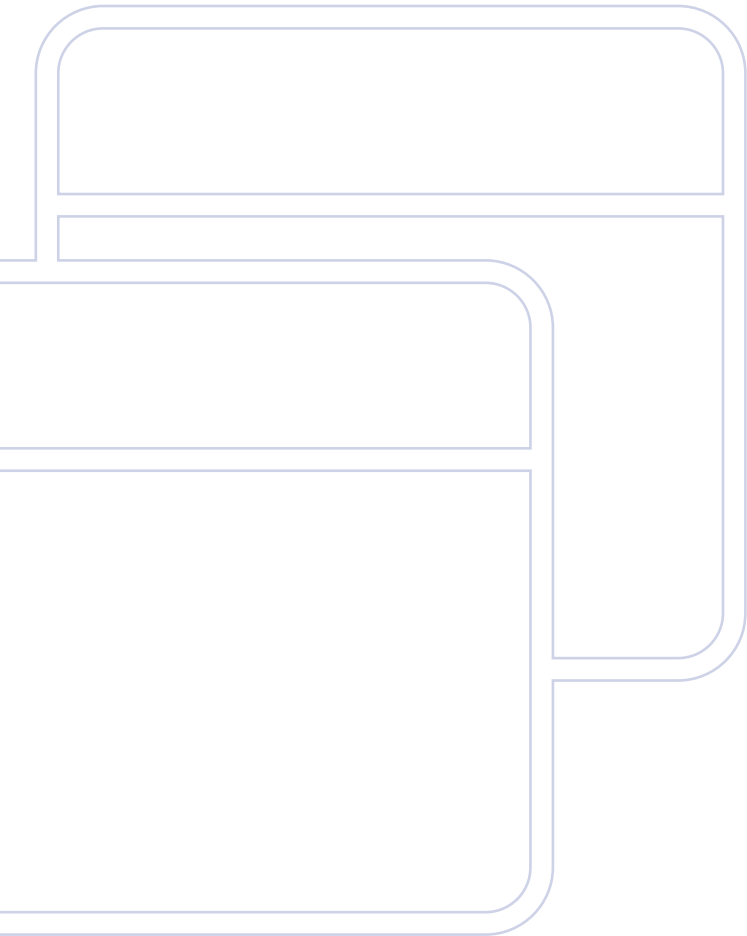


# THE UAE HACKATHON



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**UAE HACKATHONS 1.0 AND 2.0**

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## CONTEXT AND BACKGROUND

To position the United Arab Emirates (UAE) as a hub for innovation and creative thinking, the Government of the UAE launched a series of technology- and innovation-related events as part of the February 2018 Innovation Month. These innovative events involved government entities, small businesses, multinational organizations, education bodies, non-government organizations, and civil society. The 2018 UAE Innovation Month organized by the Mohammed Bin Rashid Centre for Government Innovation (MBRCGI), to expand the successes of UAE Innovation Week, had over 1,200 innovation-focused activities and workshops staged across the seven emirates. In 2018, each emirate ran its schedule of events throughout February to celebrate innovative thinking by governments, businesses, and entrepreneurs, to foster innovation among students and young people. These events fell in line with the UAE's ambition to become the most innovative nation in the world by implementing smart solutions and creative thinking to solve critical challenges facing all countries today.

## NEED

Having an IT savvy population is critical to benefit from the new technologies, platforms, systems and knowledge of the digital economy. Countries need to find a way of nurturing the creativity and innovative spirit of the youth in their country.

The challenge of the UAE Government was how to harness the energy, thinking and skills of youth to tackle public issues in an innovative event. The Telecommunication Regulatory Authority, which organized the UAE Hackathon, was keen to engage youth in the event because they are the most energetic segment of society to give new ideas. The Idea of the UAE Hackathon was born to meet this challenge. However, the UAE Hackathon itself would depend on challenges to create innovative ideas.

## IDEA

### The UAE National Context

The UAE Hackathon falls within the national context of the UAE, which aims at enhancement of innovation in government entities and employment of artificial intelligence and modern technology to achieve social development and happiness. To be a real player in the future technology revolution, the UAE government was proactive enough to launch some strategies and set some goals for shaping the future.

