

The image features a stylized, isometric digital environment. On the left, a laptop is shown with various data visualizations like bar and line graphs floating above it. To the right, there are several server racks with glowing blue lights. A person in a dark suit stands in the center, interacting with a glowing red padlock icon on a server panel. The floor is a dark blue grid with various icons like a smartphone, a briefcase, an '@' symbol, and gears. The background is a gradient of blue and red.

PITCH 2024 Grand Challenges

GROUP 1



How can data center operators manage growing energy needs while prioritising environmental stewardship?

CHALLENGE INTRODUCTION



Sara Hutchinson Tovar
Economist



Mhirika Pincha Baduge
Intensive Care Nurse



Allan Ribeiro Pimenta
Transport Engineer



Fahmida Islam
Immunologist



Thiviya Gill
Microbiologist



Sumiyyah Hameed
Chemist



Fatin Nadiah
Psycholinguist

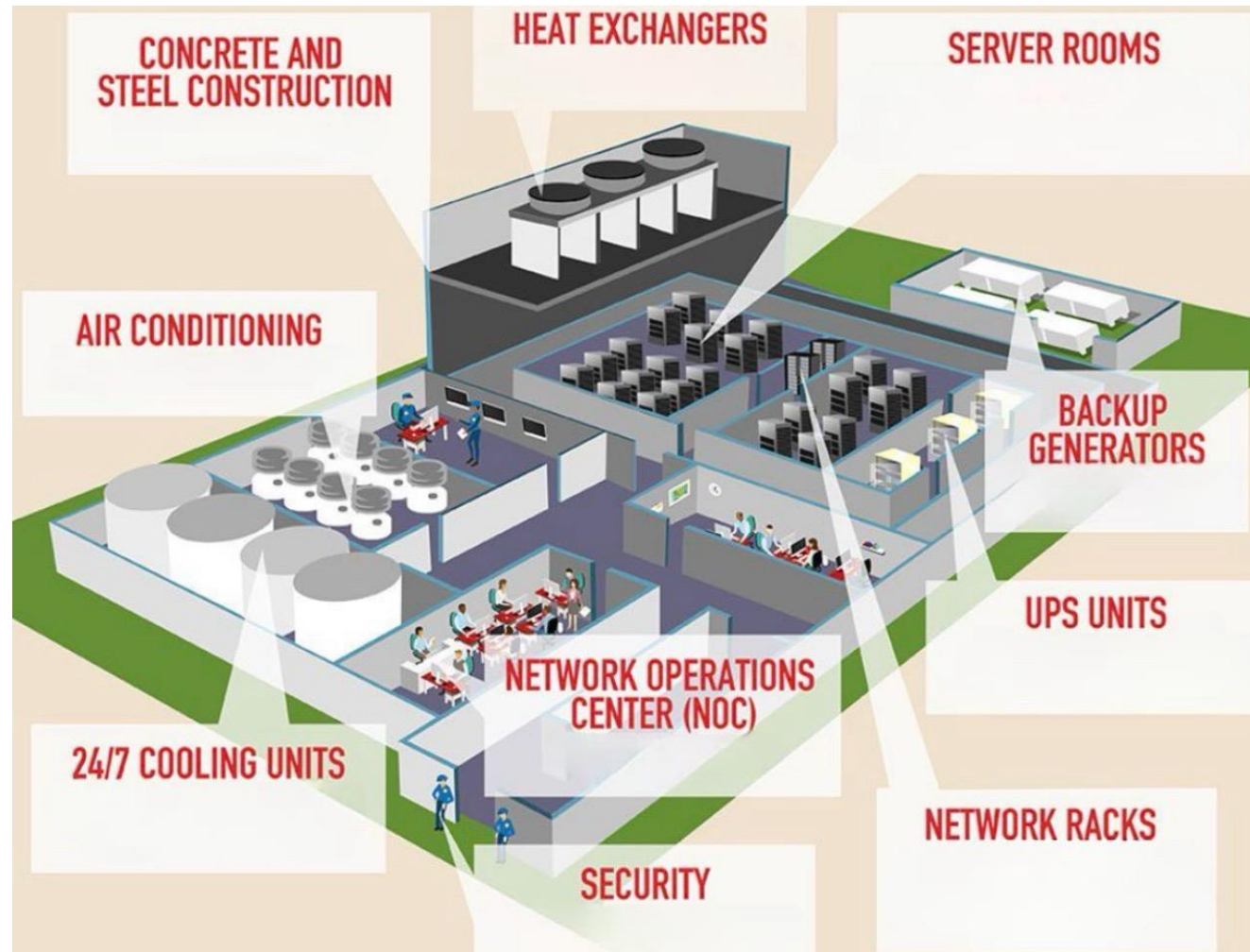
WHAT IS A DATA CENTER?

