Maritime Digitalisation Playbook

Annexes

| Supplements for Shipping Line, Ship Agency, Ship Management and Harbour Craft subsectors |
| Self Assessment Checklist |
| Digital Transformation Proposal Template (Guide) |
| Digital Transformation Proposal Template (Actual) |
A1a) Shipping Lines Supplement

- Sub-sector DAI Scores
- Sub-sector Technology Use-Cases
- Case Study
Subsector DAI Scores

Results from the 2020 DAI Sectoral Studies
Shipping Line MNC/LLCs in Singapore are Digital Literates

Face largest gap with global peers in integration with ecosystems, new digital growth, digitise the core

1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector
Source: IMDA DAI assessment
Shipping Line MNC/LLCs aspire to be Digital Performers in 3 years' time

Target uplift of ~30 points in 3 years

Source: IMDA DAI assessment
Shipping Line MNC/LLCs: Need to focus on data, ways of working, platforms

Top 5 Dimensions with largest gaps and highest importance

- Data strategy
- Data governance
- Digital transformation accelerator
- Leadership & culture
- Digital & data platforms

1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector
2. Determined by gap between current digital maturity and target state of organisations in three years
Source: IMDA DAI assessment
Shipping Line SMEs in Singapore are Digital Starters
Face largest gap with global peers in integration with ecosystems, strategy, digitise the core, new digital growth

1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector
Source: IMDA DAI assessment

<table>
<thead>
<tr>
<th>DAI building blocks</th>
<th>Singapore Shipping Line SME</th>
<th>Singapore Sea Transport SME</th>
<th>Global Sea Transport SME</th>
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<td>Business strategy driven by digital</td>
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<td>Support functions</td>
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<td>New growth</td>
<td>New Digital Growth</td>
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<td>Enablers</td>
<td>Changing ways of working</td>
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<td>Leveraging the power of data &amp; tech</td>
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<td>Integrating ecosystems</td>
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<table>
<thead>
<tr>
<th>DAI Total</th>
<th>0</th>
<th>25</th>
<th>50</th>
<th>75</th>
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<tr>
<td>Starter</td>
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<td>Literate</td>
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<td>Performer</td>
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<td>Leader</td>
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</tbody>
</table>

A1a) Shipping Lines - DAI scores
Shipping Line SMEs aspire to be Digital Literates in 3 years' time

<table>
<thead>
<tr>
<th>SME</th>
<th>DAI</th>
<th>DIGITIZE THE CORE</th>
<th>OPERATIONS</th>
<th>SUPPORT FUNCTIONS</th>
<th>NEW DIGITAL GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SME</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>13</td>
<td>14</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CHANGING WAYS OF WORKING</th>
<th>LEVERAGING THE POWER OF DATA &amp; TECHNOLOGY</th>
<th>INTEGRATING ECOSYSTEMS</th>
</tr>
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<tbody>
<tr>
<td>13</td>
<td>13</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business Strategy Driven by Digital</th>
</tr>
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<tbody>
<tr>
<td>CUSTOMER OFFER &amp; GO-TO MARKET</td>
</tr>
<tr>
<td>OPERATIONS</td>
</tr>
<tr>
<td>SUPPORT FUNCTIONS</td>
</tr>
<tr>
<td>NEW DIGITAL GROWTH</td>
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</thead>
<tbody>
<tr>
<td>37</td>
<td>38</td>
<td>25</td>
</tr>
</tbody>
</table>

**Digital starter**
- DAI: 0-8
- 9-17
- 18-24

**Digital literate**
- DAI: 25-33
- 34-41
- 42-49
- 50-57
- 58-65
- 66-74

**Digital performer**
- DAI: 75-82
- 83-91
- 92-100

**Digital leader**
- DAI: N/A

Target uplift of ~20 points in 3 years

Source: IMDA DAI assessment
Shipping Line SMEs: Need to focus on strategy, cybersecurity and data

Top 5 Dimensions with largest gaps and highest importance

- Cybersecurity
- Vision
- Data strategy
- Priorities and alignment
- Ambition

1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector; 2. Determined by gap between current digital maturity and target state of organisations in three years
Source: IMDA DAI assessment
Technology Use Cases

How technologies are used by Shipping Lines across the value chain
Examples of digital opportunities within Shipping Lines

<table>
<thead>
<tr>
<th>Category</th>
<th>Core processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>Voyage cost optimization</td>
</tr>
<tr>
<td>Operations</td>
<td>Vessel management</td>
</tr>
<tr>
<td></td>
<td>Logistics operations</td>
</tr>
<tr>
<td></td>
<td>Terminal management</td>
</tr>
<tr>
<td>Commercial</td>
<td>Freight Pricing</td>
</tr>
<tr>
<td>Support</td>
<td>Shared services</td>
</tr>
</tbody>
</table>

Existing opportunities

- **Digital platforms**
  - Network optimisation
  - Cargo optimisation
  - Empty repositioning
  - Route optimisation
- **Internet of Things**
  - Environment monitoring
  - Threat detection & prevention
  - End-to-end, real time supply chain visibility
  - Fuel management
  - Condition-based monitoring
- **Advanced Analytics**
  - Organisational platforms
  - Online, one-click booking
  - Personalized, dynamic pricing
  - Tracking of customer issues
  - Cargo tracking dashboard
  - Broader ecosystem platforms
  - Freight benchmarking platforms
  - Digital freight forwarders
  - Chartering platforms
- **Robotic process automation**
  - Software automation of previously manual, paper-driven processes
- **Cyber Security**
  - Security assurance of customer data, operational data
  - Quicker isolation of cyber attacks & incidents
- **Blockchain Technology**
  - Advancement and sophistication of current analytics through AI/ML techniques
  - Cross-border supply chain platform
  - Trade transaction platform
  - Autonomous vessels
  - Delivery of documentation/supplies via drones
- **Artificial Intelligence**
  - Insurance and claims handling
  - Invoice and payment management (smart contracts)
- **Virtual/ Augmented reality**
  - Insurance and claims handling
  - Invoice and payment management (smart contracts)
- **Autonomous ships & drones**
  - Insurance and claims handling
  - Invoice and payment management (smart contracts)

Impact (needs-based)  
Adoption

1. Covers stowage, monitoring of cargo conditions and tasks related to loading/unloading of cargo across vessels/ports; 2. Covers cargo documentation, data transfer of cargo-level information, etc. 3. Warehousing, intermodal operations, etc. 4. Route management, embarking/disembarking of vessels, etc. 5. Chandlers, classifications agencies, bunkerers, etc. 6. Customs agencies, port authorities, etc. 7. HR, invoice/billing, general IT, etc. 8. Includes financing, insuring, legal work, etc.

Source: Expert interviews, BCG analysis
Case Study: A.P. Moller – Maersk

Highlighting best practices and key success factors
A.P. Moller – Maersk is one of the largest transport and logistics organisation in the world, with over 76,000 employees, a fleet size of over 1,000 vessels and offices in 130 countries.

Amidst an atmosphere of overcapacity and margin pressures, increasing shippers’ demands and rising emphasis on climate concerns, how is A.P. Moller – Maersk leveraging digitalisation to remain as a leader?
Maersk has embraced digitalisation and integrated it throughout its organisation and offerings ...

- Using digital platforms to provide best-in-class customer service
- Centering core operations around big data & analytics
- Incubating & operationalizing new digital solutions alongside its core
- Instilling an organisational culture that is conducive for innovation to happen
- Making a longer-term bet through ecosystem-wide integration

**Clear commitment for the organisation to invest in digitalisation**
... both in the short-term and for the long-run

<table>
<thead>
<tr>
<th><strong><a href="http://www.maersk.com">www.maersk.com</a></strong></th>
<th><strong>Direct online booking of containers with Alibaba</strong></th>
<th><strong>Maersk Spot</strong></th>
<th><strong>Customer360 dashboard</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Main platform incorporating booking, quotes, tracking, MyFinance etc.</td>
<td>enabling ...</td>
<td>Platform that guarantees customers cargo space with fixed, transparent pricing</td>
<td>enabling quick identification and resolution of raised issues</td>
</tr>
</tbody>
</table>

**Digitalisation of operating backbone**, enabling use of supply chain information across core processes

- Advanced voyage & cargo optimization
- Predictive maintenance
- Remote container management (e.g. reefers)
- E2E cargo tracking
- ... and many more

**Maersk Trade Finance** – digital trade finance solution covering online KYC, credit evaluation, and disbursement

**Twill** - a virtual freight forwarder developed by Maersk Damco, integrated with its infrastructure

**Application Programming Interface (API)**, enabling customers to receive SC information in standardized formats, further used for other applications

**Creation & assignment of Chief Digital Officer role**

**Separate digital organisation** of ~300 employees,

**Hiring of non-traditional shipping talent** (e.g. experts in AI/ML, data science, etc.)

**Adoption of Agile methodology** throughout projects

**Collaboration with IBM to build TradeLens, a supply chain ecosystem built on block chain**

Source: BCG analysis, press releases, expert interviews
... bringing tangible benefits to its organisation & customers

### Maersk as a organisation

| **Using digital platforms to provide best-in-class customer service** |
| **Centering core operations around big data & analytics** |
| **Incubating & operationalizing new digital solutions alongside its core** |
| **Instilling a organisational culture that is conducive for innovation to happen** |
| **Making a longer-term bet through ecosystem-wide integration** |

| **Maersk's customers** |
| **Higher predictability and reliability of cargo bookings** |
| **Reduction of manual, transactions: now done seamlessly online** |

| **Improved customer retention rate** |
| **More efficient planning of operations (e.g. reduction of roll overs and overbookings)** |

| **Increase in cost efficiencies (e.g., voyage optimization, cargo optimization and predictive maintenance)** |
| **Reduction in vessel emissions (e.g. through voyage optimization and reduced call time)** |
| **Real-time visibility in tracking of shipments** |
| **Improved efficiencies of internal systems through integration with Maersk's supply chain data** |

| **Future-proofing against the digitalisation tide by entrenching itself and increasing its importance to the overall ecosystem** |
| **New revenue streams (e.g., monetization of analytics and financial services—insurance and trade financing)** |
| **Access to new services (e.g., container analytics, trade financing, etc.)** |
| **(and in the near future) Potentially, a truly end-to-end logistics journey through a single platform** |

Source: BCG analysis, press releases, expert interviews
Maersk’s digitalisation success is centered around five key success factors:

1. **Digital Vision**
   - Maersk has a clearly defined digital ambition & plan.