### The UAE Strategy for the Fourth Industrial Revolution

In September 2017, the UAE Government launched the UAE Strategy for the Fourth Industrial Revolution during the Government's Annual Meetings. The UAE Strategy for the Fourth Industrial Revolution aims to strengthen the UAE's position as a global hub for the Fourth Industrial Revolution and to increase its contribution to the national economy using advanced innovation and future technologies.

The strategy also outlines the path to achieve the future experience of government services by providing intelligent and interactive government services around the clock to achieve customer happiness and to position the UAE as a model for interactive cities using artificial intelligence to make sustainability.

### The UAE Artificial Intelligence (AI) Strategy

In October 2017, the UAE launched its Artificial Intelligence strategy to boost government performance and the rate of accomplishing achievements. The strategy will create a highly productive, innovative environment by investing in advanced technologies and AI tools that will be implemented in all fields of work. The goal of the AI strategy is to make the UAE the world leader in the field of AI investment in various vital sectors, such as transport, health, space, renewable energy, water, technology, education, environment, and traffic. The UAE Hackathon participants incorporated these ideas in developing creative solutions. The use of artificial intelligence from sensors to smart technologies in the cityscape were all vital parts of many of the participants' solutions.

## PROJECT AND INNOVATION

### THE UAE NATIONAL INNOVATION STRATEGY

In October 2014, Sheikh Mohammed launched the UAE National Innovation Strategy with the aim of making the UAE one of the most innovative nations in the world within seven years. The strategy has four tracks.

1. The first track will establish a stimulating environment for innovation to shape specialized entities such as innovation incubators as well as technological infrastructure to fuel innovation in all sectors.
2. The second track will develop government innovation by institutionalizing innovative practices with the support of an integrated system of modern tools.
3. The third track will encourage private sector innovation by stimulating companies to establish innovation and scientific research centers, adopt new technologies and develop innovative products and services.
4. The fourth track will prepare individuals with highly innovative skills to establish a national culture that encourages innovation.

### Data-centric smart government

The UAE aims at building an AI-based government that uses data analysis approaches to achieve its goals and shapes the future. For this purpose, the UAE government launched the open data portal (bayanat.ae), to be the primary reference and source of all official government data and statistics. The UAE official Open Data Portal provides enhanced open data systems for public use and reflects the government's intention to strengthen sustainable communities based on participation and transparency.

Hackathons can create and facilitate the right environment for the use of AI and open data for global innovation. Universities can also play a leading role in implementing the AI strategy and its deliverables by providing a conducive environment for students to step outside their comfort zones and to think creatively. They can expose students to cutting-edge technology so that they can explore and create innovation and products that will have a big impact on the present and future economic environments.

## STORY

### The UAE Hackathon 1.0, 2018

Against this background, the Telecommunications Regulatory Authority (TRA) launched in February 2018 the first nationwide Hackathon for the seven emirates in six locations under the theme of Data for Happiness. These hackathons provided young men and women the opportunity to highlight their creative talents and solve the current issues of the day. TRA provided the tools necessary to meet these challenges through training, mentoring, and by releasing data through their open government data platform, bayanat.ae, which provided access to data on the eight themes of the hackathons, which all were under the banner of Data for Happiness. Hackathons are organized as short events that provide teams with data and tools to come up with creative solutions to societal challenges in an accelerated fun competition that unleashes creativity and empowers people.

### Implementation of the UAE Hackathon 1.0

The Hackathon came about from the vision of TRA to promote Bayanat.ae and innovation month by sponsoring IT-related activities in the seven emirates. They saw the hackathons as a way of spreading the culture of innovation, building capacity at the young adult level, and incorporating the seven emirates' e-government institutions to support the expansion of open government data.

In preparing for the hackathons, the TRA took six months of work to strengthen the existing datasets and add additional datasets to the open data portal. The authority coordinated with local meetups and other IT-related communities to reach out to their respective members to obtain support for the hackathons and liaised with the universities on logistics issues. The organization team developed a marketing strategy for the hackathons, and applied that strategy before, during and after each of the hackathons.

