

DUBAI: A CITY POWERED BY BLOCKCHAIN

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Dubai is one of the seven emirates that constitute the United Arab Emirates (UAE). It is the most populous city and emirate in the UAE, and it has a gross domestic product of US\$ 382.6 billion (2017).

Over the last 40 years, Dubai has been transformed into a global city and has earned a reputation as an international economic and investment center. Thousands of companies have established their regional headquarters in the emirate's many free zones. Dubai is also known for its success as a regional business and tourism hub. The emirate has achieved this success by diversifying its gross domestic product through vast development in sectors such as tourism, real estate, retail, travel, and logistics. It also has been recognized for attracting skilled talent from around the world.

Underlying this economic growth is a strong and productive government sector that has embraced technology and is committed to standards of excellence. The city also has committed to digital transformation, a technological journey that began in 1999 with the announcement of its first ICT strategy. This was followed by the launch of Dubai Internet City, Dubai E-government, Dubai Smart Government, and, most recently, the Smart Dubai Office in 2015.

The Smart Dubai Office was formed with a vision to make Dubai a truly citizen-centric smart city, ensuring the highest levels of happiness for all residents and visitors. Today, with its adoption of new

technologies and pioneering of innovative smart pilots, Dubai is among the world's leading smart cities. Recognizing the potential impact Blockchain technology could have on city services, coupled with a worldwide trend that saw \$1.4 billion in private-sector investment in Blockchain technology in 2016 alone, Dubai launched a citywide Blockchain strategy in October 2016. The objective: to become the first Blockchain-powered city by 2020.¹

Dubai's rapid development in various economic sectors meant that traditional processes had to be updated continuously to ensure efficiency and speed. Government effectiveness became

increasingly imperative, especially in government-to-consumer and government-to-government services. In particular, the growth of the business, construction, and tourism sectors revealed that the government needed tighter controls over activities such as permits, transaction verification, and tracking. Simple processes were getting ever more complicated as the city's new businesses and residents began delving into newer industry sectors. It was clear that Dubai needed an agile way to streamline its expanding government processes.

Dubai saw the potential of Blockchain to provide a solution. Blockchain is a technology that utilizes open distributed databases for transactions that involve value, be it monetary or any kind of digital asset, such as identity, certificates, licenses, etc. Its coding method allows for secure recordkeeping in distributed online ledgers, which enable members to share and confirm information with no central authority. The Blockchain economy is witnessing rapid growth; more than 600 companies are active in Blockchain today and it is expected to have a market value of several billion U.S dollars in 2019.

Dubai's adoption of Blockchain technology on a citywide scale comes at a time

when the technology is increasingly being recognized as the ultimate trust mechanism. Blockchain eliminates the need for trusted third parties in transactions of any asset, an attribute that could significantly help simplify the Dubai government's evolving processes.

Additionally, as the UAE is the leading supporter of the United Nations Sustainable Development Goals, the adoption of Blockchain technology also applies to the smart governance, smart economy, and smart people areas of United for Smart Sustainable Cities, as the next sections describe.²

VISION

While governments around the world are cautiously exploring various Blockchain applications, Dubai is the first city that has the vision to explore the full potential of this innovative and rapidly evolving technology on a citywide scale. This ambition sees the Dubai government leading innovation and building an ecosystem that will enable Blockchain technology to thrive in both the public and private sectors.

The Blockchain strategy is based on three pillars:

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1. Government Efficiency: Implement Blockchain technology across all applicable government services.

2. Industry Creation: Support the creation of a Blockchain industry by providing an enabling ecosystem that empowers startups and businesses.

3. Local and International Thought Leadership: Lead the global thinking on Blockchain technology and become the hub for Blockchain intellectual capital and skill development.

The adoption of Blockchain technology perfectly aligns with the vision of embracing technology innovation city-wide, which will enable Dubai to offer the most efficient, seamless, safe, and impactful experiences for its residents and visitors.

IMPLEMENTATION

Dubai has developed a detailed roadmap that is organized around the Blockchain strategy's three pillars. This roadmap defines the way forward for the city's Blockchain ambitions. Dubai's plan includes actionable initiatives for each pillar in the strategy.

Government Efficiency

In 2017 and 2018, the Smart Dubai Office was identifying and piloting use cases of the most applicable government services on Blockchain. The Payment Reconciliation and Settlement System, which went live in September 2018, was the first Blockchain use case, and many more are planned to roll out in 2019. This new system reconciles payments between government entities and banks within seconds—a process that previously took 45 days!

The most applicable services are those that would benefit most from Blockchain technology, due to their need to eliminate third parties, transaction ledgers, smart controls, and/or automa-

tion. So far more than 20 government and private-sector use cases have been identified and are currently going through the pilot phase.

The Blockchain pilots are being run across several sectors in the city, including energy, transport and logistics, tourism, health, education and employment, economic development, safety and justice, social services, municipal and land works, and smart districts. This process has involved the key government champions in each public sector, including the Dubai Land Department, Dubai Electricity and Water Authority, the Roads and Transport Authority, the Dubai Tourism and Commerce Marketing Department, the Department of Economic Development, Dubai Police, Dubai Health Authority, and many more stakeholders that are key to sectoral adoption.