2. **Customer Centricity**
   - With Twill, Maersk started by looking at the pain points faced by its own customers.

3. **Data Foundation**
   - Data is crucial and Maersk has gradually integrated data collection throughout its supply chain.

4. **Strong Partnerships**
   - Maersk’s partners plug skillset gaps within its organisation – e.g. IBM.

5. **New ways of working**
   - In its digital arm, Maersk incorporates non-traditional shipping talent with new ways of working (e.g. Agile).

Source: BCG analysis and expert interviews.
A1b) Ship Management Supplement
Subsector DAI Scores

Results from the 2020 DAI Sectoral Studies
Ship Management MNC/LLCs in Singapore are Digital Literates

Face largest gap with global peers in integration with ecosystems, new digital growth, digitising the core

1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector
Source: IMDA DAI assessment
Ship Management MNC/LLCs aspire to be Digital Performers in 3 years' time

Target uplift of ~40 points in 3 years

Source: IMDA DAI assessment
Ship Management MNC/LLCs: Need to focus on digital transformation accelerator, data, digitising the core

1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector.
2. Determined by gap between current digital maturity and target state of organisations in three years.
Source: IMDA DAI assessment
Ship Management SMEs in Singapore are Digital Starters

Face largest gap with global peers in integration with ecosystems, new digital growth, digitising the core

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<td>New growth</td>
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1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector.
Source: IMDA DAI assessment
Ship Management SMEs aspire to be Digital Performers in 3 years' time

Source: IMDA DAI assessment
Ship Management SMEs: Need to focus on cybersecurity, data, lighthouses & prototyping, vision

1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector
2. Determined by gap between current digital maturity and target state of organisations in three years
Source: IMDA DAI assessment
Technology Use Cases

How technologies are used by Ship Management across the value chain
Examples of digital opportunities within Ship Management

**Existing opportunities**

- **Digital platforms**
  - Route optimisation
  - Predictive maintenance
- **Internet of Things**
  - Emissions monitoring
  - Event detection (traffic accidents, hardware malfunctions, etc.)
  - Fuel management
- **Advanced Analytics**
  - Traceability of product parts and parts supplier
  - Physical access management
  - P2P exchange platform of maintenance cycles
  - Employee certificate records
- **Robotic process automation**
  - Software automation of previously manual, paper-driven processes
- **Cyber Security**
  - Security assurance of customer data, operational data
  - Quicker isolation of cyber attacks & incidents
- **Blockchain Technology**
  - Advancement and sophistication of current analytics through AI/ML techniques
- **Artificial Intelligence**
  - Advancement and sophistication of current analytics through AI/ML techniques
- **Virtual/augmented reality**
  - Drone deliveries
- **Autonomous ships and drones**
  - Autonomous vessels

**Impact (needs-based)**

- High
- Med
- Low

**Adoption**

- No
- Low
- Med
- High

**Category**

- Core processes
  - Planning
    - Voyage cost optimisation
    - Route optimisation
  - Operations
    - Vessel maintenance
    - Emissions management
    - Cargo monitoring
    - Incident management
    - Safety management
    - Crew management
    - Customer support
  - Commercial
    - Pricing
    - Booking
    - Sales outreach
  - Support
    - Shared services
    - Procurement

**Case study**

(please see Slides 67 - 71)

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1. Includes HR, invoice/payments, general IT, etc.
Source: Expert interviews, BCG analysis
Case Study: OSM Maritime

Highlighting best practices and key success factors
With a focus on providing the best customer service and capitalising on the rise of new skills and job profiles, how has OSM Maritime doubled down on its digitalisation efforts in the last few years?

OSM Maritime is a ship management company with more than 12,000 employees, managing a fleet size of over 500 vessels from ~30 offices around the globe.
OSM Maritime has embraced digitalisation and integrated it throughout its organization and offerings ...

- **Using digital platforms to improve operations and customer service**
  - Analytics dashboard of on-ship operations, showing leading and lagging indicators for operational risk, which can be used for predictive safety measures
  - Customer portal continuously enhanced and integrated into customers’ own systems for tracking of on-ship operations

- **Ensuring internal systems are scalable and standardised**
  - Reducing legacy systems and shifting remaining systems into cloud to ensure easier, faster access
  - Global HR platforms for both seafarers and shore staff largely integrated across all offices

- **Optimising the quality of data collected and analysed**
  - Optimising fragmented landscape of tools
    Connecting various systems used by each shipowner to a common system, and ultimately aiming to transition to one system used by OSM, for operational efficiency
  - Robotic Process Automation to simplify highly repetitive processes e.g. payroll processing
  - Advocating use of people collaboration tools e.g. Microsoft Teams, removing dependence on physical location

- **Streamlining the ways of working among staff**
  - Use of VR to design virtual classrooms for seafarer training
  - Platform for self-generated learning content, paired with competency and methodology to enable fast rollout of new content in <7 days

- **Tech-enabled learning to keep staff up-to-date on latest skills**
  - Tech-enabled learning to keep staff up-to-date on latest skills

Source: Expert interviews
... bringing tangible benefits to its organisation & customers

<table>
<thead>
<tr>
<th>OSM as a company</th>
<th>OSM’s customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved <em>seafarer performance</em> through more transparent and data-driven decision making</td>
<td><em>Increased suite of products offered</em> (e.g. medical, training aspects of crew management) based on their needs</td>
</tr>
<tr>
<td>Improved <em>customer retention, customer growth rate</em> through providing services over and above relatively commoditised field</td>
<td><em>Improved use of data as source of business insights</em> due to better data collection and analysis by OSM</td>
</tr>
<tr>
<td><em>Increase in productivity by double-digit % growth</em> (less new staff recruited to handle higher volume of business)</td>
<td><em>Improved employee retention</em> with more streamlined job scope</td>
</tr>
<tr>
<td><em>Increase in skillsets of staff</em> to handle more value-added tasks rather than transactional processes</td>
<td><em>Improved quality of service enjoyed</em> with better-trained seafarers and shore staff</td>
</tr>
</tbody>
</table>

Using digital platforms to improve operations and customer service

Ensuring internal systems are scalable and standardised

Optimising the quality of data collected and analysed

Streamlining the ways of working among staff

Tech-enabled learning to keep staff up-to-date on latest skills

Source: Expert interviews
OSM Maritime's digitalisation success is centered around six key success factors

OSM employs and retains staff with right competence and attitude, embodied in their slogan: "It's all about people"

OSM recognises quality data as a crucial foundation to generating accurate insights

OSM moves fast in its initiatives, while remaining humble to what it can do better

OSM involves its customers in product development to ensure the end product is relevant to its customers

Senior management in OSM lead by example, know when to push through when required and when to adapt

Strong public-private collaboration through frequent dialogues with MPA, as well as active involvement in initiatives such as the Circle of Digital Innovators (CDO) network and PIER71 Programme

Source: Expert interviews
A1c) Ship Agency Supplement
Subsector DAI Scores

Results from the 2020 DAI Sectoral Studies
Ship Agency SMEs in Singapore are Digital Starters

Face largest gap with global peers in integration with ecosystems, new digital growth, digitising the core

1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector
Source: IMDA DAI assessment
Ship Agency SMEs aspire to be Digital Literates in 3 years' time

Source: IMDA DAI assessment
Ship Agency SMEs: Need to focus on strategy, data, new digital services

Top 5 Dimensions with largest gaps and highest importance

- Vision
- Priorities & alignment
- Ambition
- Data strategy
- New digital services/products

Gap between current and target state

1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector.
2. Determined by gap between current digital maturity and target state of organisations in three years.
Source: IMDA DAI assessment
Technology Use Cases

How technologies are used by Ship Agency across the value chain
Examples of digital opportunities within Ship Agency

1. Coordination of cargo loading/unloading, documentation etc.; 2. Coordination of warehousing, intermodal operations, etc.; 3. Engagement with classification agencies, port operator (e.g. piloting), chandlers, bunkerers, etc.; 4. Declarations to customs agencies, port authorities, etc.; 5. Coordination with insurers, banks/financiers, legal firms, etc.; 6. HR, invoice/billing, general IT, etc.

Source: Expert interviews, BCG analysis

Case study (please see Slides 79 - 83)
Case Study: GAC

Highlighting best practices and key success factors
GAC offers ship agency services representing more than 3500 principals and handling over 96,000 jobs annually from ~300 global offices.

Given its need to provide accurate information and value-added services in an increasingly commoditised field, how has GAC been digitalising to further improve its leadership position?
GAC has embraced digitalisation and integrated it throughout its organisation and offerings...