To stage these hackathons, TRA partnered with the seven local e-governments: Abu Dhabi, Dubai, Sharjah, Ajman, Fujairah, Ras Al Khaimah, and Umm Al Quwain as well as the Federal Competitiveness and Statistics Authority. The TRA also coordinated with universities: Khalifa University, American University of Ras Al Khaimah, Sharjah University, Ajman University (Ajman Campus and Fujairah Campus), and Zayed University.

Each hackathon ensured that participants were provided with specific training to develop applications, e-services, websites, and creative solutions. Also, TRA, in conjunction with the private sector and the universities, provided mentors for all participants to ensure that their original ideas would be developed.

## **Themes of the UAE Hackathon 1.0**

The themes of the UAE hackathons were related to collaboration and using data to create happiness for the UAE and across the globe. The UAE leadership has set happiness as the ultimate goal of its strategies and policies. Hence, the TRA has expressed this goal in the theme of the 2018 UAE Hackathon: Data for Happiness. The Hackathon series had eight target themes under the banner of Data for Happiness: gender balance, education, environmental protection, health and safety, transportation and traffic congestion, sustainable development in a post-oil era, enhancement of lifestyle in the UAE and enhancement of social relations in the UAE. It gave participants the freedom to select any challenge or issue under these themes to be tackled in the event.

## **Support structure**

### **The National Program for Happiness and Wellbeing**

The National Program for Happiness and Wellbeing provided significant support to the UAE Hackathon since it was launched. H.E. Minister of Happiness and Wellbeing visited the UAE Hackathon in Sharjah, the third stop in its journey. She visited Khalifa University, where the closing ceremony was held and winners were honoured and given their trophies and prizes. This support enhanced the Hackathon title “Data for Happiness and Wellbeing”.

### **Telecommunications Regulation Authority (TRA)**

Under its mandate to supervise the digital transformation in the UAE, the TRA came up with the idea of conducting a nationwide hackathon to prove the importance of delivering courses and curricula in data analytics and data science.

Hence, the TRA provided the thought leadership, financial support, and substantive staff support to ensure the success of the hackathons. Besides, they strengthened the open data portal bayanat.ae to contain as many datasets as possible. They created a hackathon website, where participants could register and obtain information on the hackathons.



## Federal Competitiveness and Statistics Authority (FCSA)

FCSA provided substantive support in expanding the number of datasets for the hackathons. It was an active player in all the events and provided training and mentoring to the participants.

## Universities

University partners were integral to the realization of the Data for Happiness Hackathon. Each university host undertook a series of tasks: logistics support, venue management, judges, mentors, trainers (in some cases), advertising and outreach to student groups for participants and volunteers and identifying existing projects with data from students or professors to expand and work on through the hackathon.

Many university partners took an added step of providing the hackathon with a booth during their innovation month activities or offered creative activities to engage participants beyond the team building and rapid prototyping of the hackathon itself. Crucially, universities are leading the local follow-up with winning teams to continue engagement and share progress and updates beyond the hackathon. Universities are a vital long-term partner in building an open data ecosystem.

## PRIVATE SECTOR

The private sector provided training expertise of specific themes, such as blockchain technology, AI, data mapping, creating apps and websites, entrepreneurship, and creative thinking.

## OUTCOMES AND WINNERS

The UAE Hackathon 1.0 achieved noticeable success. It gathered more than 780 participants, in 176 teams and produced 12 winning solutions, innovated by teams in the six hackathon locations. Also, there were 213 volunteers, 58 mentors and 46 trainers. Participating teams produced more than 60 feasible creative ideas in different fields, to improve the standard of living and bring happiness to people.

