



Title:

# Current and Future Challenges For Hydrographic Surveyors in Malaysia

Speaker:

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President of the Association of Authorised Land  
Surveyors Malaysia (PEJUTA)

Date:

18 & 19 November 2019



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UNIVERSITI TEKNOLOGI MALAYSIA



# CURRENT AND FUTURE CHALLENGES FOR HYDROGRAPHIC SURVEYORS IN MALAYSIA

**SHAHARUDDIN MUSA**

**President**

**Association of Authorised Land Surveyors  
Malaysia (PEJUTA)**

**18 & 19 November 2019**





# Presentation Outline

- \* Introduction & Defination
- \* Malaysia Maritime Zones & Related Agencies
- \* Licensed Land Surveyors in Hydrographic Survey
- \* Current scope of Work
- \* Education and Training
- \* Technology Advancement
- \* Opportunity and Challenging
- \* Take Home Notes



# \* Introduction



## Definations

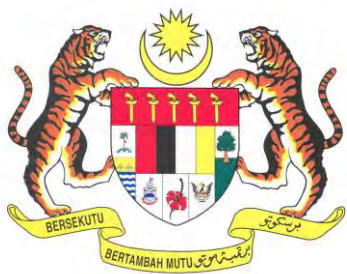
- \* Hydrography involves the surveying and mapping of rivers, lakes and oceans which gives us information about what the seafloor and movement of water above that seafloor looks like. ... These nautical publications are critical for providing mariners with the information they need to navigate ships safely and efficiently.



# \* Definations..



- \* Hydrographic survey is the science of measurement and description of features which affect maritime navigation, marine construction, [dredging](#), [offshore oil exploration](#) / [offshore oil drilling](#) and related activities. Strong emphasis is placed on soundings, shorelines, tides, currents, [seabed](#) and submerged obstructions that relate to the previously mentioned activities.
- \* The term *hydrography* is used synonymously to describe *maritime [cartography](#)*, which in the final stages of the hydrographic process uses the raw data collected through hydrographic survey into information usable by the [end user](#).
- \* [Hydrography](#) is collected under rules which vary depending on the acceptance authority. Traditionally conducted by ships with a [sounding line](#) or [echo sounding](#), surveys are increasingly conducted with the aid of aircraft and sophisticated electronic sensor systems in shallow waters.



