


Pillar
4


ENHANCING SUSTAINABILITY VIA DIGITALISATION

By leveraging on technology and data management that will enhance and enable Group-wide efforts in sustainable development

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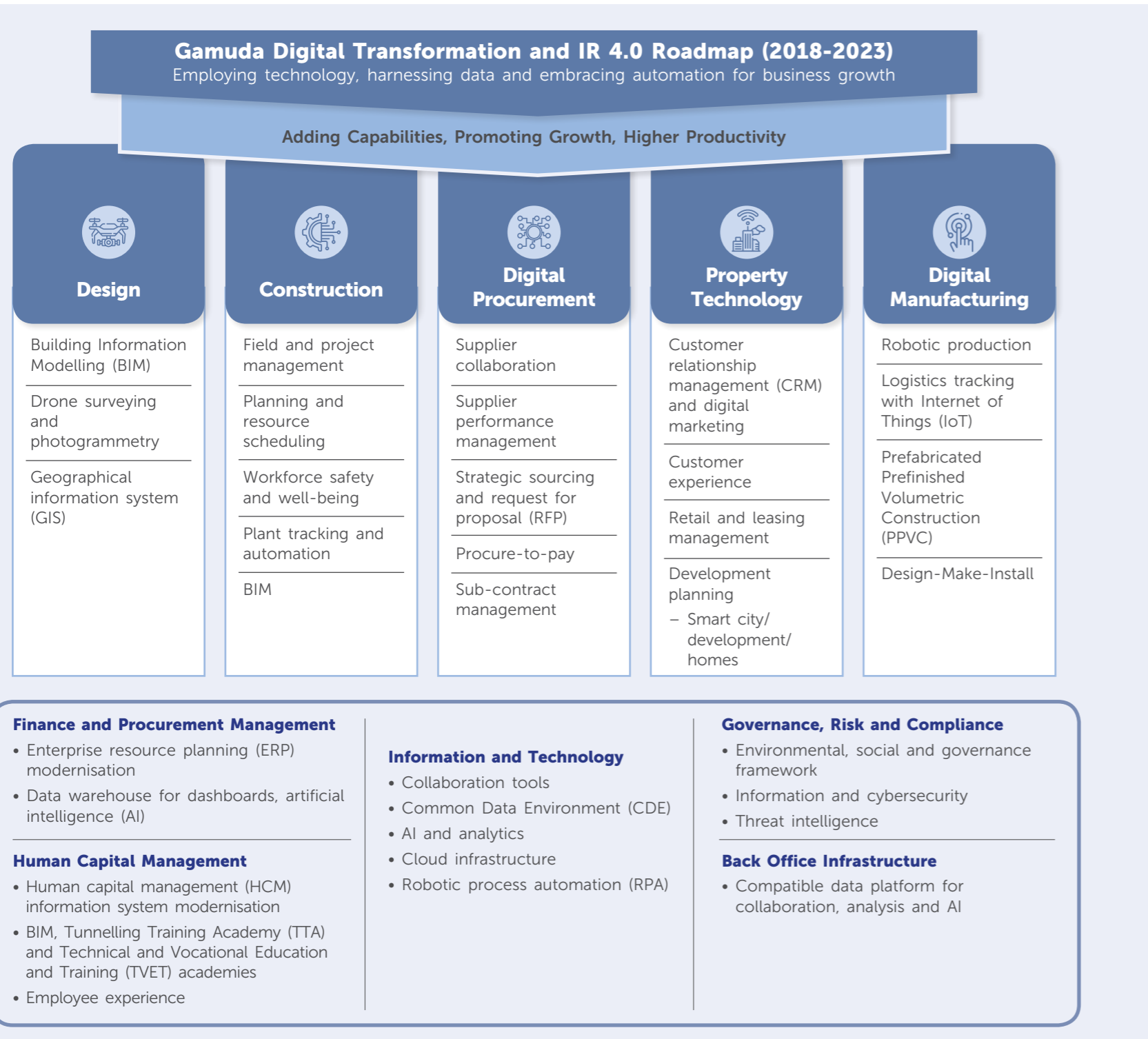


Photo: Gamuda Digital IBS factory

SUSTAINABILITY REPORT

INCREASINGLY, GAMUDA LOOKS FOR CONTINUOUS DIGITALISATION TO ENHANCE BUSINESS OPERATIONS.