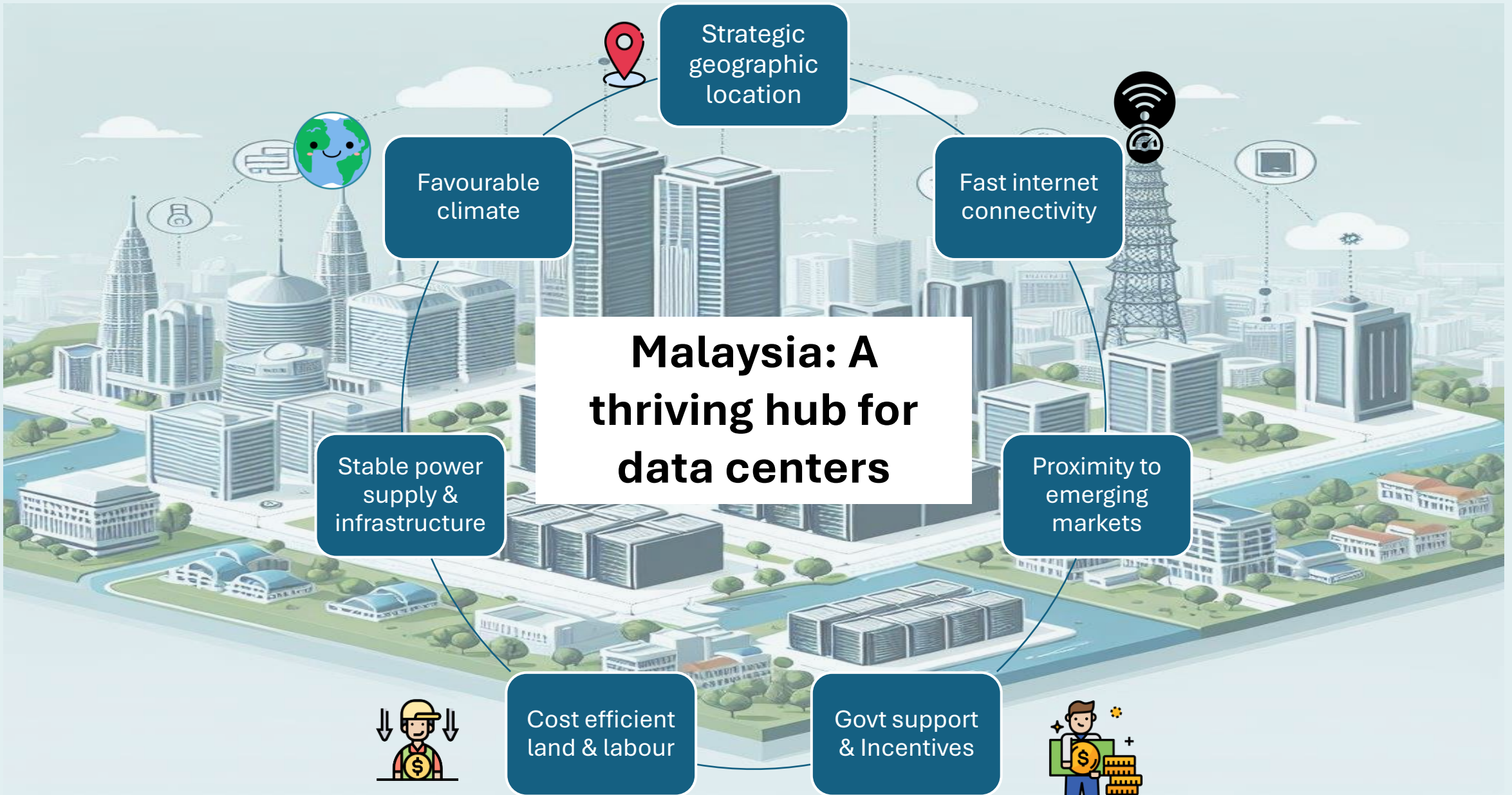


Data Centers are specialised facilities housing hardware and technology driving the internet, cloud services, and all the digital applications we rely on daily.

They store, process, and distribute vast amounts of data

HOW DO DATA CENTERS WORK?





CHALLENGES INTRODUCED BY DATA CENTERS IN MALAYSIA



High Power
Consumption

THE STRAITS TIMES

ASIA

LOG IN

Malaysia's push for data centres could strain power and water supplies, warn experts

Cont...



