

Annex D: Factsheet on BEAMP Demo Day

1 The Built Environment Accelerate to Market programme (BEAMP) facilitates the deployment of innovative solutions to the market through demand matching and funding support for start-up innovators. 14 teams from this BEAMP cycle will participate in this year's BEAMP Demo Day.

Phases in BEAMP

2 One cycle of BEAMP consists of two (2) phases:

a. Phase 1: Accelerate Solution Development Phase

In Phase 1, the solutions are “fast-tracked” to meet the needs of the industry. These needs will be identified by the industry who will also act as challenge statement owner (CSO⁷) throughout the programme. This phase is expected to take 3 – 5 months. During this solution development, regulators will also be consulted to identify possible bottlenecks that could impede the solution adoption. The outcome of Phase 1 is a minimum viable product (MVP⁸).

With a MVP, shortlisted innovators⁹ will then showcase their solution at the “Demo Day”. During “Demo Day”, the interests of stakeholders (Industry, value chain players, venture companies) are consolidated in order to solicit support for downstream solution refinement, pilot deployment and technology investment for the subsequent “Market Development” phase.

b. Phase 2: Market Development Phase

In Phase 2, CSOs are engaged with innovators to drive further solution refinement, test-bed the technology through a pilot and build up low level manufacturing capabilities to facilitate downstream adoption. This phase aims to grow demand for

⁷ CSOs stands for Challenge Statement owners. CSOs are Industry Stakeholders who proposed challenge statement(s) to address their near-term organisational challenge(s).

⁸ A minimum viable product is the most pared down version of a product that can still be released. An MVP has 3 key characteristics; i) enough value that people are willing to use or buy it initially; ii) demonstrates enough future benefit to retain early adopters; iii) provides a feedback loop to guide future development.

⁹ Innovators are solution providers who solve challenge statement(s) proposed by CSOs.

the solutions and provide a sustainable business model. This phase may take up to 18 months to yield results.

Thematic Challenges

- 3 The proposed themes for the 2nd cycle of BEAMP includes the following:
 - a. **Streamlining construction delivery processes** through Integrated Digital Delivery (IDD), Facilities Management, Maintainability and Design for Manufacturing and Assembly (DfMA) solutions. Possible solution areas are:
 - i. IDD solutions to improve productivity in DfMA and Integrated Construction Prefabrication Hubs (ICPHs) processes
 - ii. Integrated solutions for Maintainability and Quality related activities
 - iii. Smart assets management solutions
 - iv. DfMA solutions in building design
 - b. **Advancing construction technologies** through Robotic, 3D Printing and Advanced Materials. Possible solution areas are:
 - i. Development of new capabilities in 3D Printing for ICPHs
 - ii. Integrated Robotic solutions for onsite and offsite work

Program Accelerator

- 4 BCA has engaged **TNB Accelerator Pte Ltd** to co-organise the programme. TNB Accelerator will:
 - a. Surface and consolidate challenges of industry and transform them to challenge statements which are relevant and of interests to the innovation community.
 - b. Bring in innovations (locally, regionally and globally) that fit the challenge statements
 - c. Help innovators to shape their business models
 - d. Provide access to innovation network to drive innovation development and adoption (*e.g. potential solution providers, investors, VCs, production facilities, and market for solutions*)

Funding Support

5 Enterprise Singapore has a funding scheme to support shortlisted and eligible local innovators. Funding quantum would vary for local-SME¹⁰ and local non-SME innovators. To qualify as local SMEs, the companies must fulfil the following criteria:

- Registered and operating in Singapore
- Have minimum of 30% local shareholding
- Have group annual sales turnover of not more than S\$100 million or group employment of not more than 200 employees

6 Local SMEs that are shortlisted to participate in the programme will be provided with funding support of up to 70%¹¹ of the qualifying project cost, capped at S\$30,000 for phase 1 (Accelerate Solution Development Phase) and capped at S\$250,000 for phase 2 (Market Development Phase).

Examples of qualifying and non-qualifying cost are:

Qualifying Cost	Non-Qualifying Cost
<ul style="list-style-type: none"> • Manpower • Equipment and Software¹² • Professional Consultancy 	<ul style="list-style-type: none"> • Maintenance • Warranty • Common Office Equipment

7 Foreign companies are invited to participate. However, to qualify for government's funding, foreign technology providers are required to co-develop the solution with Singapore SMEs.

Proposal Evaluation

8 During proposal submission, innovators may apply for (1) Accelerate Solution Development or (2) Market Development, depending on the technical maturity of the solution proposed.