<table>
<thead>
<tr>
<th>Using external digital platforms to improve customer service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensuring internal systems are scalable and standardised</td>
</tr>
<tr>
<td>Collecting and analysing data as an information source for clients</td>
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<tr>
<td>Data-driven internal decision making through business intelligence</td>
</tr>
<tr>
<td>Streamlining the ways of working among staff</td>
</tr>
</tbody>
</table>

| **More user-friendly CRM** |
| Instant access to customer service team through touch of a button – to schedule Microsoft Teams meeting |
| Cleaner interface to prevent miscommunication with client, a pain point of ship agencies |

| **Integration of internal ERP systems** (e.g. accounting, payroll, procurement) into one single system |

| **Vessel tracking and port services platform** |
| Provision of more detailed and accurate information on the ground to supplement shipping lines’ own systems (e.g. timing of vessels receiving supplies, bunkering etc.) |

| **Customer-driven data analysis** |
| Informing clients beforehand of information that would aid their own business decisions e.g. ports that are closed as a result of COVID-19 |

| **Analysis of internal and market data to supplement business decisions and forecasts** |
| Higher frequency of data refresh and automation of data collection through technology |

| **Electronic Data Interchange (EDI), enabling staff to automatically register invoices from customer’s digital submissions** |

| **Robotic Process Automation** to simplify highly repetitive processes e.g. invoice processing |

Source: Expert interviews
... bringing tangible benefits to its organisation & customers

<table>
<thead>
<tr>
<th>Has brought benefits to...</th>
<th>GAC as a company</th>
<th>GAC’s customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using external digital platforms to improve customer service</td>
<td>Improved customer engagement, keeping customer complaints to a minimal level</td>
<td>Improved quality of services with faster customer service and less expectation mismatch</td>
</tr>
<tr>
<td>Ensuring internal systems are scalable and standardised</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collecting and analysing data as an information source for clients</td>
<td>Enhanced decision making within GAC through the use of up-to-date data to supplement critical business decisions</td>
<td>Increased revenue streams through the provision of value-added services</td>
</tr>
<tr>
<td>Data-driven internal decision making through business intelligence</td>
<td>Increased productivity with reduction in manpower needed to handle transaction-related processes</td>
<td>Improved use of data as a source of business insights with data that GAC can provide e.g. duration of port calls</td>
</tr>
<tr>
<td>Streamlining the ways of working among staff</td>
<td>Improved accuracy of transactions recorded, and no information lost in transit</td>
<td>Increased transparency in invoicing, reducing potential issues and the need to follow up with other service vendors involved</td>
</tr>
</tbody>
</table>

Source: Expert interviews
GAC's digitalisation success is centered around six key success factors, to Run, Grow, and Transform the business:

1. **Continuous technology upskilling**
   - IT staff regularly refreshes skillsets through latest training programmes and courses (e.g. cloud, cybersecurity).

2. **Integrating tech development within company functions**
   - Tech development is part of every company function's digital planning process.

3. **Senior management direction**
   - Senior management in GAC sets clear strategic direction for going digital.

4. **Customer engagement**
   - GAC continuously seeks feedback from customers on their pain points and acts on them.

5. **Delivering tangible benefits**
   - GAC obtains buy-in from its staff by showing how digitalisation can help to improve productivity.

6. **New products based on digital**
   - GAC makes sure that digitalisation plays a key part in new offerings to its customers.

*Source: Expert interviews*
A1d) Harbour Craft Supplement
Subsector DAI Scores

Results from the 2020 DAI Sectoral Studies
Harbour Craft SMEs in Singapore are Digital Starters

Face largest gap with global peers in integration with ecosystems, data and technology, digitising the core

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<tr>
<th>DAI building blocks</th>
<th>Strategy</th>
<th>Digitise the core</th>
<th>New growth</th>
<th>Enablers</th>
<th>DAI Total</th>
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<td>Business strategy driven by digital</td>
<td>Customer offer &amp; Go-to-market</td>
<td>New Digital Growth</td>
<td>Changing ways of working</td>
<td>Digitise the core</td>
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<td>Leveraging the power of data &amp; tech</td>
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<td>Singapore Harbour Craft SME</td>
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<td>Global Sea Transport SME</td>
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Starter  Literate  Performer  Leader

1. All scores are based on self-reported survey answers, peers refer to organisations in the same sector
Source: IMDA DAI assessment
Harbour Craft SMEs aspire to be Digital Literates in 3 years' time

Source: IMDA DAI assessment
Harbour Craft SMEs: Need to focus on strategy and digitising the core

Gap between current and target state

Top 5 Dimensions with largest gaps and highest importance

- Ambition
- Roadmap
- E2E customer journeys
- Priorities & alignment
- Vision

Source: IMDA DAI assessment
Technology Use Cases

How technologies are used by Harbour Craft across the value chain
Examples of digital opportunities within Harbour Craft

**Existing opportunity**

- Digital platforms
- Internet of Things
- Advanced Analytics
- Robotic process automation
- Cyber Security
- Blockchain Technology
- Artificial Intelligence
- Virtual/ augmented reality
- Autonomous ships and drones

**Impact (needs-based)**

- Tracking of fuel consumption
- Vessel management & surveillance
- Reporting
- Real-time fuel management
- Real-time vessel tracking
- Improved ship-to-ship communications
- Emissions tracking
- Supplier optimization
- Fuel consumption optimization
- Fleet management

**Adoption**

- Software automation of previously manual, paper-driven processes
- Security assurance of customer data, operational data
- Quicker isolation of cyber attacks & incidents
- End-to-end tracking and assurance of bunker fuel supply chain
- Advancement and sophistication of current analytics through AI/ML techniques
- Invoice and payment management (smart contracts)

**Category**

- Core processes
- Planning
- Operations
- Commercial
- Support

**Planning**

- Fleet optimization

**Operations**

- Vessel management
- Fuel loading/unloading
- Emissions management
- Terminal management
- Other port operations
- Declarations
- Customer support

**Commercial**

- Pricing
- Booking
- Sales outreach

**Support**

- Shared services
- Procurement

**Source:** Expert interviews, BCG analysis

1. Chanders, classifications agencies, etc.; 2. HR, invoice/billing, general IT, etc.
Case Study: York Launch Service

Highlighting best practices and key success factors
York Launch Service is a launch service provider in Singapore, with over 100 employees and a fleet size of over 38 vessels serving different anchorages.

With a focus on improving productivity, customer satisfaction and increasing attractiveness to young talent, how is York Launch Service leveraging digitalisation to be at the forefront as a first mover?
York Launch Service has embraced digitalisation throughout its entire process of conducting business...

- **Customer bookings and viewing of orders online and through app**
  - 40% of customers adopted online booking since launch
  - Planned incentives through rebates given for min. orders via online, in-app booking

- **Single source of truth**
  - 100% of orders recorded digitally in the system

- **Informed decision making through real-time information**
  - Vessel management platform tracks locations of vessels in real-time, improving process of pairing bookings with best available vessels
  - Planned use of algorithm in future to optimize fleet management based on timings of orders

- **Digitizing back-end processes**
  - Invoicing and accounting records updated digitally for transparency and easy access

Source: Expert interviews
... bringing tangible benefits to its organisation & customers

York as a company:
- Improved customer service (able to plan for orders up to 5 days in advance)
- Integration with upcoming JIT ecosystem in digitalPORT@SG™, allowing easier customer access
- Increase in time efficiencies (orders no longer manually entered into system)
- Efficient operations planning (using detailed data collected, and in future, through algorithm recommendations, to allocate vessels to orders)
- Greater transparency in invoice handling with all records visible through a single point of access

York's customers:
- Full transparency between parties (shipping lines, ship agencies, port services) on timings of orders
- Improved oversight for managers in ship agencies over individual agents' bookings
- Reduction in errors with order recording as orders are entered by customers themselves
- Ease of access at anytime, anywhere and better safekeeping with records digitized and no longer in hard copy

Source: Expert interviews
York Launch Service’s digitalisation success is centered around five key success factors

- **Digital vision**: York recognized the need to be at the forefront of digitalisation to not be disrupted.
- **Delivering tangible benefits**: York obtained buy-in from its workforce by showing how digitalisation can improve productivity.
- **Data-driven decision making**: Data is generated and analysed to inform decision making of York’s operations and management.
- **Close collaboration with workforce**: York knows that its workforce will be its most important champions of new initiatives and provide invaluable feedback.
- **Customer Centricity**: York is constantly upgrading its offering to ensure customer satisfaction.

Source: Expert interviews
A2) Self-Assessment Checklist

If your organisation did not participate in the DAI Sectoral Survey 2020, please use this checklist to conduct a self-assessment of your organisation’s current and target digital maturity.
Key dimensions to focus on for your organization (I)

Q1. Which priority does digital have for your organisation, and are you aware of how it affects your industry and business?

- We are aware that digital might impact the industry but have not yet defined a digital strategy
- Digital strategies coexist in several functions or BUs where trends and the impact of digital were analyzed. We understand the disruptive forces of digital
- The digital target state for our organisation is developed, and the vision is articulated organization-wide. We know what is best in class in our industry
- The ambition level is developed, understood by all parties (business and IT), and approved by the leadership team with specific quantitative and qualitative measures being defined what it means to reach our ambition
- Digital is number-one-priority topic and integrated part of the CEO agenda; a clear process to update the vision is defined, and a digital strategy across BUs and functions is in place

Q2. What is your aspiration for the business? To what extent are quantifiable scenarios developed and evaluated across your organisation?

- No ambition developed yet but ideas and options have been elaborated on how our organisation can become more digital
- Scenarios were developed on how our organisation can become digital, but no ambition level has been agreed upon yet
- The ambition level is developed, understood by all parties (business and IT), and approved by the leadership team with specific quantitative and qualitative measures being defined what it means to reach our ambition
- The digital ambition is articulated, understood, and promoted throughout the entire enterprise, and cascading targets have been set to mobilize the organisation towards the target state

Please mark your current position & target in 3 years

Note: Current and target states for each of the sub-sectors are based on the DAI 2020 survey, where the sample size is 158 for SMEs. Please also note that DAI scores can be continually refreshed by organisations, potentially resulting in a change in current or target states for the sub-sectors. The DAI is a proprietary BCG tool. We would encourage you to participate in the 2021 DAI survey to receive your individualized results.
Key dimensions to focus on for your organisation (II)

Q3. Are you familiar with what digital opportunities and use cases exist for your business? To support prioritization, do you have a formalized process, criteria, and investment strategy in place?

• We are aware of a few digital opportunities across one-off functions in our organisation. The traditional portfolio process does not specifically cater for digital initiatives. Performance of digital initiatives is not monitored

• Digital initiatives are managed in each BU, region, or function individually. There is no overarching plan and no involvement of external stakeholders

Please mark your current position & target in 3 years

DIGITAL STARTER

DIGITAL LITERATE

DIGITAL PERFORMER

DIGITAL LEADER

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HC

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SA

SL

SM

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SM

Q4. How does your organisation manage the digital transformation journey?