Water
Consumption

Asia

Johor's data centres getting a boost from the Singapore factor; water, power remain bottlenecks

Southern Johor is seeing a boom in data centres thanks to its proximity to Singapore, spillover effects of the US-China trade war, as well as cheaper land, water and power. More tech opportunities beckon, say experts.

Cont...



Land Usage

BUSINESS TIMES

HOME

CORPORATE

ECONOMY

FEATURE

CARS BIKES TRUCKS

SME

ESG

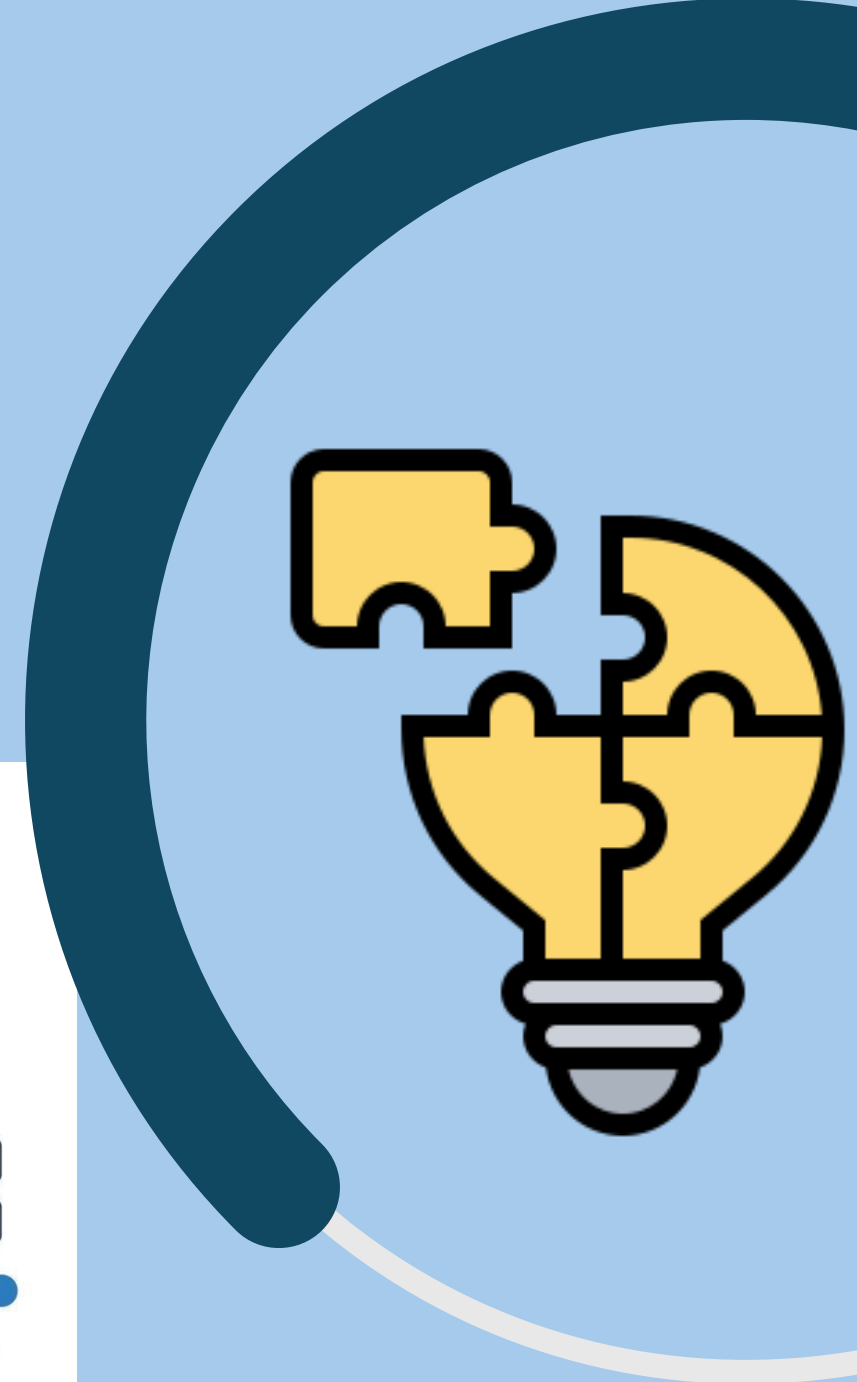
Johor now the largest data centre market in Malaysia, driven by investments from MNCs: report

Baxtel cites Johor as the largest data centre market in Malaysia now, as multinational corporations (MNCs) with regional presence pour investments into the state, according to a report by Channel News Asia.