¹⁰ SME refers to Small & Medium Enterprises

¹¹ Local non-SMEs can be funded up to 50% of qualifying project cost, subjected to the same funding caps for both phases

¹² Equipment and software are supported at up to 50% for local SMEs and up to 30% for local non-SMEs

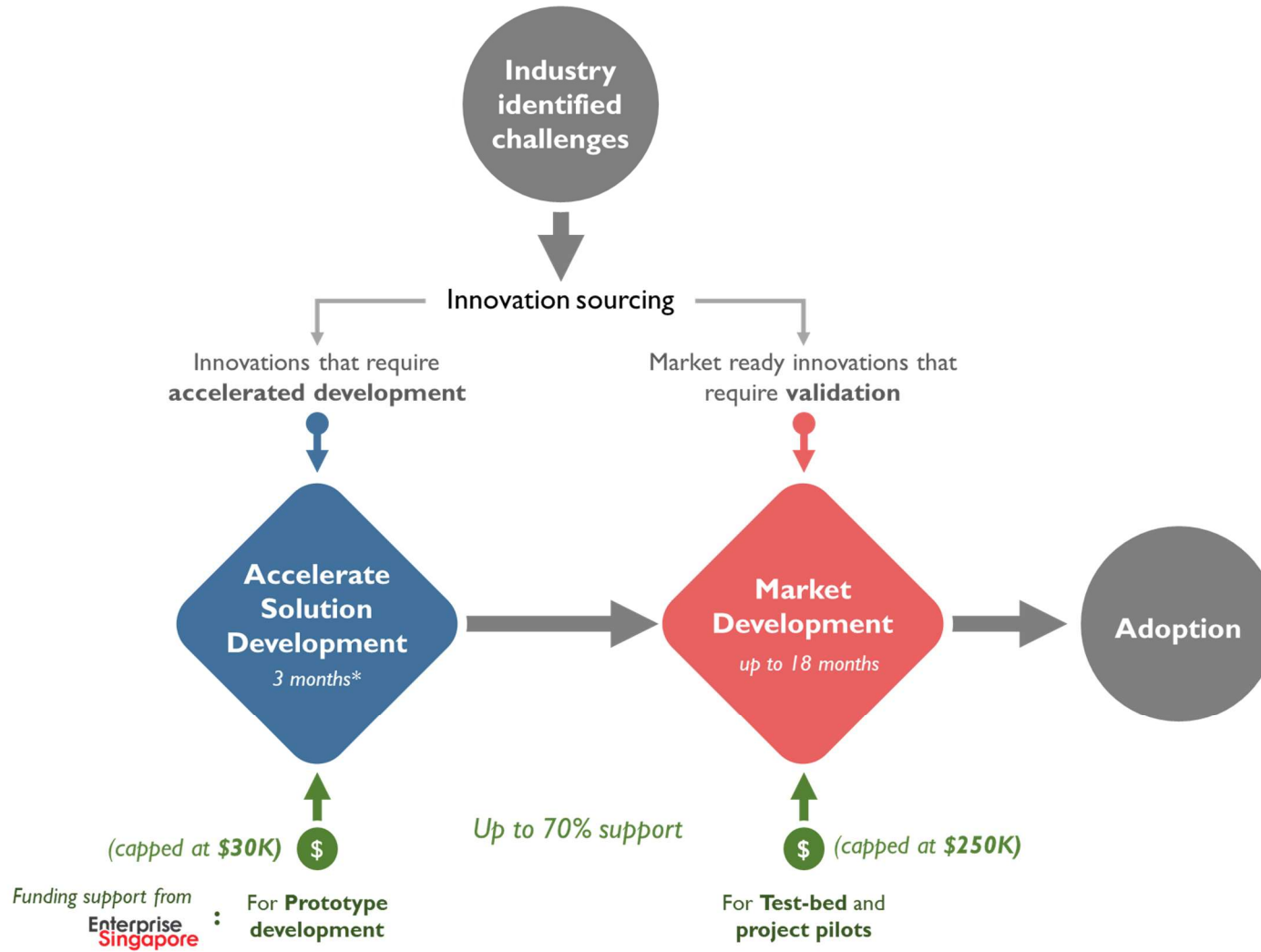
9 Assessment for accelerate solution development phase would focus on technological offering of the innovators while assessment for the market development phase would include both technological offering and financial capability of innovators. Innovators who wish to apply directly to the market development phase must fulfil the following criteria:

- Have a fully functional prototype to demonstrate on Demo Day
- Confirmation from the CSOs to test-bed/pilot the solution
- Demonstrate that the company is capable of funding the full project via means such as investments, revenue or capital

