to build the skills needed to find jobs in the technological fields, both within and beyond the Salesforce ecosystem.

Proposed Partnerships: Under several programs, Salesforce works with non-profits such as FAT, a non-profit that works with underprivileged girls and young women to close the gender gap in science & technology, and the Universe Simplified Foundation that are setting up Innovation Hubs for economically challenged children in rural and urban areas, Arundhati Bhattacharya explained. Salesforce would be eager to increase their footprint in those areas working with NGOs.

Requested Government Support: Arundhati Bhattacharya particularly promoted an initiative is to aggregate people’s second-hand phones to be refurbished and donated. She expressed eagerness to explore public-private initiatives in this matter.
**Discussant #4  Sandip Patel, Managing Director, IBM, India**

**Empowering the Youth Through Technical Skill Development**

Sandip Patel expressed that the acceleration of the digital world due to the pandemic has created a unique value proposition for schooling and education ecosystems. Now, the way people are acquiring and using skills would be different. Virtual connections are helping people leveraging skills and expertise from different parts of the world, and from open virtual universities, he argued.

**Offered Value Propositions:** Empowering the youth with technical skills and a whole digital education agenda coordinated with the government. IBM activities include advanced data and AI tools, cloud, international research on AI, blockchain, and quantum computing among other valuable activities, Patel explained. The National Skill Development Center NSDC has taken up the mandate for skilling youth of India, and IBM partnered with them to develop a comprehensive digital platform, Patel announced. Through this collaboration, IBM would build training centers providing skill development for the aspiring youth to eventually ensure job placement. IBM hereby partners also with NITI Aayog and the ministry of education, skill development, and entrepreneurship.

**Proposed Partnerships:** Patel explained that IBM partners with a range of NGOs and content providers. Eventually, they would plan to reach out to 200,000 female students through the IBM Stem (science, technology, engineering, and math) program for girls 600,000 students by the Atal Innovation Mission, and thousands of secondary education schools integrated into the IBM AI curriculum. IBM aims to train over 100,000 donors by 2021 and continue to scale up, Pale concluded.

**Requested Government Support:** IBM is working on a platform for higher education to democratize the movement, Pale explained. The government support would be very helpful in the way to institutionalize the initiatives in the long term and scale them to help India become a global knowledge hub and a global skill capital for the world.

**Discussant #5  Vishal Dhupar, Managing Director, Nvidia, South Asia**

**Integrating AI into Indian College Curriculum**

Vishal Dhupar explained that for the pursuit of understanding human intelligence, machine learning, and pattern recognition through AI, cutting-edge abilities are essential. However, future engineers and developers would be often scarce of those in math, data analytics, and programming languages such as Python, Java, etc. Dhupar explains that advanced guidance and world-class training is needed to provide fully trained mathematicians, programmers, developers, and analyzers.

**Offered Value Propositions:** Vishal Dhupar highlighted that Nvidia brought the best education curriculum from the west into IITs and universities with the Deep Learning Institute. Nvidia provides autonomous machines, cloud and data centers, deep learning, AI, high-performance computing, design, and pro visualization. With that program and Nvidia’s world-class capabilities, they created a model that started with 10 to eventually train students in every state in India. The students are not only interested in the theory, but in practice through employment in the field. Vishal Dhupar accentuated that AI needs to become a national mission for having AI running in the background while ensuring everything in the front becomes smart.

**Proposed Partnerships and Requested Government Support:** Vishal Dhupar laid out that the AI national strategy is unique for economic growth and social inclusiveness. To achieve objectives of empowering Indians with skills to find quality jobs, investing in research sectors viable for economic growth, and Indian-made AI solutions that can be used by developing countries, he argued that strong private-public partnerships are required.
Discussant #6  Abhigyan Modi, Country Manager, Adobe, India

Opening up Professional Creativity Applications to Everyone

With the COVID-19 crisis, Adobe observed an increase in the use of PDFs, as the assignments and the books shifted dramatically to digital in the educational sector, Abhigyan Modi noted. The creativity applications, therefore, increased vastly (i.e. Photoshop, Illustrator) as teachers are trying to create offline content to not rely on student’s connectivity while at the same time, students are increasingly using digital programs to consume content, he concluded.

Offered Value Propositions: Abhigyan Modi emphasized that Adobe’s mission to allow everybody to tell their story through creativity applications will now comprise not only professionals but also non-professionals. Adobe has formed extensive programs to skill a wide range of people from different socio-economic backgrounds in creative lines. Adobe is a Fortune 100 company and is the global leader in digital media and digital marketing solutions. He argued that students are constantly searching for better ways to express their creativity than solely by pen. However, access to digital devices is not ubiquitous putting additional pressure on the digital gap among society. Abhigyan Modi concluded that during the pandemic teachers first need to be enabled so that they will be able to skill their students remotely.

Requested Government Support: With the help of the government, Adobe could be able to integrate skill development programs for creativity application inside national platforms and measure efficacy while taking directions, Abhigyan Modi suggested.

Discussant #7  Sindhu Gangadharan, Managing Director, SAP Labs

Providing SAPs Solutions to Educate India on Digital Literacy

Sindhu Gangadharan emphasized that an education system should be easy to access, inclusive, and affordable. The education system should discover learnings and should incorporate curiosity building, life skills, logical and problem-solving skills. SAP is the market leader in enterprise application software, helping companies of all sizes and in all industries run at their best, Gangadharan expressed.

Offered Value Propositions: Gangadharan explained that SAP has multiple projects to address challenges in the educational sector. There is the project “Code Unnati”, a corporate-to-citizen program to offer digital literacy, and IT skill development aimed at fostering digital inclusion in India. It integrates a digital literacy curriculum within primary to higher secondary curriculum and imparts skills in next-gen technologies among the youth enabling employment opportunities. Another program is the Scholar at SAP program which inducts close to 200 science and design graduates every year across India. The intent is to provide a 2-year internship with SAP while students work part-time and pursue a master's degree fully sponsored by SAP. Successful candidates are also offered a job at SAP under this program, Gangadharan concludes.

Proposed Partnerships: There has to be a focus on skills that generate employment, Gangadharan argued. Only in close collaboration among corporations, universities, and the government, a job-ready curriculum with industry-relevant subjects could be defined and executed by the companies. As new recruits typically take 3 to 9 months to be really ready for the job, it could be a huge plus to propose long term internships as a part of the curriculum, Gangadharan concluded. SAP has currently a partnership with the Mahindra Group for “Nanhi Kali” to impart quality education to over 12,000+ girls from the underserved sections of the society. The goal is to make education inclusive. Project Nanhi Kali is one of India’s largest programs that enables underprivileged girls to complete 10 years of schooling, Gangadharan announced.
**Requested Government Support:** Gangadharan stated that SAP signed the Statement of Intent (SoI) with Atal Innovation Mission (AIM) at NITI Aayog to adopt 100 Atal Tinker Labs in the next 5 years. Close to 8,000 students would have already been trained in science, mathematics, electronics, mechatronics, digital skills, and computer literacy. Gangadharan expressed that close collaboration with the public sector is crucial for success in the educational sector.

**Discussant #8  Alok Ohrie, President, Dell Technologies, India**

_Facilitating Entrepreneurship at Young Ages and Capacity Building for Teachers_

Alok Ohrie highlighted the challenge of scale in a country like India necessitating the need for easily accessible technology solutions for everyone. He stated the importance of harnessing the creativity of each individual while inculcating complementary 21st-century skills like problem-solving and critical thinking in early education. This will go a long way in developing an innovative and entrepreneurial mindset in young minds.

**Offered Value Propositions:** Necessary to have on-the-ground initiatives to encourage students to come up with innovative solutions to help their local communities. Dell Technologies in collaboration with Atal Innovation Mission, NITI Aayog has been working on Student Entrepreneurship Program to fulfill this objective, Ohrie noted. This 10-month program presented students the opportunity to an alternate school to develop their ideas with mentorship from Dell team-members. Another value that Dell can offer is to build teachers’ capacity through technology with the mission to transform mindsets by instilling critical-thinking. The measure of success for teachers will eventually be the learning outcomes. Dell Technologies is at the forefront of driving a digital future in education focused on technology infrastructure to promote access, honing of teaching skills, and research and development to enable Educational Continuity & Learning, Ohrie stated.

**Proposed Partnerships:** To enable the Student Entrepreneurship Program, Dell had partnered with NITI Aayog (Government Think-tank chaired by PM Modi) and the Atal Tinkering Labs since 2016 and aims to extend these efforts. Ohrie stated that today’s best and first teacher is the mother, which led Dell to launch Aarambh, a program focused on training teachers and mothers to use ICT devices. The program has already touched 100,000 teachers and 130,000 mothers over the last 4 years and has plans to scale further, Ohrie added.

**Requested Government Support:** There would be almost unlimited knowledge available and accessible via Internet & digital devices. Ohrie, however, argued that the security and safety of consumption was very important. Dell is constantly building innovative security and safety features to allow the distribution and access of content in a reliable manner and seeks hereby to engage and partner with the government of India to make this objective a big success, Ohrie explained.

**Discussant #9  Pradeep Nair, Managing Director, VMware**

_Reimagining Education as Digital First and Generating Female Leaders_

Pradeep Nair highlighted the concerning secondary school dropout rate of 16% across India. A shortage of skilled labor in the industry would become a major threat especially due to women’s school dropouts. VMware helps companies to master their digital transformation.

**Offered Value Propositions:** VMware has launched a program called Taara, in alignment with building the next woman generation of leaders, Pradeep Nair stated. This program would skill and upskill women on the latest digital transformation technologies and entrepreneurial skills. Also, Nair raised the question of how to reimagine
skilling and education as digital-first, even if the public discussion tends to refer to digitization as an adjunct in education. He emphasized skill on topics that go beyond current needs but for needs in the next 10-15 years. With COVID-19, there would be the opportunity to skip a generation and make knowledge accessible right away while each individual will be able to learn at its own pace.

**Requested Government Support:** If we are not able to equip the students with the skills they need to be productive, we run the risk demographic dividend, Pradeep Nair highlighted. The new education policies would create new initiatives and new possibilities but it is to be ensured that the intellectual property is protected, that students are secure and operate in a healthy environment. Nair requests the government to fund some of the necessary infrastructures to provide the platform for the digital-first initiative.

**Discussant #10  Rahul Sharma, President, AWS, India**

*Providing the Cloud Power for Education and Facilitating Micro-Skilling*

Rahul Sharma applauded India’s new education policy as a great opportunity to take a generational leap on education. The education hadn’t change for 30-40 years but now there was the ability to have a student-focused education, where every student learns differently.

**Offered Value Propositions:** Sharma sharted that the AWS-Educate program provides free cloud credits to 200,000 students across India to teach AI, IoT, cloud architecture, etc. During COVID-19, AWS has been able to put up platforms alongside their partners and enable 2 million students to go to school online and partners with more than 3,000 EdTechs in India, he noted. Yet, villages don’t have electricity all day long and often times have only a single spot with the internet making Sharma raise the question of how many students are we willing to leave behind. Sharma also emphasized the need to make education more experiential and relevant including industry concerns and promoting the internships. Complementary, AWS believes that micro-skilling would be the future of rapid reskilling. There is a tremendous need for recognizing prior learnings to make sure that informal learnings are recognized providing equal opportunities on the job market, Sharma argued.

**Proposed Partnerships:** AWS works closely with the National Skill Development Center NSDC on their mission to digitally enable 60 million people across India. The NASSCOM (National Association of Software and Services Companies) Futureskills platform runs on AWS. These partnerships are very valuable to touch clusters of villages and address the existent digital gap, Sharma stated.

**Requested Government Support:** Rahul Sharma asked the government to the stage to constructively intervene in the national platforms through private-public partnerships and financing some of the needed infrastructures.

**Discussant #11  Prateek Pashine, CEO, Reliance Jio**

*Making Hometowns Attractive to Work From*

India is morphing into a superpower moving into high-tech hardware, software, and manufacturing and improving the literacy and education, Prateek Pashine noted. Now there would be great timing to accelerate this evolution.

**Offered Value Propositions:** At Jio, the “work from home” statement that became popular...
during COVID-19 is taken forward towards “work from hometown”, Pashine announced. This way, the standard of living would be increased, and the costs of living are reduced for the protagonist formerly having lived in big cities. There would be a lot of workforces required in hometowns and its inhabitants could be trained for these jobs at home and be employed in their hometown. 65% of the internet traffic is happening on Jio’s network while 12,000 physical stores are employing 100,000 plus men and women. 40% of these skilled laborers eventually go to work for other companies and should have recognition for their acquired skills, Pashine argued.

**Proposed Partnerships:** Partnering with Google could help giving smartphones to everyone, so there will be the eradication of 2G, and therefore no more divide between 2G and 4G. Prateek Pashine emphasized that going only digital will be an incomplete solution and that customers want a digital experience alongside a physical presence to be able to talk and gradually approach digital technologies by touch and feel. It would need various partnerships to get things done and have a more powerful solution than if everyone worked in silos.