# \* Area of Malaysia

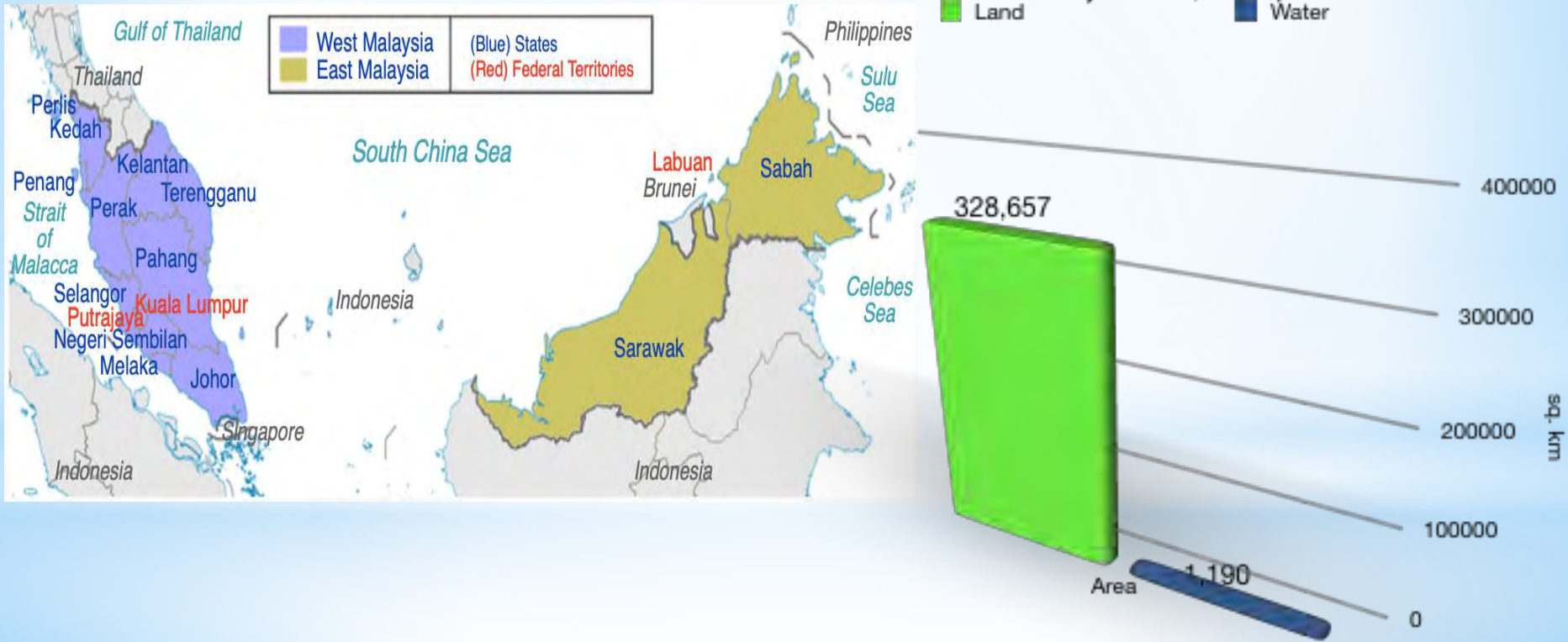


According to The World Fact Book: Malaysia

[retrieve: <https://www.cia.gov/library/publications/the-world-factbook/geos/my.html>]

Area of Malaysia: 329,847 sq. km

■ Land ■ Water



## References:

- <https://www.cia.gov/library/publications/the-world-factbook/geos/my.html>
- [https://en.wikipedia.org/wiki/States\\_and\\_federal\\_territories\\_of\\_Malaysia](https://en.wikipedia.org/wiki/States_and_federal_territories_of_Malaysia)





# Maritime Zones of Malaysia

According to The World Fact Book: Malaysia

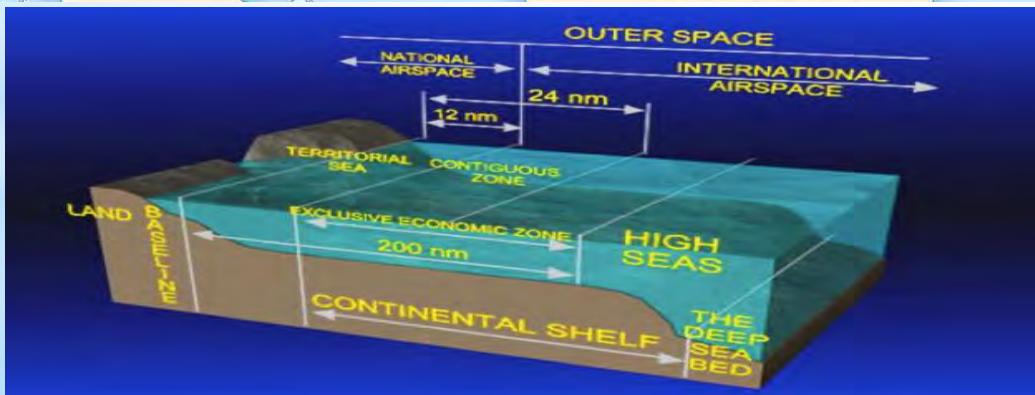
[retrieve: <https://www.cia.gov/library/publications/the-world-factbook/geos/my.html>]



Coastline: 4,675 km  
Peninsular Malaysia: 2,068 km  
East Malaysia: 2,607 km

Territorial Sea: 12 nautical mile

Exclusive Economic Zone: 200 nautical mile



References:

<https://www.cia.gov/library/publications/the-world-factbook/geos/my.html>  
[https://commons.wikimedia.org/wiki/File:Maritime\\_border\\_of\\_Malaysia.jpg](https://commons.wikimedia.org/wiki/File:Maritime_border_of_Malaysia.jpg)

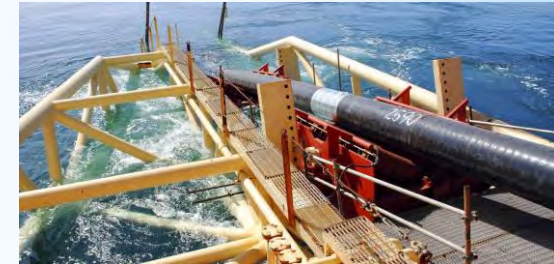
# Maritime Zones: Related Activities



**Safety of navigation/regulation of traffic**



**Protection of navigation aids, pipelines and cables**



**Conservation of living resources**

**Preservation of environments**



**Hydrographic surveys & marine scientific research**





# \* Maritime Zones: Related Legislations



**EEZ Act 1984 (Act 311)**

**Baseline of Maritime Zones Act  
2006 (Act 660)**

**Territorial Sea Act 2012 (Act 750)**

# \* Maritime Zones: Related Interest



**Fisheries**



**Resource  
Exploitation**



**Security &  
Enforcement**



# RELATED GOVERNMENT AGENCIES



# AUTHORITY



- \* KATS/JUPEM: Providing a comprehensive and integrated geospatial defence services for the purpose of defence and security.



