Smart India Hackathon
September 2019
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Foreword

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Deloitte has the honour to partner India’s largest open innovation challenge – The Smart India Hackathon (SIH) since its inception, i.e, SIH 2017, 2018, 2019. We firmly believe that rapid advancement and dynamic technological landscape is driving innovation and entrepreneurship globally. Today, the technology can have a dramatic impact on under-developed and developing countries. This is because the cost of connectivity and components have fallen significantly, while power and utility of technology have exponentially increased. In sectors such as healthcare, education, financial inclusion and open government, there are tremendous opportunities for India to leapfrog into trajectory of accelerated economic growth and development. The SIH is one of the key enablers to make this “Leapfrog” a possibility.

There is a strong requirement to have innovation ecosystem within the country to support innovation and startups. The ecosystem is complex with multitude of players: universities, government, corporations, startup accelerators, venture capitalists, private investors, foundations, entrepreneurs, mentors, and the media; each of the player in the ecosystem plays distinct role to establish a robust ecosystem. It has been observed that the countries and regions with vibrant innovation and entrepreneurship ecosystems tend to witness higher productivity rates, leading to increased economic growth and more robust job creation.

Since 2014, the Indian Government actively focused on innovation and startups inspired by American and Chinese model of startup driven economic growth and employment. As a result, India currently has the third largest ecosystem in the world, with Bengaluru ranking third after London and Silicon Valley in terms of highest number of technology startups. India also witnessed improvement in the Global Innovation Index, Ease of Doing Business, and Global Competitiveness Index rankings on account of active focus and priority accorded to innovation and startups by the Indian Government.

Aligned to the focus, seven central ministries launched schemes and policies promoting startups. Several of these policies had provisions to provide financial incentives and procedural support to organisations and institutions in setting up incubators, conducting workshops, and upgrading technology and physical infrastructure. Further, 21 of the present 29 state governments have start-up policies in place. The states such as Karnataka, Kerala, Maharashtra, and Telangana have gone ahead. They are undertaking process reforms in the form of provisions for setting up state-financed and managed incubators, conducting challenges/hackathons, encouraging existing startups, and developing linkages between the educational institutions and the industry.

The SIH is one such step of the Indian Government to encourage entrepreneurship and innovation among young population and contribute towards nation building using technology. The unique format provides a platform for ecosystem players to converge, ideate and develop transformational solutions to problems and further scale them up. It also helps each player identify and appreciate its role in ecosystem and kick-start virtuous cycle of incremental innovation and collaborations.
There are numerous problems in our country which the Government alone cannot solve and needs active participation of the citizens to find a solution. Through Smart India Hackathon, we aim to create a platform to address India’s challenges of today with technologies of tomorrow. I believe that our student community can bring in a fresh perspective to conventional problem solving approach and propose innovative applications of digital technologies; if provided with a suitable platform. Through SIH, we aim to provide this much required platform. Further, these students are going to be leaders of tomorrow and hence it is best for them to get involved in shaping the New India.

India, as we all know is an IT powerhouse and is acclaimed globally for its IT expertise. However, it is lesser known for world class products and brands such as Apple, Google, Microsoft and so on inspite of being strong in IT capabilities. We believe events like SIH will complement our focus on Make in India initiative to manufacture and develop world class innovative products.

The event brings the student community closer to real world problems, provide an opportunity to apply the concepts and principles learnt academically and innovate. Further, it inculcates the value of teaming, provide opportunity to network with peers as well as other stakeholders, boost self-confidence and get recognised by industry think tanks, bureaucrats, business decision makers and investors as well.

In SIH 2019, we have expanded the stakeholder spectrum from Governments, its ministries and departments to include Industries and NGOs. This helped us realizing the benefit of demographic dividend of the country in true sense.

Based on encouraging response and feedback received for previous edition of SIH 2018, we followed the same format of having hardware category of contests to this year’s edition as well. This is expected to pave way for path-breaking hardware innovation along with software innovation in future. As expected the SIH 2019 hardware edition was a spectacular event resulting into solutions to large number of real life problems, thus, benefitting the common man, businesses as well as national economy as a whole.
Message from Ministry of Human Resource Development

Digital technology has a potential to cater to the country’s unique needs and aspirations. The Government is focussing on leveraging them for economic and inclusive growth as well as social development of the Nation. We are the fastest growing economy in the World and our technology focus will be key towards sustaining this high growth trajectory. However, in order to bring about this digital led revolution, the country needs entrepreneurs to identify the problem and develop a marketable solution and a qualified workforce to work with technologies.

Through SIH, we have been successful in attracting India’s youth to converge and work towards solving India’s unique challenges and proposing innovative solutions. The initiative has not only been successful in effectively showcasing that digital technology can solve some of most pressing problems which country is facing but also attract students to pursue technology for higher education. The idea of working on a live project and in-turn contributing to nation building has resulted in overwhelming response from the students and educational institutes throughout the country.

Also, the platform reinforces the need to have innovative mindset and be open to its disruptive nature which holds potential to revolutionize the government and industry landscape. The event also provides a unique opportunity to showcase capabilities as a student as well as an institution. SIH has helped to shift focus from academic grades to importance of application based practical knowledge. The immense popularity of this initiative among student as well as institutions holds a testimony to the fact that concept is working and right way to leverage and engage India’s budding entrepreneurs as well as future workforce.

I wish all the best to the students and their mentors, educational institutions and participating organizations to make Smart India Hackathon a great success.
In this era of ubiquitous internet network, the digital literacy among the citizens have been improving. The Government, private companies as well as educational institutions are trying to leverage on this to closely engage with citizens, customers as well as students.

The exponential digital technologies proliferating on the back of internet connectivity is exhibiting tremendous potential to solve the critical problems i.e. inefficiency due to unavailability or lagged availability of critical data. The technologies enable capturing of data right at source, transmit it on real-time, provide insights through superior analytics capabilities, provide visibility, eliminate leakages, fix accountability as well as impart transparency in the processes. The application areas of these technologies are widespread and potential to derive benefits; both qualitative as well as quantitative is immense. It provides India with a unique opportunity to leapfrog into the next orbit of growth. Through SIH, we are trying introduce technology within government’s existing systems. We believe that India’s students are well poised and equipped to catalyse this technology led revolution. From this year, we are also inviting corporates, private companies as well as NGOs to leverage this platform, improve internal process efficiencies, connect as well as guide the best minds of the country to innovate and develop world class solutions. As a spilling effect, we are envisaging floating of new ventures as well as generation of employment opportunities for students across the country.