**Requested Government Support:** JIO is working with the state governments to see how the television content (from NSDC) can be brought into the mobile stream for mobile consumption, Pashine noted. He wished for fruitful partnerships with both central and state governments.
**Key Takeaways Initiative 2**

1. **Government support for utilizing early education:**
Includes a clear plan for infrastructure development, particularly in rural areas. To that aim, providing electricity, ease of access to the Internet at a low cost, and cellular support such as 3G and 4G remain necessary. Doing so will enable early educators to have access to high-quality materials.

2. **Government support for utilizing higher education**
Calls for a clear strategic plan to partner with leading technology firms, including IBM, Microsoft, Adobe, Salesforce, SAP, etc. as an approach to provide IT training for higher education as well as recent graduates looking for recruitment. Doing so will enable future talents to develop their skills in cutting-edge technologies including AI, machine learning, blockchain, cloud computing, and application programming.

3. **Government support for NGOs**
Calls for a clear strategic plan that enables NGOs, charitable institutes, and non-profit funding bodies to have access to technological platforms in order to facilitate educational support for early and higher education.

4. **Partnership with research entities**
Includes collaboration with leading institutions to conduct high-quality research that offers managerial and academic impact.

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**Implications and Recommendations for Initiative 2**

**Werner Fischer**
*Sustainable Business Development Advisor, Author, and former Visiting Scholar, UC Berkeley*

One key recommendation remains of critical importance based on Initiative #2. Undeniably, the rising importance of cutting-edge technologies including AI, machine learning, blockchain, and application programming will impact the future of education and work at different levels. The application of these technologies is commonly classified at three levels of mechanical, thinking, and feeling. This calls for some implications for various stakeholders. These stakeholders include those who are involved at different levels of decision-making and consuming cutting-edge technologies.

1. **Implications for businesses**
The application of cutting-edge technologies for education, recruitment, and work-related tasks requires a new focus on the feeling and empathetic nature of business. This issue remains of high importance particularly after the COVID-19 and considering the rise in working from home. Different discussants also touched upon the importance of offering feelings and emotional engagement through the application of new technologies.

2. **Implications for managers**
In line with developing economies around cutting-edge technologies, the most successful workers will be those who can manage relationships in an empathetic and emotionally intelligent way. When AI is performing more thinking tasks that have been traditionally dominated by men, women may be in a better position in the job market since major jobs require more emotional intelligence. The proportion of skilled women in cognitive/high-wage jobs increases, because when emotional skills become more important for jobs, females are (on average) more suited than males to do those jobs. The
implications are that the criteria for hiring need to shift in this direction. This was also highlighted by discussants to provide more opportunities for female candidates' employment in the new digital economy.

3. Implications for employees
Workers will need to become more sensitive to the feeling side of jobs. It is already noted that people management, coordination with others, emotional intelligence, and negotiation are all top skills in strong demand in the future of India. However, rather than worrying about whether someday new technologies are going to take over their jobs, it is more constructive for employees to learn how to work with these technologies in their jobs. Although most workers will not be analytical and mathematical experts, they need to have knowledge of the strengths and weaknesses of these technologies and must be able to communicate with them properly. In fact, providing new forms of training to engage and benefit from cutting-edge technologies was highlighted by discussants as a cross-cutting category.

4. Implications for educators
The educational system has traditionally emphasized thinking, to the extent that it is virtually unquestioned that the primary purpose of education is to teach people to think in a disciplined way. As a result, mere results have been highly prized and heavily rewarded rather than creativity. Education needs to move in a more open direction teaching higher-order thinking skills, critical thinking, and an innovation mindset from an early age, the discussants underlined. More emphasis on interpersonal relationships while accounting for individual interests and learning pace in both school admissions and curriculum goes along this line. It is well known in the academic world that most students now spend much more time letting technology do most of the calculation or analytical thinking for them, through computers and smartphones. When cutting edge technologies are able to handle the thinking tasks, we should teach students to be good at feeling and at the same time aspire them to master highly-demanded subjects such as programming to become the designers of tomorrow's technologies that can improve well-being across nations.
Day 3: August 7th

**Initiative 3: Build Ecosystems in Key Sectors to Mitigate Pandemic Risks**
- Create digital healthcare solutions for efficient last-mile access
- Create transparent agriculture platforms for frictionless farm-to-plate channels
- Deepen financial inclusion and risk management in underserved sectors and regions

**Welcome: Ganesh Iyer**

Ganesh Iyer
*Edgar F. Kaiser Professor of Business Administration of the Haas School of Business,*  
*University of California Berkeley*

Ganesh Iyer’s welcome for the third initiative expressed the importance of collaboration to provide solutions to the challenges that India is facing. He mentioned that the Haas Business School wants to bring the industry, government, and education together to provide solutions for emerging economies in the (post) COVID-19 world. He mentioned that India has important human capital challenges and opportunities for the 21st century.

Ganesh Iyer identified three key sectors to build ecosystems: digital health care, financial inclusion for the unfortunates, and agricultural supply chains. He mentioned that the Berkeley Haas community is passionate about research that creates transformational solutions. There are for example several financial inclusion and fintech initiatives at the university, which could provide interesting information and insights for India.  

1 The first example can be found in the context of India to improve financial access and rural bank technology to enable contactless banking. The second example is related to the design and training of credit access and digital enablement of small micro retailers around the world. Ganesh explained that it is important to always think about efficiency in this sector, not only because it is an engine for growth, job creation, and entrepreneurship, but also for a mission of rural and resilient supply chains.

2 Ganesh Iyer emphasized that the Haas Business School can contribute to building ecosystems, by 1) facilitating the creation of a roadmap and setting the stage for the meeting in February, by 2) bringing to the table the larger area of the campus that have been in the subject of our discussions to make sure the participants can tap into the deep research expertise that Berkeley provides, and by 3) engaging faculty members and the university to support the initiative.

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1 See Center for Effective Global Action CEGA, [https://cega.berkeley.edu/](https://cega.berkeley.edu/) and Institute for Business and Social Impact IBSI, [https://haas.berkeley.edu/ibsi/](https://haas.berkeley.edu/ibsi/)
Keynote #1: Sanjay Kirloskar
Lessons from one of India’s leading Engineering Firms

Sanjay Kirloskar
Chairman Kirloskar Brothers
President, All India Management Association

Sanjay Kirloskar set the foundation for the third initiative by emphasizing the wish of India to become the second hub for a diversified global supply chain. He shared the unique approach that his company took to build diversified global supply chains. The company is an old company that makes products for fuel fluid handling, including pumps. They were the first Indian engineering company, working since 1901. To build global supply chains, Kirloskar emphasized that the recognition of their brand was key. The company is the only Indian brand recognized around the world. This allowed the company to build global supply chains, in tough environments by developing and trimming local vendors, whether they are in India or not. Kirloskar explained that this requires local learning processes and product supplies all over the world. Many local vendors have turned into suppliers, also for competitors. He argued that the company works with its supply base across the world to get new opportunities. The company is a green company and encourages its vendors to adopt technologies that save the environment. Kirloskar provided a number of important lessons for other companies that would like to build globally diversified supply chains, as can be found below;

1. **Emphasize the strength of education**

   Kirloskar explained that many local vendors are now suppliers. Kirloskar Brothers Ltd has developed these vendors into first-level suppliers, by exposing them to the latest technologies and train them with the latest tools so they can meet the company’s expectations on cost, quality, and delivery. Besides, Kirloskar emphasized the importance of skill development in all facilities. He works with local educational institutions, to provide learning in various ways, such as training teachers the curriculum-related matters. A need exists for a network of vocational training institutes that can work with various corporates based on specific regions. Automation can be detrimental for the new generation coming into the workforce. Therefore, Kirloskar emphasized the importance to set up vocational training for the manufacturing of specific areas. This will attract new entrances to the market. Virtual reality can definitely support the learning processes according to Kirloskar.

2. **The power of government collaboration**

   Kirloskar explained that by collaborating with governments, companies can develop industrial parks that allow SMEs to set and operate within months with plug and play models. This can help industries set up and develop quickly. Besides, he worked with local educational institutions and local administrators to, for example, prevent hunger.

3. **The power of local**

   Kirloskar stated that all the factories are by choice in small towns and villages. Each plant is a hub from which the company diversifies. It is important to work with the strengths of the local (institutional) environment. The company works closely with for example local administrators, to create better irrigation. Additionally, the company works closely with farming communities for better storage of commodities, based on location as well as to get better prices by collecting information across the country. Local farmers have set up a global-wide distribution system. The company has experience with local institutions, technology, and administration.
Discussant Presentations Initiative 3

Healthcare

Discussant #1  Shri CP Gurnani, CEO, TechMahindra

*MHealthy Solution for Telehealth*

Gurnani stated that each challenge also presents multifold opportunities. The pandemic forced the company to develop a permanent solution and resulted in the development of technological innovation to create a holistic solution.

**Offered Value Proposition**: MHealthy solution. Gurnani explains that this solution is a comprehensive screening on many parameters like Blood Sugar, Hypertension, BMI, Pulse Oximetry, and an antibody test and helps to generate an immunity passport that is highly accurate and identifies three levels of Risk exposure (no risk, moderate risk, and high risk), with built-in protocols of Telehealth, etc. The development of the immunity passport has been done by putting together new-age technologies such as AI and ML. Additionally, the Mahindra Group has also produced ventilators in its manufacturing plants.

**Proposed Partnerships**: The company has collaborated and is open to new opportunities. This has helped them to survive and thrive in the new normal.

**Requested Government Support**: Gurnani explains that the company has collaborated with the Indian government to leverage the contact tracking and tracing application. These collaboration types could be continued and expanded.

Discussant #2  Nivruti Rai, Country Head, Intel, India

*Creating a Global Platform and Promoting Open source*

Nivruti Rai argues that the doctors in India are jewels because they have unique expertise by working with a wide variety of patients. There are two problems; 1) there are not enough doctors available, and 2) there are not enough beds available. There is an urgent need for improving healthcare facilities. Covid-19 accelerated this need.

**Offered Value Proposition**: Cost-effective and scalable high-quality solutions. By collaborating with a wide variety of partners, the company can develop solutions where people can get health benefits consultations and diagnostics.

**Proposed Partnerships**: Everyone has a piece of the solution and according to Rai, we need to create a platform that India could use. Open source is also important, where ecosystems could contribute. Rai explains that a wide range of partner types need to come together and need to do three things; 1) manufacture devices, 2) enable people to become more digitally aware and capable, and 3) support the society with foundational technology (e.g. common data-sharing technology). To realize everything, connectivity is critical. Rai states that partners need to collaborate with hospitals, foundational technology providers, research institutes, universities, local manufacturing ecosystems, governments.

**Requested Government Support**: Rai argues that governments can support companies with the regulatory needs for new technologies such as 5G. The role of governments is to support the development of use cases and pilots.
**Discussant #3  Preetha Reddy, Vice-Chairperson, Apollo Hospitals**

**Accessibility, Accountability, Affordability**

Preetha Reddy highlights that one must be mindful that the healthcare ecosystem is extremely dynamic, with multiple variables reshaping its contours constantly. Undoubtedly, the National Digital Health Mission has the potential to become a game-changer. However, challenges around the paucity of skilled manpower and health infrastructure will need to be addressed with equal focus.

Reddy points out that telemedicine in India has gained widespread acceptance due to the pandemic. To improve accessibility by augmenting the talent pool, her vision is to include the 1.4 million doctors of Indian origin, living around the world, who are all willing to give a few hours to support patient care through telemedicine.

**Offered Value Proposition:** In the year 2000, Apollo had introduced the Re1 per day community health insurance model in its Chairman’s native district. It was named the “Passport to Health” and the model inspired several State governments in India to develop community health insurance schemes.

For 2020-21, after an appreciable increase, India’s national healthcare budget was set at US$9.37 billion. Nevertheless, a definitive is that India needs a much bigger outlay. Now, an idea is whether India can build on the INR 1 a day approach, to augment the national health budget and build an all-new health assurance corpus by using a “Citizen Contribution” model. With the country’s recent efforts towards financial inclusion, there are (as of 2019) 1.67 billion savings and current bank accounts in India, Reddy stated. To catalyze a massive transformation, if the Government was to set up an innovative mechanism, wherein, for every bank account that one holds, they would have to contribute INR 1 per day towards the new health assurance corpus. Then at the end of a year, this would create a corpus of US$ 8.19 billion, which translates to almost 88 percent of India’s national health budget.

**Proposed Partnerships:** Qualified doctors are the bedrock of accountable care. Reddy recommends private-public partnerships between government district hospitals and private healthcare organizations, which would bring down costs to develop a medical college and also help in scaling up rapidly. In addition, there must be a revision of an outdated ratio of doctors and nurses per institution – a minimum of 300 doctors and 500 nurses per college must be permitted to make it viable and build resources rapidly.

**Government Support:** Reddy said that a big question has always been about how money can be raised to address the manifold gaps in healthcare. Over the last few years, India initiated several innovative initiatives in healthcare and now the Rupee 1 a Day charter could be another highlight.