- \* MINDEF: Safety Marine Navigation, National Defence, National Development



- \* MOT: to administer matters related to shipping and ports including maritime affair within Malaysian waters



- \* PM Dept.: tasked with maintaining law and order, and coordinating search and rescue operations in the Malaysian Maritime Zone and on the high seas.



# \* Department of Survey and Mapping Malaysia



- **Advising the government** in the field of **cadastral survey, mapping and geospatial** as well as **the state and international boundaries**.
- **Providing complete and conclusive cadastral survey information** for the purpose of issuing land titles, strata and stratum.
- **Managing the cadastral survey and mapping database** efficiently.
- **Publishing** topographic, cadastral, thematic, and underground utility maps for planning, natural resources management, environmental conservation, development, monitoring, and security purposes.
- **Providing geodetic infrastructure** for cadastral surveying, mapping, engineering and scientific research.
- **Providing a comprehensive and integrated geospatial defence services** for the purpose of defence and security.
- **Publishing astronomical and astronomy products** which include qiblah direction tables, prayers time, rukyah hilal data, hijra calendar and eclipse information and syariah astronomical almanac.

# National Hydrographic Centre, Royal Malaysia Navy (PHN)



**VISI**

**Menjadi penyumbang perkhidmatan hidrografi yang berkualiti dan berkredibel**

**MISI**

**Menyediakan maklumat hidrografi yang tepat pada kadar masa yang wajar untuk kegunaan navigasi marin, pembangunan nasional, pertahanan negara dan kegunaan lain**

- \* Accurate Hydrographic Information for Marine Navigation, national development, country defence and others



# Marine Department of Malaysia



The Marine Department is a government department under the purview of the Ministry of Transport, Malaysia.

Its objective is to administer matters related to shipping and ports including maritime affair within Malaysian waters.

Mission: To strengthen the maritime transportation system based on the compliance of national and international safety standards.

# Malaysian Maritime Enforcement Agency (APMM)



**The coast guard organization of Malaysia, and principal government agency tasked with maintaining law and order, and coordinating search and rescue operations in the Malaysian Maritime Zone and on the high seas.**

MISSION: TO ENFORCE LAWS, SAVING LIVES AND PROPERTIES AT SEA IN ORDER TO ENSURE THE SAFETY AND SECURITY OF MALAYSIAN MARITIME ZONE (MMZ)

# Department of Irrigation and Drainage



The Department of Irrigation and Drainage (DID) which is under the direction of the Ministry of Water, Land and Natural Resource (KATS), has over the years taken on new and expanded responsibilities.

Today, the DID's duties encompass :

- River Basin Management and Coastal Zone
- Water Resources Management and Hydrology
- Special Projects
- Flood Management
- Eco-friendly Drainage



# Licensed Land Surveyors in Hydrographic survey



- Hydrographic survey has been part and parcel of engineering survey being carried out by Licensed Land Surveyors in the Peninsular Malaysia, Sabah and also Sarawak decades ago.
- Hydrographic survey has been carried out primarily to provide records, plans, charts and information of the sea/river/lake beds that will be used by professionals such as engineers, architects, planners, developers, etc.
- The scopes or work are clearly stipulated in the Treasury Engineering Surveying scale of fee for Land Surveyor (Jadual Fee Ukur Kejuruteraan 2001). Moreover, there are also a clear instruction and requirement for a Land Surveyor to register the Category Code 210606-Hydrographic with Ministry of Finance to carry out the Hydrographic project offer by government.