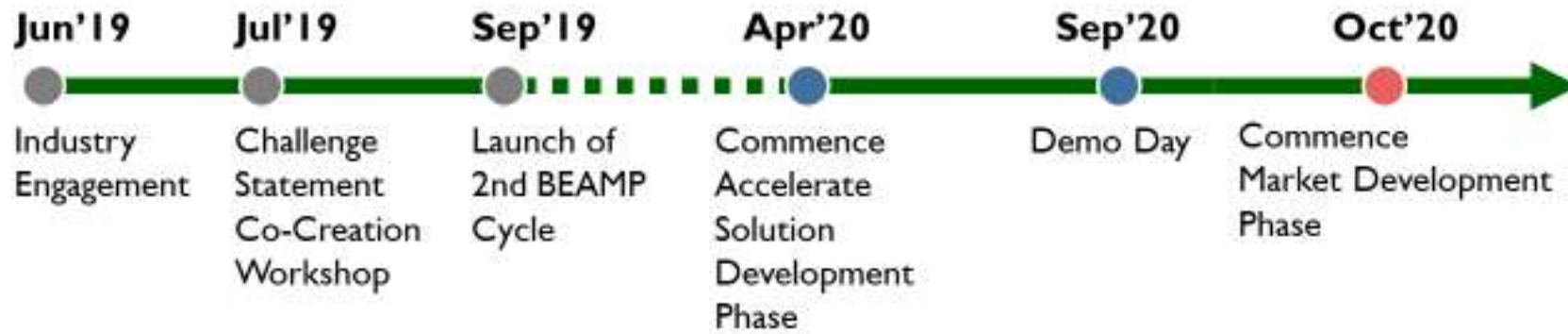
10 If the potential innovators fail to meet one or more of the above criteria, they will be further assessed on a case-by-case basis.

11 The evaluation process for both stage 1 and 2 from proposal submission to award is expected to take around 12 weeks.

Schematic flow diagram of Built Environment Accelerate to Market Programme



Programme Timeline for 2nd Built Environment Accelerate to Market Programme Cycle



List of Awarded Innovators for 1st BEAMP Cycle

1. Accelerate Solution Development Phase (9 projects)

Company:	Tagvance
Project Title:	Industrial IoT Tracking Platform
Challenge Statement Owner :	Straits Construction
Scope of the Project:	<p>Tagvance works with Straits Construction to develop an IoT network, comprising of tags and sensors riding on Long Range wireless communication (LoRa) and Bluetooth 5.0, to relay positioning data of people and assets in order to enhance work safety.</p> <p>The IoT network can potentially penetrate through dense concrete structures, track vertical positioning in both semi-confined and large spaces which are common in construction sites.</p>

Innovator:	Nucon Labs
Project Title:	Prioritisation Engine for Streamlined Coordination
Challenge Statement Owner :	Kimly Construction
Scope of the Project:	<p>Nucon Labs works with Kimly Construction to develop an AI platform, powered by historical production data, to automate the prioritisation of matters to follow-up and streamline the process of decision making for its users.</p> <p>The novelty lies in the Natural Language Processing (NLP) model in the AI platform to read natural language (especially Southeast Asian English) and extract critical information.</p>

Innovator:	Vebits
Project Title:	Smart Sensor for Detection of Foreign Objects from Aggregated Stockpiles
Challenge Statement Owner :	Samwoh Corporation
Scope of the Project:	<p>Vebits develops an affordable camera system which is able to recognise foreign objects in stockpiles through the incorporation of an AI-driven video analytics software and machine learning.</p> <p>The cost-effective solution is selected by Samwoh for its ability to separate non-metallic materials from stockpiles.</p>

Innovator:	Unabiz
Project Title:	Asset Tracking and Utilisation Monitoring with Sigfox
Challenge Statement Owner :	Samwoh Corporation
Scope of the Project:	<p>Unabiz develops cost-effective assets tracking and utility monitoring device which rides on Sigfox (i.e. Low Power Wide Area Network) network technology.</p> <p>The solution allows critical data such as location and utilisation rate of assets to be transmitted at low cost and low battery consumption.</p>

Innovator:	OneWork
Project Title:	Smart Trackers for Monitoring Workers' Health and Safety
Challenge Statement Owner :	Facebook Singapore (<i>in collaboration with Fortis Construction</i>)
Scope of the Project:	<p>The solution detects workers' health and location in urban construction on BIM platform for accident prevention and reduce critical response time.</p> <p>It is done through a safety wearable device attached to a safety helmet which integrates multiple technologies such as LPWAN (Low-Power Wide-Area), RFID (Radio-Frequency Identification), health monitoring sensors and GPS system.</p> <p>Safety supervisors are able to track workers' health and safety and movement over a backend software in construction sites with low connectivity.</p>