• Digital initiatives are managed in each BU, region, or function individually. There is no overarching plan and no involvement of external stakeholders

• Some digital initiatives are managed across BUs, functions, and regions

Please mark your current position & target in 3 years

DIGITAL STARTER

DIGITAL LITERATE

DIGITAL PERFORMER

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• We are starting to ideate and pilot one-off digital initiatives within select BU’s/functions of organisation. In these BUs or functions, individual governance processes are established to prioritise digital in that BU or function

• A roadmap of digital initiatives is being developed and frequently reviewed to reach our digital ambition holistically across BUs, functions, and regions. All stakeholders are strongly engaged

Please mark your current position & target in 3 years

DIGITAL STARTER

DIGITAL LITERATE

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• We are starting to systematically ideate and pilot one-off digital initiatives within select BU’s/functions of organisation. A global guideline (process, responsibilities, decision-making) is defined on how to evaluate digital projects regularly based on dedicated measurements

• An integrated overall digital transformation journey is defined and globally aligned. We continuously track progress and measure specific indicators, e.g., growth of budget assigned for digital

Please mark your current position & target in 3 years

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Key dimensions to focus on for your organisation (III)

**QUESTION**

Q5. What is your current approach to consistently defining and delivering the best-in-class customer journey experience through digital?

**DIGITAL STARTER**
- We have individual customer touchpoints mapped. We use journey mapping tools to visualize touchpoints and journey analytics tools to gather touchpoint data to analyze interactions. We have transaction surveys to measure customer experience for specific interactions.

**DIGITAL LITERATE**
- We have complete end to end customer experience initiatives to map interactions across touchpoints, channels and products. We leverage human-centered design to reimagine journeys and identify initiatives to improve customer experience. We have episodic customer journey measurement programs in place.

**DIGITAL PERFORMER**
- We have cross functional persistent journey teams that are re-imagining and implementing initiatives-transforming operations, technology, products and policies. We implement change initiatives through a series of MVPs. We have comprehensive customer experience measurement programs covering transactions, journeys and overall relationship.

**DIGITAL LEADER**
- We have multi-year customer journey programs covering majority (60%-80%) of change initiatives in the organisation. We have a cross journey delivery center focused on deep enablement and upskilling of resources & institutionalization of new ways of working. We have comprehensive closed loop customer listening and ongoing testing programs in place. Feedback and research is part of prioritization framework and key decisions.

Please mark your current position & target in 3 years:

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Key dimensions to focus on for your organisation (IV)

Q6. To what degree are you using digital tools and digital-supported processes to improve the research & product development function?

**DIGITAL STARTER**
- We use simple digital development tools with limited integration and classical processes for operations feedback. We largely follow standard waterfall development methodologies.

**DIGITAL LITERATE**
- We currently evaluate scenarios on how to improve R&D with digital and run first pilot projects. We have started to integrate/harmonize our development data and have first teams using rapid development methods.

**DIGITAL PERFORMER**
- We use E2E development processes with strong tool support and PDM data backbone. We pilot analytics use cases for faster operations feedback. We have first lighthouse projects to speed up R&D, e.g., via 3D-printed prototypes. Agile is standard in our innovation process, and we use external collaboration.

**DIGITAL LEADER**
- Our agile development processes and data are integrated to get early feedback from operations. Fast and low-cost prototyping is tool-supported E2E (e.g., simulation and 3D printing). We have built and we leverage AI capabilities to become more innovative.

Please mark your current position & target in 3 years

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<th>Current position for average SME</th>
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Key dimensions to focus on for your organisation (V)

Q7. How do you target customers via digital channels, and how do you run a digital marketing operating model?

**DIGITAL STARTER**
- Our digital assets (sites, apps) are fragmented with limited traffic; we are behind our competitors in terms of digital presence; we do not feel we have significant control over digital marketing execution.

**DIGITAL LITERATE**
- We have adapted our investment mix to focus on the touchpoints that matter along the consumer decision journey but do not feel we are able to effectively track and optimise its execution and ROI; we have digital-marketing experts locally but siloed next to “traditional” marketers; we experiment with data-driven targeting and personalization.

**DIGITAL PERFORMER**
- A significant share of our consumer activation is in micro-segments, based on audience profiles but also context; we get significant visibility from digital advocacy and influence; we have transparent access to data and technology as well as digital experts that can effectively challenge agencies on digital-campaign execution.

**DIGITAL LEADER**
- We have clear measurement of the incremental ROI of our digital marketing; we have direct personalized relationships with a significant part of our consumers; digital is a core skill of all marketers in the organisation; there is effective collaboration between marketing, media, agency, and technology teams to design impactful consumer engagement strategies.

Please mark your current position & target in 3 years:

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### Key dimensions to focus on for your organisation (VI)

**Q8. Do you leverage data and use advanced analytics to deliver a 1:1 personalized experience to customers in a scalable, cost-efficient way?**

- We communicate with our customers in segments and lack a strategic agenda for personalization. We miss full data availability, analytic capabilities, and the technology to support personalization at scale.

- We started engaging with customer micro-segments, as our current technology only supports the deployment of limited variants, and our targeting analytics is based on simple business rules.

- We can deliver 1:1 tailored experiences in individual channels and for different stages in the customer life cycle. We are able to perform the required analytics and deployment in near real time but cannot scale up to a cross-channel experience yet. We do have a long-term strategy and a roadmap in place.

- We are delivering fully individualized experiences to our customers across channels and in real time. Our analytics is enhanced by deep learning (AI), and the full marketing technology stack to enable further value optimization via continuous testing is implemented. Our platform is scalable.

**Please mark your current position & target in 3 years**

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<th>Current position</th>
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**DIGITAL STARTER**

**DIGITAL LITERATE**

**DIGITAL PERFORMER**

**DIGITAL LEADER**

**Q9. How do you optimise and integrate your sales channels and processes (incl. payment and fulfillment) using digital technologies and analytics?**

- Individual channels get optimised in silos. Overall stronger focus on product rather than sales improvement.

- Omnichannel integration is currently implemented, and new concepts are explored, e.g., digital stores, inside sales, e-commerce, and customer success.

- Omnichannel sales with highly effective sales force supported by CRM. Data not yet exploited to the full potential.

- Highly automated and omnichannel sales. Rich data is used to prioritise leads, AI/ML technologies are applied.

**Please mark your current position & target in 3 years**

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**Legend**

- SL: Starter Level
- SM: Literate Level
- SA: Performer Level
- HC: Leader Level

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Key dimensions to focus on for your organisation (VII)

Q10. Do you improve your pricing by applying digital and data-driven technologies and thus gain competitive advantage?

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<th>QUESTION</th>
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<tr>
<td>Q10. Do you improve your pricing by applying digital and data-driven technologies and thus gain competitive advantage?</td>
<td>• Basic pricing principles are applied, and only rudimentary pricing tools are in place</td>
<td>• Deploying advanced-analytics tools to optimise pricing, based on segment-specific willingness to pay. Omnichannel pricing process is in place</td>
<td>• Advanced analytics tools and ML are in place to optimise pricing and enable an omnichannel dynamic pricing process. Personalized and differentiated pricing by micro-segments is continuously recalibrated</td>
<td>• Fully digital-enabled, advanced, omnichannel, personalized, and dynamic pricing tools are in place, fully automated with ML</td>
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Please mark your current position & target in 3 years

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Key dimensions to focus on for your organisation (VIII)

Q11. Do you exploit the benefits of real-time visibility, supply process optimization, and automation to the full extent?

**DIGITAL STARTER**
- Many manual activities and fragmentation in most processes, e.g., production scheduling, forecasting, fulfillment. Data is likewise fragmented and often missing or not valid. Customer experience is not leveraged as input for feedback loop into processes.

**DIGITAL LITERATE**
- Some process automation in forecasting, scheduling, network design, segmentation, and sales and operations planning. Inventory is controlled, and supply issues do not disrupt the business. First capturing of CEx, e.g., during shipment tracking. Digital supply chain skills are being developed, and tools are getting used, but still with low integration and simple analytics only.

**DIGITAL PERFORMER**
- Real-time end-to-end visibility of suppliers, manufacturers, logistics, inventors, and customer experiences (e.g., demand-sensing). Highly automated processes (order-to-cash, warehouse, fulfillment) with intelligent robotics solutions in place and partners’ activities integrated. Data is shared across those integrated systems. Old processes are consequently getting changed by digital.

**DIGITAL LEADER**
- Highly automated and dynamic supply chain with complete end-to-end visibility, involved ML/AI and blockchain for transactional processes, and risk responsiveness. All chain nodes are connected, e.g., suppliers, (contract) manufacturers, distribution centers, third-and fourth-party logistics providers (3PL/4PL), and customers whose data is monitored to decrease issues, and shorten delivery time. AI and advanced analytics are applied across all supply processes.

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Key dimensions to focus on for your organisation (IX)

Q12. To what degree does your procurement organisation leverage digital technologies and analytics to optimise the function?

**DIGITAL STARTER**
- Procurement org. uses available data for basic analytics, and transactions are a mix of paper-based and electronic, with high reliance on manual E2E order processing. The organisation does not invest in advanced technology or analytics skills specific to procurement.

**DIGITAL LITERATE**
- Procurement org. has started to integrate data from multiple sources to make informed purchasing decisions. Processes are partially digital with some degree of automation in order processing (e.g., purchase to pay tools). We started to build capabilities and invest in technologies for procurement.

**DIGITAL PERFORMER**
- Multiple sources are successfully integrated to visualize and interpret data, make informed purchasing decisions, and manage suppliers (e.g., supplier risk management tools). Processes are mostly digital with room for further E2E automated processing. The organisation is implementing new technologies and further develops skills of the employees to apply advanced analytics for procurement.