**Discussant #4  Satish Reddy, Chairman, Dr. Reddy’s Laboratories**

**Automation and Mechanization of Healthcare**

Satish Reddy argued that Life sciences and healthcare will have a tremendous impact on humanity in the coming years. From a business standpoint as well, Reddy experiences the upcoming 10 years as one with great potential and opportunity. It is his dream and vision that all major stakeholders will come together, collaborate, and make the most of this opportunity to create a difference. Several companies, many of them from India, have been able to produce and export medicines at very short notice. In addition, there is a significant push to develop India as a life science innovation hub, for which, according to Reddy, we need to create a holistic, integrated innovation ecosystem.
Offered Value Proposition: Automation and mechanization of healthcare. In the context of Dr. Reddy’s, automation and mechanization have made the company more competitive and increased productivity. Currently, the company is developing digital marketing and propriety digital ecosystems to increase market access and connect with experts in specialized areas. Many technologies are disrupting things that society has been taking for granted. Whether it is clinical trials, design of experiments, enhanced productivity, AI and technology have disruptive potential according to Reddy. A lot of data is available, including through e-commerce platforms, that can be used to develop and customize solutions. Many of these can bring medicines to patients with speed and agility.

Proposed Partnerships: Reddy argued that Indian companies have already demonstrated their capability to bring medicines to the market at affordable prices. To boost this, incentives and more streamlined regulations are important. Collaboration is key to build capabilities to develop products and create the right ecosystem and to find funding opportunities. In addition, laying the foundations for the ecosystem of innovation can make India truly a hub for global healthcare. The opportunities are tremendous, and in Reddy’s opinion, companies can realize them through collaboration. Reddy sees three clear areas of collaboration; 1) the innovators (multinationals) for contract research, development and manufacturing, in a fully integrated manner, from chemical starting materials to drug substance to drug products 2) medical devices companies for investment in manufacturing capabilities, 3) universities to develop new technologies and to make recommendations to boost for the healthcare systems.

Discussant #5  Sudarshan Ballal, Chairman, Manipal Hospitals Group

Providing Digital Healthcare

Sudarshan Ballal argued that Covid-19 has changed our lives forever, by affecting the whole economy. Ballal states that pandemics offer both challenges and opportunities. Currently, e-consultation is becoming the new standard, dramatically reducing the need to travel. The problem still remains, because digital health is still mostly available in the cities. There has to be more awareness about connectivity also in rural areas.

Offered Value Proposition: Providing digital healthcare. Ballal explains that there is currently a division between rural and urban areas within India; in the rural areas, there are almost no specialists available. There is also a digital division because the hinterland is poorly connected resulting in serious problems. Unless this gap is bridged, moving forward is difficult. It is important to develop medical colleges and universities in more rural areas, such as in Manipal.

Proposed Partnerships: Ballal explains that all partner types need to come together in think tanks to develop new ideas, including insurance, governments, tech companies, policymakers, device manufacturers, and international companies to realize a robust private partnership to enable accessible, affordable, sustainable healthcare system.

Requested Government Support: In the current system, the majority of tertiary care is provided by the private sector. Ballal highlights that public-private partnerships that are viable are crucial to address healthcare issues in rural areas. With the support of the government, affordability and accessibility of healthcare can be resolved by strengthening the universal health care system. In addition, the government can support developments by quickly changing regulatory issues around e-consultations and digital healthcare platform. These regulatory changes are boosted by the pandemic. Last, governments can support the development of healthcare by increasing public spending to strengthen preventive and primary care.
Discussant #6  Raghuram Lanka, Head of Healthcare, Jio

**Accessible Healthcare for Every Indian**

Raghuram Lanka argued that Covid-19 showed a fundamental change in how we think about healthcare and how we deal with it. Several problems need to be solved, according to Lanka, to enable a shift in healthcare. The first problem is that India needs to scale to solve the discrepancies in providers versus consumers. It is to identify the scale that needs to start. To do so technologies such as AI can be used to identify and predict a score for an individual the potential areas that are the foremost point of the problem. Second, also the actual infected need to be easily and effectively detected with very rapid diagnostic tests. Third, there is a need to find the right treatments for persons and the outcome of the treatment. Last, Lanka argued that we also need to look at population awareness. Education and awareness are crucial in this story. There is currently a shift from physical towards digital healthcare ecosystems and their co-existence.

**Offered Value Proposition:** Accessible healthcare for every Indian. The company offers an integrated value proposition that consists of three pillars; 1) core connectivity, 2) strong platforms using a cloud-scale using Microsoft Azure, 3) Health hub platform to provide information on health. These pillars offer solutions to the four major problems in health care.

**Proposed Partnerships:** The company is interested to work with public and private entities that support their solutions.

Discussant #7  Sanjeev Singh, Head of India Business, Wipro

**Building an Integrated Healthcare Platform: Schemes, Applications, and Databases**

Sanjiv Singh started his presentation by asking the question of how we can improve the quality of health care services in the public sector space. He explained that especially in rural areas, people are dependent on primary healthcare, and as a technology company Wipro has been working closely with various States as well as Central Government agencies in this area. In Singh’s opinion, we should go back to one system to enable the citizen-centered approach, by building an integrated healthcare platform.

**Offered Value Proposition:** There is a strong need to change the approach from a scheme based reporting to citizen-centric reporting of benefits. Building an integrated healthcare platform that integrates all existing schemes, applications, and databases across states, covering both private and public sector data. This allows us to make a 360-degree understanding of healthcare needs and to track the services being provided. Wipro has deep expertise in this area and has a lot of use cases to support the development of a robust integrated platform. The solution is not very expensive, is not very disruptive, and allows both Wipro and governments to develop new use cases.

**Proposed Partnerships:** Singh explains that the platform could be monetized by further expanding it to private players, and to further develop the provided services. The company believes that there is an opportunity to create a common system that could be leveraged by all the states. This could decrease costs. To do so, all partners have to work together to create a certain understanding and contract agreement on how to continue to the next level, according to Singh. Singh explains that the development of contracts is difficult because it is not easy to predict the evolution of their specific sector.

**Required Government Support:** Singh explains that the focus of the government is on the citizen-centric approach, and healthcare is one of their highly prioritized areas. The government and political leadership have invested large amounts of money in the sector. Very simple solutions by technology exist, that could improve the public sector space when being
leveraged. Governments have to deal with many healthcare schemes and applications, resulting in multiple, overlapping offerings. This has resulted in duplicates, and therefore with a high complexity of the market, and too much scheme centric and reporting centric approaches. Singh explains that a collaboration between the company and the government could support the development of an integrated healthcare platform.

**Discussant #8  Anil Shah, Executive Chairman, Smart Village Movement**

*Providing Scalable Digital Platforms to Address People’s Needs*

Anil Shah highlighted the importance of digital platforms for good living to happen. According to Shah, the current healthcare system is designed for disease management, not prevention, and positive health. A shift towards prevention will decrease the need for disease management and further to focus on achieving targeted parameters for positive mental, nutritional, and physical health. To realize these goals, it is important to integrate many verticals such as healthcare, education, and livelihood. These verticals require open innovation and digital technologies. Shah stated that the productivity of the workforce can be improved when it is healthy. Additionally, the whole industry can be built around the healthcare industry. The education of healthcare workers is very expensive and the shortage of doctors and nurses will not be resolved in short order. The workforce required for positive health can be built locally with targeted educational achievements to serve the community.

**Offered Value Proposition:** Digital platforms that support the development to scale to achieve the targeted benefits. Shah explained that the current goal of the Smart Village Movement is to create a system in a cluster of 50 villages that are engaged to be made smart and target a number of parameters. Smart Village Movement is considering clusters of the population from 50,000 to 250,000 for positive health parameters, especially aspirational districts.

**Proposed Partnerships:** The design and integration of this platform require the identification of pain points and identification of parameters numbering about 60 to 100. According to Shah, these pain points are an important input to improve the system according to international standards. To realize a system within the villages, Shah would like to collaborate with private companies, NGOs, and governments to be able to integrate the unique knowledge and expertise of all these partners and to enable the integration of smart models.

**Requested Government Support:** To scale up from clusters of villages to whole states, Shah emphasized that close collaboration with chief ministers is key. Shah would like to ask the government to support the Smart Village movement by supporting the budgets for targets, making sure that private companies and NGOs can take the targets. Shah specifically needs three Senior State Officials from the State Government and collaboration with the School of Public Health, the local doctors, as well as the primary healthcare centers to work with the movement for a year, to scale the whole district or region to pick up the ideas. If successful, it can be scaled to the whole State.
Agriculture

**Discussant #9  Manav Seghal, Head of Solutions, Amazon, India**

*Customer Obsession and long-term Investment Experience to Create National Agriculture and Healthcare Inclusion*

M. Seghal runs hyper-scale cloud-based platforms for millions of active customers globally. The company is investing in digital learning and aims at educating students about emerging technologies.

**Offered Value Proposition:** Customer obsession and long-term investment experience to create national agriculture and healthcare inclusion. Seghal explained that capacity building digital learning is essential to the company, and they have a mission to have a million students in India learning on emerging technologies such as AI and blockchain. In addition, there are several cloud innovation centers where AWS co-invests with public institutions, where Seghal saw solving national scale problems using system thinking, design thinking, etc.

**Proposed Partnerships:** Given the complexity of the industry, Seghal highlighted that the company is specifically interested in collaborations that can support Indian startups and help them scale so that they can deliver national digital platforms. Seghal mentioned that the company developed AWS-Educate, which is a complete investment from AWS for education institutes.

**Requested Government Support:** Seghal accentuates the positive trend that governments are investing in enabling open innovation, technology standards, and software and data standards.

**Discussant #10  R. Venkat, Advisor to Reliance Industries**

*Designing a New Participatory and Partnership-oriented Physical Digital Landscape*

R. Venkat argued that digital connectivity could re-shape the agricultural world. He explained that the extent of connectivity can transform peoples’ lives. Challenges remain to change the mindset of the industry and to build ecosystems for agriculture.

**Offered Value Proposition:** Designing a new participatory and partnership-oriented physical-digital landscape. Venkat explains that India has a wide diversity of climate zones and several possible agricultural products can grow there. There is a need to connect the fragmented supply chains and Venkat stated that this required an ownership mindset.

**Proposed Partnerships:** Venkat stated that most of the systems are independent proprietary systems and not necessarily participatory. According to Venkat, large organizations such as governments, foundations, private sector, universities and, research institutes need to come together to solve a fundamental problem, preferably at scale and for society. Collaboration is the only way in which sustainable value co-creation would be possible and the landscape could be transformed. Venkat argues that it is interesting to look into agricultural ecosystems with players and partners. Especially with players such as Berkeley, some of the best practices both globally and for India can play a role.
Financial inclusion

Discussant #11  Dhiraj Relli, CEO, HDFC Securities

Offering a Viable Commercial Micro-Lending Structure

Dhiraj Relli highlighted that financial inclusion is important to empower the Indian nation. Financial inclusion is only possible, according to Relli, when there is a viable commercial model. At the moment, social-economic barriers, regulatory barriers, and product design barriers, and the still prevalent practice of local borrowing at high-interest rates make financial inclusion difficult.

Offered Value Proposition: Offering a viable commercial micro-lending structure. Relli explained that HDFC Bank (holding majority ownership in HDFC securities) has been working in the sustainable livelihood initiative that services more than 10 million customers and services them profitably. Technological assimilation is helping to expand the market.

Proposed Partnerships: Relli emphasized that it is important in collaborations that a company has a good reputation and is seen as a credible and accepted partner. He stated that financial inclusion requires collaboration within and across industries. To enable collaboration, each company and industry could do their specific literacy. According to Relli, the community needs to scale and structure new services and products. It is important to have a standardized KYC, to make it less expensive and easier to board.

Discussant #12  Dilip Asbe, CEO, NPCI

Providing (contactless) Payment Infrastructure by Providing Direct Linkages

Dilip Asbe argued that the advancements in (online) infrastructures has simplified online transactions and brought in many efficiencies to the direct benefit transfer program. The infrastructure helps the economy to recover faster.

Offered Value Proposition: Providing (contactless) payment infrastructure by providing direct linkages. Asbe emphasized that this payment system will enable financial inclusion. Transfers can be organized within 30 seconds, with only a mobile phone according to Asbe. The costs of the infrastructure are really low, enabling better financial inclusion for the rural areas.

Proposed Partnerships: Asbe argued that the infrastructure can provide large benefits to the governments. They can now do large amounts of transfers in a short time. As a result, the company functions not only as a financial address but also as an access authentication biometric for the rural population. This has resulted in a payment system and a business correspondence location. Also, in collaboration with governments, the company also proposed to collaborate with banks. Several banks have been embracing collaboration with fintech resulting in significant changes in the ecosystem that need to be continued in the future. Also, companies such as PCI, Mastercard, and Visa, have been part of the company’s ecosystem, to grow the contactless payment industry predominantly.
Key Takeaways Initiative 3

1. Solutions must be future proof in terms of health, economy, and society
Pandemics such as the COVID-19 pandemic do not only influence the health of people but can also result in social and economic pandemics. Solutions that are designed should be aware of this and should make sure that they also contribute to social and economic welfare.