The use of technology is pervasive across the Group to transform our current processes and value chain. These include Industrial Revolution 4.0 (IR 4.0), big data analytics and other technologies.



GAMUDA DIGITAL IBS

MALAYSIA'S FIRST DIGITAL IBS

Gamuda Digital Industrialised Building Systems (IBS) seeks to transform traditional delivery models and construction practices by implementing a system that facilitates improved resource usage and efficiency, reduced material wastage and quicker delivery times.

Digital IBS approach employs cutting-edge, IR 4.0 technology that drives a more sustainable approach compared to conventional construction methods.

Unlike conventional IBS systems, Digital IBS affords more flexibility in design, faster construction and superior finishes. This reduces manpower by 60 percent and is faster by 40 percent compared to conventional construction. The controlled environment in Gamuda IBS is superior to on-site set ups reducing wastage to less than one percent. Gamuda Digital IBS has independently verified by the Construction Research Institute of Malaysia to increase productivity and equip contractors for IR 4.0.

Digital IBS is a powerful production system to deliver end products that are error-free with high precision and quality. With BIM solutions, Digital IBS affords the advantage of virtual design on a CDE. This enables design to be done online amidst a shared platform, thus eliminating errors and enhancing efficiency throughout the construction process.

State-of-the-art robotics and a high degree of automation are also significant aspects of Digital IBS. These enable the manufacturing of high-quality end products that meet stringent tolerance levels. The system also enables the use of a wide range precast products towards accommodating a variety of building applications including precast bathroom pods.

Our end-to-end Digital IBS solution captures all design data online whereby drawings will be translated into construction elements and assembled on-site. Currently, we are working towards digitalising all of our management work systems.

All Gamuda Digital IBS products are *QLASSIC-compliant with construction shortened by up to a 40 percent reduction in construction duration.

Consistent quality from the manufacturing environment compared to on-site construction.

*Quality Assessment System for Building Construction Works (or QLASSIC), administered by the CIDB.

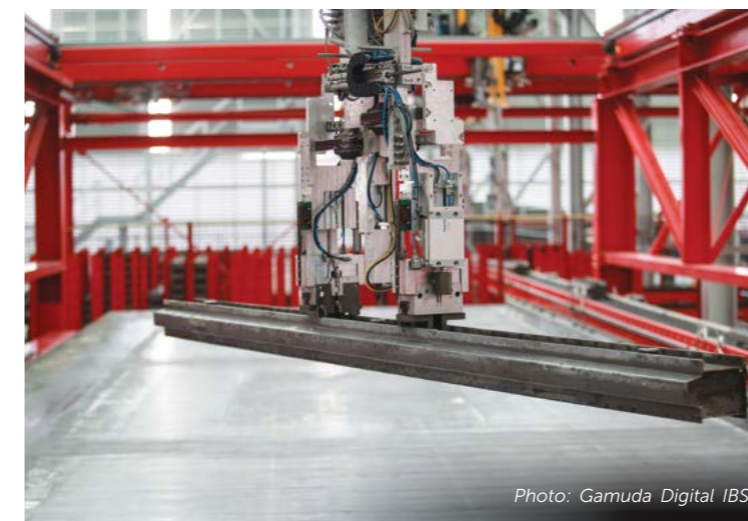


Photo: Gamuda Digital IBS

Our IBS Completed Track Record

- 40 percent faster construction
- 60 percent reduced reliance on foreign workforce
- Fully integrated BIM robotic production
- IBS score as high as 92 percent
- Australia Federal Safety Commissioner (FSC) accredited
- Proven for both high-rise and landed residential, commercial and infrastructure projects

Our Digital IBS completed track record are as follows:

- Bukit Bintang City Centre Independent Side Walls, Lucentia Residence
- Gamuda Cove, Palma Sands
- Gamuda Gardens, Gaia Residences
- GEMS Residences
- MGKT (Underground) Escape Shaft 3*
- RSKU Gamuda Gardens, Danau Ria*
- RSKU Cybervalley (PKNS), Idaman Residensi*
- RSKU Jade Hills, Gapura Bayu*
- RSKU Kota Kemuning, Pangsapuri Aranda*
- RSKU Kundang Estates, Laman Adonis*
- RSKU Puncak Bestari, Seri Seraya*
- Tun Razak Exchange (TRX) Central Plant Room Walls
- twentyfive.7, The Amber Residence

*Completed projects.
RSKU – Rumah Selangorku.

Our high-quality control standard is already seeing Digital IBS rapidly expanding into several Gamuda Land projects, including Amber Residence at twentyfive.7, Gaia Residences at Gamuda Gardens and Maya Bay Residences at Gamuda Cove. Moving forward, plans are underway to fabricate not just high-rise homes, but also luxurious landed bungalows, high-rise buildings up to 50 storeys and even public facilities like hospitals.

SUSTAINABILITY REPORT

IMPROVING BUILD QUALITY

OUR FULL-SCALE IMPLEMENTATION OF DIGITAL IBS AND BIM HAS ENABLED GAMUDA TO CONTINUOUSLY IMPROVE BUILD QUALITY.

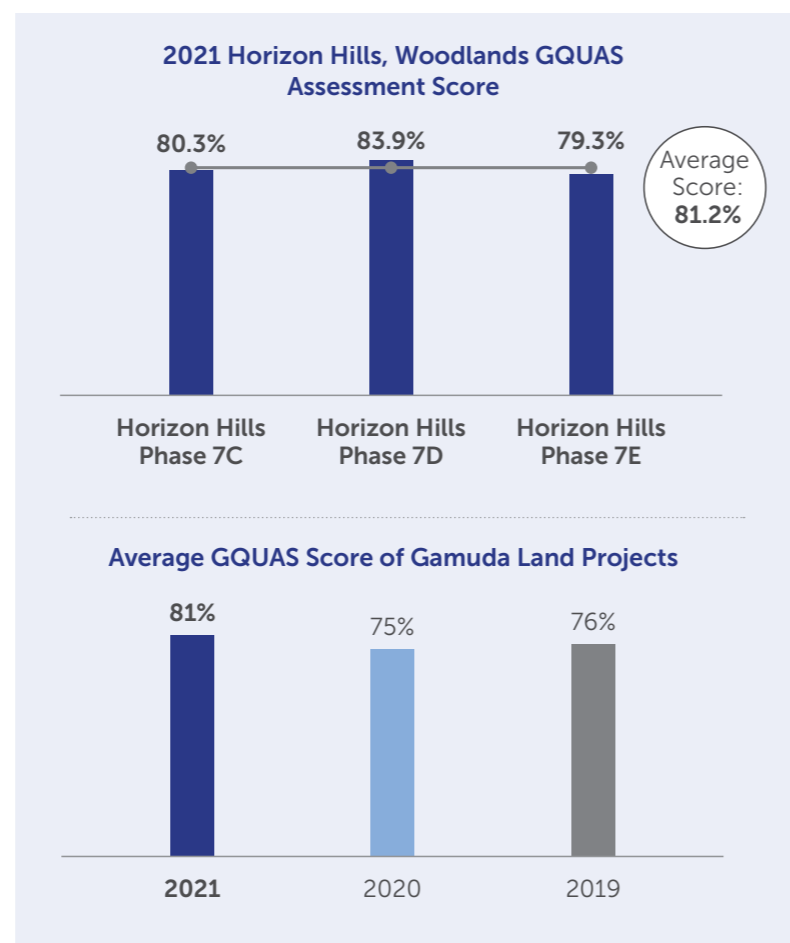
Gamuda Land continues to build upon the high scores set under the Quality Assessment System in Construction (QLASSIC) system, as stipulated by the Construction Industry Development Board (CIDB). As our ongoing projects are still in progress, no QLASSIC assessment was conducted in FY2021. On the other hand, we have completed our Gamuda Land Quality Unit Assessment System (GQUAS) evaluation and Quality Gate Assessments (QGA) for Gamuda Land's projects.