\* CURRENT SCOPE OF  
WORK IN THE FIELD OF  
HYDROGRAPHIC SURVEYS  
COVERED AND CARRIED  
OUT BY LAND  
SURVEYORS



Current scope of work in the field of Hydrographic surveys covered and carried out by Land Surveyor are:

- Hydrographic Surveys at Territorial Waters
- Hydrographic survey in support of Management of coastal zones
- Hydrographic survey of deltaic regions and river mouth and river
- Hydrographic survey in support of the development of coastal engineering, property, infrastructure projects and activities
- Hydrographic survey in support of the management and development of jetties, ports,
- harbors and associated maritime facilities
- Hydrographic survey in support of the management and development along inland waterways and Inland water body
- Hydrographic survey in all open area and security area





- Bathymetric (offshore) profiling
- Tidal observation and tidal analysis
- Current measurement through self-recording and direct reading
- Seawater temperature and salinity measurement
- Seabed (Grab) Soil Sampling
- Seawater sampling
- Hydrographic survey in support of Land reclamation,
- Hydrographic survey in support of dredging on channel, realignment of river,
- Hydrographic survey in support of construction of canal,
- Hydrographic survey in support of construction of wharf, jetty
- Bathymetric survey at near shore, offshore, river, pond and lake



# EDUCATION AND TRAINING



□ Hydrographic Surveying is taught in all Institution of Higher Learning all over the World as **one of the subject** in bachelor degree course in Land Surveying.

Hydrographic surveying cannot be taught as a degree course by itself as it requires many other **supporting subjects** such as Geodesy, Cartography, Map Projections, Mathematics and Terrestrial Survey.

The most important is, Category A and Category B Hydrographic course never be accepted as an **independent subject** or as a degree course by itself without a support of basic degree in land surveying.





# FORMAL EDUCATION



## GEOOMATIC

### POSTGRADUATE



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**UNIVERSITI  
TEKNOLOGI  
MARA**

### UNDERGRADUATE



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أَبُو سَيْبَتِي تَيْكُونُ لَوْ كُنَّ مَبَارَا  
**UNIVERSITI  
TEKNOLOGI  
MARA**