2. The power of accessibility, affordability, and scale
To bridge the gap between the rural and urban areas, healthcare, food, and financial systems need to be accessible, affordable, and scalable. These three aspects are related and should be considered together when developing new innovations for rural Indian citizens. Many examples can be found that it is possible to combine the three elements, but collaboration is key to realize this. Public-private partnerships are critical for these elements because it is impossible to realize the complex requirements for innovation in rural areas by only one company.

3. Education is important at the individual, organization, and ecosystem level
Education needs to take place at different levels, to enable the realization of value co-creation. Individual members need the required (vocational) training to be able to do their jobs, but organizations also need to learn. Within organizations, it is important that the required knowledge of structures and processes be in place to enable efficient learning processes to capture value. Education is also important to create awareness in rural areas of the opportunities that being connected can offer them in terms of quality of life.

4. Digitalization can create a good quality of life for people in rural areas
Digital technologies can improve the lives of many people living in rural areas because technology can reduce costs and can enhance the scale of technologies and services. Farmers need to be connected to the market, to get good prices. Rural citizens need to be connected to access affordable healthcare, and to be financially included. The microlevel has to integrate technology to improve the quality of life of the rural people and to bridge the gap between the urban and rural areas.

Implications and Recommendations for Initiative 3

Dieudonee Cobben (PhD)
Researcher in Business Ecosystems
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Two key recommendations retain of critical importance based on Initiative #3. The first one emphasizes on the importance of governance in ecosystems. The second one explains the importance of co-creation to understand and realize the basic needs of the Indian people.

1. The importance of governance in ecosystems
Ecosystems can produce innovations for sustained industrial competitiveness. Typically, an ecosystem leader governs the ecosystem and facilitates joint value capture and creation. Partner alignment is key in this story because partners can only contribute when they feel part of the system and understand the importance of contributing to the higher-level goal. It can be challenging to ensure that actors behave in congruence with the interest of the ecosystem instead of behaving opportunistically. To mitigate the risk of opportunistic behavior, the ecosystem leader can use a variety of formal and informal control mechanisms to safeguard the system. These two types of mechanisms should be balanced, to create a
sense of belonging and trust between the members. When partners feel aligned, they will most optimally contribute to the realization of the ecosystem goals. Partner stimulators, such as clear leadership and expectation management, influence the effectiveness of governance mechanisms used by ecosystem leaders (see the article by Cobben and Roijakkers (2018) for more details).

The use of governance mechanisms can change when ecosystems evolve. Over time, ecosystems can grow, and the complexity of the system will increase, which makes it more challenging to manage the needs and wishes of all those different ecosystem members. We would like to recommend ecosystem leaders to, in the initiation phase, emphasize governance mechanisms that aim at strengthening the internal relations. In this phase, elements such as trust, commitment, and the formulation of common goals are key to develop a common understanding and a sense of belonging between the partners. In the growth phase, the ecosystem leader should focus on establishing relations with new partners, and also integrate potential interesting partners such as competitors and suppliers. In this phase, elements such as the development of co-creation strategies and a dedicated organization for the promotion of the ecosystem are important to facilitate the communication with new and external partners (see the article by Ooms, Caniëls, Roijakkers, and Cobben (2020) for more details.

2. Co-creation and participation of ecosystem members
People in India have special basic needs that need to be fulfilled to improve the lives of the Indian population. Current agriculture, healthcare, and financial systems are facing a number of challenges that need to be resolved to be able to fulfill the basic needs. We, therefore, need to have further discussions to understand how we can provide solutions that matter and that can have a big impact. These solutions should not be designed from a merely technocratic perspective but should take a social perspective in which the Indian rural population takes part in the design and innovation processes. A social perspective, in which co-creation with the Indian rural population is key, enables people to articulate their specific needs and enables governments, NGOs, educational institutions, and companies to provide solutions to the complex challenges. Farmers, for example, need frictionless and transparent platforms, which are easy to enroll. By providing them access to dynamic platforms (that provide information to for example fertilizer prices, crop prices, availability of goods), the farmers could become more efficient and earn more money. Additionally, for the financial sector, a need exists for a strong internet connection and transparent systems, to make sure Indian people understand how they can, for example, borrow money to start their business. To summarize, a need exists for co-creation with the Indian rural population and other stakeholders to enable a fair and equitable discussion.

Note from the Editor

Emma BRUNAT
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Attached are individual surveys compiled from each of the participating firms. The summary statement has been written accordingly to the surveys sent by the companies. It represents the overall picture of the future in vision 4.0. I had to compress the information on one page to make it easier for people to thumb through. I apologize ahead of time for any oversight of critical information that might be missing. Let me know if any corrections need to be made.
Appendix: Survey Results by Individual Company

Attached are the individual surveys that provide you information for each of the companies for your reference and collaboration. This appendix section will be updated according to the feedbacks of the companies.

**Picture of Your Future: Summary Statement**

10 years from now, the represented companies want to be leaders in their fields, using the best technological and digital tools.

**Manufacturing**: Companies are very enthusiastic about industry 4.0 and collaborating in cross-training programs to support one another economic growth.

**Education**: Companies are ready and enthusiastic to equip the necessary talent pool to support the industry 4.0 for building platform, provide content, certification, enable job placement, etc.

**Healthcare**: Companies are ready to provide continuing medical and technical education to support healthcare. They are enthusiastic to initiate and support the readiness for the expansion into the rural areas. This will create many entrepreneurial activities to support economic expansion.

The ecosystem approach is understood and appreciated.

**Education**: Despite the competitiveness of the similar programs that are offered, differentiation and specialization present a challenge but also create opportunities for a more efficient ecosystem for sustainability. One company raised the concept of the circular economy, in phase with this ecosystem approach. As the companies come and form ecosystems, they promote small entrepreneurship.

The concept of Open Innovation is accepted as a standard factor by everyone. The industrial companies are already very familiar with this concept.

The general consensus is that governmental support is key to success.

University collaborations will become increasingly critical to companies’ success in the industry 4.0 environment, as they are creators of knowledge, as validated by the contribution of UC Berkeley and Stanford University in Silicon Valley.

The relevance and importance of use cases are recognized in the industries represented. The need of specific use cases is detailed within the attached survey.

Besides infrastructure and technology, the most critical support that is needed to accelerate industry 4.0 is the support and policies of the government.

As the companies are different, the KPIs to measure success are several. For manufacturing, KPIs are about the adoption (scale-up) and the benefice. For education, KPIs are mostly related to the effectiveness of the initiative and the progress of the students. For healthcare, the favorite KPI is “access”.

Participating companies have expressed willingness to contribute to their related specific area in the attached “Ecosystem Fostering and Development” item.
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The Picture of Your Future
Adobe, initiative #2

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4) Create an ecosystem focusing on 1) Creativity, Communication and Critical Thinking 2) Content 3) Analytics (of the initiatives).

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3) Education and Skill development to foster digital skills for economic growth: 1) Student Experience; 2) Educators: professional development program, training content and pedagogy for creativity and productivity tools; 3) Engineering Research integrated with Artificial Intelligence and Machine Learning capabilities

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached, Public – Private – Partnership models in collaboration with Govt and other organizations contributing to overall development of scale-able and sustainable models to emerge.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached) Creativity and innovation is the key pillar of Adobe’s education initiatives

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   TBD

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   • Dell: Access to devices is crucial for anytime any
   • Microsoft: virtual platform MS teams
   • Reliance Jio: internet for students and educators to help bridge the digital divide
   • VMware, AWS, SAP & Salesforce: Mentorship sessions

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   • Our use cases would be developed on how creativity is the fundamental foundational skills for all jobs for Industry 4.0
   • Progressive levels of certification for students from K-12 to Higher Ed
   • Entrepreneurship can also be studied for students to be job creators

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed: Support of resources for local implementation Berkeley students to monitor the success of the pilot and help with case studies

9. How do you measure success in the new landscape – list at least four KPI’s
   **Impact on students:** X students actively involved in the pilot;
   **Impact on teachers:** X teachers/educators certified as Adobe Creative Educators;
   **Creativity & Digital literacy:** X students creatively submitting projects to enhance creativity, communication & critical thinking using Adobe Creative Cloud & Document Cloud;
   **Overall enhancement of skills** for K-12 & HED students in a digital environment through distance learning

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached) Education and Skill Development initiatives for K-12 & HED being planned as per the MOU between Berkeley and Govt of Meghalaya.
The Picture of Your Future

Appendix 2: Applied Materials

Applied Materials, Initiative #1

1. What is the picture of future 10 years from now in light of GoI’s Industry 4.0 Vision?
   - India evolve its semiconductor supply-chain to include a commercial scale fab and integrate its design to device manufacturing ecosystem to achieve its rightful place in the global semiconductor eco-system
   - With a competitive EoB and progressive, predictable regulatory system that enables it to deliver operating efficiencies that out-execute other Asian economies
   - With an active, vibrant R&D Ecosystem in India that integrates well with global R&D collaboration best practices

2. How does your firm plan to participate in the PM’s action plan to promote economic growth through his industry 4.0 initiative?
   - Expanding its India Global Engineering Center with people (grow employee base from 3800-to 5500) and higher integration with the AMAT Customer needs
   - Building a $100 mln Procurement from India and enable an initiating base of world-class semiconductor equipment supply-chain from India and Build Region Specific Specialized Centers of Excellence in Nanotechnology
   - Enable a 100% export oriented manufacturing of select semiconductor capital equipment from India
   - Expand R&D project base out of India and increased collaboration with Government labs.academia.

3. How can the “Ecosystem Approach: help achieve your firm’s objectives?
   Strategic Focus on creation of semiconductor supply-chain in India through a Mission-mode approach instead of a spray-and-pray implementation, Focus on ease-of-business to enable Competitive operations out of India, and Build R&D collaboration programs that enable MNC participations with Indian Academia/Govt labs

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy?
   - Enable a competitive, world-class India Supply-chain for semiconductor capital equipment evolve (target $100 mln by 2025)
   - Build more R&D Collaboration programs with India
   - Engage with Indian Startups in AMAT interest areas to provide scale and success

5. Who are your current ecosystem members- critical to your success?
   Government Stakeholders like SCL/Dept of Space; GTRE/ MoD; Industry Stakeholders like Adani (Solar); Tata (Solar/Supply-chain), R&D stakeholders like DST/ IITs/ IISc

6. For the Industry 4.0 environment, who would be your prospective ecosystem members -critical to your success?
   AMAT sees that all the above will continue to be the key stakeholders in the AMAT ecosystem. We foresee the need to have a leading foundry/ATMP ecosystem and a National Electronics Mission/Govt initiative that will tie together the missing links in the semiconductor – electronics supply-chain and rest Indian electronics industry on a growth trajectory.

7. What new use cases would you need to enhance your level of confidence to develop your strategy?
   - Help it deliver a competitive export-oriented manufacturing and services project at Karnataka/India
   - With World-class EoB and efficient export-import TATs that out-execute, at least equal, other competing Asian economies
   - With an increased trust, predictability and collaboration on R&D and industry front for India operations

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?
   We recommend a National Electronics Mission/Govt Initiative that will tie together the missing links in the semiconductor-electronics supply-chain and rest of Indian electronics industry into a growth trajectory.

9. How do you measure success in the new landscape – list at least 4 KPIs
   For India: 1. Commercial Fab and ATMP operations. Initiated by Q4 2021; Factory Move-in by Q1 2023 and commercial production Q1 2025. 2. Indigenous Product design and global market positions
   For AMAT (by 2025): Expanded India Operations (3800->5500 employees), India Procurement for global operations (0-$100 mln), India manufacturing successful Commercial Ops (Q2 2022), R&D project intensity in India to cross Rs.100crs for AM India

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”
    Linkages in Semiconductor ecosystem for foundry/ATMP operations, Enablement of Semiconductor Supply-chain, R&D Collaboration opportunities in nanotech sectors like Semiconductors, Display and emerging deep tech sectors like Life Sciences, Advanced Coatings & AI.
The Picture of Your Future
Apollo Hospitals, Initiative #3

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision ref page 4)
In a decade from now, the global medical device business is estimated to reach nearly US$800 billion While the near term will be about medical devices becoming offerings of ‘smart’ services, as connected health IT solutions, they will deliver quality data for actionable insights to strengthen prevention and also dynamically improve clinical outcomes.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative?
Being a strong advocate for greater synergies between tech & medicine, Apollo will participate in Samarth 4.0 by working towards the development of a hybrid model that combines hi-tech with hi-touch.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
With health shifting from ‘the state of illness’ to ‘state of well-being’, it will be an agile ecosystem that will be able to dynamically develop a digital care continuum and an ecosystem, focusing not just on treatment, but also awareness, prevention and even rehabilitation/post treatment care. The “Ecosystem Approach”, wherein multiple partners come together & work towards a common goal, will work to help us enhance outcomes & meet said objectives.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
Open innovation, partnerships and collaboration have always been integral to Apollo. To guide smaller healthcare facilities in India to manage COVID-19 patients, Apollo created the ‘Red Book’, with weekly clinical protocols. It steered creation of the Global Indian Physician Collaborative against COVID-19, that has brought together 1.4 million physicians together from 9 countries for knowledge sharing.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
- All States and the Central Government of India (Health is a State subject in India)
- MoHFW, Ministry of Finance, Ministry of Commerce, Ministry of HRD, MeITY
- NITI Aayog, ICMR, MCI and IMA & NATHEALTH, AHP, CII, FICCI, ASSOCHAM
- Insurance Providers, Trained & skilled healthcare personnel, Medical device manufacturers and Patients – physical & virtual