As we all know, the Smart India Hackathon has achieved unprecedented success since its inception in 2017. The inaugural edition of smart India Hackathon witnessed participation from 40000+ students and 29 ministries and government departments. The second edition of the event became even larger witnessing participation by 100000+ students from 44 union/state government entities. The 3rd edition of World’s Biggest Open Innovation Model also witnessed participation from 2 lakh students and 2000 institutions.

I wish all the best to all participants to make this a grand success.
Message from Innovation Cell

Many of you might not be aware that, in India, at any given time point, we have more than 50 lakh students enrolled in technology courses. As per the norm, every student spends at least 6 months doing some project work or internship during his 3 or 4 years of academic course. If we just do a back of envelop calculation, then the total amount of energy and time invested by these students doing projects is equivalent to 5-8 lakh person years per year. It’s humongous! This is the time required for human evolution!

More importantly, majority of these efforts go waste as large number of student copy-paste the concepts, data and/or designs from internet. Some students even have the audacity to buy readymade projects from market.

Having said this, there are also large number of students who are keen on doing some genuine good work. But unfortunately, again many of these good students aren’t guided properly and as a result end up working on projects which may be very theoretical and sometimes even irrelevant and obsolete considering the current market or social requirements.

As a result, we end up producing vast pool of very mediocre graduates incapable of solving problems. According to one latest survey, more than 60% of our technology graduates are unemployable. As a result, these low quality students end up doing either non-technical low-end jobs or invest more money for doing post-graduation in equally mediocre institution or attending predatory finishing schools or certificate courses with a hope of getting better opportunities. These students simply fail to realize that the real requirement for being successful in life is to become a problem solver and unfortunately our education system fails in imbibing this critical requirement.

If India has to progress and innovate, then the primary requirement is to create large pool of good problem solvers. Ministry of HRD, AICTE and UGC has realized this requirement and are undertaking multiple initiatives to promote creativity, critical thinking and development of cognitive skills. One of the key initiative of MHRD is Smart India Hackathon, which is specially aimed at promoting the culture creativity and problem solving within institutions.

Hackathons (Hack + Marathon) are sprint-like event during which engineers/students, graphic designers, interface designers, experts collaborate together to develop a functional product capable of solving the given problem within stipulated time-frame eg: 36 hrs or 48hrs. In India, people usually think that word ‘Hack’ is negative and associate it with stealing or unauthorized breaking into someone else’s computer. But in reality, the word ‘To Hack’ is very positive and means ‘doing things differently or innovatively’. The primary objective of a hackathon is test the viability of any good idea by building minimal functional product in a short time span.

The philosophy behind MHRD’s Smart India Hackathon is very simple. On one hand, we have millions of problems in this country and on the other hand we have millions of students who are expected to be problem solvers. Can we get these problem solvers and solution seekers on one common platform? This opportunity will not only help create good innovative
products but will also give immense technical experience to students making them far more competent and market read.

This year, Smart India Hackathon (SIH) is in its 3rd edition and earlier two editions were bumper success. During the first edition, Smart India Hackathon-2017, we approached various central government ministries and requested them to share their Governance related problems. We received 598 problem statements from 29 different central government agencies including prestigious institutions like ISRO, Dept. of Atomic energy, Earth Sciences, Railways, etc. These 598 problems were used to challenge the technical students to offer innovative solutions across all major Indian technical institutions. More than 40,000 students from 1200+ institutions participated in the first round. After two rounds of screening, we selected 8000 students with innovative ideas to work non-stop for 36 hrs across 26 different cities in India.

Undoubtedly, SIH became world’s biggest Hackathon. Unknowingly, we also successfully established world’s biggest open innovation model. More importantly, students didn’t disappoint us and offered some really innovative solutions. Prestigious agency like ISRO, Dept. of atomic energy, Civil aviation Ministry were so happy with the outcome that they decided to continue working with the students on their ideas even after the Hackathon. Multiple newspaper articles and reports were published highlighting the success and potential of Smart India Hackathon model. The story got even bigger and better with 2018 edition as more than 1600+ institutions and 1.0 lakh students participated. We even had 17 state governments participating along with central agencies and for giving 1200+ problem statements.

Another innovation, we did during 2018 edition was conceptualization of a very unique ‘Hardware Hackathon’ for developing innovative hardware products. For Hardware Hackathon, we selected 10 workshops in country’s most premier institutions like IISc Bangalore, IIT-Kanpur, IIT-Kharagpur, IIT-Guwahati, etc. and put the selected student teams with very good ideas into these workshops for 5 days and challenged them to convert their ideas into real products. This pilot for hardware hackathon was again a huge success.

Now in 2019 edition, we have received problem statements from more than 90 industries in addition to problem statements from MSMEs and ministries, which are more challenging to our young technical minds. I take this opportunity to invite all institutions from India to join us in this national initiative for SIH 2020 edition. Together, we can achieve the sea-change in quality of technical students produced by India education system. Undoubtedly, this is our ultimate dream.
Message from Inter Institutional Inclusive Innovations Center

Engineers love a challenge! Challenges drive them to go beyond their comfort zones and come up with innovative solutions. Surmounting engineering challenges require team work, as the saying goes, A lone wolf perishes but the pack survives, today innovations are all about co-creation, collaboration and being intensely competitive as a TEAM. A great team ensures that the whole is greater than the sum of its parts.

Hackathons provide an excellent platform to bring together a cross functional team, a challenging problem, the tools and support infrastructure to solve the problem and most importantly a time bound competitive environment to provide that adrenaline rush. Hackathons are helping convert programming and problem solving into a glamorous spectator sport.

At Persistent, we have been using hackathons to drive innovation with our customers and have conducted multiple joint hackathons to come up with innovative solutions which have later matured into robust solutions. For more than 10 years, we also run an annual 24 hour global Hackathon, “Semicolons”, within the organization and have seen lot of innovative ideas coming out of this platform. If we look around the industry, lot of start-ups are born out of hackathons and with the VC and start up culture maturing in India, hackathons are an excellent channel to bootstrap some of the ideas into start-ups.

