Fact Sheet

DRIVING DIGITAL TRANSFORMATION FOR SINGAPORE'S SMART ESTATES

Background

According to IDC, US$43.5 billion will be invested in smart cities development by 2021 in smart cities technologies in Asia-Pacific (excluding Japan). A smart city is made up of many interconnected estates and as part of IMDA's digital economy efforts to strengthen Singapore's position as a leading global node for technology and innovation, IMDA is working with developers to improve environmental sustainability and operational efficiency and enhance customer service and experience.

IMDA has also been working with local technology providers and Built Environment service providers to co-create and testbed new and innovative urban solutions in Singapore with the aim to seize the market opportunities in the region. These efforts will help build local technology companies' capabilities in the areas of deep technology for smart cities solutions such as Artificial Intelligence, Augmented and Virtual Reality (AR/VR), Internet-of-things (IoT), and Vehicle-to-Everything (V2X), to enable them to seize smart city opportunities within the region.

In November 2018, IMDA announced it had set aside S$14 million over the next three years for its smart estates efforts, to support initiatives such as the Smart Estates Technology Call for Innovative Solutions (CFIS).

New projects to build tech capabilities and innovation

On 27 June 2019, IMDA announced the projects selected under the CFIS with Ascendas-Singbridge and JTC, and launch a new smart estates technology call in partnership with the Housing & Development Board ("HDB") and Frasers.

1. Call for Innovative Solutions (CFIS) with Ascendas-Singbridge and JTC

- IMDA's CFIS, in partnership with Ascendas-Singbridge Group and JTC, aims to bring estate developers and technology companies together to tackle problem statements and pilot innovative urban solutions.

- A total of 74 proposals were submitted and after a comprehensive joint-evaluation process with our partners, IMDA has selected eight projects to support with a total grant amount of $1.5m. These eight projects were chosen for their inventive concepts that can potentially assist the estate developers to enhance estate management processes and achieve more efficient use of resources. Through these projects, IMDA aims to build technology and innovative capabilities to benefit the industry.

- The appointed technology providers will pilot innovative technology to address key challenges outlined in the Smart Estates CFIS, supported with funding from IMDA. Projects Awarded for Smart Estates CFIS with Ascendas-Singbridge and JTC:

S/N	Project	About the CFIS Project
1	3D Digital Twin: Visualisation Intelligence Centre Company **Graffiquo**	A 360-degree photo-realistic view of estates with precise 3D model of buildings and areas captured using an innovative photo-grammetry method. This project will enable and automate image recognition and labelling that will allow real-time updates to assets through live streaming of information via IOT sensors directly onto the 3D model. This project by Graffiquo will allow for development of new capabilities such as 3D model of indoor environment, one that is extremely lightweight and suitable even for use on mobile devices, as well as new security measures for data integrity.
2	Project Helix Company **PropGen Technology Pte Ltd** Consortium Partner HELIX RE Pte Ltd	A tech and data platform that captures photo-realistic visual of units in any building (a) to enable marketing efforts by developers and real estate agents, (b) to help monitor real time maintenance and efficiencies at each unit, and (c) allow for asset owners to conduct accurate checks on assets before and after lease terms.

		This project by PropGen Technology will enable new capabilities such as allowing the ability to layer and "pin" multiple data points together in various units in the buildings (e.g. unstructured data from scans & 2D photos). This project will also help to convert these multiple sets of information into light-weight and cost-effective BIM models, and to develop AI engines that will work with them.
3	SMARTgreen Sensor and Artificial Intelligence Development Company **Chop Ching Hin Pte Ltd**	A live feed of the data of plant performance and with SMARTgreen Artificial Intelligence Patented Algorithm, SMARTgreen can allocate labour and resources in an on-demand basis, effectively saving water consumption, labour cost and manpower hours. By having tailored threshold and emergency points which trigger alerts, this project introduces smart landscaping that can customize requirements according to the customer's or plant's needs.
4	Smart Parking Company **Elixir Technology Pte Ltd**	The solution aims to improve the traffic ecosystem with insights derived from the analysis of parking patterns using video analytics coupled with licence plate recognition (LPR). Through the collection and analysis of real-time data, initiatives such as dynamic pricing and type of car park lot allocation (season vs time-based) can be implemented. When coupled with a Traffic Management System, the solution can provide estate owners with a holistic view of the traffic conditions within the estate. This paves the way for accurate predictive models and estate owners to make informed decisions.
5	Unmanned Retail Concep Store Using FR and AI for Seamless Shopper Experience Company **Le Tach Pte Ltd** Consortium Partner D2k Analytics	Using a combination of facial recognition, AI and predictive analytics, customers will receive curated product recommendations from an unmanned store/cafe and be able to retrieve them and make payments in a seamless manner. Data, such as visitors' tracks, heatmap, dwell time and crowd counting can be displayed on a dashboard and enable the store management to make more informed decisions to enhance customers' unique shopping experience.

6	Multi-Function Light Field Camera with Edge Analytics for an Intelligent Carpark Management System (ICMS) Company **Xjera Labs Pte Ltd**	The Intelligent Carpark Management System (ICMS) combines a new multi-function light field camera with edge analytics using XJERA LABS' Athena A.I. platform to perform an analysis of the traffic patterns (e.g. vehicle speed, vehicle counting, vehicle classification) and also develop a predictive model to predict under what scenarios is traffic likely to be congested. With an improved field of view, the new camera will help to increase the parking lot to camera ratio from the existing 3:1 to 12:1, achieving 4 times cost savings than current solutions. Incorporating the newly developed high efficiency Athena Lite model in the new cameras will enable fast and accurate edge processing and real time response.
7	IoT and Digital Twin-based Smart Building Platform Company **Anacle Systems Limited**	This Project is the first end-to-end and fully integrated IoT-to-Digital Twin-to-Artificial Intelligence Smart Building Platform with integrated AR and Utilities Management System in Singapore. The fully extensible platform monitors, analyzes and proactively manages utility consumption through the real-time intelligent anomaly detection of energy and water usage. Additionally, by leveraging a Digital Twin, users will be able to wear AR glasses and visualise virtual objects/spaces and their characteristics, even through walls.
8	SPaaS – Space as a Service Company **DP Architects Pte Ltd** Consortium Partners DP Sustainable Design Pte Ltd Eutech Cybernetic CohnReznick	Space as a Service (SPaaS) is a technology platform that integrates the Marketplace, an e-commerce platform for buyers and sellers of Smart Building and Workplace solutions, products and consulting services and an Experience Portal, which allows users to view all the information from any application or product through an integrated platform. The Marketplace and Experience Portal solution is underpinned by iviva LUCY iPaaS 2.0, the first next generation iPaaS (integration platform as a service) specifically developed for the Digital Workplace/Smart Building sector. It connects not only legacy building systems but also enterprise systems, cloud services and mobile apps and

		allows solutions to be assembled like lego blocks through an ecosystem of connectors, templates and infrastructure. The proposed SPaaS will revolutionise the way Smart building solutions are assembled, implemented and operated.

2. New Smart Estates Technology Call for Innovative Solution (CFIS) with HDB and Frasers

IMDA has been working with HDB and Frasers Property Singapore to identify problem statements and to trial innovative smart urban solutions at their newly designated sites. For this second wave of Smart Estates CFIS, in addition to welcoming innovative solutions for smart environment and estate management, there is also a focus on the community and people aspects in terms of working and living in these estates.

- Frasers: Alexandra Technopark, which comprises two high-specification business space blocks and an amenity hub in a campus environment, is located in the prominent Alexandra business corridor. The amenity hub, which is part of the recent S$45 million Asset Enhancement Initiative (AEI), houses a variety of food and beverage offerings, services and many social and communal facilities including a landscaped roof garden, barbeque pits and a function room.

- HDB: In partnership with HDB, the Centre of Building Research (CBR) in Woodlands and Oasis Terraces in Punggol, the first new generation neighbourhood center have been selected as trial sites to develop more innovative smart estates solutions.

In addition to these two partners' sites, IMDA will progressively on-board additional partners to create more opportunities for technology companies.

Related Resources

- Quotes from Industry Partners
- More information from the companies awarded for the Ascendas-Singbridge and JTC CFIS

Quotes from Industry Partners

"In high density cities like Singapore, innovation and technology are game-changers that can help provide a more livable environment for citizens. With more than 80% of the Singapore population living in HDB flats, HDB has constantly strived to incorporate smart technologies in the planning, development and management of our towns, to improve the lives of Singaporeans. Through the Call for Innovative Solutions (CFIS), we hope to open doors to more innovative ideas and solutions that could further enhance the HDB living experience."

Er. Dr. Johnny Wong
Group Director, Building & Research Institute
Housing & Development Board

"At Frasers Property Singapore, we believe that the drive towards innovation and adoption of technology is a continuous journey that will not only increase our operational efficiency, but also benefit the overall business community."

The continuously evolving technology landscape presents opportunities for businesses to come together and continually innovate to pre-empt problems and derive better solutions for common pain points.