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
All of the above as in Answer 5 and additionally:
- Ministry of Education and Skill Development – as existing norms and curriculum need upgradation
- Ministry of Tourism as patients and and individuals from around the world can benefit from India’s AYUSH and cost effective world class clinical care.
- Corporate India, as employee health must become a metric of success
- Editorial media who must become ‘evangelists for good health’
- Technology majors, IITs and leading STEM academic institutions
- Innovators – technology, device, drugs & software

7. What new use cases would you need to enhance your level of confidence to develop your strategy
Case studies of smart manufacturing in healthcare are vital to boost confidence. ‘Innovation Bootcamps’ can be planned as springboards - ideation for healthcare innovation, guidance to foster entrepreneurial creativity, problem solving, open discovery and leadership.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?
- Empowered Groups (EGs) for Samarth 4.0 – Similar to EGs set up by GOI for ensuring a comprehensive and integrated response to the Covid-19 pandemic.
- Incubation Finance – critical to encourage startups
- Consumer representation – Critical for co-creation and development
- Market research – A pulse of the end user and to ascertain acceptance

9. How do you measure success in the new landscape – list at least four KPI’s
Accuracy, reliability and high quality data generation & mining, (ii) Ease of access of raw materials, (iii) speed to scale and (iv) Sustainability

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
Healthcare, Medical Education, Skill Development and Innovation testing & validation
Survey Sheet - Rebuilding India Post Covid-19

The Picture of Your Future
Autodesk, initiative #1

Appendix 4: Autodesk

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)
   In 2030, we envision a design and manufacturing ecosystem that is more connected and more circular than ever before. As design and make converge, product and process will converge, and materials and waste will converge. We will be designing and making products of which the entire product lifecycle balances people, profit, and the planet.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   Autodesk participation in the Prime Minister’s action plan is directed towards helping Indian MSMEs simplify and de-risk their Digital journey. Autodesk is willing to Partner with Indian Government, Manufacturers, Universities etc to establish Manufacturing CoE / Innovation / Lighthouse factory to enhance technological awareness and promote R&D in Advanced Manufacturing.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
   In line with “Be Vocal for Local” mantra of the Indian Prime Minister, for becoming a global powerhouse in Manufacturing, Indian Industry should work towards creating a robust local ecosystem by developing the skill set in advanced manufacturing technologies and build a strong local supply-chain for indigenization of manufacturing parts/products currently being imported into our country. Autodesk is willing to be part of this “Ecosystem approach” that will help Indian Industry and academia collaborate and set global benchmarks.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
   Autodesk has resources / tools such as Autodesk Knowledge Network, Autodesk Design Academy, Autodesk Education community, Autodesk Certification programs. All these help to strengthen small manufacturing businesses, provide platform for Industry to form product specific groups and provide complimentary access to students, faculty, and educational institutions to access Autodesk’s professional-grade software portfolio at no charge.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   Autodesk would like to work with all key players in the Indian manufacturing ecosystem- NITI Aayog, Manufacturers, Suppliers, think-tanks, educational institutions (IISC, IITs etc) for the success of this initiative.

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success? <Please see 5>

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   Sustainable product design supporting part reuse, disassembly and recycling, AI Driven process control to predict and optimise for efficiency, Generative Design in Manufacturing, Digital twins / Data connectivity across product lifecycle.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?
   Public and private organizations, academia must work together to help the workforce transition towards the future of manufacturing. This will require retooling the education system, investing in large-scale reskilling and upskilling efforts and developing a learning environment favourable to lifelong learning that enables continuous adaptation.

9. How do you measure success in the new landscape — list at least four KPI’s
   Number of Skilling / Reskilling programs conducted, Relevant courses introduced in educational curriculum, collaboration activities / projects done by R&D of Industry and academia( hardware & software), Government policy related to cybersecurity etc could be some of the success measures.

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
    We would like to offer cloud based manufacturing software solution in Hub and Spoke model for MSMEs, Tooling Associations, State Governments etc. We also offer Capability building with global design & manufacturing communities; provide tools & software for sustainable product design; free projects; webinars; courses using Autodesk portfolio for students, educational / scientific institutions.
1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)
We envisage continued investment in the country due to intrinsic organic growth and appetite to technology adoption. We expect to unlock significant value for our customers by providing a digital identity to every physical product. Our own manufacturing units shall transform into smart manufacturing hubs, exporting to a large part of the world.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
We have invested in our Avery Dennison Innovation and Knowledge Center (ADIKC) for labelling technology and an experience center for RFID-enabled solutions which we call Intelligent Labels. The center shall help to improve awareness, impart skills and catalyze proof of concepts. We can enable smart factories, integrated supply chain and robotics-based processing across industries. Additionally, our digitally printable pressure-sensitive labels portfolio shall foster faster, easily customizable and close to consumption label stock solutions.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
The ADIKC investment brings fifteen leading global suppliers under one roof and is reflective of ‘ecosystem approach’. We believe in sharing the knowledge and harnessing the power of collective wisdom. Our consultative approach and innovation mindset draws largely from our customers, partners and peer group’s collaboration.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
Through Avery Dennison ventures initiative, we are reaching out to ecosystem for opportunities that help to innovate together or co-create. Globally we have been partnering in early stage startups and are exploring opportunities in India.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
Automatic data capturing and identification companies: that’s are able to integrate different systems for offering real time data-based solutions
Customers: Consumer brand owners and print converters who want to render better customer experience and higher supply chain efficiency
Print machine manufacturers and print consumable suppliers

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
Same as above

7. What new use cases would you need to enhance your level of confidence to develop your strategy
Track and trace for assets and consumables for defense / railways
Adoption of anti-counterfeit technology for stopping revenue leakage and enhancing product safety
Better supply chain management for govt sponsored essential sector products like fertilizer

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?

9. How do you measure success in the new landscape – list at least four KPI’s
Reduced wastage in supply chain, Higher productivity, improved inventory management, higher capacity utilization and improved transparency to consumer

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4) By 2030, the education scenario would have reformed from current education to focus on learning Industry, which would directly impact the quality of education, future employment and research in India. Lifelong learning, realistic assessments, job-linked/vocational trainings would be the norm of the day.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   - provide essential digital infrastructure with a reduced carbon footprint and better energy efficiency
   - drive equitable access (including Dell Giving programs), fostering innovation and inquisitiveness (through mentorship prog), and invest in capacity building programs (for educators & students).
   - Dell Policyhack captures insights on teacher’s digital enablement.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
   - Innovative policy making: needs to be forward looking and should be able to balance innovation and regulation.
   - Bring together & skill various actors: students, educators, administrations, governments, industry, civil society organisations.
   - While there is focus on providing equitable access & opportunites, there also needs to be focus on pushing those ahead of the curve to achieve newer heights.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached) Dell is committed to lifelong learning of our employees – and this will continue to be our differentiator in the R&D for ICT space. The role of data storage, security, and analysis will be the cornerstone of open innovation.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   - State and Center education boards, Public & private sector schools
   - Education ISVs: ExtraMarks, EduComp, Akshara, CopyKitaab, ELK Education
   - Partnered with VMware, Microsoft, Intel, TCS, Google, Jio, Nvidi, to explore tech for digital transformation of education

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   - Platform and Content providers
   - System integrators and consultants
   - State and Center implementation bodies

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   - How access to devices, connectivity and content is built for economically disadvantaged segments
   - How remote learning can help bridge the divide and promote adaptive customized learning

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?
   1) Devices that can aid in content creation (laptops/ PCs) over devices of content consumption (mobiles, smartphones).
   2) Devices to store and access data: servers and storage

9. How do you measure success in the new landscape – list at least four KPI’s
   - Penetration of content creation devices
   - Penetration of local IT Labs for community use
   - # of teachers trained to teach using digital tools
   - # of digitized classrooms

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
    Talent Pool (Dell Education Services for on-demand tech trainings), Digital Infrastructure development (core value proposition), including secured data storage and retrieval, and Technology (Dev of relevant H/w and S/w)
1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)
With the National Digital Healthcare Blueprint (NHDB), healthcare records, insurance, preventive care, diagnostics will all be transformed. While the infrastructural upgrades will happen, the bigger chain in the link will be to build capacity for HCPs and para health professionals to leverage the digitized systems. Data governance of sensitive healthcare data will be extremely critical;

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience—pages 2-3)
• modernizing IT Infrastructure across governance as well as delivery, automate IT services and applications in healthcare
• transform workflows which will aid last-mile delivery. Dell’s Non-Communicable Disease (NCD) platform, Digital Lifecare, has been adopted as a part of the GoI’s Aayushman Bharat program and is live in 165 districts.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
While Dell provides the right technology, processes, and information to care providers, governments, academia and NGOs will have to help build capacity to use these tools effectively. With the public sector being the key custodian of healthcare data of citizenry, secured infra can support healthcare and life sciences organization be more secure and compliant in data protection.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
To foster innovation, we can help accelerate time-to-insight and reduce lengthy technology implementations with research and clinical care solutions

5. Who are your current ecosystem members – critical to your success? (Provide names of firms & customer segments only)
• Ministry of Health & Family Welfare & Tata Trusts (Digital Lifecare)
• Healthcare solution providers, Emergency response solution providers

6. For the Industry 4.0 environment, who would be your prospective ecosystem members – critical to your success?
• AI solution providers for healthcare solutions, including preventive healthcare
• System integrators to provide holistic solutions to center and state governments for monitoring and analysis
• Para healthcare workers, who will help deploy solutions at the endpoint
• Government of India

7. What new use cases would you need to enhance your level of confidence to develop your strategy
• Creation of Digital Health ID. As enablers of UIDAI and ePassport Seva, Dell Tech can offer insights into the process
• Predictive healthcare and its success: Digital Lifecare with its expanse and impact over the next few years can serve a real-time example of how pan-ecosystem players can come together to make a difference

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?
• Devices that can aid in content recording as well as programme development
• Servers and storage devices

9. How do you measure success in the new landscape – list at least four KPI’s
• # of people in the digital healthcare landscape
• Relevance of predictive healthcare and fine tune usage
• # of ICT professionals in healthcare segment
• Integration of emergency response with healthcare management

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
Building Talent Pool on emerging technologies (via Dell Education Services), Digital Infrastructure development (core value proposition), including secured data storage and retrieval, and Technology (Dev of relevant H/w and S/w)
The Picture of Your Future
Dell Technologies, Smart Village

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)
Explosive population growth is propelling the world to a new phase in urban evolution. From health, transportation, housing, security, education and waste management to culture and tourism, today’s urban administrators face unique challenges. As digital infra firm that empowers these solutions, Dell can enable governments world over transform cities digitally and knit them together.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   - Foster safety in cities: video surveillance, mobility management, smart meters, digitize citizen services (digitizing records, automating processes)
   - Help the MSME sector in India to digitally transform itself to become increasingly efficient and competitive and to expand their reach to the Global markets.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
Combining hardware and software with flexible management, it’s simple to deploy storage and analysis of vast quantities of security and safety content generated across the city. This data forms the bedrock of innovation as well as its security ensures digital equalization.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
Connected devices are changing processes faster than before. From real-time weather updates, to efficient and digital supply chains to connected consumers. Open data exchanges are helping entrepreneurs and researchers innovate and create relevant prototypes based on city data
With the National Research Foundation also focused on solving country issues leveraging emerging technologies, governments, academia and industry will directly help the innovation ecosystem spring up.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   - Ministry of Housing and Urban Affairs
   - Solution providers and end users across the verticals of Smart Village, as defined in the framework

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   - Smart city solution providers (including application layer)
   - System integrators and consultants
   - Smart City SPVs and Panchayats

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   - Interoperability and systems approach among various smart solutions in the village
   - Data governance and the focus on ethical usage and storage of data

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?
Computational devices (edge and core), Servers and storage, IoT Sensors, Software

9. How do you measure success in the new landscape – list at least four KPI’s
   - Better safety and surveillance
   - Self-sustenance and development
   - Improved transparency and governance across public services
   - Predictive analytics

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
Digital Infrastructure, Safety and Surveillance related solutions, Security, Data Analytics, Identity and Access management
The Picture of Your Future
Enel Green Power, initiative #1

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)
   India emerging as a globally competitive manufacturing powerhouse with advanced technologies and technical skills

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his
   Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   Contribute to the achievement of the country’s economic growth by providing affordable, reliable, quality, clean
   energy solutions utilizing the most innovative technologies, in partnership with other players across the supply
   chain.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
   Through optimal utilization and sharing of expertise and resources, proffer risk sharing and allocation, focusing on
   complementary skills to achieve the best outcomes, cost reduction,

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
   Utilize “Open Innovation” approach to open ourselves to provide and gain access to a much more diverse range of
   technologies, capabilities and ideas, and combine them to create solutions that meet the desired needs. This would
   drive value creation and, ultimately, transformation.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   Government agencies, financial institutions, equipment suppliers, land owners, local communities, peer players in
   renewable energy generation, customers (industrial consumers of electricity)