**DIGITAL LEADER**
- Procurement org. leverages a single source of data to run advanced analytics, transactions are mainly digitised, and E2E processes are highly automated. The organisation has a clear IT strategy that involves procurement, heavily invests in related technology (with many new digital tools already rolled out), and has already developed analytics skills of the employees.

Please mark your current position & target in 3 years:

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Key dimensions to focus on for your organisation (X)

Q13. Are digital tools used to optimise core service processes, e.g., network operations in a telco or utility, risk assessment in insurance?

**DIGITAL STARTER**
- Core service processes are run in the traditional way (partly manual), largely supported by legacy systems

**DIGITAL LITERATE**
- First use cases to optimise single process steps are implemented, e.g., analytics for churn prevention and prediction tools to prevent faults. Legacy systems are getting replaced

**DIGITAL PERFORMER**
- Use cases along processes on a stand-alone basis are implemented, but no E2E optimization across processes yet. Substantial successes in replacement of legacy systems being identified. AI gets leveraged to replace humans in execution

**DIGITAL LEADER**
- Core service processes are optimised E2E and interlinked via automated workflows. Digital tools are leveraged like analytics robotics (and AI) to increase efficiency and effectiveness. Legacy systems have been replaced

Please mark your current position & target in 3 years

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Key dimensions to focus on for your organisation (XI)

Q14. Are digital technologies and opportunities holistically deployed across the corporate-center functions or part of a roadmap to digitise center functions?

**Digital Starter**
- Low degree of digitization in corporate-center functions; opportunities are passively observed by functional leaders but not pursued

**Digital Literate**
- Relevance of digitization in center functions is seen for strategic processes, such as decision-making, and pilot projects are launched to explore the opportunities and as POCs

**Digital Performer**
- Selected corporate center functions are driving the digital agenda based on proven use cases, especially AI and advanced analytics are pursued in expertise-driven processes and for decision support. However, overarching strategy, innovation approach, and roadmap across functions are still missing

**Digital Leader**
- Digitization for center functions is on top of the agenda of all functional leaders and a part of a holistic digital transformation agenda. Digitization benefits are realized, such as fewer human errors, less downtime, and better decision-making. AI/ML are key enablers for center functions and make work much more convenient and flexible

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Key dimensions to focus on for your organisation (XII)

**QUESTION**

Q15. Are processes, especially in the SSC, digitised and automated using RPA in order to enable the SSC to become a full service provider?

- Low degree of digitization in front-and back-office processes. Many administrative tasks remain heavily manual. In shared services, only basic technologies like BPM are used

Please mark your current position & target in 3 years

**DIGITAL STARTER**

- SL

**DIGITAL LITERATE**

- SA

**DIGITAL PERFORMER**

- HC

**DIGITAL LEADER**

- ST

Q16. Are digital interactions leveraged substantially? Is each customer service channel (call center, web, app, mail, email, chat, etc.) optimised for efficiency and effectiveness using digital technologies?

- Predominant interaction channels are physical; no use of digital or self-service tools in front-end (e.g., chat bots, IVR) and in back-end functions. Reactive customer service

Please mark your current position & target in 3 years

**DIGITAL STARTER**

- SM

**DIGITAL LITERATE**

- SA

**DIGITAL PERFORMER**

- ST

**DIGITAL LEADER**

- HC

Note: Current and target states for each of the sub-sectors are based on the DAI 2020 survey, where the sample size is 158 for SMEs. Please also note that DAI scores can be continually refreshed by organisations, potentially resulting in a change in current or target states for the sub-sectors. The DAI is a proprietary BCG tool. We would encourage you to participate in the 2021 DAI survey to receive your individualized results.
Key dimensions to focus on for your organisation (XIII)

Q17. How does your organisation foster digital innovation, identify opportunities and white spaces, and develop and commercialize new digital offers?

- We just started to foster digital innovation between product managers and customers to identify new digital value pools
- We have started to complement our core offerings with digital services. We have started to experiment with consumer-led innovation and to identify new value pools but rather ad hoc, not really structured
- We have led most of our core offerings into the digital space, and we digitally enhanced the remaining non-digital offerings. We launch new products (value pools) quickly
- We are disrupting our business model and inventing new businesses, and we are on the way to profitability
- We monitor the markets and new incumbents, and proactively innovate our core offerings to become digital. We are very early in the market with integrated offers (fast time-to-market)

Please mark your current position & target in 3 years

Q18. How aggressive are you in trying to revolutionize your own industry?

- We are disrupting our customer journeys but currently just for the same products
- We are disrupting our product offering and customer experience
- We are disrupting our business model and inventing new businesses, and we are on the way to profitability
- We have successfully launched a digital disrupter in our industry which is profitable. We have entered adjacent markets with new offers

Please mark your current position & target in 3 years

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**Key dimensions to focus on for your organisation (XIV)**

**Q19. How do you mobilize your organisation for digital?**
- **Digital Starter**: Our people know digital disruption is a priority.
- **Digital Literate**: We experiment with prototyping to set teams in motion in an agile way and to validate the feasibility of a potential product.
- **Digital Performer**: Several times we have used lighthouses and prototypes resulting in our employees, clients, and shareholders being proud of the organisation. We have a strong experimental mindset.
- **Digital Leader**: Lighthouse projects and MVPs set the direction of where digital evolves in our organisation; they are well recognized externally and also serve to promote the potential of digital corporate-wide.

**Q20. How do you capture the value and the business coming from disruptive digital organisations?**
- **Digital Starter**: We are benchmarking our competitors but have no relationships and have not yet invested in any disruptive organisations.
- **Digital Literate**: We bought start-ups and have some cooperation with start-ups, and we drive incubation with external teams.
- **Digital Performer**: We have successfully launched disruptive businesses and joint ventures. We have an M&A strategy defined for partnering and venturing.
- **Digital Leader**: We use all options to advance in digital: Incubation, venturing, and M&A. We continuously launch disruptive concepts, and we scale up.

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Key dimensions to focus on for your organisation (XV)

Q21. In your organisation, is digital institutionalized through leaders and cascaded throughout the organisation fostering a cultural change?

**DIGITAL STARTER**
- There are no dedicated leaders to manage or drive digital initiatives, also the awareness is missing, and digital is not aligned with business objectives. Initiatives are executed in silos and in traditional ways (with no defect culture).

**DIGITAL LITERATE**
- We onboard digital talents into new roles and introduce them to the steering boards. The organisation has started to adapt towards digital and works collaboratively under good executive guidance. Digital gains awareness and is already partly aligned with the overall business strategy.

**DIGITAL PERFORMER**
- Digital leaders/champions are appointed and incentivized to make quick decisions, take risks, and experiment. The mindset of the organisation is strongly adapting towards digital, e.g., applying new methodologies (campus approaches, agile, fail-fast culture, etc.). Also, non-digital leaders drive digital change and transform the organisation towards digital. Digital and business strategy are strongly aligned.

**DIGITAL LEADER**
- Digital leaders are fully empowered and have a strong seat in decision boards. Digital is cascaded top-down in all functions and BUs. Digital is the new normal, and the whole organisation (incl. non-digital leaders) is adapting and optimizing with digital driven by digital champions. Fail-fast-and-improve is the new culture, and team performance is incentivized. Digital is the de facto business strategy.

Please mark your current position & target in 3 years:

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Key dimensions to focus on for your organisation (XVI)

QUESTION

Q22. Where is digital anchored in your organisation, and do the current governance structures foster digital, e.g., prioritise digital initiatives?

DIGITAL STARTER
- No deliberate organisation of digital, little or no digital coordination, at best some single experts working in silos. Digital is not driven by current governance, and activities are not synchronized. Digital is purely opportunistic, and there are no measures (KPIs) for digital

DIGITAL LITERATE
- Digital is still executed decentrally, but there is a central governance, just with small budgets and no decision rights to push digital across BUs and functions. There is some global alignment on central transformative topics. Very basic KPIs (rather IT-related) are defined for measurement

DIGITAL PERFORMER
- Central or hybrid organisation of digital with centers of excellence in BUs and functions, sometimes executing in silos, but sharing cross-sectoral topics. Digital is fostered by central governance (funding, staffing, etc.), and KPIs are in place to measure progress in digital. Often a CDO is assigned, either centrally or in selective BUs/functions

DIGITAL LEADER
- Digital is ingrained in the day-to-day paradigm across the whole organisation. There is a strong inter-BU and functional collaboration as well as top-down incentives (KPIs, governance) to make digital a prió-1 topic. Processes like staffing and funding are fully adapted to support the fast-paced environment. The organisation operates like a tech organisation

Please mark your current position & target in 3 years

Legend

Current position for average SME

Target state for average SME

Note: Current and target states for each of the sub-sectors are based on the DAI 2020 survey, where the sample size is 158 for SMEs. Please also note that DAI scores can be continually refreshed by organisations, potentially resulting in a change in current or target states for the sub-sectors. The DAI is a proprietary BCG tool. We would encourage you to participate in the 2021 DAI survey to receive your individualized results.
Key dimensions to focus on for your organisation (XVII)

Q23. How do you attract and hire digital talents and develop the required digital skills across your organisation?

**DIGITAL STARTER**
- We are currently struggling to attract and recruit digital talent. So far, we don’t have a recruiting and upskilling plan or general training mechanisms to develop digital skills. The digital skills needed by our employees are under development and need to be improved.

**DIGITAL LITERATE**
- We are addressing recruiting of digital talents with first initiatives, but we do not have a strategic workforce plan. We have developed a basic approach for upskilling and training, focused on selected digital skills. Some of our employees are already equipped with the necessary digital skills, but the majority are not yet there.

**DIGITAL PERFORMER**
- We have a dedicated people strategy to attract, onboard, and retain digital talent, based on a holistic workforce plan. We also run programs to upskill and train our employees. Most employees already have the digital skills they need, and our entire workforce will soon be at this stage.

**DIGITAL LEADER**
- We are among the top organisations in terms of attracting, recruiting, onboarding, and retaining digital talent. We base our actions on a clear digital strategy and long-term workforce plan. Our trainings and upskilling mechanisms are at the forefront of digital. Our workforce is one of the most digitally skilled in the market.