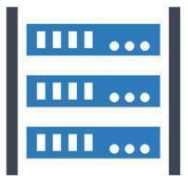
The site lists some **13 data centres facilities across more than 1.65 million square feet of land mass in Johor**, with another four under construction. Baxtel ranks Johor as the ninth-largest data centre market in Asia Pacific.



PROPOSED SOLUTION



DATA CENTER



Server



Cloud Computing



Big Data



Data Security



Network



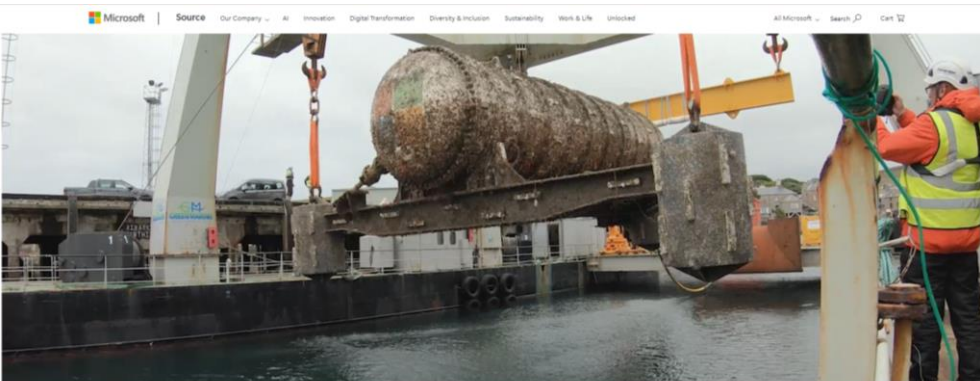
Backup

PROPOSED SOLUTION: AN UNDERWATER DATA CENTER



EXISTING UNDERWATER DATA CENTER PROJECTS

Project Natick by Microsoft



Microsoft finds underwater datacenters are reliable, practical and use energy sustainably

Subsea Cloud Project in Singapore

HOME > NEWS > CONSTRUCTION & SITE SELECTION

Subsea Cloud announces three underwater data center projects



Chinese Government Project

Technology 15:10, 01-Apr-2023



World's first commercial undersea data center hits water in S China



SWOT ANALYSIS

Strengths

- Natural cooling efficiency.
- Facilitate the use of tidal and offshore. Wind energy.
- Secure and scalable.

Weaknesses

- Maintenance and accessibility
- Technological risks
- Environmental monitoring needs

Opportunities

- Generate jobs.
- Attract foreign investment.
- Affordable real estate.
- Disaster resilience.

Challenges

- Marine ecosystem impact.
- Construction and maintenance.
- Increase sea temperature.