Smart India Hackathon is into its third year now and the overwhelming response we have received from bright young students and support from the Government agencies and departments and the industry augurs extremely well in driving future innovation within the country.
Overview

Imagining a possibility to engage India’s citizens instead of relying on handful of people in solving country’s challenges is the key driver towards adoption of crowdsourcing. Globally public sector has been experimenting with dramatic results. The creative force of crowd has already been used in past to solve number of problems. For example, crowd has already developed software for humanoid robots to complete various tasks in space, created ways to predict mass atrocities and even tagged millions of historical documents to reveal our past. The White House has led the way by releasing a “Federal Crowdsourcing Toolkit” to accelerate adoption across the Government.1 The Indian Government has also embarked on journey of crowdsourcing solutions to address issues with governance, efficiency and transparency. The Smart India Hackathon (SIH) is one of the steps taken in this direction by the-Government.

About Smart India Hackathon
The Smart India Hackathon (SIH) is a nationwide initiative to provide students a platform to solve some of the pressing problems we face in our daily lives, and thus inculcate culture of innovation and mindset of problem solving.2 It is stated to be the world’s biggest open innovation model aimed at promoting out-of-the-box thinking amongst the young minds i.e, Indian students studying technology. The SIH is organized jointly by Ministry of Human Resource Development (MHRD), All India Council of Technical Education (AICTE), i4c and Persistent Systems.

The SIH is a non-stop product development competition. Each participating team comprises of 6 students and 2 mentors with no limit on entries sent per college/institution. So far, three consecutive editions of the SIH have been held in 2017, 2018 and 2019.

The Smart India Hackathon 2017 was a 36-hour non-stop digital product development competition whereas SIH 2018 and 2019 extended the scope with two sub-editions: Software and Hardware. The Software sub-edition similar to SIH 2017 was a 36-hour non-stop digital product development competition whereas the Hardware sub-edition was a 5-day non-stop physical product development competition.1

Figure 1: Smart India Hackathon in a Nutshell
Reach
2 Lakh+ students from 2,000+ institutions in participation

Partners
160+ governments, the private sector including MSMEs, and NGOs partnered and posed problem statements

Prizes
Prizes worth INR 1+ Crore to be won

Infrastructure
Over 45+ centres (Software sub-edition) across the country established for competition

Source: Ministry of HRD

1 https://www.citizenscience.gov/about/toolkit
2 PIB, Ministry of Human Resource Development, Union HRD Minister launches the 3rd edition of world’s biggest open innovation model – “Smart India Hackathon 2019” dated August 29,2018
At inception, SIH 2017 witnessed problem statements posed by only Union Government ministries and its departments, however, enthused by participation as well as quality of solutions received, even state governments participated in SIH 2018. The SIH 2019 edition has become even bigger with involvement of Private sector and NGOs who posted their problem statements.

The winners of the Hackathon are provided cash prizes as well as opportunity to work with respective sponsors i.e. Ministries and its departments, State governments, Private sector as well as NGOs to implement the solution over a larger scale.

Thus, the Smart India Hackathon aims to:\(^3, 4\)

- Harness collective creativity and expertise of citizens
- Spark institute level hackathons
- Build funnel for Startup India Campaign
- Crowd sourcing solutions for improving governance and quality of life
- Providing opportunity to citizens to provide innovative solutions to India’s daunting problems

**Trends across three years**

The three events i.e. SIH 2017, 2018 and 2019 witnessed very good success in terms of participation from government departments and its agencies, private sector, NGOs, engineering/technical education institutes as well as students. As indicated, the number of agencies partnering the event to seek solution for their unique problems witnessed approximately six fold increase since 2017. On the other hand, number of students participating in the event witnessed almost five fold increase since 2017 expecting SIH 2019 as the ‘World’s Biggest Hackathon’.\(^5\)

**Chart 1: Participation trends in SIH across three years**

The participation from number of agencies seeking solution increased ~6 times since 2017.

The participation from students increased ~5 times since 2017.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Agencies</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>29</td>
<td>45168 *</td>
</tr>
<tr>
<td>2018</td>
<td>44</td>
<td>105234 *</td>
</tr>
<tr>
<td>2019</td>
<td>169*</td>
<td>208839*</td>
</tr>
</tbody>
</table>

*Registered students in 2019

*Sudden spurt in number of solution seekers on account of participation from Corporate and MSME sectors in SIH 2019

Source: https://www.i4c.in/site/outcome; Ministry of HRD

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\(^2\) https://www.mic.gov.in/SIH.html

\(^3\) PIB, Smart India Hackathon 2017 Grand Finale in Pune on Saturday 01 April, Ministry of Electronics and IT, GoI dated March 30, 2017

\(^4\) PIB, Union HRD Minister launches the 3rd edition of world's biggest open innovation model – Smart India Hackathon – 2019, MHRD,
The number of problem statements selected witnessed a marginal decrease despite increase in participating solution seeking agencies, indicating more focused approach towards problem identification. Increase in number of problem statements to 532 was seen in 2019. However, the number of ideas received against problem statements witnessed about 6.5 times increase, thus providing recipients with plethora of choices, possibilities as well as perspectives with respect to the solution to be adopted. In SIH 2019, number of problem statements received were 334 and 198 in Software and Hardware sub-editions respectively viz a vis 340 and 68 in SIH 2018.

**Chart 2: Problem statements posed and number of ideas proposed over last three years**

While the number of problem statements posed as part of SIH 2019 decreased marginally in comparison to 2017

The number of ideas received increased ~6.5 times since 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Problem Statements</th>
<th>Ideas Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>598</td>
<td>7531</td>
</tr>
<tr>
<td>2018</td>
<td>408</td>
<td>16300</td>
</tr>
<tr>
<td>2019</td>
<td>532</td>
<td>50046*</td>
</tr>
</tbody>
</table>

*includes approved ideas only

Source: [https://www.i4c.in/site/outcome; Ministry of HRD](https://www.i4c.in/site/outcome; Ministry of HRD)

The number of teams participating in Grand Finale round witnessed an increase of about 28%, however, the number of winning teams increased by 133% since SIH 2017.

**Chart 3: Increase in competition and winning teams over three years**

The number of teams participating in the Grand Finale increased by 28% since SIH 2017

The number of winning teams witnessed an increase of 133% since SIH 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Registered Teams</th>
<th>Winning Teams</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>1266</td>
<td>135</td>
</tr>
<tr>
<td>2018</td>
<td>1402</td>
<td>241</td>
</tr>
<tr>
<td>2019</td>
<td>1619*</td>
<td>319*</td>
</tr>
</tbody>
</table>

*includes registered teams of upcoming SIH 2019 hardware edition

*includes winning teams of software edition only

Source: [https://www.i4c.in/site/outcome; Ministry of HRD](https://www.i4c.in/site/outcome; Ministry of HRD)
The number of colleges for winning teams in software sub-edition of SIH Grand Finale 2018 were 178, maximum representation of which was from non-government colleges with its share being ~75%.