The Grand Champion team was Life Saviours from the Fujairah Hackathon. The Life Saviours

team looked at health data. All the members were students at the university and included a technologist, an artist, and dentistry students. They focused on creating a medical device and drug regime for reducing the speed of poisoning from snake bites and scorpions. The team consulted a pharmacologist and toxicologist to verify their ideas and design. They used data on the rates and location of deaths in the UAE, as well as other places. They conducted independent research on causes and remedies for snake venom. Life Saviours stated they were inspired by the many cases of death from snake bites. They sought out data on Bayanat and found some on the instances of deaths caused by poisonous snakes and scorpions. Their solution is a delivery system for a drug that reduces the damage to the liver from the venom, dispense an anti-venom for the five most common snakes in the UAE, and send a location message to the nearby hospitals as soon as it is used.

As a result of the great success achieved through the UAE Hackathon in 2018, the TRA decided to organise it in February 2019, which again coincides with the Month of Innovation.

### **UAE HACKATHON 2.0, 2019**

Considering the above and funded by the Information, Communication, and Technology (ICT) Fund, the second nationwide Hackathon was launched for the seven emirates in seven locations under the theme of Data for Happiness and Well-Being. These Hackathons provided young men and women the opportunity to display their creative talents and provide solutions to the current issues of the day. TRA provided the tools necessary to meet these challenges through training, mentoring, and by releasing data through their open government data platform, bayanat.ae.

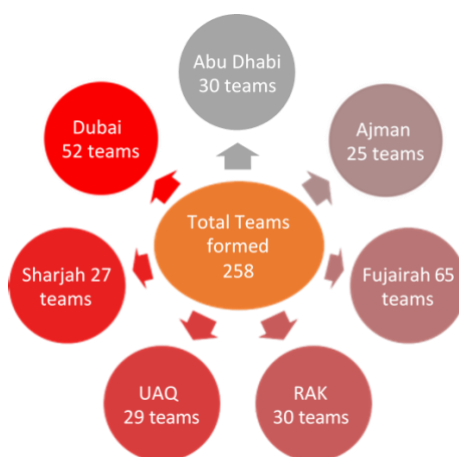
The UAE Hackathon 2.0 - Data of Happiness and Wellbeing is the second step of the TRA's innovation journey in conjunction with the Month of Innovation. What distinguishes the UAE Hackathon from other initiatives and experiences in this context is that it adopts the method of collective intelligence and partnership between different sectors. It is a virtual laboratory for young people who are open to modern technology and have a creative mind.

The UAE Hackathon 2.0 was more comprehensive and more collaborative than the previous one. It received more support from about 40 partners with the TRA. The data portal provides more diverse datasets, which covers a wide range of sectors and themes. The number of themes and challenges was greater as more entities suggested their challenges and provided

necessary data to find solutions for these challenges. Government entities pledged to sponsor the winning ideas to convert them into real solutions and tackle the set challenges. In 2019, the UAE Hackathon was organized in the seven emirates of the UAE, including Umm Al Quwain, which host the UAE Hackathon for the first time.

### UAE Hackathon 2.0 formed teams

This year a total of 258 teams were formed from the 7 emirates that presented innovative ideas for the challenges posed in the hackathons.



The UAE Hackathon 2.0 contributed to the achievement of the national agenda of the UAE 2021 and UAE 2071 by developing a cadre of digital perceptive young men and women. It will enhance their capacities as well as enhance knowledge sharing and innovation in open government data to a wider section of society.

The hackathons have unleashed the creativity of the youth living the UAE, as well as government institutions that have to provide challenges for the hackathons to solve. The engagement of the government institutions provided structure to the hackathons and the participants were able to solve real-life challenges.

The hackathon participants have developed a keen sense of collaboration and cooperation during the last two years. They have been the best at marketing the hackathons to their friends and colleagues and using social media to share their ideas with a wider audience. TRA has been instrumental in keeping the spirit of the hackathons going the last two years and has developed the branding of the UAE Hackathon 3.0.

## THEMES OF THE UAE HACKATHON 2.0

Thirteen themes were drawn for the UAE Hackathon 2.0. Each theme was adopted by a government entity, which set some challenges and provided the necessary data to cover solutions produced for these challenges. Themes included:

### 1. Trending Technology

The UAE Hackathon participants were invited to find solutions using block-chain technology for the protection of personal data, development of government services and development of proactive tools for customer services

### 2. Data for Sustainability

Ministry of Climate Change and Environment asked hackathon participants to develop apps or tools to analyse data on food and natural resources to help the government to secure food and maintain the sustainability of resources.