When organizing the rollout of the Blockchain pilots, Dubai recognized the importance of putting in place a governance framework that would ensure that all stakeholders are aware of their roles and receiving the support they need. The Smart Dubai Office, for example, held workshops with each stakeholder in order to identify the best potential pilots for their sector and provide stakeholders with the technical standards and unified protocols they needed to implement their pilots.

During the pilot phase, most entities identified the need for official government-issued Blockchain implementation policies, therefore Blockchain policy will be developed for a number of areas, such as security, ownership, infrastructure management, consumer rights, startup support and enablement, financial technology, etc. The policy implications of Blockchain implementation will be assessed continually. Smart Dubai is therefore also running policy workshops with public- and private-sector entities to

identify challenges they will face before Blockchain is implemented, and will finalize the policies with their feedback in mind.

Industry Creation

In addition to rolling out Blockchain in the government, Dubai aims to create a Blockchain industry that enables private companies and startups to thrive and innovate. To achieve this aim, it has created two key action areas to support the development of an enabling ecosystem that will empower businesses:

Blockchain Accelerators: Smart Dubai has participated in two accelerators, the Dubai Future Accelerators and the Startupbootcamp Smart City Dubai Accelerator. Blockchain solution providers from around the world were invited to work with local government entities and to test Blockchain implementation.

Smart Dubai Global Blockchain Challenge: Hosted annually in Dubai, the Smart Dubai Global Blockchain Challenge invites startups from across the globe to pitch Blockchain ideas that could be implemented in the city. In May 2018, the second Global Blockchain Challenge received more than 200 applications from 85 cities that wanted to showcase their best and brightest Blockchain solutions. Smart Dubai shortlisted the top 17 entities and flew them to Dubai to present at the Future Blockchain Summit in May 2018, where three winners were awarded cash prizes and introduced to relevant government and private-sector partners.

By opening the door to Blockchain professionals from around the world to come to Dubai and help pilot and implement use cases for each sector, the city is stimulating both the Blockchain market and its own economy.

Thought Leadership

This pillar reflects Dubai's aim to lead global thinking on Blockchain technology and become the hub for Blockchain intellectual capital and skill development. To achieve this aim, Smart Dubai is working on four key action areas:

Skill Development: Dubai aims to become the regional and global hub for Blockchain skill development by offering the most comprehensive and frequent training programs aimed at Blockchain coders, policymakers, strategists, and project managers.

Intellectual Capital—Smart Cities Global Network: Smart Dubai aims to create and share intellectual capital related to its Blockchain adoption by developing case studies for each of its city pilots. To achieve that goal, in April 2018 Smart Dubai launched the Smart Cities Global Network, the largest international network of smart-city stakeholders. Smart Dubai aims to bring together partners that share its passion for advanced technology, Fourth Industrial Revolution breakthroughs, smart living, and spreading happiness in the community through tech-enabled, human-centric services.

Network members include representatives from government, the private sector, research centers, academic institutes, subject-matter experts, and the media. The network approach is agile and flexible, as it has no fixed time commitments and governance structures. Instead, members can join the network online and become visible to one another through the first comprehensive global smart-city directory. This visibility enables Smart Dubai and other network members to reach out to one another to exchange knowledge around the implementation of smart-city and technological initiatives; about ecosystem enablement efforts that support startups and entrepreneurs; and about skills development, publications, events, awards, and more.

Blockchain Conferences: Dubai has been hosting Blockchain experts and speakers on a regular basis in order to stimulate debate and discussion around the most pressing and controversial issues surrounding the adoption of Blockchain technology on a citywide level. The 2018 Future Blockchain Summit was the largest such conference ever held, with more than 8,000 attendees.

Academic Sector Activation: Smart Dubai is heavily engaging schools and universities in all Blockchain activities, such as pilot development, training, speaker events, and building intellectual capital. As part of Dubai's 10X program, a program launched to put Dubai ten years ahead of all other cities across all industry sectors, Smart Dubai will soon launch the Smart City Academy. The academy will be the world's first open platform for decentralized education and skill development that will run on Blockchain.

CONCLUSION

The Smart Dubai Office has developed a performance management framework that will track the progress of all the action items detailed in this case study on a regular basis.

Dubai's adoption of Blockchain technology on a citywide scale is testament to its commitment to drive innovation and provide an enabling ecosystem in which businesses and startups can thrive. Blockchain is a nascent technology, and only a bold city would make such a strong commitment to developing this technology, and to export the intellectual capital and skills that emerge so the world can learn from them.

Dubai has been a pioneer in adopting Blockchain technology and it intends to be the global leader in this field. It has both a clear vision and a roadmap for following through on its vision. Dubai strongly believes that the novel approach

and overall framework it has adopted are easily transferable to other cities. Although each city's particular context will differ in terms of the services it needs, Dubai's approach is both scalable and highly transferable.

¹ See <https://news.bitcoin.com/1-4-billion-invested-Blockchain-pwc/>.

² "The United for Smart Sustainable Cities (U4SSC) initiative is a UN initiative supported by 16 UN agencies and programs to achieve Sustainable Development Goal 11: 'Make cities and human settlements inclusive, safe, resilient and sustainable' . . . The U4SSC serves as the global platform to advocate for public policy and to encourage the use of ICTs to facilitate and ease the transition to smart sustainable cities . . . A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects." See <https://www.itu.int/en/ITU-T/ssc/201804/Pages/default.aspx>; <https://www.itu.int/en/ITU-T/ssc/united/Pages/default.aspx>.