Please mark your current position & target in 3 years

Note: Current and target states for each of the sub-sectors are based on the DAI 2020 survey, where the sample size is 158 for SMEs. Please also note that DAI scores can be continually refreshed by organisations, potentially resulting in a change in current or target states for the sub-sectors. The DAI is a proprietary BCG tool. We would encourage you to participate in the 2021 DAI survey to receive your individualized results.
Key dimensions to focus on for your organisation (XVIII)

**QUESTION**
Q24. Do you apply agile delivery principles across a wide range of the organisation, in both business and IT?

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<td>• We experiment with agile ways of working; we have a few agile pilots ongoing as well as a few successful agile teams up and running. New roles are getting defined, e.g., scrum master, and agile coach</td>
<td>• Our agile operating model has been defined and is continuously evolving. We have a portfolio of stable agile teams and have successfully established the required interfaces with the rest of the organisation</td>
<td>• Agile culture and agile product delivery are rolled out across businesses and IT, delivering measurable business value for a complete business line or market. Organisational, governance, and technology agility enablers are addressed to foster agile</td>
<td>• E2E agile product delivery is deployed across (most of) the enterprise. Agile ways of working extend beyond (digital) product delivery into other parts of the enterprise. Teams work autonomously with a clear customer focus</td>
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<th>Current position for average SME</th>
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Key dimensions to focus on for your organisation (XIX)

Q25. To what extent are you driving the build-up of capabilities to bring your transformation at scale?

**DIGITAL STARTER**  • Scattered initiatives, no consistent approach, neither methodologies, nor talent management to manage and drive build-up of digital expertise; no dedicated accelerator center operating to own and drive digital

**DIGITAL LITERATE**  • Talents are recruited in a dedicated unit with the mandate to drive digital across the organisation; limited spread of digital resources; some coordination but limited momentum. Units start working in agile ways

**DIGITAL PERFORMER**  • In a dedicated unit (accelerator center) talent pools are structured, and processes, governance, and toolbox are in place (including Agile@Scale in IT). Value creation potential is confirmed

**DIGITAL LEADER**  • Digital talent pool is recognized and successfully delivering digital projects, effectively articulated across the organisation through control towers, with a focus on value generation. The accelerator center is the showcase of the future digital operating model

Please mark your current position & target in 3 years

Q26. Do you fully understand the value that data can create, also from use cases, and have you implemented a structured plan to realize this value?

**DIGITAL STARTER**  • The organisation has started experimenting with use cases and POCs, but data is not part of the top-management agenda. Potential value of data has not been assessed

**DIGITAL LITERATE**  • Selected BUs have started assessing the value that can be generated from data. Several successful POCs are in the process of industrialization and receive funding, but no long-term agenda is defined

**DIGITAL PERFORMER**  • A data strategy clearly is part of the top-management agenda. A data value map (i.e., structured collection of use cases) is developed, and a comprehensive roadmap for implementation is built. A structured POC pipeline is starting to be developed. Funding is available at enterprise level for infrastructure and HR data

**DIGITAL LEADER**  • Data clearly is recognized as a key corporate asset. Several applications and datadriven business models have been industrialized. Data value realization has spread throughout the organisation, and data value contribution gets measured regularly. Our organisation highly invests in data projects and respective resources

Please mark your current position & target in 3 years

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Key dimensions to focus on for your organisation (XX)

QUESTION
Q27. Do you have the organisational structures necessary to effectively and efficiently govern data and analytics?

**DIGITAL STARTER**
- Data is still managed by IT with limited input from business. No central function or Clevel appointed to assure cross-organisation data management

**DIGITAL LITERATE**
- A CDO has been appointed and started implementing a structured data governance approach (incl. on regulation). First global data governance policies and procedures are planned

**DIGITAL PERFORMER**
- A fully functional data organisation exists, under a CDO reporting to top management. The CDO organisation includes design authorities for data platforms and data architecture. A governance charter for data is defined, incl. policies and tools. Data quality has significantly improved

**DIGITAL LEADER**
- All key data and analytics governance roles have been implemented and are fully functional, in a hub-and-spoke operational model covering the entire organisation, where also all data domains are defined. Data and analytics leadership is included in all corporate governance processes

Please mark your current position & target in 3 years

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### Key dimensions to focus on for your organisation (XXI)

#### QUESTION
Q28. Do you leverage AI to improve your offerings and business processes as well as to achieve significant business value?

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<td>• Basic understanding of AI in parts of the organisation but neither larger adoption nor use case prioritization. No AI job profiles exist and the common perception is that AI could be covered by existing analytics experts like statisticians</td>
<td>• Awareness of major use cases enabled by AI on management level, with first pilot project(s) to assess their impact, e.g., NLP or deep learning. Job profiles (e.g., data scientists) are being defined with explicit AI and machine learning skills demand</td>
<td>• Major AI use cases are defined and prioritised with first value-generating lighthouse implementation and clear responsibilities to drive adoption and experimentation. Current focus is just on parts of the value chain, but here AI becomes key for decision-making and to create new value pools</td>
<td>• AI is successfully adopted in core offerings and processes, providing competitive advantage. AI is rolled out across the whole value chain and shapes new business models. AI is key to decision-making in the organisation</td>
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**Legend**

- **SL**: Strategic Leader
- **SM**: Senior Manager
- **SA**: Senior Analyst
- **HC**: Head of Category
- **ST**: Staff Technician

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Key dimensions to focus on for your organisation (XXII)

Q29. Do you have an efficient data platform in place to deliver significant business value from data?

**DIGITAL STARTER**
- Traditional data warehouse systems for historical data in place, but often lacking efficient MDM functionalities and clear referentials. Analytics are mainly descriptive and run primarily through packaged BI and database tools via batch feeds. Analytical resources are disseminated across the organisation.

**DIGITAL LITERATE**
- Fit-for-purpose systems using a mix of traditional technologies and an efficient but small Hadoop/Apache big-data platform. Most MDM issues are addressed. Data lakes are in advanced testing. New ways to improve analytics with dashboards, interfaces, or high performance data platforms are investigated.

**DIGITAL PERFORMER**
- Fit-for-purpose enterprise-level platform based primarily on Hadoop/Apache ecosystem or cloud resources for batch-processing solutions. Predictive analytics has become a key input in most operational and strategic decision-making, using modern visualization and also geospatial analyses. MDM issues are being fully addressed at enterprise level. Data lakes exist and offer new analytics possibilities.

**DIGITAL LEADER**
- Fully optimised batch and streamlined big-data infrastructure, based on best-in-class technologies originating primarily from the Hadoop/Apache ecosystem or cloud resources. One or more data lakes are fully functional and in production, supporting advanced-analytics tools (real-time capability). This technology has become a key enabler to offers new business models. There is also an enterprise-wide analytics resources strategy.

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Key dimensions to focus on for your organisation (XXIII)

Q30. How future ready is your IT/Tech operating model, workforce, and partnership with the business functions?

• The tech organisation is reflecting geographies to allow market proximity and local synergies. The business and tech functions are entirely separated in silos. The relationship of business and tech is a typical customer-supplier relationship.

• The tech organisation structure is reflecting business functions to enable group wide synergies. Tech resources are clearly aligned to business needs and have built product and business expertise.

• The tech function structure is reflecting customer groups or channels. Tribes and chapters are self-organizing across the entire organisation. Tech is a strategic partner of the business and integral part of the strategic and operational business planning and decision making.

Q31. Do you apply DevOps and continuous-development principles for IT development and operations?

• No clear ownership for digital products, strong silo-thinking with individualized processes for development and deployment, mostly manual testing.

• Business and development teams jointly collaborate, some script automation for testing and pilots for self-services or delivery of infrastructure provisioning.

• Same responsibility for development and deployment. Teams are using code repositories, and processes are similar for all stages of the software development life cycle except for deployment. Strong DevOps culture.

• Full-service responsibility and self-organizing communities. Automated testing, standardized processes, and real-time infrastructure provisioning for development, testing, and deployment.

Please mark your current position & target in 3 years

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Key dimensions to focus on for your organisation (XXIV)

Q32. How effectively is your organisation leveraging connected things to unlock additional value?

**DIGITAL STARTER**
- Limited recognition of benefits of IoT to the business and limited assessment of hurdles to implement IoT technology in the organisation’s products or services

**DIGITAL LITERATE**
- Some prioritization of potential use cases where IoT can be implemented and can enable value capture and IoT pilots are planned or in progress. Some gaps in technology that are being addressed in roadmaps

**DIGITAL PERFORMER**
- IoT is already deployed in key use cases with benefits in operational improvements or enabling new business models. Technology is aligned with currently implemented use cases. Organisation has key roles to unlock full value of IoT, incl. analytics, and HW/SW, OT skills

**DIGITAL LEADER**
- Advanced IoT-enabled business model, such as data orchestration, new services, or platform capabilities. IoT is a key consideration for current and future business model design across BUs and value chain. Active participant in the IoT ecosystem with active complementary partnerships

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Key dimensions to focus on for your organisation (XXV)

Q33. What are the maturity and breadth of your CS governance, strategy, and architecture?

**DIGITAL STARTER**
- CS is handled by the IT organisation and is not very visible in the organisation. There is little business involvement. We have not formally identified our key business assets but have deployed some protection and detection technology (e.g., antivirus software and firewalls).

**DIGITAL LITERATE**
- A CS program is in place, headed by a CISO (or similar) for our existing business, and includes documented governance, strategy, and architecture. However, we don't have a comprehensive view of business assets and have not broadly implemented CS best practice throughout the organisation.

**DIGITAL PERFORMER**
- Our CS program is centered and prioritised around business assets and risks. Security is a priority for senior executive leadership who push "security culture" across the organisation. Security is implemented "in-depth," i.e., in technology, processes, and people. All digital initiatives consider CS from the beginning.