### Table 1: Win statistics for participating institutions in SIH 2018 (software sub-edition)

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of colleges (for winning teams)</th>
<th>Share in %</th>
<th>Total number of awards won</th>
<th>Share in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polytechnic-Government</td>
<td>1</td>
<td>1%</td>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td>College-Government</td>
<td>14</td>
<td>8%</td>
<td>15</td>
<td>7%</td>
</tr>
<tr>
<td>College –Government Aided</td>
<td>3</td>
<td>2%</td>
<td>3</td>
<td>1%</td>
</tr>
<tr>
<td>College-Non Government</td>
<td>134</td>
<td>76%</td>
<td>158</td>
<td>75%</td>
</tr>
<tr>
<td>NITs</td>
<td>6</td>
<td>3%</td>
<td>6</td>
<td>3%</td>
</tr>
<tr>
<td>IITs</td>
<td>3</td>
<td>2%</td>
<td>3</td>
<td>1%</td>
</tr>
<tr>
<td>University – Government</td>
<td>11</td>
<td>6%</td>
<td>17</td>
<td>8%</td>
</tr>
<tr>
<td>University-Non Government</td>
<td>6</td>
<td>3%</td>
<td>7</td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>178</td>
<td>100%</td>
<td>210</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: https://www.shastriinstitute.org/sites/default/files/Short_Note_on_SIH_2018.pdf

The top ten states with maximum participation represented around 70% of the winning teams in SIH 2019 Software sub-edition, of which top four states; Maharashtra, Tamil Nadu, Karnataka and Madhya Pradesh; alone represented 54% of winning teams. The event also witnessed winning/participating teams from comparatively smaller states and UTs such as Goa, Puducherry, Andaman & Nicobar Islands and Assam.

The SIH 2018 – Hardware Edition received submissions against 68 problem statements posed by Union Ministries and State Governments. Total 106 teams were shortlisted to participate in the Grand Finale and 31 teams were adjudged as winners. The winning solutions were built around Automobiles/Smart Vehicles, Medical devices/Healthcare, Import Substitution, Agriculture/Agro – Electronics, Security and Surveillance, Clean Water, Waste Management and so on.

**Chart 4 : Top 10 states by number of winning teams in SIH 2019-software sub-edition**

Source: Ministry of HRD
On similar lines, SIH 2019 had set out ten key themes focused in terms of articulating problem statements as well as proposing solutions. Further, the SIH 2019 witnessed total 532 problem statements posed to students for developing innovative solutions. The software sub-edition was organized on 2-3 March 2019 at 48 centres and hardware sub-edition of SIH 2019 was scheduled on 8-12 July 2019 at 18 nodal centres across the nation.

Figure 3: Key Themes of SIH 2019

- Smart communication
- Waste management
- Healthcare & Biomedical Devices
- Smart vehicles
- Agriculture and Rural development
- Renewable energy
- Food technology
- Security and Surveillance
- Robotics and Drones
- Clean water

Source: https://www.sih.gov.in/sih2019
Success stories
The previous two SIHs witnessed solutions, which were innovative, broad based and impacted all the spheres of the economy. Some of the interesting ideas/concepts suggested were

Agriculture

- A software application to forewarn and detect in real-time, pest attacks, onset of disease in plants and effect of climate on the crop based on previously collected data and detect the current changes in the crop's soil such as nutrient deficiency, increased moisture content, etc. using seamlessly integrated self-made low cost high area coverage sensors capable of sending alert messages, as well as provide detailed report in the app in local languages.

- Another idea was to develop an e-marketplace for farmers to log in the system and sell their produce at highest rate offered by retailers directly. The Retailers can directly choose the farmer and buy the produce at rates mutually agreed, thus eliminating middle-men and issues with respect to lack of information.

- One of the winning teams built an app, which predicts rain, and local weather conditions based on previous 100 years of rainfall data and modelling a farmer decision support system. The application enhances ease of usage and improved coverage of farmers belonging to various parts of India using a multi-lingual CHATBOT which provides 24 X 7 seamless connectivity to the artificial intelligent expert system.
Railways

- The team designed Automotive Foldable Flaw Detection Vehicle (AFFDV) comprising a vibration sensor, IR sensor and Ultrasonic sensor for flaw detection in the track.
- Another device was developed to digitize ticket-checking system for ticket checkers as well as make efficient public address systems.

Some of the other innovative solutions which targeted efficient governance consisting of a mobile app were:
- Skill India
- Liforce platform for blood donor & blood bank communication management
- Food for all to solve hunger crisis
- Mess food wastage saver
- Water deducing box
- GIS application for emergency response system for disaster situation
- Theft detector in bank ATM using acoustics
- Cyber guard – cyber bullying reporting and counselling
The Smart India Hackathon Vision

Notwithstanding India’s recent rise in ranking on Global Innovation Index from position 88 in 2015 to 57 in 2018, India faces significant challenges to make innovation its forte on the global stage. India’s brand of innovation has always been associated with frugal innovation and jugaad. Historically, the government’s focus on innovation has been misconstrued as the creation of low cost and low-tech products. Secondly, the public and private sector investment in research and development (R&D) is quite low. Less than 1% of the country’s GDP when compared with 3-6% contribution by countries like Israel, Finland and the US. Thirdly, Indian universities suffer from poor linkages to industry and research collaboration compared to its American and European counterparts. The government has realized that it can play a role of major change agent and catalyst for innovation touching lives of Indian citizens through embracing digital technologies and redesigning processes.

The Digital India programme envisages complete transformation of entire ecosystem of public services through use of information technology. Shri Narendra Modi, the Hon’ble Prime Minister of India envisages a Digital India to bridge the digital divide in our country and further promote digital literacy. The vision aims to transform India into a digitally empowered society and a knowledge economy. It is centered on three key vision areas: digital infrastructure (broadband highways, mobile connectivity, public internet access and cybersecurity), on demand governance and services (e-governance, electronic service delivery, electronics manufacturing, IT for jobs

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8 Soumitra Dutta, Mint, Elevating India’s innovation mission dated September 28, 2016
9 http://digitalindia.gov.in/content/about-programme
10 http://digitalindia.gov.in/content/about-programme
and early harvest programmes) and the digital empowerment of citizens (digital literacy, information for all, participative platforms, digital resources in Indian languages).  