**POLITEKNIK  
KUCHING SARAWAK**



**POLITEKNIK MERLIMAU**



**POLITEKNIK SULTAN HAJI AHMAD SHAH**



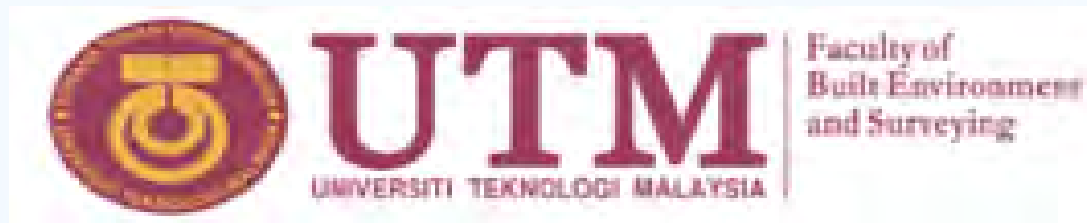
**TUANKU  
SULTANAH BAHYAH**





# PROFESSIONAL CERTIFICATION

## UTM HYDRO III (HYDROGRAPHIC AND MARINE TECHNOLOGY PROGRAMME) FIG/IHO/ICA CATEGORY A



RECOGNISED BY



INTERNATIONAL  
FEDERATION  
OF SURVEYORS



INTERNATIONAL  
HYDROGRAPHIC  
ORGANIZATION



INTERNATIONAL  
CARTOGRAPHICAL  
ASSOCIATION

IN COLLABORATION WITH



# PROFESIONAL CERTIFICATION



## UTM HYDRO III (HYDROGRAPHIC AND MARINE TECHNOLOGY PROGRAMME) FIG/IHO/ICA CATEGORY A

5 OCTOBER 2018 – 4 AUGUST 2019



AMAN  
HAMIDI BIN  
MOHAMAD



ABD. MALIK  
BIN YAHDY



DEVAN A/L  
SAMINATHAN



FAKHRUL  
AZMAN BIN  
ALI



GENGATHARA  
N A/L  
MARIAPPAN



HAFIZI BIN  
ISMAL



LEOW KAM  
CHOY



MAHADI BIN  
SUBOH



MOHD ROZI  
BIN LATIB



MOHD  
HAFIZI BIN  
MOHD ZAWI



NG BOON  
CHYE



NORDIN BIN  
MD



SHAH  
NIZAM BIN  
BASIRUN



SIVAGANAM A/L  
KANAGARATNAM



YIP KIT  
MENG



ZAINAL  
ABIDIN BIN  
KAMARUDDIN





# UTM HYDRO III (HYDROGRAPHIC AND MARINE TECHNOLOGY PROGRAMME) FIG/IHO/ICA CATEGORY A

5 OCTOBER 2018 – 4 AUGUST 2019

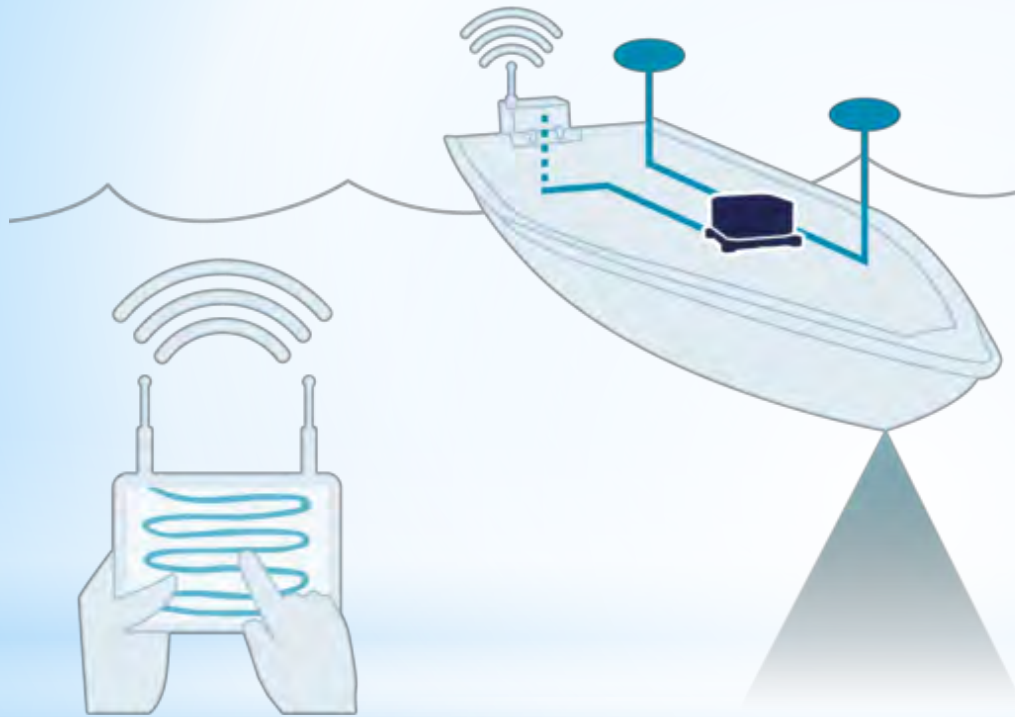


ER



# Technology Advancement

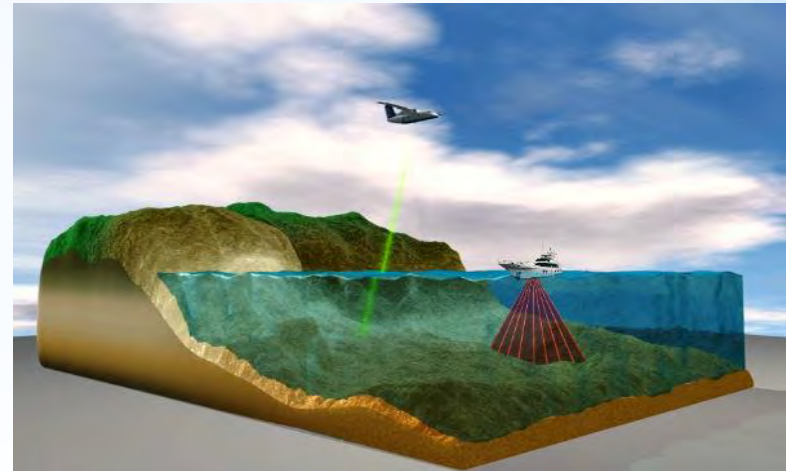
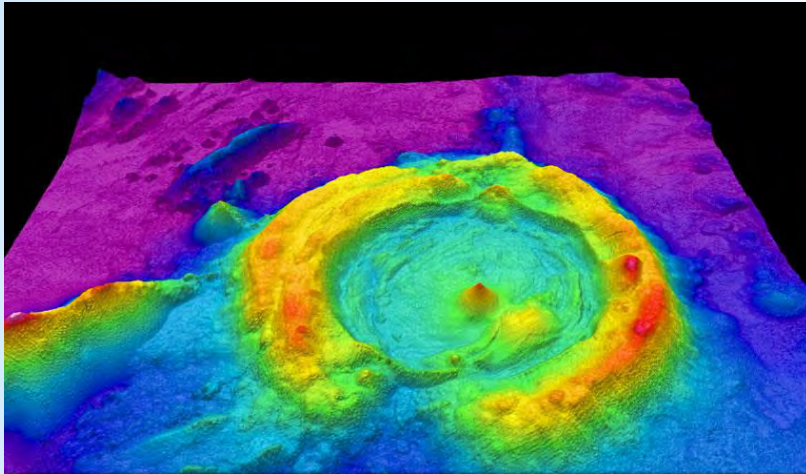
# UNMANNED SURFACE VEHICLE [USV]