### 3. Safety & security

Ministry of Interior's General Command of Civil Defence adopted this theme and invited participants to find smart applications and use artificial intelligence in fire accidents to tackle the most common reasons for fire accidents and minimize them.

### 4. Health

This theme was set by the Ministry of Health and Protection to analyse data on diseases and their causes and identifying common factors among them. This will help healthcare providers to predict future trends in treatment.

### 5. Employment

Ministry of Human Resources and Emiratization encouraged participants to find solutions promoting career opportunities for job seekers in the private sector.

### 6. Education

Gamification is an enjoyable method for learning. Ministry of Education is encouraging participants to find a solution based on gamification to improve education at primary and middle schools.

#### **7. Social Development**

Ministry of Community Development adopted a challenge to innovate tools/apps using gamification to help people of determination, support good behaviour and stop bullying.

#### **8. Innovative Solutions to serve justice**

Ministry of Justice's challenge was finding innovative solutions to help people settle their disputes and cases fairly, amicably and finally out of the court

#### **9. Enhancement of Social Relations in the UAE Community**

Abu Dhabi Systems & Information Centre asked participants to find solutions through technology to connect generations and fill the generation gap

#### **10. Enhancement of Lifestyle in the UAE**

This was the second challenge of the Abu Dhabi Systems & Information Centre to make people of determination happier with Abu Dhabi Government services and how to make the Abu Dhabi community more connected using AI and big data.

#### **11. Shaping the future of land and maritime transport**

Federal Transport Authority – Land & Maritime set its challenge to make Arab people qualified for maritime jobs.

#### **12. Integrated infrastructure**

This theme was set by Sheikh Zayed Housing Programme with the challenge to improve the quality of life of people in residential areas.

#### **13. Environment**

Ministry of Climate Change and Environment's first challenge was to develop an app to recycle or dispose of electronic waste, wood waste, car parts and tyre waste. The second challenge was to develop an app to open the e-market for local agricultural

and animal products to support local farmers. The third challenge was to develop an app to support sustainable production by Emirati women and an app to answer veterinary queries.

## Winners impact of the UAE Hackathon 2.0

The closing ceremony saw the honouring of 21 winning teams in the UAE Hackathon 2.0. The LIFT OFF Project won the Grand Prize for a smart app, showcased at the Ajman Hackathon, which augments cameras with artificial intelligence to diagnose the user's health by examining the face, eyes, nose and face colour, and accordingly determines the medical condition.

The winner of the first place in the Abu Dhabi Hackathon is the KHADER project, which aims at preserving the environment through the use of artificial intelligence in waste recycling operations. JUSTICE-SMART POSITIVE CENTER has also won the first place in the Sharjah Hackathon, which aims to find solutions to family problems by the user's interaction in a room containing several smart mirrors, each asking the user to answer a question until solving the problem.

The first place in Umm Al Quwain Hackathon went to the FAST RESPONSE project. The concept of the project is to manufacture a remotely-controlled aircraft equipped with special sensors linked to a smart app, which can be guided to a fire scene and can give detailed data about the same and whether there are human casualties or not.

The first place in the Fujairah Hackathon went to the SO CALLED ENGINEERS project, a project to provide a smart helmet for motorcyclists, which will, in the event of an accident, alert the competent entities by reporting the condition of the injured, time and location of the accident.

As for Ras Al Khaimah's Hackathon, the first place went to THE HEALTH INSPECTORS, a smart app that enables users to provide feedback on restaurants and how healthy they are.

The diversity of challenges presented by the UAE Hackathon resulted in a variety of ideas and suggestions by the competing teams. The Umm Al Quwain school children's team introduced, within the security and safety challenges, the idea of designing a small device with heat sensors linked to a smart app. The 'JUNIOR DIAR2' team of Fujairah introduced the idea of an electronic stick dedicated to the blind and elderly citizens, vibrating to send a sound alert when the user approaches dangerous places. The 'Hackabees' team from Abu Dhabi chose the subject of employment, focusing on ideas that will create new jobs and facilitate suitable job finding for youth.