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   In addition to the above, local equipment suppliers, system integrators & technology partners (battery storage and
   new technologies), independent service providers (operations & maintenance partners)

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   To provide low cost/affordable energy solutions to customers, would like to see development of specific
   manufacturing zones in the country (with incentives) to enable companies to set up local manufacturing base and
   global supply chain lines. These would be customers that we could cater to and help them enhance their
   competitiveness by supply reliable, cost effective electricity. Also development of AI tools and remote
   communications network for accurate energy forecasting for customers could help in better demand and supply side
   energy management.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed:
   Strong policy and contractual structures for IPR, data privacy, compliance with processes etc, talent pool of
   resources, collaborative and inclusive culture

9. How do you measure success in the new landscape – list at least four KPI’s
   1. Scale up in MW/ market share
   2. Percentage of procurement from local manufacturing sources
   3. Capital invested (4) Electricity production (5) Time to market

9. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
   Talent pool, technology development
The Picture of Your Future
Hero Cycles, initiative 1

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)
   To leverage technology IOT, Data and Analytics for operational efficiencies and to decrease the production costs by 10–30%, logistic costs by 10–30%, and quality management cost by 10–20%. To enable Digital Supply chain 4.0: Implementing advanced planning processes, such as analytical demand planning or integrated S&OP, leveraging IOT for feedback on current production capacity; automated storage and retrieval systems and always knowing the exact location and condition of each shipment.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   A: In the upcoming hi-tech cycle valley, we are developing our own anchor unit in 50 acres and also inviting major national and international manufacturers as ancillary and vendor units. This will increase our manufacturing capacity to 10 million units per annum by the last quarter of FY21.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
   A: In today’s interdependent world, Ecosystem Approach will be of immense help to enable us to deliver on our objectives to double its capacity and increase its market share. Govt push and tax relief towards environmentally friendly sector like cycling, promoting Cycle lanes in the smart cities and villages should give required impetus.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
   A: We will like to work with academia, govt, fellow corporations to solve real, consumer-level issues and unlock greater value for the consumer through technology. Leveraging best practices shared in these brainstorming sessions to deliver the required business efficiencies and must faster Go-To-Market for new tech.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   We are working with Government, our key suppliers, joint venture partners and customers. To name a few we have BMW, Harley Davidson, Ducati, Mercedes and Toyota as our customers and JV Partners like ZF Hero and KIRIU Corporation.

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   A: All above (as in Q 5) Our logistics partners to bring efficiency and visibility of inward and outward shipments, an most importantly Academia.

7. What new use cases would you need to enhance your level of confidence to develop your strategy?
   • Smart Cities with dedicated Cycling Lanes
   • Right environment for investors to do large partnerships in India positioning India as a viable alternate to China in changing scenario.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed:
   • Skill training and upgradation programs
   • Commercialization support for technology in Material sciences

9. How do you measure success in the new landscape – list at least four KPI’s
   • Business Revenue/Bottomline
   • OEE & Capacity utilization
   • Quality
   • Customer Reach and Satisfaction.

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
    • Transportation and Mobility.
Survey Sheet - Rebuilding India Post Covid-19
The Picture of Your Future
Intel, initiative #3

Appendix 11: Intel

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)
   □ Affordable, Accessible and world-class healthcare @ Populatiaon scale; Just like we enabled financial inclusion with an “India Model” leveraging “JAM trinity” Intel needs to innovate and leverage technology, local social context and innovation to solve this critical need to have a “healthy India”

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   □ Build capabilityis and infrastructure to accelerate applied research in core technologies like AI and build the ecosystem to innovate for the priorities of India
   □ Foster, enable Local supply chain ecosystem for technology components and products
   □ Skilling towards developing and deploying technology for India needs and use cases
   □ A foundational national platform to accelerate healthcare in India. The platform should encompass

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
   □ Ecosystem is critical to build national scale solutions. Moreover, future technologies and tech based products need scale and adoption at global level to maintain economies and drive value creation. Partnerships between Public and Private players, Between Start-Ups and Academia will drive broadbased innovation and deployment of technology

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
   □ Enable & create an “open foundational platform” with the right architecture and technology elements that can evolve, grow and scale with the needs. It will need to provide te base “public good” capabilities like data exchange platform in secure manner, foundational IP and algorithms (e.g. AI models, novel algorithms for Indi) on which the industry and ecosystem can develop and deploy solutions for economic and societal value

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   □ Working with academia, Industry players and Govt Bodies and Ministries as well as key global players

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   □ Research institutes (IIIT Hyderabad, Key IIT Pros);
   □ Technology Ecosystem and Platform Players (e.g. MSFT, Google etc);
   □ India Industry players (Finance, Telecom – like Jio),
   □ Global Manufacturing supply chain partners
   □ Government and regulatory partners – NITI, MEITY, Ministry of Health, Dept of Science and Tech, Ministry of HRD

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   □ Mass deployment of AI for diagnostics;
   □ Use cases to share healthcare data in secure confidential manner to drive diagnostics, drug discovery and research.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed;
   □ Incubation and capital for “capacity build out for electronics products”

9. How do you measure success in the new landscape – list at least four KPI’s
   □ Applied research output (IP, Patents, Solutions for India); Published and public datasets for India needs; A core platform for sharing and commercial usage; Creation of a Reference Arch for Products; Early signs of a local supply chain for the same

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
    □ Develop Core Platform (AI, algorithms Architecture, Key tech Ingredients); Develop and enable a manufacturing ecosystem;
1. What is the picture of your future 10 years from now in light of GOI's Industry 4.0 Vision (defined on page 4)

Johnson Controls India has 4 manufactory locations though India. Johnson Controls is willing to develop the IOT based manufactory to explore and add value to the Industry 4.0. Even if the supply is not big yet, Johnson Controls is very confident about their energy management system, and security system.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)

Johnson Controls plays a big role in 1) energy efficient infrastructure, 2) security and 3) Integrated digital platform.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)

One company can’t do everything. Johnson Controls needs medium and small-scale companies to provide parts to realize the vision. Bigger companies are also required such as the Software companies (cloud, advanced analytics) to create the solutions. The ecosystem requires complementing solutions partners, strong policies and government support, and to show incentives to reach to the citizens.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)

In the US, Johnson Controls is very much involved in the Berkeley Innovation Center. In India, the government’s engagement needs to get stronger as the Triple Helix (government + companies + academy) hasn’t been very successful yet. Open innovation is a key.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)

1) Contractors (experts in their own geographies): Johnson Controls is very much involved in training and enabling them
2) For the development: startups in India provide faster innovation
3) Technologies companies for software

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?

Same as question 5
+ highly skilled developers to implement the Industry 4.0 solutions.

7. What new use cases would you need to enhance your level of confidence to develop your strategy

1) Adaptational digital technologies with demonstration of benefits at the highest level: integrated commands and controls
2) Demand for energy modeling or real time measurement of the consumption of energy through India

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?

Create a business environment where private companies can work without too many limitations: public private partnerships.

9. How do you measure success in the new landscape — list at least four KPI’s

Citizen happiness index (with more transparency and inclusivity)
What share is the government spending on the PPP projects
Find a KPI measuring the reducing energy consumption in India (consuming less energy and still growing)

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)

Building and energy efficient economy.
Appendix 13: Kirloskar Brothers Ltd

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4) This is a difficult question to answer as it is forward looking. No programm stays static. As an MNC, Kirloskar Brothers Ltd will continue to build on its strengths globally, and not just with the vision of GOI.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3) Kirloskar Brothers Ltd is committed to India and Indian industry. As an MNC, they have adopted the latest technologies in their Indian and foreign factories and will continue support the ecosystem in their desire to grow. Kirloskar Brothers Ltd is ready to participate in any programme that the Government deems fit to help grow the economy.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached, Any corporation cannot grow by itself. It needs the support of all its stakeholders. This is how Kirloskar Brothers Ltd has grown from a small Indian village into a company which employs over 5000 people across the world, with 35% of the revenues coming from operations outside India and 15% of the workforce being foreign. One has to work with the entire supply chain for growth of the enterprise.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached) The company utilises the services of academia, consultancies, as well as their customers in order to generate new ideas. For example, their young engineers have to do projects every year to develop new ideas through interaction with customers, thereby learning to understand their products and how to improve them.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only) Ecosystem members are extremely important. No names will be provided. Confidential information. Segments are Building & Construction, Industry, Irrigation, Marine & Defence, Oil and Gas, Power, Retail, Water Resource management and After sales Service.

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success? This is confidential information. No names will be provided.

7. What new use cases would you need to enhance your level of confidence to develop your strategy Kirloskar Brothers Ltd is able to get cases and references from all their partners for building confidence.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed: Kirloskar Brothers Ltd is able to get such information on their own.

9. How do you measure success in the new landscape – list at least four KPI’s Kirloskar Brothers Ltd believe they are at the cutting edge of their technology with regard to Additive Manufacturing, AI, AR/VR as well as other technologies. We compete with companies across the globe getting orders against the MNCs.

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached) Kirloskar Brothers Ltd is a manufacturing company at the nexus of water, food and power. There are many areas that they can contribute to.
1. **What is the picture of your future 10 years from now in light of GOI's Industry 4.0 Vision** *(defined on page 4)*

Building on MaGE (Manipal Global Education Services) network with Industry (BFSI, IT/ITES, CG) and training to be/just graduates to improving their Employability Quotient, it would become a partner of choice of skill training in all sectors by brining in world class content, global trainers/institutions. It would also partner with industry to assist in developing education credit based content for students in their pre/final year of graduation.

2. **How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative?** *(2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)*

Since new skilled jobs are to get added, MaGE can anchor the cocreation/development of content & deliver training programs in partnership with industry/partner academic institutions creating the required talent pool. These programs could be both online as well as blended (where workshop skills are involved).

3. **How can the “Ecosystem Approach” help achieve your firm’s objectives?** *(Our definition of the ecosystem is attached)*

MaGE can develop and deliver training programs (online, blended, f2f) for creating/skilling talent in IR 4.0. The ecosystem will support the need for virtual labs, subject matter experts, curriculum development, project based learnings, certifications leading to internships, apprenticeships – eventually job placement.

4. **How do you plan to utilize “Open Innovation” as a part of your growth strategy?** *(Open Innovation definition is attached)*

Open Innovation will allow Manipal Global to access new knowledge (products, technology, content, delivery models) as they get created (real time) and work with partners to cocreate/develop training program to create a talent pool around it. Internal knowledge/experience/reasearch to be shared with partners to speeden up creation of new business models.

5. **Who are your current ecosystem members - critical to your success?** *(Provide names of firms & customer segments only)*

- Product & Technology companies to develop new programs/content, curriculum & delivery; access to virtual labs & other softwares / hardwares needed for academic purpose. To improve reach – the Telecom companies
- All industries for internship / employment (currently Banks, Insurance, IT/ITES companies)

6. **For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?**

- Product & Technology companies: develop & co-deliver programs; access to labs, softwares & hardwares etc.. (example: SAP, Microsoft, Google, Nvidia). Research Universities – to co-develop world class content
- All industries for internship / apprenticeship leading to employment/jobs

7. **What new use cases would you need to enhance your level of confidence to develop your strategy**

- Product development and Technology in Education to create/disseminate training
- Digital reach to develop online skill based or research based programs to tap the vast talent pool in rural

8. **In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?**

Ecosystem to include pool registry of SMEs, a platform connecting jobs to talent, a repository/library of content available to all academia.

9. **How do you measure success in the new landscape – list at least four KPI’s**

- Training program effectiveness
- Reach/New set of talent pool added
- Employability Quotient Improvement Index
- Employability / Placement of Graduates

10. **In which specific area can your firm contribute to the “Ecosystem Fostering & Development”?** *(list attached)*

Talent Pool and Ed Technology
Appendix 15: Manipal Hospitals

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)? Manipal hospitals expects technology and ecosystem play to be major developments. Skill development in enabling digital health will be imperative.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3) Improving Manipal’s reach, collaborating via PPP models, focusing on augmenting skilled workforce.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached) The collaborative approach that Manipal Hospitals has set up with the government in addressing the pandemic enables it to take forward the ecosystem approach in the post covid scenario.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached) Growth in healthcare will be enabled by cutting edge technology. Given Manipal’s core focus on healthcare delivery, Manipal Hospitals intends to use open innovation to fuel growth.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only) TBD

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   - Skilled healthcare personnel,
   - Medical device manufacturers,
   - Suppliers insurance companies,
   - Local and central governments

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   Use cases on technology initiatives that reduce cost of care, improve access and improve outcomes are critical. Also, use cases where new payor initiatives are evaluated are important.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed
   A functioning model of the digital infrastructure, albeit in an abridged form, is needed.