**Genesis of the idea of SIH**  
The concept of SIH has genesis from three major priorities of the Government as indicated in the schematic below.

01. The government wants to showcase digital transformation and innovation by leveraging technologies in improving governance  
02. Further, as indicated above, Government realizes importance of strong research collaborations between universities and industry (public sector as well as private sector) which in turn will lead to improving competitiveness of Indian goods and services in global market  
03. Encourage entrepreneurship among students inline with Startup India programme and thus boost employment.

**The Vision**  
The Smart India Hackathon (SIH) is type of public sector crowdsourcing with focus on citizen engagement, high stakes to maintain citizen trust, impacts global and regional public policy issues as well as its implementation. Such events effectively crowdsource innovative ideas to solve some of the most pressing problems of the country leveraging digital technologies and the fact that it is participatory in nature, improves reach and acceptance at ground level resulting into better implementation.

The broad vision of the Government behind organizing SIH is to:  
04. Reinforce Government’s commitment to transparent and open governance by applying crowdsourcing and online public participation.  
05. Provide a benchmark for various organization as well as governments to harness collective wisdom in solving challenges through crowdsourcing.  

06. Develop a robust common crowdsourcing platform for various government ministries, departments as well as public sector companies to internalize as well as leverage.

The approach enables government to source ideas from a vast array of citizens beyond traditional means. These external problem solvers are less constrained by institutional bias that inevitably results when people with similar background approach problems with same lens. Further, it also helps maximize resources by tapping outside individuals and focusing them on resource intensive problems and lastly, the approach helps government to reach citizens, empower them and play active role in solving government problems.

Figure 4: Genesis of SIH

**Need for innovating governance**  
The government aims to discover innovative ways using digital technologies to improve governance in terms of improving reach, efficiency, and transparency.

**Encourage entrepreneurship and support job creation**  
The government intends to support entrepreneurship that will ultimately result in innovation-driven enterprises and the creation of employment.

**Improve Industry – Academia linkages**  
Encourage the Industry-Academia linkages by way of research collaborations to improve competitiveness of Indian goods and services in global markets.

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11 [https://www.innovationpolicyplatform.org/content/india](https://www.innovationpolicyplatform.org/content/india)  
Role of ecosystem players

For any crowdsourcing initiative, the ecosystem plays a vital role to ensure its success. The section below provides a view of ecosystem constituents of SIH and their roles.

**Current Ecosystem composition**
The SIH event witnesses participation of four main ecosystem constituents namely

**Educational Institutions**
Academic institutions such as colleges and institutes; both private as well as government funded; encourage students to participate in the event. They provide professors to mentor as well as guide students in terms of team composition, selection of problem to target, submit application, guide during development as well as preparation of pitch presentations to evaluators.
Smart India Hackathon

Educational institutions
- Spread awareness regarding the event
- Encourage students and mentors to participate
- Showcase the winning talent and solutions proposed.

Technology students and academicians
- Participate in the event and develop solutions to the problem statements provided
- Professors guide students in the selection, development, and presentation of solution

Partners
- Government ministries and departments, state governments, corporates, and NGOs pose problem statements that they would like to address
- Corporates providing support to event by way of providing infrastructure and sponsorships

Government
- Provides a platform to bring together solution seekers and solution providers
- Co-ordinate event through the provision of infrastructure, logistics, and funding.
- Provide recognitions by way of certificates, prize money, and so on

Technology Students and Academicians
As a pre-requisite, the hackathon demands students undergoing technical education to be eligible to take part in the contest. The hackathon has become an attraction among students to showcase their skills and make a difference. Further, the unprecedented participation levels witnessed, makes selection to this event to showcase solution as a personal achievement to quote as well as showcase.

Partners
Government mainly Union government ministries and their departments, Public Sector Units (PSUs) as well as state governments mainly propose problem statements based on issues faced by them. These organizations in turn benefit by receipt of variety of solutions to evaluate and choose. The selected teams are then invited to deploy the solutions in real life condition. As mentioned earlier, SIH 2017 witnessed participation from 29 Union Government ministries and departments, which rose to 40+ in SIH 2018 and inclusion of State Government as well. The SIH 2019 is poised to be grander in participation from partners since it will also witness private organization as well as NGOs to pose problem statements. As of 01 July 2019, the 2019 SIH is expected to witness participation from 150+ Corporates, Micro, Small and Medium Enterprises (MSME) and NGOs. Besides being solution seekers, they also help in spreading awareness, providing activation infrastructure and sponsorships.

Government
The Union Government acts an enabler to bring together solution seekers and solution providers through a common platform. The Platform also enables spreading awareness and outreach medium to enhance participation. The Government further provides infrastructure in form of centers/premises with data connectivity and other requisite facilities to undertake event, manage logistics pertaining to event as well as participants and provide recognition in form issuing certificates, awarding prizes, press releases and so on.
Globally, it has been proven repeatedly that crowdsourcing is a cost effective and most potent approach to discover diverse ideas and solutions. Hence, the national governments across the globe are relying more and more on crowdsourcing to solve the complex governance problems as well as foster innovation. The governments have also setup their own crowd sourcing platforms which can be used by various government departments to host challenges, invite ideas as well as engage with citizens and experts within country and globally.

**National crowdsourcing platforms**

A Government crowdsourcing platform is collaborative and innovation focused approach where government openly collaborate with citizens, companies, other government organizations as well as NGOs. Here, the government is the orchestrator for ecosystem collaboration but with undefined participant roles.

This platform is suited for countries in which new policy issues demand innovative problem solving with civil society on complex as well as global issues. For example, the United States Agency for International Development Grand Challenge for fighting ebola epidemic is a classic case of using government crowdsourcing platform.

**The United States of America (USA)**

The “Strategy for American Innovation was formulated by Obama administration in 2009 and subsequently updated in 2011. The document prepares a compelling argument for the use of open innovation and public participation methods like challenges to improve America’s economic growth and international competitiveness.
In 2010, the Office of Management and Budget issued a Memo providing a formal policy framework to guide agencies in using challenges and prize competitions to advance their core missions. The challenge concept goes back centuries, Longitude and ship navigation, Lindbergh’s transatlantic flight; even initial designs for the US Capitol and White House-all were result of prize competition. More recently, challenges have produced concepts for cost effective clean water systems, gunshot detectors to improve responses to school shootings and robots that can set up life support and communications infrastructure on Mars in preparation for human missions.