During the ceremony, 21 teams were honoured, including the winner of the grand prize, winners of the first place in each emirate, as well as the honouring of 100 teams from various emirates, who presented innovative smart solutions to the challenges. Partners from government entities, universities, private sector, arbitrators, supervisors and volunteers involved in the success of the hackathon were also honoured, in addition to winners of the best media coverage of the hackathon.

## IMPACT OF THE UAE HACKATHON

The success of a hackathon is not simply the products and solutions developed during the event, but the continued engagement of the participants and the expansion of the community beyond the event. Each participant and winning, finalist, or honourable mention team expressed interest in learning more about a dedicated Code for UAE data community and several offered to lead a local chapter. Consistent and continued collaboration will serve the UAE for the generation to come.

The hackathons focused and supported the following areas:

1. Build on the initial success of BAYANAT.AE and continue to identify and gather open data on the UAE from a variety of online and offline resources; publishing them on BAYANAT.AE.
2. Hosted a series of high-level meetings to assess the interest of the government, identify stakeholders inside and outside of government, and develop an open data ecosystem in the UAE. This will build upon the preparatory work for the hackathons and sustain this work over time, embedding it into institutions and the community.

3. Increased participation of government institutions to be more inclusive of real-life problems and solutions to address them.
4. Developed a marketing strategy to have greater outreach to all universities and professionals, a strategy inclusive of the use of social media and influencers.
5. Create over 3,000 open data sets by Hackathon 3.0
6. Develop thematic hackathons during the year

## Expanding the Open Data Portal

To expand the portal, several actions are needed to add more data and an enhanced system for the publishing data to the portal. To add more data, the government is going to take the following steps:

1. Gather existing data that is already published. The UAE ministries, government, and Emirates currently publish data in various formats in statistical books, annual reports, and other printed materials and/or via online sites. What should be considered is how to incorporate these data sets to be hosted and incorporated into the portal, which would be useful to developers and innovators. During the hackathon, several teams did just that to gather the data they needed in a way that would allow them to analyze and visualize the information.
2. Generate data from online trusted sources; for example, several open data sources within ministries or Emirates already published open data. The BAYANAT.AE team could create service level agreements with these organizations and generate the data so that it is also accessible via BAYANAT.AE. Rather than just pulling the data, a service level agreement could help establish metadata standards and publishing methods.
3. To make the data more useful, the Government could publish APIs with all and/or key datasets to allow easier integration for developers.
4. Create agreements with ministries and key organizations that when data is released, the data can also be published to and/or generated by BAYANAT.AE at the same time.



## Creating a culture of government innovation and transparency

1. Create a government-wide Data Community with ministry representatives to discuss data-sharing plans, data publishing standards, and expectations of open data.
2. Host a Data Academy to help government staff gain skills in data gathering, creation, management, and publishing. Develop and execute a series of capacity-building training and orientations across all levels of civil service staff to ensure knowledge sharing of the importance of inventorying, documenting, sharing data, and facilitating good stewardship of UAE data.
3. Support multi-disciplinary working groups within each ministry and across the government to be responsive to considerations of legality, privacy, quality, communications, and engagement around datasets.
4. Create a plan to add new data from each ministry and an annual publishing plan.
5. Host an internal hackathon that encourages and empowers government employees to innovate with data and create new solutions to a set of challenges.
6. Recognize and celebrate the best ministries who publish data. Consider awards such as Most Data Published, Most Popular Dataset, and/or Most Unusual Dataset.

## Growing the Open Data Ecosystem

1. Reach beyond the boundaries of government and create a more vibrant open data community. Establish a Code for UAE (modelled on the successful Code for America organizations). Enlist winners from the UAE hackathon to help run regional groups and central leadership board. Host and sponsor meetings with government staff as well to build the relationship.
2. Enlist established businesses to bring some of the top teams as interns into their respective companies. This will provide an invaluable professional experience to them, especially as they will in the future seek employment opportunities.