9. How do you measure success in the new landscape – list at least four KPI’s
   Improved access, reduced cost, improved outcomes and ease of use

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
    Healthcare delivery
1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)? Microsoft is leading this transformation in manufacturing (on-demand services becoming ubiquitous and the need of reliable, economic and agile manufacturing hubs) from the forefront and we are continuously investing in creating technologies for today (IOT, AI, Blockchain, Big Data, Digital Twins, Autonomous Systems and Mixed Reality) and technologies for tomorrow (Quantum computing).

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3) Microsoft’s participation in Prime Minister’s action plan is directed towards helping Indian industry keep pace with the rapid changes of Industry 4.0 by modernising factories with new disruptive technologies. Microsoft plans to help the industry, augment industrial automation software with Internet of Things (IoT), cloud-based computing, artificial intelligence (AI) and mixed reality to drive new levels of productivity, quality, sustainability and innovation. Microsoft can support in setting up demo and experience centers for Industry 4.0.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached, In line with “Make in India, Make for World” mantra of Prime Minister, for becoming a global manufacturing hub, Indian industry should work towards eliminating friction in movement of material, information and finances through use of new age technologies. “Ecosystem Approach” will help accelerate adoption of technologies to eliminate this friction.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? Microsoft is pioneer in leading open innovation initiatives. Specific to manufacturing, Microsoft created a global alliance to drive open innovation in manufacturing (https://open-manufacturing.org/). Microsoft can invite interested Indian manufacturers to join this global alliance. With our experience, we can also help setup similar open innovation platform for manufacturing in India. Microsoft also drives several open sources projects globally.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only) Wide range of manufacturing companies, innovative startups, IT System Integrators, global automation solution providers, industry bodies, academia etc are the ecosystem partners who are critical for our successful participation in this initiative.

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success? <Please see 5>

7. What new use cases would you need to enhance your level of confidence to develop your strategy AI driven innovations in quality, productivity, reliability, sustainability and supply network efficiencies.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed? In the changing world, all the tech innovations are happening in cloud. So the GOI vision should also layout guidelines for public cloud adoption and data & cyber security in manufacturing industry.

9. How do you measure success in the new landscape – list at least four KPI’s
   - % of companies that adopted Industry 4.0
   - Avg % of employees (Mfg Industry) using digital tools
   - Spend as % of Revenues, on Industry 4.0 initiatives
   - Number of certified experts in Industry 4.0 technologies

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached) <Please see 4>
Also Microsoft is driving skill building in Industry 4.0 through AI school jointly developed with academia.
1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4) Higher growth companies are combining skilling with AI deployment for greater business value. Microsoft identifies 3 pillars of learning: leveraging the power of social learning, contextual learning, self-learning. For the non-tech audience, skilling needs would be to either acquire vocational skills or to make the end consumer proficient in using innovative and friendly tools and platform solutions.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3) Microsoft can align its existing programs, initiatives, solutions and platforms. This includes bridging the skill gap of the Covid impacted tech professional (providing platform, access to data, access to free content, access to low cost certification, partnering with non-profit); industry-academia affiliation (No-costs programs for students and educators, discounted academic pricing for industry certifications); digital literacy curriculum; extention of the Project Sangam (platform).

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached) Aligned to Microsoft’s mission, the objective is to drive tech intensity across the ecosystem so that others are able to create technology using Microsoft’s technology. Skilling is core to Tech Intensity (=Tech adoption^Tech capability) and hence through ecosystem approach Microsoft would be be able to drive the Tech Intensity charter for the country.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached) Open Platforms that provide choice and open ways of sharing information to its user; Open Ecosystem which offers a ‘marketplace’ model for solution providers; OpenSource Software and Code collaboration community. GitHub sits at the center of Microsoft’s Open Innovation growth strategy.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only) Facilitator: the Government; Knowledge Partners: Industry Associations; NGOs; Technology Partners: more than 17 million people servicing end customers with technology-based solutions and services; Beneficiaries: Employers, Institutions: Educators and Students.

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success? Job seekers (inclusive recovery program); Blue collared workforce (digital skills and platforms to address content in areas where bandwidth is a challenge); Infra partners (laptop, bandwidth)

7. What new use cases would you need to enhance your level of confidence to develop your strategy 1) Credit points for Industry Certification aligned to NEP 2020. 2) Interoperable learning records & Credits, that allow individuals to easily share their academic and professional certification credentials. 3) Canada’s creative “Work-Sharing (WS)” program.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed: Employer subsidy: government and stimulus spending measures for small businesses; Fuel startup ecosystem: investments in startups to drive sustainable growth through skilling and employment; Leveraging GICs: friendly policies to set up AI innovation hubs; Increased skills funding for individuals; Alignment of NEP 2020: industry recognized certifications; Data and innovation: system that helps the workers understand available training and in-demand career paths: a key step is to create interoperable learning records.

9. How do you measure success in the new landscape – list at least four KPI’s Reduce skill gaps; connect skills to opportunities; increase the Workforce Confidence Index; use data and analytics to better understand in-demand skills and jobs; increase reach and accessibility; defining and tracking skill index.

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached) Education ecosystem: access, basic & creative skills, technical skills, certifications, job placements
Appendix 18: NPCI

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision *(defined on page 4)*
   - To become best payments network globally
   - Touch every Indian with one or other payment services (1Bn txns / day)
   - Cashless transactions exceeding cash transactions

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? *(2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)*
   - NPCI with the support of Government of India (GoI) launched various modes of digital payments to promote cashless transactions and make India a digital economy
   - Increase Digital Payments Contribution in India’s GDP
   - Less Cash Society
   - Focus on Financial Inclusion
   - Expansion of Digital Payments in rural and semi-urban areas to achieve its mission of a Digital India.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? *(Our definition of the ecosystem is attached, The Digital India program is a flagship programme of the Government of India with a vision to transform India into a digita empowered society and knowledge economy. The Ministry of Electronics and Information Technology (MeitY), Reserve Bank of India (RBI), Indian Banks’ Association (IBA) along with the fintech, Bigtech and Start-up players are working with NPCI towards the cashless economy. The Ecosystem Approach will help India’s digital payment market to grow at faster pace.)*

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? *(Open Innovation definition is attached)*
   - Open Innovation would help NPCI to collaborate with fintech, Bigtech and Start-up to tap innovative solutions which can improve efficiencies in products and services offered by NPCI. With the help of Reserve Bank of India, Indian Banks' Association, and ecosystem participants to explore use new gen technologies which will help in proactive security measures. With the pandemic disrupting our lives, the world is going to become contactless and digital payments are going to play a major role in helping people to adjust to a new normal.

5. Who are your current ecosystem members - critical to your success? *(Provide names of firms & customer segments only)*
   - Reserve Bank of India (RBI), Indian Banks' Association, Union Government, Banks, Fintechs, Bigtechs and Start-ups

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   - State Governments, NBFCs, Insurance firms, Capital Market

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   - 1) Expansion of UPI and RuPay + NCMC in international markets; 2) Use of Artificial Intelligence and Machine learning for proactive risk management; 3) Blockchain technology for clearing and settlement; 4) Use of IOT to create new use cases for online product and platform like like UPI, RuPay; 5) API based online dispute management; 6) Leverage technology to create next gen products and platforms

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed;
   - Partnerships and Financial Aid to SMEs could also be added to achieve Ecosystem Fostering & Development.

9. How do you measure success in the new landscape — list at least four KPI’s
   - 1 Billion transactions per day
   - Adding next 500 million users in Digital Payments
   - Enabling every customer to use one or other digital payments.
   - 4D Strategy: Zero Downtime, Zero Defect, Zero Danger and Zero Delay

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? *(list attached)*
    - Driving Innovation, Financial Inclusion, Creating Payment Standards and creating Payment literacy can help in contributing to the “Ecosystem Fostering & Development”. 
Appendix 19: Nvidia

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)?
   NVIDIA specializes in accelerated computing, solving challenging problems that normal computers cannot. Nvidia innovates at the intersection of computer graphics, high performance computing, and artificial intelligence. Nvidia is a real-time simulation company – simulating worlds, physics, intelligence. NVIDIA achieves spectacular speed-ups by applying a combination of GPU optimized for parallel computation, deep expertise and craft across the entire computing stack, and algorithm and ecosystem expertise in the focused domains. As the Government of India (GOI) continues to build its compute infrastructure, NVIDIA will help revolution India’s largest industries: Manufacturing, Healthcare, Retail, Logistics, etc.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   Nvidia seeks to work with the GOI where together they can make great impact. Their unique expertise translates to incredible scale for solving India’s daunting challenges. By building on one architecture, leveraging algorithms and stacks and focused ecosystem teams, they can engage with multiple vernicles that will contribute towards the Prime Minister’s vision towards economic growth.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
   For NVIDIA, the ecosystem approach is very important as it understands the value of the software stack and infrastructure. By building on One Architecture which leverages algorithms and stacks, and focused ecosystem teams, they can engage diverse markets from manufacturing, automotive, healthcare, etc.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
   NVIDIA works with high-profile researchers and domain experts who are dedicated to solve daunting challenges. NVIDIA’s endeavor to partnership with academia and industry helps solve problems for both industry and the nation.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   - Large number of deep tech. companies are partners to NVIDIA and use the technology to build leading edge solutions.
   - Nvidia collaborates with Higher Education and Research (HER) by bringing deep learning institutes and creating AI labs.
   - Nvidia works with leading researchers in the fields of Science, Biotechnology and Space
   - Nvidia works closely with Research organizations in the fields of science, space, and defense by providing engineering support to solve their challenges.

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   Same as question 5. NVIDIA is currently working on establishing a strong working relationship with all the ecosystem members and bringing them together to ensure that accelerated computing aids the transformation of industry 4.0.

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   Use cases are centered around solving Data Center challenges, edge computing and creating a robust deployment pipeline that help the nation solve some of HER’s most daunting challenges.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?
   India requires a modern age digital infrastructure combined with leading end researchers who can do their life’s work in India. This will enable solving the grand challenges in key sectors: manufacturing, agriculture, education, healthcare, etc. Attracting the best research talent to solve these challenges is an important step which will follow the establishing of a reliable infrastructure.

9. How do you measure success in the new landscape — list at least four KPI’s
   - Ease of adoption
   - Ease of deployment
   - Reach
   - Impact to the educated youth

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
    Software, computing platform, tools, SDKS, skilling and re-skilling for software 2.0.
Appendix 20: Salesforce

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)?
   India is well on its way to become a $1 trillion digital economy by 2025, benefiting all sectors and people, owing to rapidly expanding digital infrastructure, youngest working population, and rise in digital natives: Digital transformation, Innovation, SMBs (Digital transformation of small businesses with access to latest tech at competitive costs).

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   Vertical alignment: Accelerate our focus on innovation across key industries, creating an ecosystem of trailblazers.
   SMB market focus: Our customised solution Salesforce Essentials, will empower every small business to get started and tap into the power of Salesforce with apps for sales and service that are easy to use, setup and maintain.
   Tier 2 & 3 market expansion: Showing great propensity to adopt & buy technology - expand footprint here; focus on training youth through Trailhead Job Ready Program

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
   Salesforce was a pioneer in building a business model built on partnership and a vibrant ecosystem. SF is deeply invested in the success of each customer, developer, and partner, with our multi-tenant cloud at core. The Ecosystem Approach will complement our own approach that combines innovation and customer success to create opportunity for everyone in the Salesforce ecosystem.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
   SF investments in ISVs across India accelerated over last 3-4 years; SF India - largest developer ecosystem outside US
   Local solutions: Leverage ISV ecosystem to address unique use cases & customer pain points & develop creative solutions to address local requirements, enhance & strengthen core offerings

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   Salesforce ecosystem: We embed ourselves deeply into the community, leveraging Salesforce’s 50,000 employees & technology, & connecting with other orgs/partners working to change education & workforce development landscape.

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   • Customers: 1.8 mn Salesforce customers already contribute to our success community to connect & share feedback
   • Partners: Thousands of independent software vendors & developers who build businesses in AppExchange. Also, consultants & system integrators (SIs) give expertise, technical skills, & guidance for orgs.
   • Developers: 2 m from business user to coder, building employee & customer apps.
   • Government: Work collaboratively to unlock regulatory bottlenecks & facilitate ease of doing business

7. What new use cases would you need to enhance your level of confidence to develop your strategy

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?
   Digital India depends on creating an ecosystem where every citizen is digitally empowered with access to key services:
   • Continue accelerated growth and adoption of technologies the government needs to ensure, wide scale infrastructure access to citizens, and expand digital literacy drives
   • Focus on development of application ecosystem customizing apps and services to cater to local needs.
   • Encourage collaboration with private sector, using innovative engagement models with commercial viability.
   • Startups to be incentivized for development of the last mile infrastructure and localized services and applications.