The General Services Administration (GSA) launched Challenge.gov, the official clearinghouse for all federal problem-solving competitions. Since 2010, the US government has run nearly 1,000 challenges and offered well over $250 million in cash prizes for the best ideas. The Challenge.gov provides a central place online for agencies to post and manage challenges. It is a one-stop shop for the public to discover and engage with federal agencies that are running crowdsourcing competitions. Challenge.gov breaks down barriers to innovation by providing an open format for collaboration. The platform allows government representatives to communicate with citizens and feature data and visualization tools that make it easy for agencies to track and report the success of their challengesii.

Singapore

The country has deployed a Government Platform as a Service (PaaS). It is a centralized platform named Ideas! for the whole of government crowdsourcing activities. It enables SG government agencies to tap on the collective wisdom of their citizens. (i.e. crowdsourcing) for cost effective way to generate and develop good ideas. Through Ideas! the government agency can independently develop, organize and manage crowdsourcing activities such as app development, competition, hackathons and campaigns. The public can access the platform to submit, comment and vote on the best ideas as well as share them on their social networks.

Beyond giving citizens a voice, the platform encourages direct participation by citizens. Communities are empowered to drive the process of development that shapes their lives. Ideas contributed by the citizens might be selected to be pilot projects, building citizen ownership and belongingiii.

Non-Government crowdsourcing platforms

iDEA Lab Platform

It aims to provoke students and young researchers to actively use their intellectual potential to generate innovative ideas and act as a regional

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i https://www.ideas.gov.sg/about-us

ii http://www.idealab.uns.ac.rs/article/project-details/objectives-of-the-project.html
marketplace for ideas. It fosters collaboration between universities and enterprises, advance employment as well as self-employment potential of graduates and enhance innovativeness of the companies. The specific objectives of setting up iDEA labs are:

- To set up, equip and network co-creative centres (iDEA labs) to support students to generate, develop and commercialize their own innovative ideas through entrepreneurship and/or open innovation.
- To foster student entrepreneurship and start-up creation at university settings by improving infrastructure, entrepreneurial culture and skills.
- To introduce and implement open innovation as a new form of partnership among key stakeholders.
- To revise and adapt curricula to include entrepreneurial skills and problem-based learning.

The Platform can be described as a problem-oriented third party operator, which is focused on finding solutions for specific challenges and awarding the best proposal. The platform also acts as a knowledge repository and open innovation platform. It also provides information on live events, lessons on specific subjects, online workshops, seminars, different multimedia contents, alumni and mentors section.

Through this platform, the industry interacts with student community and motivation to contribute to an innovation contest is fostered by a reward system that is adapted as much as possible to the needs of the target group. The tasks are highly specific and call for elaborated concept solutions, within the time frame of six months.

Figure 6: iDEA Lab Platform structure
Community functionality is provided through the elements which foster interaction, like information exchange and topic related discussion on the platform or face-to-face lessons or consultations. Evaluation of the submitted solutions is realized by the jury, consisted of the companies' representatives as well as university professors, teaching assistants and researchers in the field.

About the X Prize competition

The XPRIZE foundation is a non-profit organization, which designs and manages public competitions intended to encourage technological developments that could benefit humanity. Their board of trustees include James Cameron, Larry Page, Arianna Huffington, Ratan Tata among others.

The platform is setup with a mission to bring about “radicalized breakthroughs for the benefit of humanity” through incentivised competition. It fosters high profile competitions to motivate individuals, companies and organizations across all disciplines to develop innovative ideas and technologies that help solve grand challenges hindering human progress.

XPRIZES are monetary rewards to incentivize three primary goals:

• Attract investment from outside the sector that takes new approaches to difficult problems.

• Create significant results that are real and meaningful. Competitions have measurable goals, and are created to promote adoption of the innovation.

• Cross national and disciplinary boundaries to encourage teams around the world to invest the intellectual and financial capital required to solve difficult challenges.

The major difference between the XPRIZES and other similar organizations (e.g. NOBEL prize committee) is awarding prizes based on the first to achieve objective 'finish line' requirements rather than a selection committee discussing the relative merits of different endeavors. For instance, the Archon Genomics XPRIZE's target was to sequence 100 human genomes in 10 days or less, with less than one error per 100,000 DNA base pairs, covering 98% of the genome and costing less than $10,000 per genome (this prize was cancelled because it was outpaced by innovation).

The first XPRIZE – the Ansari XPRIZE – was inspired by the Orteig Prize, a $25,000 prize offered in 1919 by French hotelier Raymond Orteig for the first nonstop flight between New York City and Paris. With the Ansari XPRIZE, XPRIZE established a model in which offering a prize for achieving a specific goal can stimulate entrepreneurial investment. Since then, new challenges have expanded into a range of other fields such as Exploration (Space and Oceans), Life Sciences, Energy & Environment, Education and Global Development.

https://web.archive.org/web/20100728232727/http://www.xprize.org/about/the-x-prize-heritage
Global Crowdsourcing Experience
USA
The White House has led the way by releasing the Federal Crowdsourcing and citizen science toolkit to accelerate adoption across the government. Some of the case studies about experience of federal agencies employing crowdsourcing to solve diverse problems are provided as follows:

Case Study: Apps for Communities Challenge
One of the interesting challenge to undertake innovative uses of local data to bridge gaps between government programmes and its intended beneficiaries. The communities challenge effectively targeted this, resulting into innovative apps that aimed at increase in public transport ridership; provide access to services to its intended recipients such as homeless and poor individuals and connecting local parolees, homeless as well as job seekers with local jobs.

Apps for Communities Challenge
Sponsored by the Federal Communications Commission and the Knight foundation
The challenge intends to bring together providers of public data, developers and traditionally underserved population through a national contest.

For innovative uses of local data and provide recognition to contestants who develop the apps to provide easy access to relevant content.

The goals of the challenge were
• Make local public information more personalized, usable and accessible for all Americans
• Promote broad based adoption and create better links between Americans and between services provided by local, state, tribal and federal governments

The Completion witnessed some interesting innovations with respect to connecting individuals with hyper-local information and enhance reach of government programmes/services.