**DIGITAL LEADER**
- The CS program covers all domains (business IT, industrial IT, and product IT), as well as all parts of the value chain (organisation, suppliers, distributors, customers, and others). We have built extensive cyber-intelligence capabilities, i.e., to actively look for threats to our assets (e.g., searching the dark web), research new security technology (e.g., security analytics), and deploy offensive techniques to identify vulnerabilities in our systems (e.g., red teams).

Please mark your current position & target in 3 years:

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Key dimensions to focus on for your organisation (XXVI)

QUESTION

Q34. Are the customer value proposition and the required partnerships to deliver it defined, and how is value shared among digital ecosystems members?

DIGITAL STARTER

• Our strategic goals do not reference partnering in a DE. We do not participate in any DE, and have limited understanding about the opportunities DEs offer to create value. In that regards, we are rather in a supplier role to organisations who participate in DEs.

DIGITAL LITERATE

• We started to define a value proposition and which customers we want to target via DE. We have formed 1:1 partnerships but not yet a digital ecosystem community. We align sporadically on our strategic goals with some of our partners. As we rather pilot some of our partner or DE offerings, we do not exploit the full value potential yet.

DIGITAL PERFORMER

• We successfully deliver digital solutions with DE partners and can say we are a key player in this community. Not all of our customer are targeted yet, so we push for broader adoption and we promote and communicate our vision to customers. As we more and more align on strategic goals across the whole DE, value creation mechanisms are being refined.

DIGITAL LEADER

• A material part of our business, so a double digit % of revenue, comes from delivering digitally enabled and integrated customer value propositions through DE. We orchestrate a wide range of partners including start-ups. All DE members are aligned on strategic goals and how value is shared. The ecosystem grows in a sustainable way.

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Key dimensions to focus on for your organisation (XXVII)

**QUESTION**

Q35. Is the right DE governance and organisation established and are methods in place to share data among DE members?

**DIGITAL STARTER**
- There is neither a dedicated organisation nor talent and skills to manage DE. We have not yet agreed on rules of engagement (e.g., decision making or IP protection) with partners, therefore, data and processes for running a DE are not yet defined as well

**DIGITAL LITERATE**
- We are currently setting up an organisation to manage DE and recruit or upskill FTE to operate it. In that regards, we also started to align with potential partners on engagement rules. The process mapping and integration effort pick up as we expect to share data with partners soon

**DIGITAL PERFORMER**
- Our DE is operating successfully with a small set of partners with whom we make joint decisions, share data (within defined rules) and our DE processes and infrastructure are stable. Our people are learning together with our partners’ people how to create value from the DE. Still, in many ways we are still experimenting, but we have started to operationalize our strategy to scale up our DE

**DIGITAL LEADER**
- We have a DE operating model that successfully orchestrates multiple partners and ecosystems and has a clearly define governance. Our model is geared towards both DE orchestration and participation, and the rules of engagement are individualized by partner. Our IP and data is well protected and securely shared using dedicated platforms and with clearly articulated processes and data management approaches

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**Integrating ecosystems**

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A3) Digital Transformation Proposal Template (Guide)

A template for you to pitch your digitalisation initiatives
There are 6 sections to the Digital Transformation Proposal Template

It provides a structured approach in thinking about digitalisation efforts and in presenting your digital initiatives to key stakeholders

0 Executive summary
1 Strategic rationale
   1a Vision – the "Why"
   1b Initiatives – the "What"
   1c Enablers – the "How"
2 Implementation plan
3 Financials
4 Risks and mitigants
5 Immediate actions required
0. Executive summary
Create a crisp, concise summary of the proposed initiative

### Template

<table>
<thead>
<tr>
<th>1. Highlight (or recap) company vision and target</th>
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<tbody>
<tr>
<td>&quot;We are seeking [x]‘s approval for [Y]s across [z] months/years to implement [a]...&quot;</td>
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<thead>
<tr>
<th>2. Outline areas of focus, supported by DAI self-assessment</th>
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<tr>
<td>&quot;The key reason for driving this project is [x]; this is in line with the findings in DAI 2020.&quot;</td>
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<tr>
<th>3. Summarise the initiatives and their respective benefits</th>
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<tr>
<td>&quot;Fundamentally, the product is a [x] which operationally upgrades our processes via [y].&quot;</td>
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<tr>
<th>4. Summarise the enablers required and how to build them</th>
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<tr>
<td>&quot;This project will require [x] IT/Ex across a period of [y] months/years, across [z] phases.&quot;</td>
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<thead>
<tr>
<th>5. Reiterate the key financial metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;The full capital outlay is [Y]s. We project a full realization of our investments by year [Zx].&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Highlight key risks and mitigating measures in place</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;If we do this project, the major risks are [x]... [z] will be put in place to mitigate this risk.&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. Note immediate actions required</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Further to approval, we will engage [x] with the projected slated to start in [a].&quot;</td>
</tr>
</tbody>
</table>

---

1. Summarize the following sections in this template. Note that this should be done after completing the subsequent sections.

2. Refer to the sample text as an inspiration for the content to include here.
1a. Vision
Create a vision that is clear and measurable

1. Have a clear goal that is communicated to the whole organisation
2. Ensure that the goal can be measured by defined KPIs
3. Define a period to achieve the goal

Powered by digital innovation, [x] will be a leading [x] provider in Singapore, having [x] customers and a profit margin of [x] by [202x].
Examine the "What" dimensions in your current maturity heatmap.

How to read the current maturity heatmap:

- There are 35 dimensions in the heatmap.
- Each dimension belongs to one of 6 blocks:
  - Business strategy driven by digital
  - Digitize the core
  - New digital growth
  - Changing ways of working
  - Leveraging the power of data & technology
  - Integrating ecosystems
- Each dimension's score indicates your organisation's current maturity for that dimension.
- You can shortlist the "What" dimensions that your organisation is scoring lower in as potential areas in which to propose initiatives.

1. Provided in the giveback pack by IMDA, based on self-reported survey answers of each organisation. If your organisation did not participate in the DAI survey, please use the Self-Assessment Checklist in Annex 2 to determine your current maturity.

Source: IMDA DAI assessment
1b. Initiatives – Choosing what to start on (2/4)
Check which dimensions you are setting a high target for in your target maturity heatmap

How to read the target maturity heatmap

- Each dimension's score indicates your organisation's target maturity for that dimension in 3 years
- Consider shortlisting dimensions that are also scoring higher for target maturity

1. Provided in the giveback pack by IMDA, based on self-reported survey answers of each organisation. If your organisation did not participate in the DAI survey, please use the Self-Assessment Checklist in Annexe 2 to determine your target maturity.

Source: IMDA DAI assessment
1b. Initiatives – Choosing what to start on (3/4)
Use the priority grid\textsuperscript{1} to cross-check if your selected dimensions have the largest gaps and most importance.

How to read the priority grid

- Each dimension is arranged in the grid based on its gap between current and target states (vertical axis), and its importance (horizontal axis).

---

\textsuperscript{1} Provided in the giveback pack by IMDA, based on self-reported survey answers of each organisation. 2. Determined by gap between current and target states of organisations in the years 2015 and 2016 DAI assessment. 

Source: IMDA DAI assessment
1b. Initiatives – Choosing what to start on (4/4)

Use the priority grid to cross-check if your selected dimensions have the largest gaps and most importance.

1. Provided in the giveback pack by IMDA, based on self-reported survey answers of each organisation.
2. Determine gap by current digital maturity and target gap of at least one gap in three years.

Source: IMDA DAI assessment

Focus on dimensions in the blue-shaded quadrant (You can expand further from the quadrant if required)

Determine which dimensions belongs to the "Digitise the core" and "New digital growth" blocks

Use the dimensions as guidance on what initiatives to embark on; it should ideally match with your organisation's overall vision

If you do not have the individualised priority grid, you can refer to slides 9 and 10 (of the main MDP publication) for the sector priority grids and Annex 1 for the subsector priority grids.
1c. Enablers – Understanding what is needed for chosen initiative

Use the priority grid to identify "How" dimensions to focus on to support the initiative.

Focus on dimensions in the blue-shaded quadrant (You can expand further from the quadrant if required)

Determine which dimensions belongs to the "Changing ways of working", "Leveraging the power of data & technology" and "Integrating ecosystems" blocks

Use the dimensions as guidance on what enablers to improve on; it should complement the initiatives you are proposing to embark on.

If you do not have the individualised priority grid, you can refer to slides 9 and 10 (of the main MDP publication) for the sector priority grids and Annex 1 for the subsector priority grids.

---

1c. Enablers – Understanding what is needed for chosen initiative

Use the priority grid to identify "How" dimensions to focus on to support the initiative.

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---

We will ensure that we are equipped with enablers to accomplish our initiatives.

---

1. Provided in the giveback pack by IMDA, based on self-reported survey answers of each organisation.
2. Source: IMDA DAI assessment.
1b. and 1c. Detailed description of initiative and enablers required

Provide more details of the initiative, its benefits, enablers and success stories of similar initiatives

1. Detail the initiative(s) and the benefits they will provide

2. Take note of the enablers identified and how they will spur on the initiative(s)

3. Refer to the sample text as an inspiration for the details to include
2. Implementation Plan

Plan for a realistic timeline and update it based on progress

**1.** Detail the time and resources required for each phase of the initiative(s) (you can use the Gantt chart on the left, or any other method, to track progress)

**2.** Keep your broader organisation updated on the progress – they may have ideas and offer support for the project

**Additionally,**

Do not get bogged down in "finalizing" every requirement – oftentimes, timelines will evolve as the solution materializes.
3. Financials
Start monitoring key financial metrics for performance tracking purposes

Instructions

1. Estimate the amount of CAPEX investments at various stages of the initiative(s). Assess if these investments are reasonable, given your organisation’s current financials.

2. Determine when the initiative(s) will be profitable on its own (when revenue it contributes is higher than its operating costs). If the initiative is not revenue-generating, consider quantifying the benefits it would bring from a cost/productivity standpoint.