3. Outreach to the ICT communities to keep the hackathon alive throughout the year and not just in February.
4. Strengthen the knowledge of AI technology and blockchain in universities.
5. Consider continuing the relationship with universities started in the hackathons. This could range from continued hosting of the annual UAE Hackathon to having IT or data science classes work on projects with the government. This could also provide a potential pipeline of talented innovators to apply for government positions.
6. Collaborate with universities to identify research projects that are of direct relevance to improving government data or that have been made possible from government support to add to the BAYANAT.AE data inventory.
7. Reach out to the venture capital and start-up community to be part of events, use the open data released, and help to host meetings around sectors using open data. For example, convene a forum for Energy Data Innovators when new data is released, showcase the data, and encourage its use; this could itself facilitate monthly virtual meetings of the community and/or annual forums.
8. Provide an online form that allows organizations to submit how they have used data or what data they need. Potentially publish the data requests on Github and/or social media, noting when the requested data is published. Showcase the best stories of data usage.
9. Establish regularly, monthly public engagements with updates to Bayanat and integrate feedback and improvements from civil servants and the public. Thus, continuing to foster and grow a community of civic tech actors who are committed.

## **Energizing a Generation of Data Scientists**

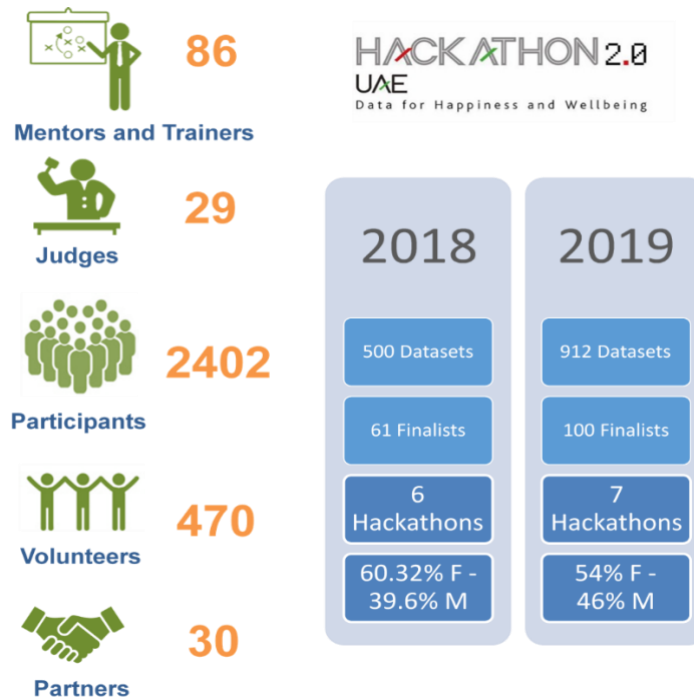
To realize the vision of the Fourth Industrial Revolution, the UAE must be a data-savvy

country and support a generation of cross-disciplinary leaders. Data and innovation are intertwined with a growing and prosperous future, and the support and growth of data literacy and data science across all disciplines are integral to success. The hackathon held a core objective of increasing data literacy among participants and across the UAE, and high-quality training was an integral component of success. Training ranged from introductions on how to think about open data or how to develop a website or mobile app. More technical sessions focused on how to gain insight from data by analyzing spreadsheets and using visualization tools, coupled with training on using artificial intelligence software, blockchain, and big data analytics. Throughout the Data for Happiness series, 27 unique pieces of training were offered. Hackathon staff provided six trainings consistently at each event. Members of the private sector offered 11 different kinds of trainings, which varied based on the event and location. American University of Ras Al Khaimah provided six trainings for its event and one trainer to participate in an additional three events. The UAE government from FCSA, RTA, and SmartDubai shared five additional trainings.

### **UAE Hackathon in numbers**

As per the graphs are shown below, there was a growth from Hackathon 1.0 to Hackathon 2.0 in terms of datasets, finalists, ideas, teams, mentors, trainers and participants. Hackathon 1.0 was conducted in 6 emirates in comparison to Hackathon 2.0, which was conducted in all 7 emirates.

The percentile of males participating in hackathons have also increased noticeably.



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