The best adjudged apps in the competition were

01
Provide real time bus arrival notification system that uses voice and SMS to inform users when the next arrival times for bus stops

02
Connect homeless individuals with services according to specific needs and eligibility

03
A system that uses text to speech to help parolees, homeless and other job seekers receive information about new job postings and allow them to apply for jobs as well

Source: IBM center for business of government, Challenge.gov, using competitions and awards to spur innovation.

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17 Daren C Brabham, University of South Carolina, Using Crowdsourcing in Government, collaborating across boundaries series, IBM center for Business of Government, 2013
Case Study: Apps for Healthy Kids Challenge

The rising instance of obesity among American kids on account of lack of awareness about healthy eating habits, very less information on nutritional value of food as well as benefits of engaging into regular exercise, lead to conceptualization of this challenge. The developers competed with each other to design apps/platforms/games around concept of identifying healthy foods, nutritional value of food we consume in diet vis a vis dietary requirement as well as need for exercise.

In addition to above, the US government has engaged into crowdsourcing efforts with respect designing efficient processes, pooling of efforts in digitizing paper records and making them more accessible as well as voluntarily pooling of efforts for transcribing historical documents into digital format and hence accelerate full time researchers' work. A brief description of the above applications is provided herein.

01. The General Services Administration (GSA’s) annual hackathons are a chance to find products at a fraction of the cost and time of the typical procurement cycle. The GSA crowd produced results have already saved the government thousands of dollars in IT spending. In 2015, 16 teams created systems to visualize agency vehicle contribution to greenhouse gas emissions. The groups designed virtual tools that combine disparate data sets and improved travel booking procedures in a single day.

02. The Completion witnessed some interesting innovations with respect to platforms/games which spread awareness about nutritious food and importance of exercise.

The best adjudged apps in the competition were

1. Pick Chowl, a website that allows children to create meals by dragging and dropping foods onto their virtual plate with meter showing nutrition value

2. A game that gives player responsibility of caring for creatures that all have dietary and fitness needs

3. Work it Off, a mobile app which teaches children co-relation between calories they eat and calories they burn.

4. Tony’s plate calculator, an online tool that can help calculate nutritional values for a single item, an entire recipe or full day’s worth of food.

Source: IBM center for business of government, Challenge.gov, using competitions and awards to spur innovation.

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18 Daren C Brabham, University of South Carolina, Using Crowdsourcing in Government, collaborating across boundaries series, IBM center for Business of Government, 2013
02. The National Archives and Records Administration (NARA) contains more than 12 billion pages of paper records; however, the majority of its information was not easily accessible. In 2012, the NARA capitalized on the archives popularity to launch an effort to enlist the help of “Citizen Archivists”. The terms describes volunteers that are dedicated to making National Archives records more accessible online.

03. The Smithsonian Institution adopted open collaboration by launching a Digital Volunteers Initiative. Passionate citizens virtually support the Smithsonian Transcription center, which helps to make collections more accessible online. The volunteers transcribe historical documents into digital text, which makes the artifacts machine-readable. All these micro contributions provide inputs used to accelerate the full time researcher’s work by freeing them from time-consuming tasks. Volunteers may see value in interacting with history in this way and may feel a sense of pride in helping achieve the Smithsonian Mission.

**United Kingdom**

Urban Prototyping experience, an initiative of the Gray Area Foundation for the Arts (GAFFTA) in London; using hackathon to explore how art, technology and design can serve as new tools for civic participation in digital era is a case study worth examining.

**Figure 7: Case study: Urban Prototyping London**

**Civic participation through technology, art, and design for innovative uses of digital technology**

It is a focus-centric hackathon focused on innovation and digital technology in urban spaces, including hardware and software hacking. The hackathon commenced with introductory presentations, followed by information on the challenge spaces and prizes. The event was organised by RCUK Digital Economy Programmes Sustainable Society Network +.

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<tr>
<th>Format</th>
<th>Rewards</th>
<th>Outcomes</th>
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<tbody>
<tr>
<td>• A weekend hackathon lasting 48 hours.</td>
<td>• All expenses paid opportunity to present at the Mobile Expo Asia in Shanghai.</td>
<td>• An emergency contact app developed by a single technologist.</td>
</tr>
<tr>
<td>• The size of teams varied from single technologist to large teams of technologists engaging in software hacking.</td>
<td>• Prizes sponsored by GSM Association and intel</td>
<td>• A paper prototype for a website to share food developed by a team of two designers.</td>
</tr>
<tr>
<td>• There were also teams of designers and technologists engaged in hardware hacking, and small teams engaged in paper prototyping.</td>
<td></td>
<td>• A system that identifies crowds on google maps via Twitter contributions developed by a large team of technologists</td>
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The hackathon stands a testament to how a heterogeneous group of participants drive innovations pertaining to concept, designs, and application, and solve some of the complex urban and social problems of large cities.

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Sweden

Hack for Sweden is another compelling case study to draw a leaf while studying hackathons. The hackathon intends to promote innovation through open data. As a part of increasing the digitalization of public sector, the Swedish Government focusses on open data and citizen driven innovation. It is Sweden's largest annual hackathon.

Figure 8: Case Study: Hack for Sweden

Sponsored by Corporates and Government agencies

Hack for Sweden is an initiative to raise awareness and demonstrate the value of government agencies open data. It is a community consisting of more than 30 government agencies and companies that want to create a sustainable impact using open data.

### Participation
- Participation is open as an individual or as team.
- A maximum of eight members are allowed per team.
- As most data is available in Swedish, it is suggested to have a Swedish-speaking team member.
- For participation, the solution needs to use at least one of the data sources from the government’s open data platform, www.oppnadata.se.

### Evaluation
- The solutions submitted will first undergo shortlisting based on public voting.
- Judging criteria shall consist of:
  - Impact
  - Cost
  - Innovativeness
  - Utility
  - Reliability
  - Comprehensibility

### Awards
- US$20,000 in prizes
- **The Hack of Sweden Award** – For a team that creatively combines data and create an innovative application
- Best visualisation/data analysis
- Best use of deep tech to showcase the innovative use of a new technology
- Best benefit for the public to find a solution that solves a societal problem in a sustainable way
- Participant’s choice award – Contestants will vote for the best team or solution created

The event witnessed participation increased from 200 to 2 million in 2 years. It has emerged as a Sweden’s new platform for citizen-driven innovation where public and private sector come together to create the Sweden of tomorrow.