Innovator:	Boustead Projects
Project Title:	Integrated System for Facilities Management
Challenge Statement Owner :	Echo Base (<i>affiliated to Razer Singapore</i>)
Scope of the Project:	<p>Boustead Projects works with Echo Base to deploy an open platform that will consolidate the monitoring and execution of building-related operations.</p> <p>The main innovation is the integrated platform for all systems and devices in the building environment to leverage their data to implement complex business processes which are otherwise impossible when using the standalone systems.</p>

Innovator:	Aviation Virtual
Project Title:	BIM-based Augmented Reality for Dimensional and Spatial Verification of Building Elements
Challenge Statement Owner :	Building and Construction Authority
Scope of the Project:	<p>Aviation Virtual has developed a wearable device for BCA which maps BIM model as an augmented reality (AR) overlay onto structures or open spaces at construction sites. It facilitates the inspection process by giving real-time measurement and feedback.</p> <p>The responsiveness of the device enables real-time feedback to its users by segmenting heavy BIM file into multiple smaller segments to improve software responsiveness.</p>

Innovator:	Aviation Virtual
Project Title:	Drone-Based Scanning of Buildings for 3D Modelling
Challenge Statement Owner :	Building and Construction Authority
Scope of the Project:	<p>The solution improves the efficiency and accuracy of inspection activities by developing an integrated building inspection solution by combining multiple technologies such as LIDAR scanning, BIM-related technology and drones.</p> <p>It is adopted by BCA to demonstrate effectiveness of 3D model in virtual reality environment for data analytics.</p>

Innovator:	Aespada Technologies
Project Title:	Smart Logistics Platform
Challenge Statement Owner :	JTC Corporation
Scope of the Project:	<p>Aespada Technologies provides a smart logistics platform which allows construction companies to gain access to a network of heavy vehicle providers.</p> <p>The solution aims to reduce inefficiencies and optimise resources by connecting and coordinating the movement of assets in the construction industry.</p>

2. Market Development Phase (5 projects)

Innovator:	Qi Square
Project Title:	Digitalising Building Energy Performance Optimisation
Challenge Statement Owner :	JTC Corporation
Scope of the Project:	<p>Building on their virtual energy audit platform, QISquare works with JTC Corporation to optimise building performance by developing a multi-physics simulation model. The model will create an accurate representation of 'Digital Twins' for real-time operational control.</p> <p>The solution provides a cost effective way for building owners and developers to make continuous improvements and informed decisions such as retrofitting investments.</p>

Innovator:	VR Collab
Project Title:	Auto Checker with Virtual Reality Modelling
Challenge Statement Owner :	Housing Development Board (HDB)
Scope of the Project:	<p>VRCollab works with HDB to further develop an auto-checker module within the existing multi-user virtual reality communication tool which enables the Building Quality team to inspect a virtual mock-up instead of the conventional timber mock-up.</p> <p>The solution would improve the user experience and application by allowing end users to select and checks semantic rules based on flexible filters.</p>

Innovator:	EP Watson
Project Title:	Effective Management of Equipment Maintenance and Utility Rate
Challenge Statement Owner :	Samwoh Corporation
Scope of the Project:	<p>EP EAM is a cloud-based telematics platform for tracking off-road equipment that provides Samwoh with real-time operational intelligence to become more productive and profitable.</p> <p>EP Watson's NB-IoT tracker is ruggedised, affordable and OEM agnostic. The platform integrates with third party Can Bus devices to extract granular datapoints such as fuel consumption & diagnostic trouble codes.</p>

Innovator:	Novade
Project Title:	Innovative Predictive Planning Solution
Challenge Statement Owner :	Soilbuild Construction
Scope of the Project:	<p>Novade's platform improves full coordination of construction project with information from various stakeholders as well as project information in integration with BIM model.</p> <p>The key novelty is the real-time digitisation of coordination work that allows engineers to make informed decisions to prioritise jobs without having stakeholders to meet up in person.</p>

Innovator:	Xjera Labs
Project Title:	Innovative Tracking and Predictive System for Workplace Safety
Challenge Statement Owner :	Kimly Construction
Scope of the Project:	<p>Building on their visual analytics platform which has been deployed at Chong Qing and Tuas Port, Xjera Labs works with Kimly to further develop and enhance their analytics platform to provide warnings for safety breaches, identification of hazardous objects and rule based intrusion alerts.</p> <p>The complete solution is a holistic site safety management tool which is marketable and commercially viable for the industry.</p>