Our internal GQUAS and QGA systems evaluate our products' workmanship quality and processes. The QGA is currently conducted for all Gamuda Land's Klang Valley projects and will be expanded to Horizon Hills, Bukit Bantayan Residences as well as Vietnam projects. The objective of this assessment is to measure the constructed and in-process works against the required workmanship standards, GQUAS standards or higher specifications, identify issues and solutions to prevent recurrence and promote continuous improvements. Over the last three years, the average quality score has improved as shown in the diagram.

In FY2021, Horizon Hills, the Woodlands project underwent the GQUAS and achieved a high 81.2 percent. A total of 30 QGA sessions took place from August 2020 to 28 May 2021. No QGA sessions were conducted between June 2021 to July 2021 due to the rising COVID-19 infection cases and ensuing of the Full Movement Control Order (FMCO) and Enhanced Movement Control Order (EMCO) that limited physical mobility.

Gamuda is ahead of the curve, with our early adoption of BIM technology in the design and build of our products. Gamuda BIM is a three-dimensional (3D) model-based computerised system that involves the creation and management of digital information to facilitate the planning, designing, construction, operation and maintenance of a building or facility on a shared platform.

BIM enables the Group to improve productivity at the design stage, reduce abortive works in the construction phase and overall achieve greater efficiency in the construction process, whilst ensuring timely delivery of our projects with thoughtful placemaking. The number of Gamuda projects tapping BIM technology continues to rise through the years.



| Developments | Number of QGA sessions |
|----------------|------------------------|
| Gamuda Cove | 9 |
| Gamuda Gardens | 7 |
| twentyfive.7 | 5 |
| Jade Hills | 5 |
| Horizon Hills | 3 |
| Kota Kemuning | 1 |
| TOTAL | 30 |

BIM ENABLING TIMELY AND INTELLIGENT PROJECT PLANNING AND PROGRAMMING

This digital transformation is a paradigm shift within the Malaysia construction industry standards, as it changed the project management and supply chain collaboration, which is in line with the Construction Industry's Transformation Programme.

The strategic usefulness of BIM is applied across the Group for our property and infrastructure projects. This is best exemplified in its application to ensure on-time and on-cost delivery of mega infrastructure, such as the MRT Putrajaya Line. Gamuda remains one of the few companies in the world to implement BIM Level 2 for rail and tunnelling infrastructure project of this scale and complexity. This complexity is largely materialised in the massive coordination of multiple disciplines working in tandem to deliver a successful project.

Through BIM, these three key disciplines can simultaneously look at smaller details and the bigger picture by communicating with consultants and other auxiliary departments like Approval Management Department, Contract and Commercial Department and Project Management Department (PMD) to bring together the various work sections – Civil, Structural, Stations and Systems.

Gamuda is currently in the process of getting ISO 19650 certification (international standard for managing information over the whole life cycle of a built asset using BIM). This will bring more meaning to our efforts to digitalise our construction processes while minimising environmental footprint, in this case omitting the dependency on paper, reducing resources and ensuring precise projection of material usage.

- Design and Technical**
Elements such as construction design, alignment, station location and costing
- Project Management**
Responsible for executing and monitoring the entire construction, which entails ensuring smooth work progress, the safety of all contractors and overall work quality
- Planning and Programming**
Responsible for overseeing the successful construction of the project at the highest quality within the stipulated budget and timeframe

Building Information Modelling Augmented Reality (BIMAR) Application

BIMAR is a first generation augmented reality application for buildings, construction sites and infrastructure projects. It allows asset owners, project developers, facility managers, contractors and architects to visualise and interact with customised BIM models on-site and off-site. In November 2020, MMC Gamuda KVMRT (T) Sdn Bhd (MGKT) leveraged on the BIMAR App and took top honours in the **Malaysian Technological Excellence Awards (MTEA) 2020** under the Augmented Reality and Virtual Reality (Engineering) category.