PROPOSED LOCATION: JOHOR BAHRU



SITE SELECTION RATIONALE

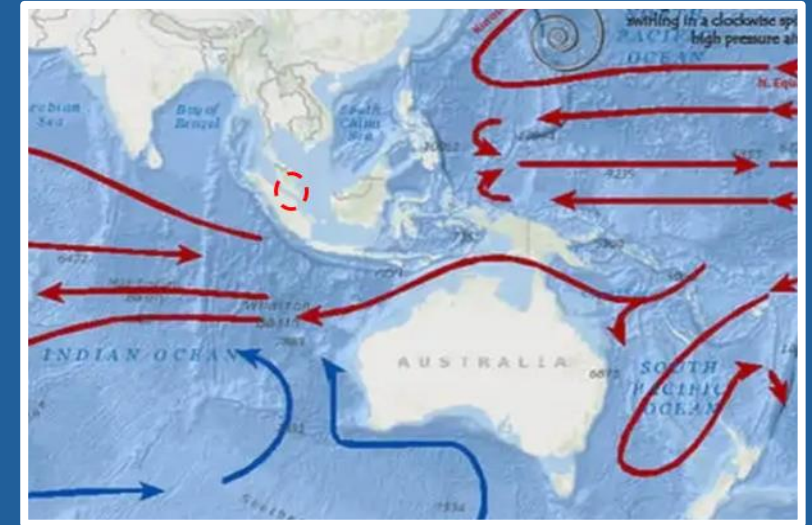
Peninsula area surrounded
by land



Do not conflict with current ship
routes



Do not conflict with major ocean
currents



Near Singapore border



Sufficient depth for capsule
installation



Near existing on-shore data
centers

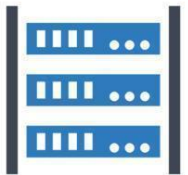




DESIGN



DATA CENTER



Server



Cloud Computing



Big Data



Data Security



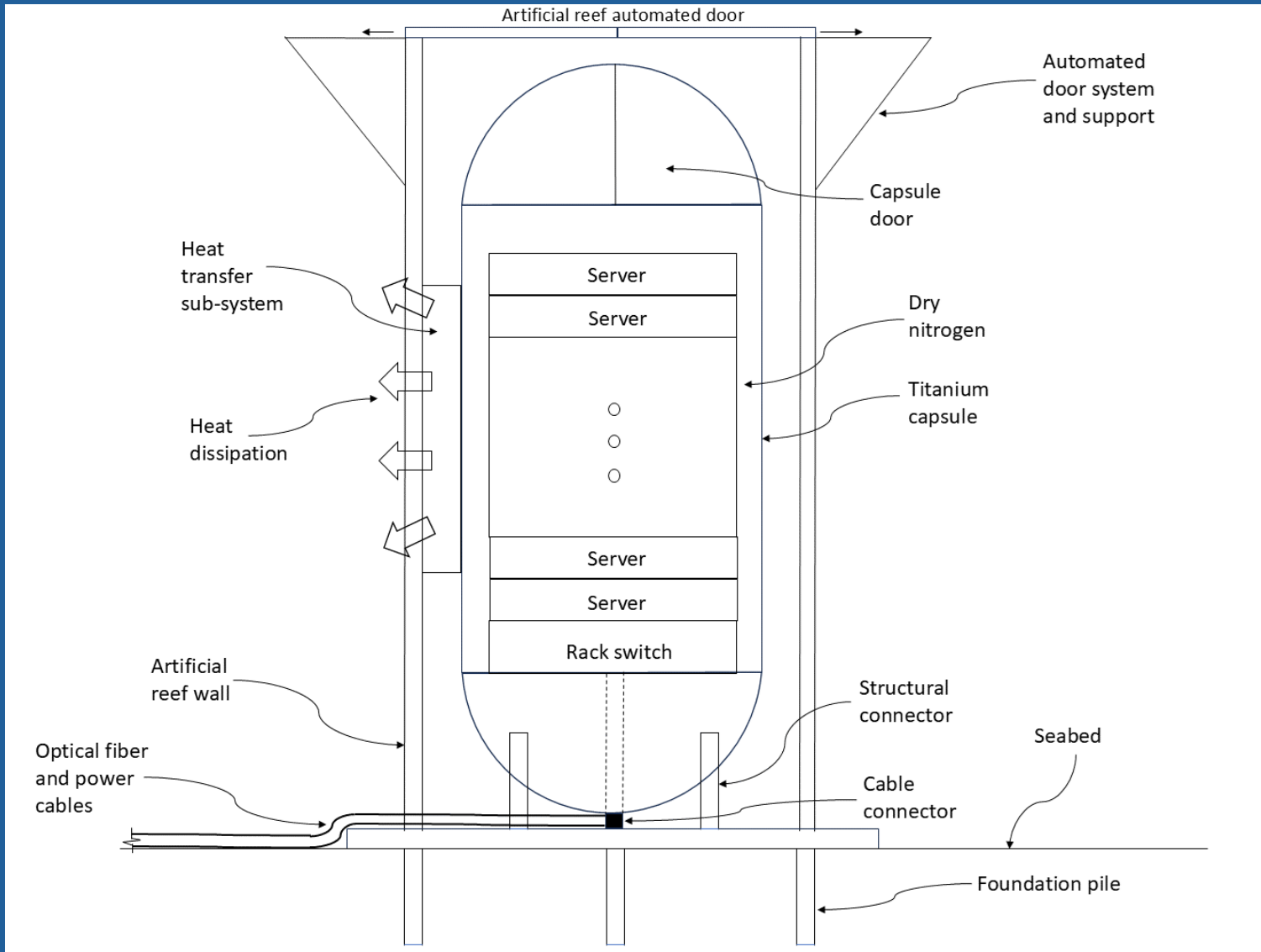
Network



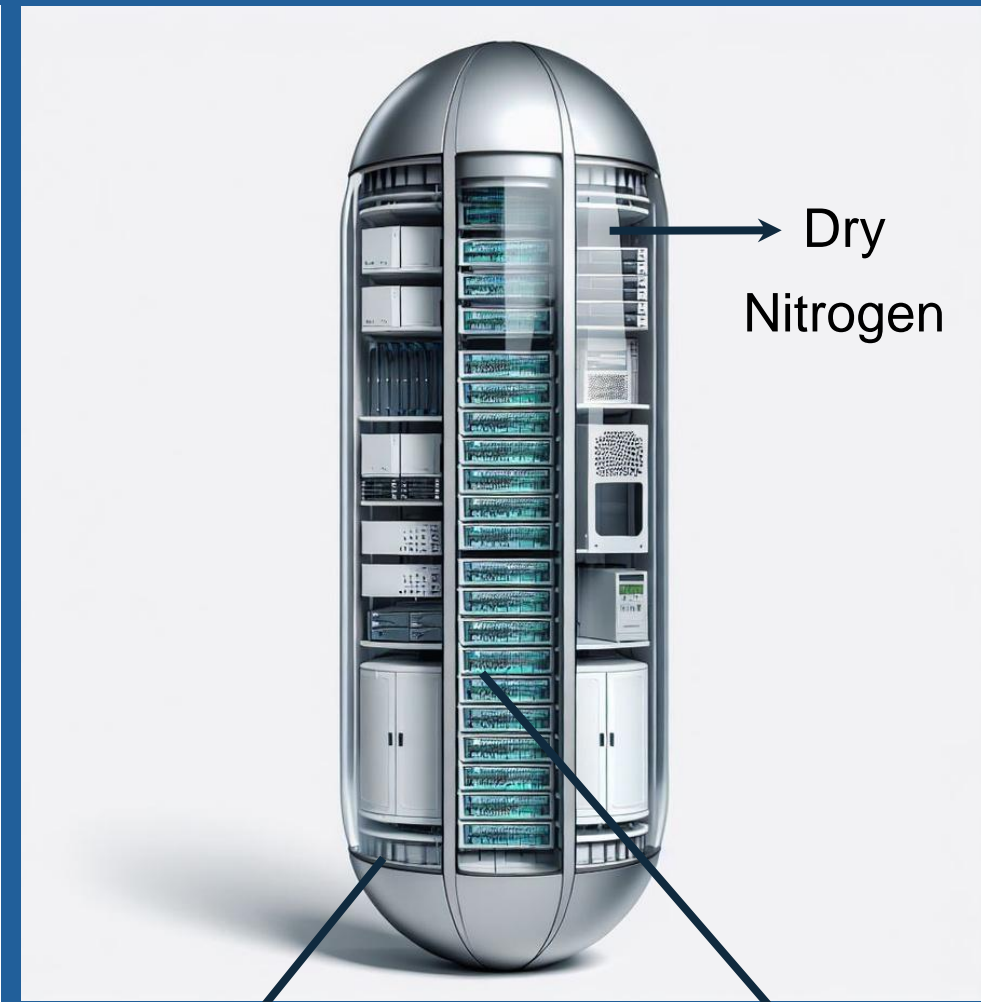
Backup



TECHNICAL DETAILS



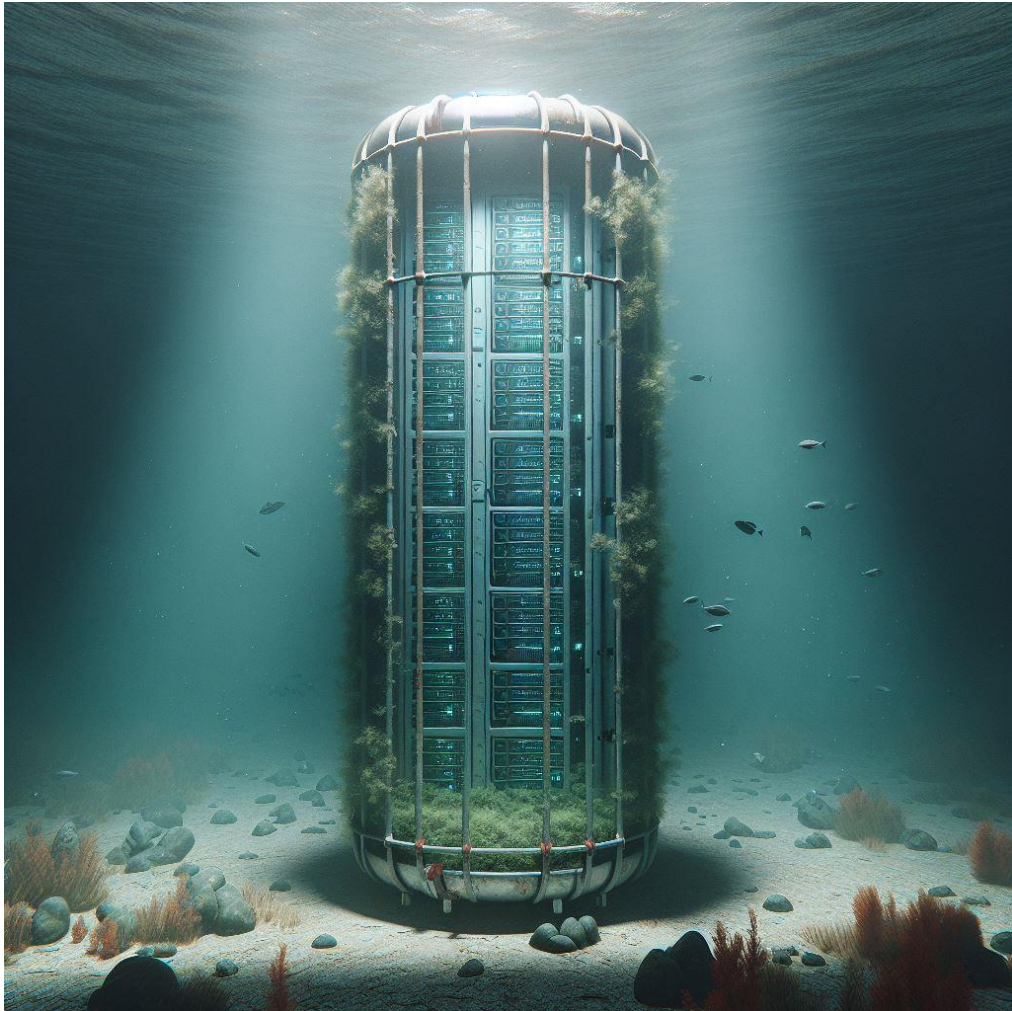
CAPSULE DESIGN



Titanium Capsule

Servers

ECOLOGICAL ASPECT



Biodiversity promotion

- Promote artificial reef for marine species

Wave and Current Protection

- Protect from underwater vibrations

Renewable energy

- Tidal energy

MAINTENANCE



PROJECT ROADMAP BY 2035

Phase 2: Design & Engineering (2027 - 2028)

- Finalise technical design
- Test prototype underwater

Phase 4: Operational Launch & Expansion (2032 - 2035)

- Launch operations
- Expand capacity and upgrade technology

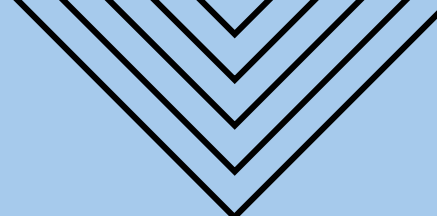
Phase 1: Planning & Feasibility (2025 - 2026)

- Government and funding approvals
- Feasibility studies
- Finalise project plan

Phase 3: Construction & Deployment (2029 - 2031)

- Build and install the structures
- Perform systems testing





TAKEHOLDERS



STAKEHOLDER



Investors



Community



Trade Unions



Government



Customers



Creditors



STAKEHOLDER ENGAGEMENT



Public & Private Partnership

1. Government

- MAMPU
- MIDA
- JPPDNJ
- Malaysia Marine Department Southern Region

2. Private Sector

- Current data centers investors – Microsoft, Google, IBM, Meta

3. Local Community

- including indigenous people

4. Non-gov Environment organisations

5. Defence Ministry-Nav

6. Other Countries

7. External Renewable Power Companies



FUNDING BODIES

Potential Investors  Meta  Microsoft  Google   OpenAI 

UNDP 

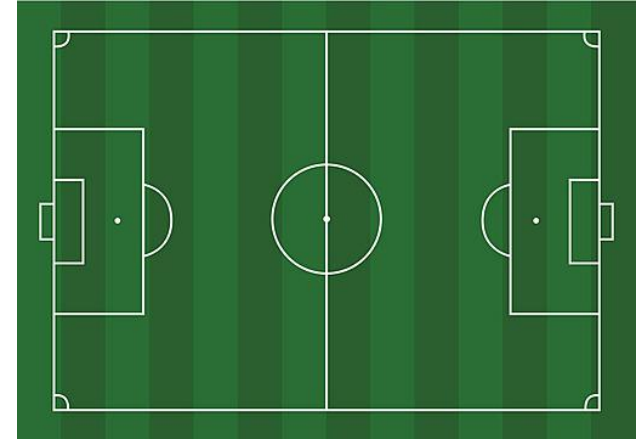
World Bank  **THE WORLD BANK**

Asia Development Bank 

POTENTIAL BENEFITS



292M Liters a day
(+10M people)



730,000m²
(+73,000 Football
pitches)

TECH

Malaysia is emerging as a data center powerhouse amid booming demand from AI

PUBLISHED SUN, JUN 16 2024 8:55 PM EDT



400,000
Households

5,000 megawatts
(MW) by 2035.

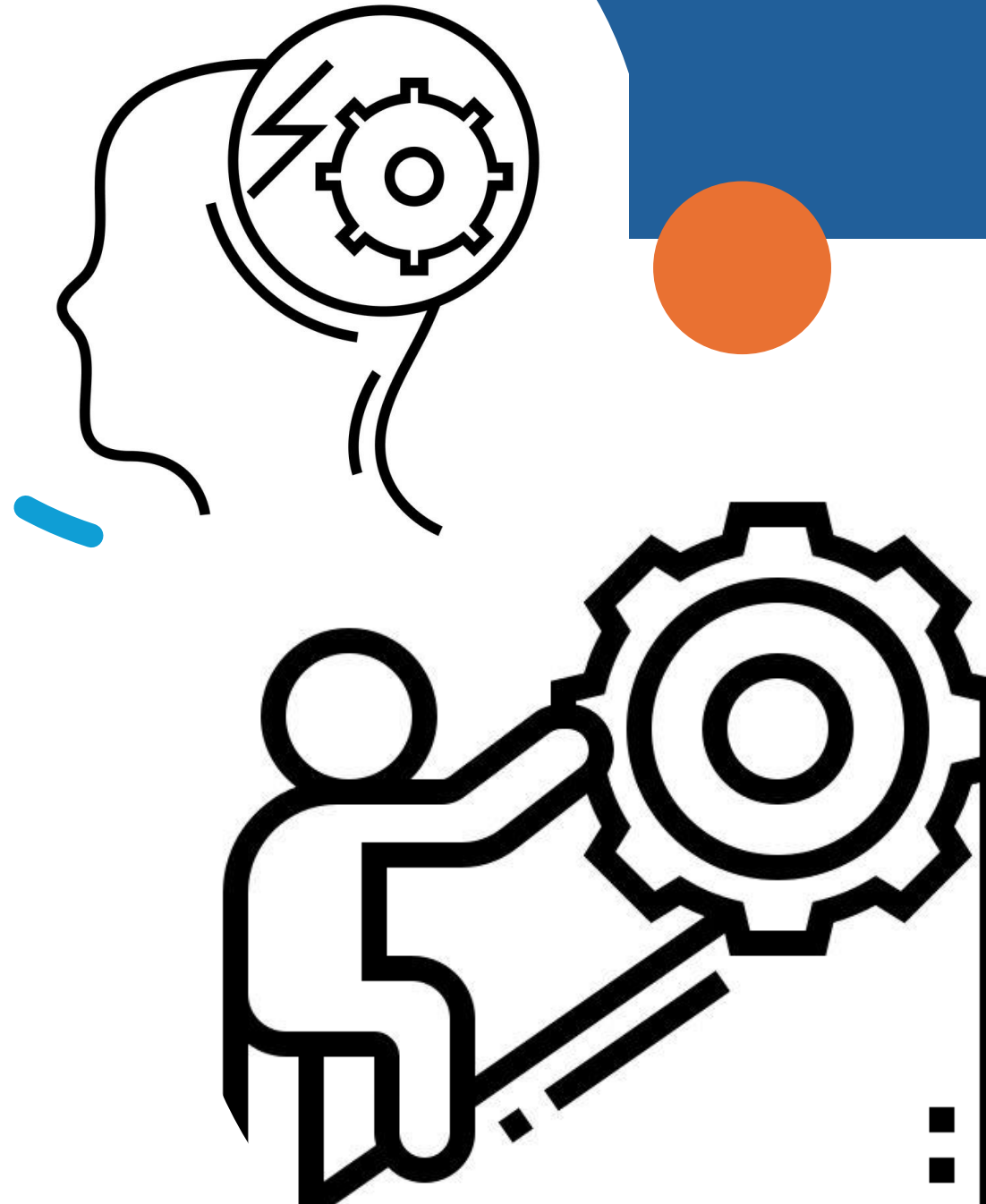
40% of Energy is used for
cooling – McKinsey & Company

CONCLUSION

Data centers can boost economy,
generate jobs & develop digital
infrastructure

Underwater data centers eliminate
the challenges of:

- ✓ limited land
- ✓ high power & water consumption



Resources

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Explore underwater data centers' viability, sustainability

<https://www.techtarget.com/searchdatacenter/tip/Explore-underwater-data-centers-viability-sustainability>

Artificial reef Microsoft patent

<https://patents.google.com/patent/US10524395B2/en>

A server rack is positioned in the center of the frame, appearing to be submerged in a dark, blue-green underwater environment. The rack is filled with various server components, including circuit boards and cables. The background is filled with numerous small fish swimming in the water. The floor of the underwater environment is covered with rocks and some sparse, brownish vegetation. The overall scene is dimly lit, creating a mysterious and somewhat eerie atmosphere.

THANK YOU!