3. Project when the initiative(s) will breakeven (when the benefits derived are greater than the initial CAPEX investments).
4. Risks and mitigants

Identify the risks involved with the initiative(s) and possible mitigation measures

Potential categories to consider:

1. Product risk
   - Could there be issues with quality, late delivery, etc.?
   - Can this be mitigated by customer validation, customer testing, phased releases, etc.?

2. People risk
   - Could there be a lack of talent to operate the new software?
   - Can this be mitigated by having the internal team work hand-in-hand with a vendor, easing change mgmt.?

3. Operational risk
   - Could there be technology/CI/CD/infrastructure/insider incidents, malfunctions, etc.?
   - Can this be mitigated by having a backup/concurrency plan, cybersecurity solutions, etc.?

4. Market risk
   - Could there be an economic downturn, reducing projected gains?
   - Can this be mitigated by incorporating the possibility of downturn in financial assumptions?

5. Reputational risk
   - Could there be public backlash in the event of a breach of data?
   - Can this be mitigated by an escalation plan/social media response in such events?

Determine the categories of risk your initiative(s) might involve (the provided list is non-exhaustive)

For each category of risk, assess each risk factor based on their severity and likelihood

Determine the appropriate mitigant required for the respective risk factors, given their severity and likelihood
5. Immediate actions required

Determine what is needed to start immediately, and what would require external support

### Potential categories to consider:

1. **Procurement**
   - Shortlist and select vendors (and if applicable, issue RFPs, RToRs, etc.)
   - Finalize commercial/technical discussions with said vendors

2. **Funding**
   - Identify funding support channels and submit funding applications
   - Engage financial institutions (e.g., banks) to obtain funding
   - Plan with internal teams to draw down organisation funds

3. **Engagement**
   - Socialise and seek support from relevant teams within organisation
   - If applicable, seek regulatory guidance from MPA

4. **Advisory and Project Management**
   - Seek advisory or consultancy services
   - Seek project management support
   - If applicable, seek mentorship through an accelerator (e.g., PERY1)

5. **Product Development and Research**
   - Conduct customer interviews to validate pain points
   - Refine product specifications through market testing

---

1. Determine next steps, resources required and external support needed

2. For areas requiring external support, refer to slide 33 (of main MDP publication) for a list of resources by categories
A4) Digital Transformation Proposal Template

A template for you to pitch your digitalisation initiatives.

The .PPT template can be downloaded here.
0. Executive summary

1. Highlight (or recap) company vision and target

"We are seeking [x]'s approval for [S$X] across [x months/years] to implement [x] ..."

2. Outline areas of focus, supported by DAI self-assessment

"The key reason for driving this project is [x]; this is in line with the findings in DAI 2020"

3. Summarise the initiatives and their respective benefits

"Fundamentally, the product is a [x], which operationally upgrades our processes via [x]"

4. Summarise the enablers required and how to build them

"This project will require [x] FTEs across a period of [x months/years], across [x phases]"

5. Reiterate the key financial metrics

"The full capital outlay is [S$X]. We project a full realization of our investments by year [20xx]"

6. Highlight key risks and mitigating measures in place

"If we do this project, the major risks are [x]. [x] will be put in place to mitigate this risk"

7. Note immediate actions required

"Further to approval, we will engage [x], with the projected slated to start in [x]"
1a. Vision

Powered by digital innovation, [x] will be a leading [x] provider in Singapore, having [x] customers and a profit margin of [x] by [202x]
1a. Vision

Potential categories to consider:

**Customer needs and pain points**
- Are customers asking for this solution?
- Do they face a common issue in current services?
- Is this a complementary solution that could bring new revenues?

**Efficiency- or cost-driven needs**
- Could this solution significantly increase productivity (e.g., free up time from laborious processes)?
- Are there clear cost savings to be derived if this solution is implemented?

**Talent and manpower driven**
- Will this solution provide a workplace environment that could attract more new talent?
- Could this solution automate a task whereby hiring is challenging?

**Regulatory requirements**
- Are there new rules that require us to implement this solution (e.g., emissions or cybersecurity regulations)?

**Integration with ecosystem**
- Are we able to benefit from the rich port ecosystem by implementing this solution? (e.g., JIT, MSW, startup ecosystem, etc.)

---

1. Just-In-Time (JIT); Maritime Single Window (MSW)
1b. Initiatives – Choosing what to start on (1/3)

Dimensions that we are scoring low in currently are

- [Dimension X]
- [Dimension Y]
- [Dimension Z]
1b. Initiatives – Choosing what to start on (2/3)

Dimensions that we are setting a high target for in the next three years are:

- [Dimension X]
- [Dimension Y]
- [Dimension Z]
1b. Initiatives – Choosing what to start on (3/3)

Priority grid by dimensions

<table>
<thead>
<tr>
<th>Priority dimensions</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

In the next [x] years, it is crucial that we focus on [x]—in line with priority dimensions of our DAI diagnosis in the top right quadrant.

1. Provided in the giveback pack by IMDA, based on self-reported survey answers of each organisation 2. Determined by gap between current digital maturity and target state of organisations in three years

Source: IMDA DAI assessment
1c. Enablers – Understanding what is needed for chosen initiative

### Priority grid by dimensions

<table>
<thead>
<tr>
<th>Gap to target maturity state</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8, 20, 35</td>
<td>5, 11, 24</td>
</tr>
<tr>
<td></td>
<td>6, 27, 30</td>
<td>10, 19, 22</td>
</tr>
<tr>
<td></td>
<td>1, 26, 28</td>
<td>12, 13, 25</td>
</tr>
</tbody>
</table>

#### Business strategy driven by digital
- Vision
- Ambition
- Priorities and alignment
- Roadmap

#### Digitize the core
- E2E customer journeys
- Research & product development
- Digital marketing
- Personalisation
- Next-generation sales
- Digitally driven pricing
- Digital supply chain
- Procurement
- Service Operations
- Corporate centre
- Shared services & centers of excellence
- Customer services

#### New digital growth
- New digital services/products
- Degree of digital disruption
- Lighthouses & prototyping
- Start-up incubation, VC, M&A

#### Leveraging the power of data & technology
- Data strategy
- Data governance
- Artificial Intelligence
- Digital & data platforms
- World Class Tech function
- Digital delivery (DevOps)
- Internet of things
- Cybersecurity

#### Integrating ecosystems
- Digital ecosystem go to market
- Digital ecosystem operating model

---

We will ensure that we are equipped with **enabler(s) [x]** — to accomplish our initiatives

---

1. Provided in the giveback pack by IMDA, based on self-reported survey answers of each organisation.
2. Determined by gap between current digital maturity and target state of organisations in three years.

Source: IMDA DAI assessment
1b. and 1c. Detailed description of initiative and enablers required

<table>
<thead>
<tr>
<th>Introduction to the product or solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Brief introduction &amp; history of the initiative</td>
</tr>
<tr>
<td>• What is the underlying technology?</td>
</tr>
<tr>
<td>• Who will use the product? (e.g. internal use, clients, …)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurable benefits of the product</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Outline the key benefits and tie back to DAI dimensions</td>
</tr>
<tr>
<td>• Make benefits measurable – e.g. &quot;the solution is projected to reduce error from XX% to XX%, saving $XX&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enablers required &amp; impact to current processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Describe enablers required and what is needed to set them up</td>
</tr>
<tr>
<td>• Outline changes in processes; consider using a process/flow chart to describe the changes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Success stories globally</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Alleviate &quot;fears&quot; by showing proof that others have done it— and more so if they have done it well!</td>
</tr>
</tbody>
</table>
2. Implementation Plan

Project will span [x weeks] from [x]

<table>
<thead>
<tr>
<th>Activity</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
</tr>
<tr>
<td>Activity 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity 2</td>
<td></td>
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<tr>
<td>Activity 3</td>
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<td>Activity 4</td>
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<td>Activity 5</td>
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<td>Activity 6</td>
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<td>Activity 7</td>
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<tr>
<td>Activity 8</td>
<td></td>
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<tr>
<td>Activity 9</td>
<td></td>
<td></td>
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<tr>
<td>Activity 10</td>
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</tr>
</tbody>
</table>

Legend
- Blue: Phase 1
- Yellow: Phase 2
- Orange: Phase 3
- Key updates

1x Project Manager
1x Data Scientist
2x Programmer

1x Project Manager
1x UI/UX Designer
2x Programmer

Update to broader team

▲ ▲ ▲ ▲ ▲
3. Financials

[xx] capital required; breakeven in [x]
4. Risks and mitigants
We recognize the following risks and have developed mitigation plans for them.

Potential categories to consider:

Product risk
- Could there be issues of poor adoption, poor quality, late delivery, etc.?
- Can this be mitigated by customer validation, customer testing, phased releases, etc.?

People risk
- Could there be a lack of talent to operate the new software?
- Can this be mitigated by having the internal team work hand-in-hand with vendor, easing change mgmt.?

Operational risk
- Could there be technology/cyber incidents, malfunctions, etc.?
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Market risk
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Reputational risk
- Could there be public backlash in the event of a breach of data?
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## 5. Immediate actions required

### Potential categories to consider:

<table>
<thead>
<tr>
<th>Category</th>
<th>Actions</th>
</tr>
</thead>
</table>
| **Procurement**           | • Shortlist and select vendors (and if applicable, issue RfPs, RfQs, etc.)  
                          | • Finalize commercial/technical discussions with said vendors           |
| **Funding**               | • Identify funding support channels and submit funding applications     |
|                           | • Engage financial institutions (e.g. bank) to obtain funding           |
|                           | • Plan with internal teams to draw down organisation funds              |
| **Engagement**            | • Socialize and seek support from relevant teams within organisation    |
|                           | • If applicable, seek regulatory guidance from MPA                      |
| **Advisory and Project Management** | • Seek advisory or consultancy services                                   |
|                           | • Seek project management support                                      |
|                           | • If applicable, seek mentorship through an accelerator (e.g. PIER71)   |
| **Product Development and Research** | • Conduct customer interviews to validate pain points                     |
|                           | • Refine product specifications through market testing                   |
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