Along with various cloud-enabled functions which allow direct reporting from the field, BIMAR is scalable and customisable to facilitate seamless, large-scale roll-out across mega infrastructure projects in a short time in line with IR 4.0 trends.

INTEGRATED DIGITAL ECOSYSTEM

The ongoing pandemic has further stressed the importance of leveraging digital technologies in our business for faster decision-making and more automated procedures, especially when it comes to managing our larger value chain of suppliers and tenders.

Since 2018, the Group has digitised procurement processes to minimise processing efforts and increase transparency. Gamuda has further invested in a new-generation ERP platform – SAP S/4HANA. Its in-memory capabilities will allow faster and data-driven decisions in a more efficient manner. This is implemented Group-wide by phase basis.





Sustainable Procurement through SAP Ariba

At Gamuda, we ensure fair and transparent procurement practices for all our projects and dealings with vendors and suppliers. Anchored by the Group Procurement Policies and Procedures and the Gamuda Procurement Code of Conduct which gives rise to these three premises:

- Ethical, Fair and Transparent Sourcing**
- Sustainable Resource Management**
- Local Sourcing**

SUSTAINABILITY REPORT

Four SAP Ariba modules have been implemented between October 2018 to April 2019. These are:




| | | | |
|---|---|--|--|
|  <p>Strategic Sourcing</p> <p>Handles the RFP, quotation and tender processes. Its electronic templates support faster requests for information and quotation, facilitate technical and commercial scoring, and are powered by a robust e-auction platform.</p> |  <p>Procure-to-Pay</p> <p>Supports the process of requisitioning, purchasing, receiving, paying and accounting for indirect goods and services. The Group will deploy this by phases as it empowers efficiency in employee self-service, enabling governance and control.</p> |  <p>Supplier Life Cycle Performance Management</p> <p>Consolidates supplier information, allowing suppliers to self-serve in updating their company and compliance information in line with Gamuda's high compliance and sustainability targets. Periodic supplier performance evaluation can be automatically facilitated and computed by the system.</p> |  <p>Contract Management</p> <p>Centralises commercial and business transaction contract management. It monitors and manages commitments as well as the supplier's performance as per these contracts. This online collaboration between suppliers and tenderers increases response times and reduces paper work.</p> |
|---|---|--|--|

Since the digitalisation of procurement and supply chain processes, the Group had achieved more than RM300 million in savings through supply chain collaboration to achieve more competitive pricing in delivering superior values to project stakeholders. A holistic digitalisation initiative in procurement eliminate significant paper consumption that circulating in the supply chain processes.

A fast in-memory cloud ERP platform with real-time analytics, the SAP S/4HANA system is embedded across the Group's organisation and subsidiaries, allowing us to take advantage of growing data streams on the project management, trading activities, procurement and finance automation fronts. This e-management approach provides greater clarity, transparency and insight.

EMBRACING THE DIGITAL LEAP THROUGH GAMUDA EXCELLENCE TRANSFORMATION

The Gamuda Excellence Transformation (GET) unit is the Group's pool of digital and data experts. GET has the mandate of elevating digital excellence in partnership with all business units and employees through employee empowerment, championing digital engineering, driving innovation programmes and catalysing innovation opportunities.

| | |
|--|---|
| <p>DIGITAL ENGINEERING GOVERNANCE</p> <p>Developing our technology landscape and talent pool in digital engineering</p>  | <p>DIGITAL EMPOWERMENT</p> <p>Creating innovation leaders and empowering them to innovate in their teams</p>  |
| <p>DATA EXCELLENCE</p> <p>Innovating processes in the company and creating digital growth opportunities</p>  | <p>DATA HERO COMMUNITY</p> <p>Providing a steady pipeline of innovative talents and disruptive ideas</p>  |

GET drives a variety of internal digital-centric programmes through designated incubators that support and execute the GET initiative and its core team:

