Developing Future Capabilities in Singapore's Built Environment
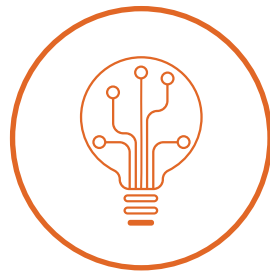
The Smart Estates Talent Development Programme

As part of Singapore's digital economy efforts, the Infocomm Media Development Authority (IMDA) has been working with property developers, technology and solution providers, and Built Environment service providers to co-develop and test innovative urban solutions to achieve greater effectiveness and efficiency in designing and managing Smart Estates. To do so, IMDA has launched the Smart Estates Initiative, focusing on three strategies:

To complement the proliferation of Smart Estates solutions and to drive thought leadership both locally and overseas, the development of Smart Estates talent and the adoption of new skills and competencies across the Built Environment value chain is essential.

The Smart Estates Talent Development Programme is a strategic initiative introduced by IMDA and SSG, in collaboration with BCA, to envision the future jobs, skills and competencies, and the talent pipeline needed to support the Smart Estates ecosystem of tomorrow. The talent and skills initiative will bring in industry demand drivers to scan future jobs, develop an integrated Smart Estates training curriculum, carry out the training and measure the impact.
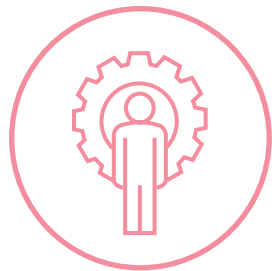
The development of Smart Estates in Singapore is supported by **3 key pillars:**

Forming strategic public-private partnerships to strengthen the Smart Estates ecosystem by developing new technology capabilities

Building innovative technologies and identifying market opportunities to deploy and scale Smart Urban solutions locally and overseas.

Developing Smart Estates Talent and driving thought leadership to enable the effective use of digital technologies and solutions throughout the Smart Estates lifecycle.
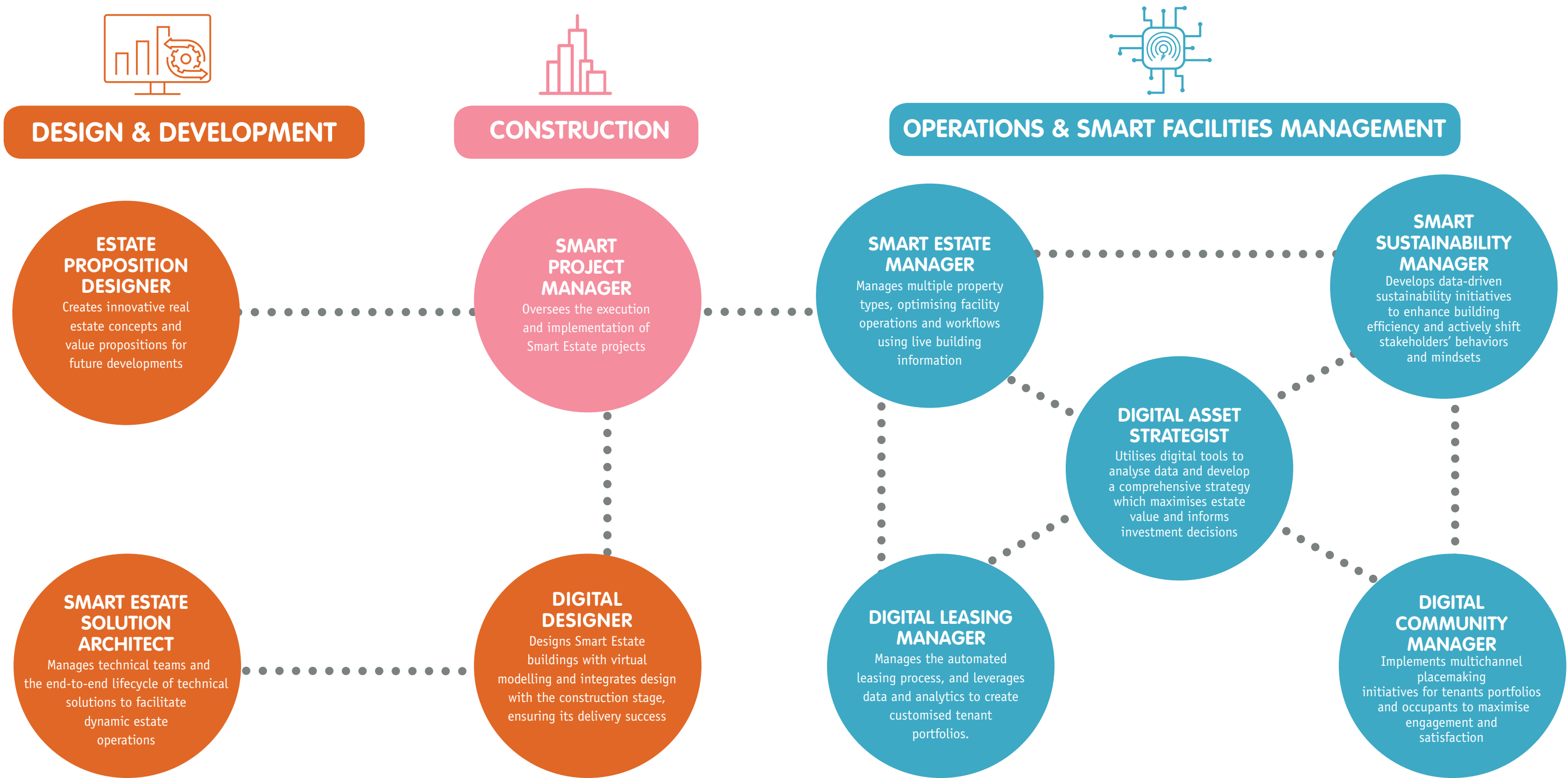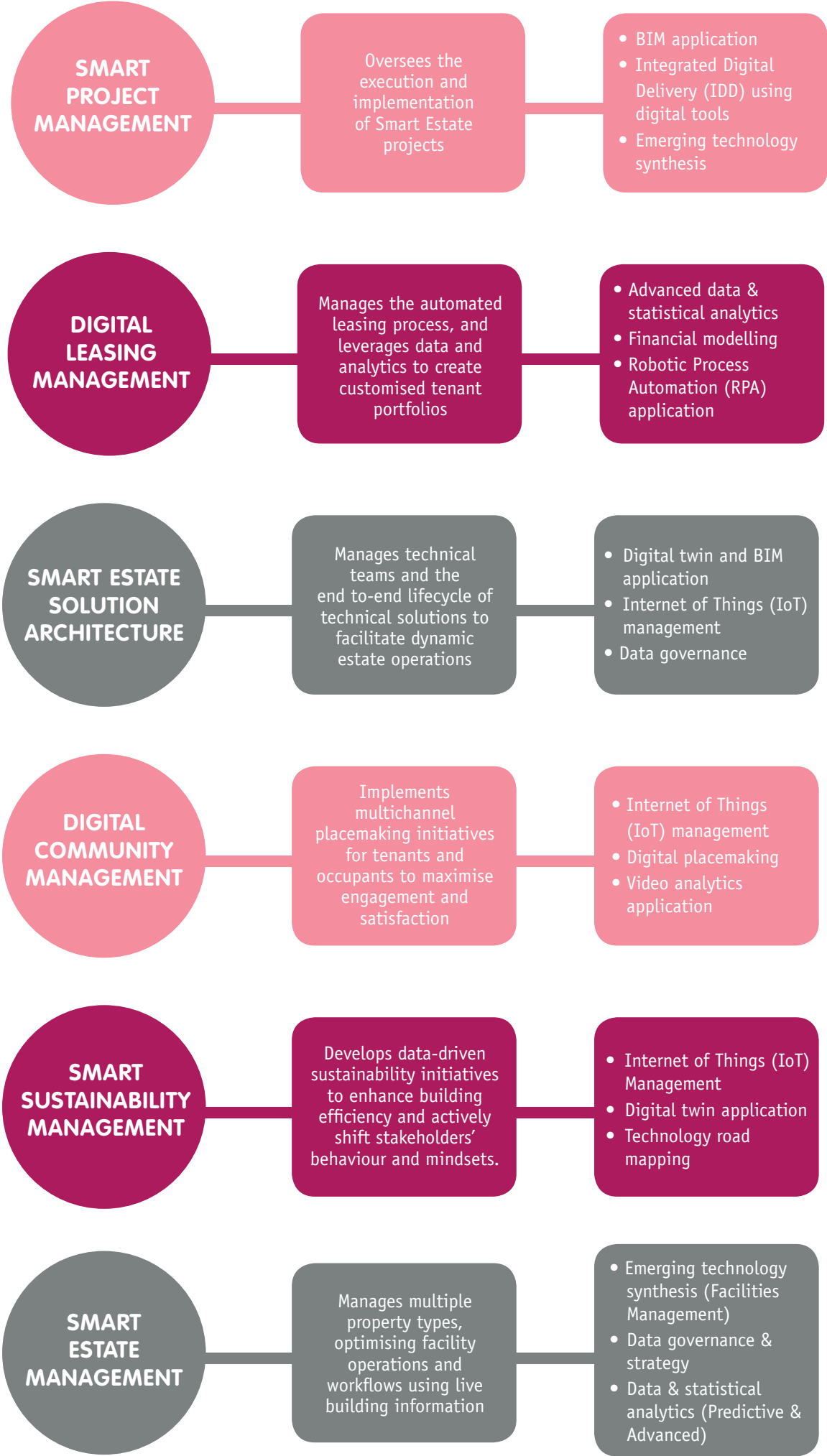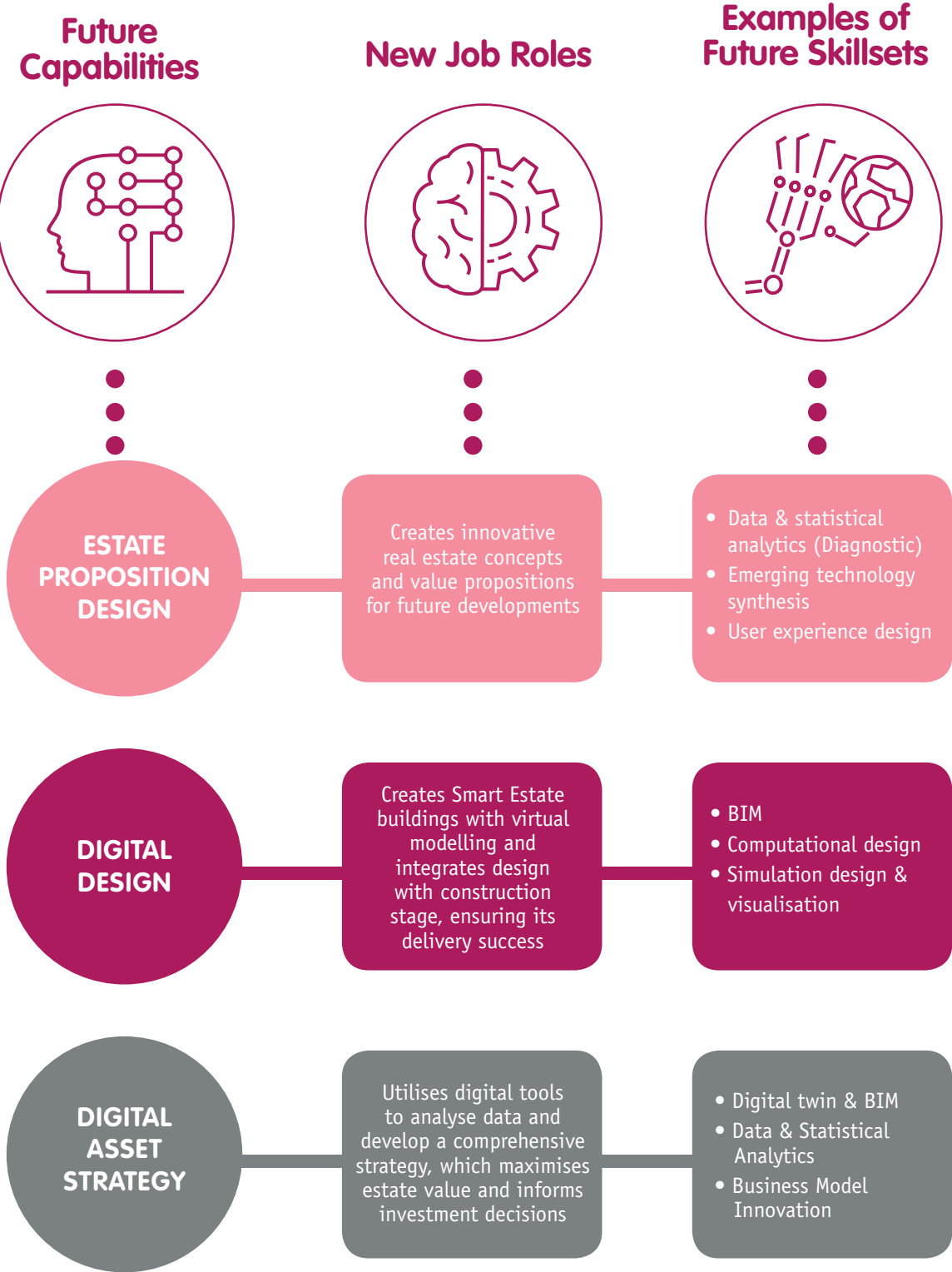
What Future Capabilities Should Businesses Invest In?

This section demonstrates an initial set of emerging job roles that firms can use as a reference to support their Smart Estates talent needs. As the respective government agencies continue to work with more industry and best-in-place players, it will be an ongoing process to grow and refine this base of job roles and skills insights.

DESIGN & DEVELOPMENT

ESTATE PROPOSITION DESIGNER
Creates innovative real estate concepts and value propositions for future developments

SMART ESTATE SOLUTION ARCHITECT
Manages technical teams and the end-to-end lifecycle of technical solutions to facilitate dynamic estate operations

CONSTRUCTION

SMART PROJECT MANAGER
Oversees the execution and implementation of Smart Estate projects

DIGITAL DESIGNER
Designs Smart Estate buildings with virtual modelling and integrates design with the construction stage, ensuring its delivery success

OPERATIONS & SMART FACILITIES MANAGEMENT

SMART ESTATE MANAGER
Manages multiple property types, optimising facility operations and workflows using live building information

SMART SUSTAINABILITY MANAGER
Develops data-driven sustainability initiatives to enhance building efficiency and actively shift stakeholders' behaviors and mindsets

DIGITAL ASSET STRATEGIST
Utilises digital tools to analyse data and develop a comprehensive strategy which maximises estate value and informs investment decisions

DIGITAL LEASING MANAGER
Manages the automated leasing process, and leverages data and analytics to create customised tenant portfolios.

DIGITAL COMMUNITY MANAGER
Implements multichannel placemaking initiatives for tenants portfolios and occupants to maximise engagement and satisfaction

What Are the Future Job Roles, Capabilities And Skillsets Needed?

Future Capabilities	New Job Roles	Examples of Future Skillsets
ESTATE PROPOSITION DESIGN	Creates innovative real estate concepts and value propositions for future developments	• Data & statistical analytics (Diagnostic) • Emerging technology synthesis • User experience design
DIGITAL DESIGN	Creates Smart Estate buildings with virtual modelling and integrates design with construction stage, ensuring its delivery success	• BIM • Computational design • Simulation design & visualisation
DIGITAL ASSET STRATEGY	Utilises digital tools to analyse data and develop a comprehensive strategy, which maximises estate value and informs investment decisions	• Digital twin & BIM • Data & Statistical Analytics • Business Model Innovation

SMART PROJECT MANAGEMENT	Oversees the execution and implementation of Smart Estate projects	• BIM application • Integrated Digital Delivery (IDD) using digital tools • Emerging technology synthesis
DIGITAL LEASING MANAGEMENT	Manages the automated leasing process, and leverages data and analytics to create customised tenant portfolios	• Advanced data & statistical analytics • Financial modelling • Robotic Process Automation (RPA) application
SMART ESTATE SOLUTION ARCHITECTURE	Manages technical teams and the end to-end lifecycle of technical solutions to facilitate dynamic estate operations	• Digital twin and BIM application • Internet of Things (IoT) management • Data governance
DIGITAL COMMUNITY MANAGEMENT	Implements multichannel placemaking initiatives for tenants and occupants to maximise engagement and satisfaction	• Internet of Things (IoT) management • Digital placemaking • Video analytics application
SMART SUSTAINABILITY MANAGEMENT	Develops data-driven sustainability initiatives to enhance building efficiency and actively shift stakeholders' behaviour and mindsets.	• Internet of Things (IoT) Management • Digital twin application • Technology road mapping
SMART ESTATE MANAGEMENT	Manages multiple property types, optimising facility operations and workflows using live building information	• Emerging technology synthesis (Facilities Management) • Data governance & strategy • Data & statistical analytics (Predictive & Advanced)

How Will Our Estates Evolve In the Future?

In order to systematically understand what capabilities will be required to drive the evolution of Smart Estates, the study by SSG, IMDA and Eden Strategy Institute, started with an initial scan of sociocultural and economic trends, international case studies, emerging technology drivers, as well as contextualisation to different Smart Estate typologies. This resulted in the following five Smart Estate scenarios in Singapore:

SOCIOCULTURAL & ECONOMIC TRENDS

- Demographic projections
- Emerging consumer demands
- New models of business and service delivery
- Policy/regulatory shifts
- Sociocultural behaviors

- Smaller and affordable homes for millennials
- Omni-channel retailing
- Experience economy
- User-centric design and design thinking
- Dependence on mobile devices
- Crowdsourcing
- Multi-modal transportation options
- Shared Economy
- Data security and privacy concerns
- Ageing population
- Customised and personalised products and services
- Multi-generational housing
- Ministry of Ageing formed to target manpower and healthcare
- Trade wars
- Rise of China

INTERNATIONAL CASE STUDIES

- Pioneering and innovative examples of smart services, products, buildings, districts, cities, innovations to surface core principles which could inspire future Smart Estates

- Centralised over-the-air software updates in Tesla products
- Customer-centric experience design at Disneyland
- Transformative retail concepts at Amazon Go
- Manufacturing and combinatorial technology at Voodoo
- Contact-free patient monitoring systems at EarlySense
- Citizens' data security concerns about Sidewalk Labs
- E-concierge guest service robots at Yotel
- Use of beacon technology at Hong Kong International Airport

TECHNOLOGY DEVELOPMENT

- Technology enablers which may drive Smart Estates management including their level of maturity, key success factors, and resource requirements to implement

- Aggregated "super" applications
- Artificial Intelligence
- Automation
- Big Data
- Cloud Computing
- Edge Computing
- Predictive Analytics
- 5G networks
- Internet-of-Things
- Digital Twin Technology
- Quantum Computers
- Advanced Robotics and Drones
- Additive Manufacturing
- Augmented and Virtual Reality
- Autonomous Vehicles
- Blockchain Technology
- Digital Biology
- 4D modeling software

SMART ESTATE TYPOLOGIES

- Education
- Sports
- Residence
- Commerce
- Business
- Industry

- Smart campuses such as Global Indian International School in Singapore and Pune, Curtin University, Manchester Metropolitan University
- Sports complexes such as Optus Stadium and Anoeta Stadium
- Smart residential estates such as Amber Park and JadeScape
- Smart retail malls such as Wanda Group's mall complexes and Westfield London
- Smart industrial or business park such as China Fortune Smart Industrial Park, Songdo International Business District, Greenpark in Finland

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SCENARIO 1: DIGITALLY ENHANCED EXPERIENTIAL SPACES

SCENARIO 2: VIRTUOUS FEEDBACK LOOPS FOR INTELLIGENT ESTATE DESIGN

SCENARIO 3: INTEGRATED CONSTRUCTION VALUE CHAINS

SCENARIO 4: LIVING LABS TO MAXIMISE ESTATE VALUE

SCENARIO 5: DYNAMIC HYPER-CONNECTED FACILITIES

For further information on the study's methodology and findings, as well as the full recommendations, please refer to the SETDP Playbook.
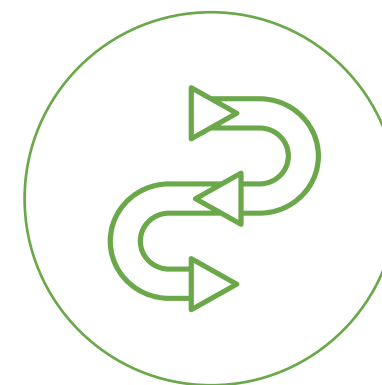
How Do I Get Started Today?

Use the Smart Estates Talent Playbook as a reference for upskilling, job redesign, and talent development

The playbook can help to provide guidance to develop your talent approach of the future, whether you are mapping training and development needs, charting career pathways, or conducting manpower forecasts.

Co-develop training curriculum with SSG and IHLs to address business needs

What are the key cost drivers and business challenges that your company faces? By mapping these elements, you can play a part to influence and shape the curriculum with SSG and the IHLs to address business needs such as improving productivity or reducing costs.

Send your employees for the Smart Estates Talent Development Programme

Sign up your employees for the applied training programme that will have a mix of skills training, project implementation, and mentorship. SSG funding is available to help offset course fees.

Reach out to SSG on how else we can support your talent and skills needs

SSG provides different kinds of support for individuals and companies to embark on skills upgrading, and life-long learning. Come talk to SSG to discuss further how you can be supported in building your talent pipeline.

About the 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.

About SkillsFuture Singapore (SSG)

SkillsFuture Singapore (SSG) drives and coordinates the implementation of the national SkillsFuture movement, promotes a culture of lifelong learning and strengthens the ecosystem of quality education and training in Singapore. Through a holistic system of national SkillsFuture initiatives, SSG enables Singaporeans to take charge of their learning journey in their pursuit of skills mastery. SSG also works with key stakeholders to ensure that students and adults have access to high quality and industry-relevant training that meet the demands of different sectors of the economy for an innovative and productive workforce.

For more information, visit www.ssg.gov.sg or follow SSG on Facebook SkillsFuture SG and LinkedIn SkillsFuture-SG.

About the Building and Construction Authority (BCA)

The Building and Construction Authority (BCA) of Singapore champions the development of an excellent built environment for Singapore. BCA's mission is to shape a safe, high quality, sustainable and friendly built environment, as these are four key elements where BCA has a significant influence. In doing so, it aims to differentiate Singapore's built environment from those of other cities and contribute to a better quality of life for everyone in Singapore. Hence, its vision is to have "a future-ready built environment for Singapore". Together with its education arm, the BCA Academy of the Built Environment, BCA works closely with its industry partners to develop skills and expertise that help shape a future-ready built environment for Singapore.

For more information, visit **www.bca.gov.sg.**

About Eden Strategy Institute

Eden Strategy Institute is a strategy consulting firm specializing in Business System Innovation. We approach the global issues of urbanization, disease, poverty, illiteracy, and exploitation by formulating strategies, models, processes, and products that help our clients create, realize, and sustain their economic impact. Eden plans and sets up industry blueprints, facilitates co-creation workshops, forecasts and evaluates the impact of policy interventions. We have supported governments and corporations to successfully bring Smart City innovations to market using qualitative and quantitative research, engineering, business planning, partnerships, and impact assessment.

To learn more about our work, please visit **www.edenstrategyinstitute.com**