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20 https://www.hackforsweden.se/the-mission
What next?

While the SIH 2017, SIH 2018 and SIH 2019, in a short span of three years has garnered a unprecedented support from educational institutes as well as technology students, the time has come to leverage the popularity as well as enthusiasm, channelize towards broader involvement of solution seekers and solution providers. Further, there is a need to understand the various approaches to crowdsourcing and apply them to variety of problems faced in governance and administration.

Areas for improvement
01. The third edition of SIH 2019 aimed at identifying new ideas by tapping into the diversity of the thought; witnessed participation from private organizations as well as NGOs. While this appears to be a good approach to broaden the ecosystem, it might not be effective and efficient way to crowdsource. While public and private sectors have both exhibited history of implementing crowdsourcing effectively, the applications are inherently different in each setting. The private sector is motivated to crowdsourcing approach as an alternative to existing labor resource that can ultimately drive financial performance whereas the public sector on other hand seeks to increase citizen engagement and public outreach. The public sector generally plans to challenge citizens to solve global and regional problems while private sector may not seek same level of impact. Hence, it would be worthwhile to have two different hackathons targeting public sector as well as private sector and NGOs.

02. The current form of Hackathon is targeted only towards technology student fraternity and their institutes, a similar hackathon/ event can be conceptualised and implemented which allows participation from experts/retired professionals/Students from non-technical educational background to provide solutions tempered with practical experience as well
as different perspectives. These could be solution to some of the most intractable problems faced by Government.

For example, the US Military’s African Command (AFRICOM) identified need for new engagement strategies to combat illicit narcotic trafficking in Africa. It exposed the problem with global analytic crowd of over 2000+ analysts from 70+ countries comprising Millennials, Retired generals and PhD academia. The AFRICOM identified a consensus in views of the group to combat the problem using soft power and not military might, which it would have adopted as an approach if relied on internal resources. In absence of the effort, the AFRICOM might have relied on traditional means and limited its potential range of engagement strategies. This approach works very well since problem solvers are less constrained by institutional bias that inevitably results when people with similar background approach problems through the same lens.

The events like Hack for Sweden and Urban prototyping London as described previously are classic success stories on kind of problems that can be solved through employment of heterogeneous composition of teams along with team size ranging from singular member to groups.

03. The SIH approach may be extended towards testing possible solutions by exposing it to crowd to receive rapid feedback, refine solution and reduce risk of rejection. This can prove to be very valuable for public sector organization as it reduces risk of wastage of resources.

For example, the Food and Drug Administration (FDA) in the US, released a new collaboration platform to advance medical care tailored to an individual’s genetic makeup. This required having a collaborative environment that engages the genomics community to test and refine this nascent approach to medicine. Hence, FDA established a platform named PrecisionFDA to collaboratively conduct genomics research and development. The platform allows FDA to closely observe the evolution of this field and facilitate in development of standards required for this new approach.

Many public sector solutions can affect large number of stakeholders and using the crowd to test and refine these ideas can provide a safe environment to seek valuable feedback and lower the risk of failure.

04. The SIH scope can be expanded based on providing specific flavour with respect to technology or focus.

A Tech centric Hackathon focuses on software development with a specific technology or a specific application. They can be categorized into single application, application type and technology specific hackathons based on objective to improve existing application, existing platform or applications using specific language, technology or framework.

On the other hand, a focus centric hackathons target software development to address or contribute to a social issue or business objective. Basis the focus area, the target audience mix can consist of Institutes, Corporates, NGOs, Startups, Students, Individuals, Subject Matter Experts, Retired government officials and so on.

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21 The value of crowdsourcing: A public sector guide to harnessing the crowd, DeloittePixel
22 The value of crowdsourcing: A public sector guide to harnessing the crowd, DeloittePixel
Key focus areas

- The government in partnership with Industry and academics should identify areas of focus – areas where India seeks to innovate with appropriate technologies and create solutions for India and the world. The areas defined can lead to organizing technology centric hackathons furthering the development in selected exponential technologies and strengthen country’s position with respect to technological expertise.

- Gradually involve in a useful digital tool to complement traditional public participation programmes for governance. At the most, the public participation can be seen as a logical extension of the democratic process, engaging local citizens in direct and deliberative activities to guide public administrators and planning projects.

- Expand the scope of crowdsourcing from hackathons for developing solutions to improve understanding of the issues, testing solutions as well as augmenting resources, mainly labor. Based on approach adopted, the crowd sourcing can be categorized into four major types:
  - Knowledge discovery and management;
  - Distributed Human Intelligence and Tasking;
  - Broadcast search;
  - Peer vetted creative production

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<th>Table 2: Approach to Crowdsourcing*</th>
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<td><strong>Type</strong></td>
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<td>Type one: Knowledge discovery and management</td>
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<td>Type two: Distributed human intelligence tasking</td>
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<td>Type three: Broadcast search</td>
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<tr>
<td>Type four: Peer vetted creative production</td>
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• Focus on developing the crowdsourcing ecosystem within country, which can be leveraged by government and its ministries. Further, develop toolkits as well as design education collaterals to enable administrator select mode of crowdsourcing, finalize the likely participant mix as well as methodology to be adopted.

• The Governments can take a leaf out of X-prize challenge and design India specific version, which clearly defines problem statements along with quantifiable objectives and definite timelines leveraging extensively India’s demographic dividend.

• The Government should create linkages between students and technology and business incubators to help students in scaling up of viable solution, assist in their deployments, promote entrepreneurship and in turn encourage entrepreneurs towards start-ups.
Acknowledgements

We acknowledge efforts of all members of MHRD Innovation Cell, Persistent, i4c, AICTE and partners of SIH, whose contribution is helping in reaching out to lakhs of students across higher educational institutions and in identifying new and disruptive technological innovations to solve the challenges faced in our country, making this open innovation model a success.

We would like to thank various people for their valuable contributions without which this report would not have been possible.

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- Anuja Kanhere from Persistent Systems for internal approvals and patronage.

Endnotes

1 36 Hour Smarti India Hackathon 2018 Grand Finale to be held in Kanpur and Varanasi, Ministry of Water Resources, GoI, PIB dated 23 March 2018
2 https://digital.gov/services/challenge-gov/
5 https://www.hackforsweden.se/the-mission
9 Daren C Brabham, IBM center for the Business of Government, University of Southern California, Using Crowdsourcing in Government