9. How do you measure success in the new landscape — list at least four KPI’s

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
   Talent Pool: Salesforce is focused on creating an inclusive future with Trailhead, our free online learning platform available to everyone across our ecosystem (customers, employees, students, communities), to skill up for jobs of the future.
Appendix 21: Tata Chemicals

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)
   Tata Chemical’s vision ‘To be a leading Sustainable Chemistry Solutions Company serving customers based on innovative, science-led differentiated products and solutions’ is in sync with the GOI’s Industry vision 4.0. In 10 years Tata Chemicals will be a global leader in Performance Materials, Nutrition Sciences, Agri Sciences and Energy Sciences, based on the principals of sustainability, science and serving society.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   **Energy Science** – Unique recycling technology based on principles of sustainability and circular economy
   **Agri Science** – Digitization in agriculture value chain with Rallis Samruddha Krishi (RSK) Program
   **Skills development** – Tata has technical skill training institute at Mithapur (affiliate with National Skill Development Corporation) and supporting Tata Strive Center for running skill development center at Aligarh and Industrial Training Institute (‘ITI’) at Dwarka. Tata has initiated vocational skill training and are moving to hybrid model (online + physical) for our some of the courses in technical skill training institute at Mithapur.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached, Energy science business will benefit from the ecosystem approach by integrating each element of value chain and implementing the concept of circular economy. PCPIRs (Industrial Parks) are the form of Ecosystems that will help Tata optimize manufacturing costs and access to resources

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
   Tata has adopted collaborative model for the innovation and technology development with universities and research centers. They have partnered with CECRI, Karaikudi to explore collaborative technology for scaling up the manufacture of cathode materials for lithium-ion cells. They are also collaborating with ISRO (Indian Space Research Organization) for the development of Lithium – Ion cell technology. Tata is also associated with International Research Institutes like IIT-B Monash, Yale University, GI labs to foster innovation in Nutrition business.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   **Government** (Central & State): Collaboration on sustainability frameworks, policy advocacy, contribution to local infrastructure, skill and capacity building etc. We hold active membership within industry bodies such as ICC, BCCI, CII, FICCI; **Partners**: For sustainable supply chain solutions, safety, compliance, productivity enhancement, ethical behaviour etc. **Employees**: Human capital is key to our success for efficiently performing business operations (Business Excellence), executing strategic growth initiatives, ensuring health and safety, creating conducive work environment and adhering to Tata Code of Conduct.

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   Same as the current ecosystem members

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   Lithium recycling is the successful use case based on which we are building our sustainable play in Energy Sciences
   Validating the optimum technology for the large energy storage systems for Energy Sciences vertical
   Study and explore new technologies like Aeroponics, Hydroponics which are truly based on Smart Agriculture involving IoT platform for automation and controls

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed:

9. How do you measure success in the new landscape – list at least four KPI’s
   - Impact and Scale – the outcome should have adequate scale and impact across stakeholders
   - The business / solution must comply to all sustainability criteria
   - It must benefit each element of value chain

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
   Agriculture inputs, agro advisory, other farm support services, farmer education
The Picture of Your Future
TechMahindra, initiative #3

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)? Industry 4.0 has many aspects including but not limited to automation, data and analytics especially in area of Smart Manufacturing. Safeguarding against risks and protection in areas of cyber and physical securities system coupled with IoT and cloud. But 45% of the country’s manufacturing production is comprised of 60 million micro, small and medium enterprises (MSMEs), and it is in this sector that business improvement strategies, including Industry 4.0, face significant barriers and challenges. For comprehensive India story, the government needs to introduce special policies for MME and SMEs to be able to grow and be in sync with global parameters and thus be truly be reflective of Industry 4.0

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3) Tech Mahindra plans to be a front runner in technologies such as “Factories of the Future” whereby creating an integrated manufacturing streamline. One of the biggest challenges for India as a nation in 4.0 is skilling and upskilling; Tech Mahindra through Tech Mahindra Foundation will continue towards upskilling people to be future ready.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached) Tech Mahindra sincerely believes that Public Private Partnership is the area to build a collective ecosystem of growth, especially when it comes to area of Infrastructure and education. Until infrastructural and ecosystems backlogs are improved, India’s manufacturers will be constrained and require higher costs to access extrapolating Industry 4.0 capabilities and will remain at a disadvantage to their global competitors. The government has already documented improvement programs and policies, including an IoT Policy (2015), and a Cyber-Physical System Mission, aimed at rolling out training and development in automation, robotics and AI applications in manufacturing. Government, manufacturing industry and academia need to collaborate to enable an Industry 4.0-ready workforce. Initiatives should be fast-tracked through subsidies, tax-breaks and other corporate incentives.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached) Tech Mahindra has an innovation center, called Makers Lab for crowd source innovation both internally and externally in multiple areas such as track and trace applications, automated service centers or even protein research on Covid-19. The mission at the Makers Lab is to make innovation happen through experimentation and celebration of failures. There is no age limit or even education criteria to come and contribute to the maker lab except for hunger for innovation.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success? Our dependency on telecom service providers and government bodies to ensure 5G in India is critical to the future of Industry 4.0. It is also critical to have the right kind of support from manufacturing bodies such as Automobile Association of India, SIAM, or others to be able to develop the narrative for leading automobile industries. Also, dependency on infrastructure companies and government to bolster the spend on infrastructure is to take into account.

7. What new use cases would you need to enhance your level of confidence to develop your strategy. Use cases that are based around the perspective of 5G in the country and also the use cases that allow for SME and MMEs to invest in Industry 4.0 in a staggered manner.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed; Similar to answer 7.

9. How do you measure success in the new landscape – list at least four KPI’s. Digital Penetration, Data Speeds

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached) Skilling, networks of the future and smart manufacturing use cases.
1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)
   To significantly increase thyssenkrupp’s India business over the next decade by providing smart and sustainable engineering and manufacturing solutions in the areas of [a] mining [b] energy including renewables [c] mobility [d] defence.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   - Bringing the latest and environmentally sustainable technologies to India in the focus areas
   - To partner with government and other stakeholders to create the ecosystem
   - To develop MSMEs in the value chain
   - To use India as a global manufacturing hub

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached,
   - Government can provide more incentives and impetus to promote green technologies
   - Collaborating with different academic institutions and companies pooling resources to create an ecosystem.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
   - Carbon-to-chem
   - Green hydrogen
   - Electric mobility

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   - For Carbon-to-chem: BASF, Siemens, Linde, Evonick, Covestro, VW, Clariant, Akzo Nobel
   - For Green Hydrogen: Air Products

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   For biomass boiler technologies, a potential partner would be NTPC

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   - Mining: blast free mining (Barracuda)
   - Environment: Biomass fed boilers

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed:
   Government incentives
   Overt support to promote green and sustainable technologies.

9. How do you measure success in the new landscape – list at least four KPI’s
   - Improved productivity
   - Improved profitability
   - Reduced GHG emissions
   - Increased collaboration and innovation

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
    - Carbon-to-chem
    - Green hydrogen
Appendix 24: VMware

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision *(defined on page 4)*

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? *(2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)* VMware plans to partner with others in the ecosystem to build a hybrid, but Digital First approach to skill development that enables job creation. They provide tools that enable the foundational digital infrastructure, while others contribute content, pedagogy, last mile access.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? *(Our definition of the ecosystem is attached, The ecosystem approach ensure the whole is bigger than the sum of its parts. As outlined above, while each of us bring components to the solution – the platform we build by combining these becomes a force-multiplier)*

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? *(Open Innovation definition is attached)*
   Happy to explore – needs further detailing

5. Who are your current ecosystem members - critical to your success? *(Provide names of firms & customer segments only)*
   VMware works with Dell and Amazon

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   - For Content - Adobe, Salesforce, the startup Mr. Nilekani introduced
   - For Cloud cabability – AWS & Microsoft
   - For Access – Dell & Reliance Jio

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   Delivering high-quality, industry relevant skills in the Smart Village Initiative – VMware can help build the infrastructure to enable access, all the way to job placement

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?

9. How do you measure success in the new landscape – list at least four KPI’s
   - Students trained
   - Job created

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? *(list attached)*
1. What is the picture of your future 10 years from now in light of GOI’s Vision (defined on page 4)

To facilitate and create an ecosystem for the propagation of comprehensive Health Care Platform leveraging New Age technologies to have a seamless patient care experience from primary health at the village level to tertiary care.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)

Wipro will contribute as Public Healthcare Domain and Technology Partner in this initiative with existing IP’s that can be deployed immediately to enable Health component in Smart Village initiative.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)

This will help accelerate the value of Wipro’s existing IPs by integrating with other eco-system players who can help to deliver Health Care in Smart Village initiative.

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)

Wipro’s IPs are build on open source technologies and sharing and monetizing these IPs in a pooled approach with the eco-system players would be one of Wipro’s top strategies to deliver Health care initiatives.

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)

The current eco-system members are Microsoft, Piramal Foundation and State Governments.

6. For health care environment, who would be your prospective ecosystem members - critical to your success?

The prospective eco-system members would be State Governments, Niti Ayog, IOT players like HealthCube, NDHM, and Ayushman Bharat.

7. What new use cases would you need to enhance your level of confidence to develop your strategy.

Wipro’s platform needs to be deployes along with the eco-system players in the primary and secondary health care facilities with the objective of enhancing and delivering integrated platform driven health care.

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?

Wipro will be able to work around the digital infrastrcutre and technologies already mentioned in the summary.

9. How do you measure success in the new landscape – list at least four KPI’s.

Some of the KPIs are – Number of Infant deaths per 1000 births, Average life expectancy, Average number of Doctors per 1000 population, Availability of health care services in remote areas, Average waiting time for a surgery/treatment in a Government facility, Average number of patients reported for a particular disease and Average Spend by individual on health care.

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)

Wipro can contribute in the development of Talent pool and can also contribute towards policy formulation.
Appendix 26: Xerox

1. What is the picture of your future 10 years from now in light of GOI’s Industry 4.0 Vision (defined on page 4)
   Key areas where Xerox can enable the vision of Industry 4.0 are in acceleration of large scale digitization projects in various Government institutions. The picture is of an ecosystem built around our core capabilities: Workplace technology solutions; Global network of Xerox service, support and delivery teams; Content and data management; AI-powered process & workflow automation, all of this enabled by Xerox’s secure cloud infrastructure. Xerox India will also be in a position to impact core business processes for targeted vertical industries of Industry 4.0.

2. How does your firm plan to participate in the Prime Minister’s action plan to promote economic growth through his Industry 4.0 Initiative? (2-page executive summary of PM’s action plan is attached for your convenience – pages 2-3)
   Xerox India can partner with Government institutions to accelerate their digitization journey and deliver the experience of a “Digital Citizen”. Xerox can participate right from the starting point where a physical document is created, scanned and digitized, ensuring secure management of physical as well as digital records to deliver information availability at the right time for decision-making. Xerox India can participate in this massive push to achieve a process workflow that can impact individual constituents of an industry or a government institution thereby leading to a large-scale macro impact.

3. How can the “Ecosystem Approach” help achieve your firm’s objectives? (Our definition of the ecosystem is attached)
   • Enabling remote learning and education
   • Large scale population studies to estimate access of basic amenities
   • Impacting finance disbursement in agriculture
   • Delivering impactful awareness campaigns
   • Efficiency in patient information access in primary and secondary healthcare institutions

4. How do you plan to utilize “Open Innovation” as a part of your growth strategy? (Open Innovation definition is attached)
   Innovation through Collaboration, Human-centric Design, Customer-led Innovation, Partnerships with companies and universities

5. Who are your current ecosystem members - critical to your success? (Provide names of firms & customer segments only)
   Xerox’s current eco-system members include technology partnerships, manufacturing vendors, global delivery capabilities and an “Open innovation” strategy centered around collaboration, human-centric design, customer-led inputs and active partnerships with leading research institutions.

6. For the Industry 4.0 environment, who would be your prospective ecosystem members - critical to your success?
   For Xerox to effectively participate in Industry 4.0, critical to leverage the technology partnerships of the eco-system, the innovation capabilities, as well as the world-class consulting and delivery capabilities around achieving a vision of a “Digital Citizen”

7. What new use cases would you need to enhance your level of confidence to develop your strategy
   1) Historical physical records and how these can integrate with the new systems. 2) Managing unstructured digital information that’s inaccessible (silioed, lacks metadata, unclassified) 3) Benchmarks for responsive, customer-centric processes
   4) Approach to storage and facilities costs for paper archives 5) Regulatory expectations driving need for security and control of digitized data 6) High demand for secure, easy-to-access and easy-to-consume content for mobile, browser, on- and off-premise

8. In addition to the digital infrastructure & technologies listed in the attached executive summary what else is needed?
   Complementing the already listed digital infrastructure and technologies, we would need to look at solutions that address data and document management requirements throughout the business processes using RPA and AI. Throughout the continuum, data transformation with Artificial Intelligence and Robotic Process Automation to add structure and meaning.

9. How do you measure success in the new landscape – list at least four KPI’s
   Increased response; Increased compliance and adoption; Improved efficiency / reduced “time to serve”; Lower cost; Greater agility – digital data is more easily analysed to gain insight to drive decision making; Reduced risk – through improved awareness, compliance and sensitive data / communications being held securely & digitally rather than on paper

10. In which specific area can your firm contribute to the “Ecosystem Fostering & Development”? (list attached)
    Citizen engagement; Citizen / Business Communications; Census Management; Inbound Application Processing; Welcome Pack Creation; Smart Transactional Communications; Citizen Correspondence Management; Human Resources; Records Management; Citizen Insight; Marketing Communications Management; Digital Evidence Portal.