We are pleased to collaborate with like-minded partners on the CFIS for Smart Estates, and we look forward to more opportunities for deeper collaboration as we seek sustainable long term business solutions."

Mr Low Chee Wah
Senior Executive Vice President, Head of Retail & Commercial
Frasers Property Singapore

Awarded Companies for Smart Estate Call for Innovation Solutions

1. Graffiquo Pte Ltd

- Graffiquo is a Singapore based company that believes in providing real digital twin platform to collaborate and aggregate IoT devices, pictures and applications in a geospatial eco-system. Our key technologies encompass photogrammetry processing on an innovative, shareable platform with collaborative business applications. Our solution provides an integrated approach to IoT, Big Data and serves as a visualisation platform for enterprise applications.

2. PropGen Technology Pte Ltd

• Propgen has experience in real estate management and capability in system integration (BIM), Boustead: integration of Building Information Management construction and into site management.

3. Anacle Systems Limited

• Anacle designs and develops innovative and practical end-to-end Smart City technologies. Founded in 2006, Anacle is headquartered in Singapore with offices in Hangzhou (China) and Pune (India). With a workforce of more than 200 full-time professionals and R&D engineers, Anacle specialises in real estate and industrial asset. Anacle is also accredited under IMDA's Accreditation@SG Digital programme (www.imda.gov.sg/accreditation).

4. Chop Ching Hin Pte Ltd

• Chop Ching Hin is a ASEAN soft-scape supplier since 1987, with more than 200 acres of nursery land, mainly based in Malaysia. Offering a diverse supply of high quality landscaping hardscape materials and soft-scape materials. Chop Ching Hin has supplied and implemented in countries of Asia such as Malaysia, Singapore, Thailand, India, Philippines, Indonesia, China. Their business scope are to supply or install landscape related works, Specialized Urban Greenery Solutions (Green wall/roofs/irrigation systems/flood mitigation and design/Storm water.

5. DP Architects Pte Ltd

• DP Architects is a multidisciplinary design consultancy group with 1,100 staff, 17 strategically linked international offices from Shanghai to London. In addition to architectural design, DP Architects has in-house capability for interior design, structural and building services engineering, sustainable design, façade design, landscape design, urban planning and design, lighting design, placemaking, wayfinding and experience design. Operating with a designFirst philosophy, the company was founded on a deep concern for the built environment and a conscious effort towards design excellence that uplifts the human experience and spirit.

6. Elixir Technology Pte Ltd

• Headquartered in Singapore, Elixir's multiple award-winning Elixir Repertoire Business Intelligence (BI) tools have been used in many organisations, both government and commercial, locally and internationally. With the introduction of Elixir Ambience Business Analytics Platform, Elixir has been active in Smart Nation Initiatives involving Video Analytics, Big Data Analytics and Visualisation, IoT Integration and Analytics, and Data Marketplace.

7. Le Tach Pte Ltd

• Le Tach Pte Ltd was incorporated in Singapore. The company begun their business in importing and operating high quality vending machines utilizing the latest technology from Japan, US and China. Leveraging on latest technology to create the One Stop Web Portal to cater for all the customers' needs. Le tach provides state of the art mobile applications to create the mobility convinces to the customer.

8. Xjera Labs Pte Ltd

• Founded in December 2013 in Singapore, Xjera Labs Pte Ltd has been dedicated to developing accurate, flexible and robust image and video analytic solutions to a wide range of applications. All Xjera Labs' VA solutions were developed based on the award winning deep-learning algorithm, IMDA video analytics challenge 2015 and Changi video analytics challenge 2017, in which Xjera's deep-learning framework out-performed algorithms developed by teams from universities, Research Institutes and commercial companies, and proved itself as one of the best of video analytics algorithm in South East Asia. Xjera Labs is the only South East Asia Video Analytic company in Nvidia's Metropolis Software Partners Program. Xjera is also accredited under IMDA's Accreditation@SG Digital programme (www.imda.gov.sg/accreditation).

About Infocomm Media Development Authority (IMDA)
The Infocomm Media Development Authority (IMDA) leads Singapore's digital transformation with infocomm media. To do this, IMDA will develop a dynamic digital economy and a cohesive digital society, driven by an exceptional infocomm media (ICM) ecosystem – by developing talent, strengthening business capabilities, and enhancing Singapore's ICM infrastructure. IMDA also regulates the telecommunications and media sectors to safeguard consumer interests while fostering a pro-business environment, and enhances Singapore's data protection regime through the Personal Data Protection Commission.

For more news and information, visit www.imda.gov.sg or follow IMDA on Facebook IMDAsg and Twitter @IMDAsg.

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