Unmanned Surface Vehicles (USVs) are vehicles that operate on the surface of the water without a crew. USVs have many applications similar to [Small Survey Boats] but have the advantages of being deployable without a crew. This makes USVs cheap and easy to use.

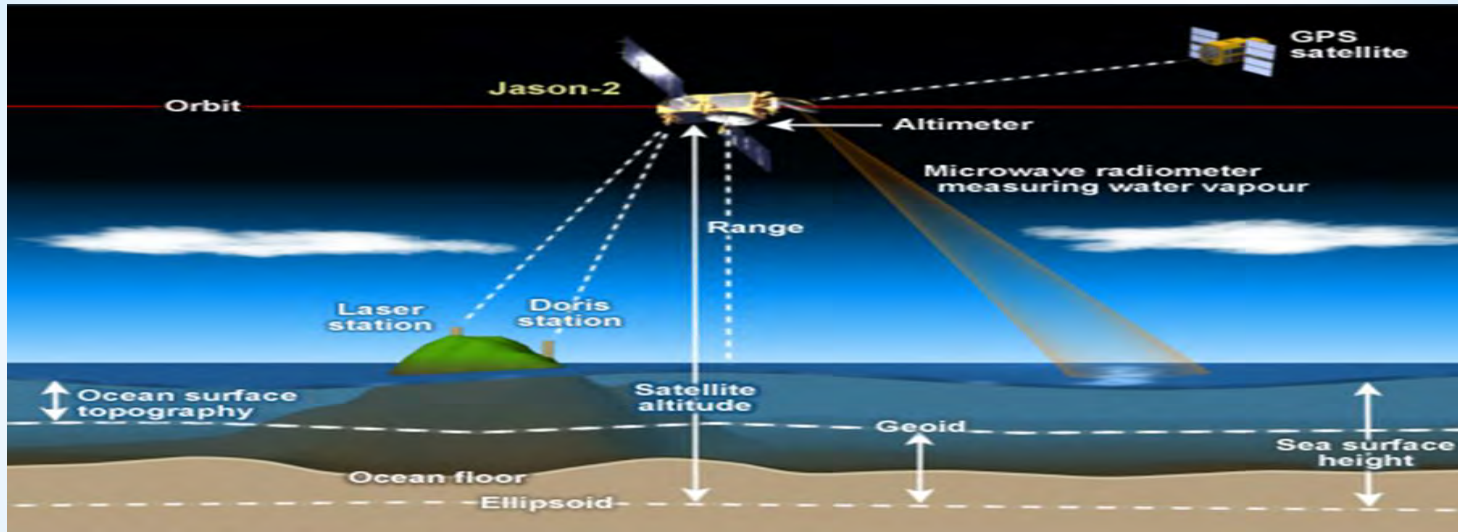


# BATHYMETRY LIDAR



**Bathymetric Lidar is a technique to capture geospatial data of the coastline and (shallow) waters. It is a method potentially facilitating efficient and fast creation of hydrographic data.**

# SATELLITE ALTIMETRY



**Satellite altimetry has revolutionized sea-level measurements because it provides measurements of sea-surface height with global coverage and a revisit time of several days.**



# OPPORTUNITIES AND CHALLENGES



# End Users;

- \* Marine Department
- \* Drainage and Irrigations Department
- \* State Development Authorities
- \* TNB Hydro / IPP
- \* Public Work Department
- \* Local Port Authorities
- \* Petroleum and Gas Companies



**PKNS**



**TENAGA NASIONAL**

*Better. Brighter.*



**PETRONAS GAS**



**PORT KLANG**  
malaysia



# Hydrographic survey Services ;

- \* Marine Cadastral
- \* Coastal Erosions and sedimentations
- \* Reclamations and New Coastal Development
- \* Underwater cable networks





# EDUCATION



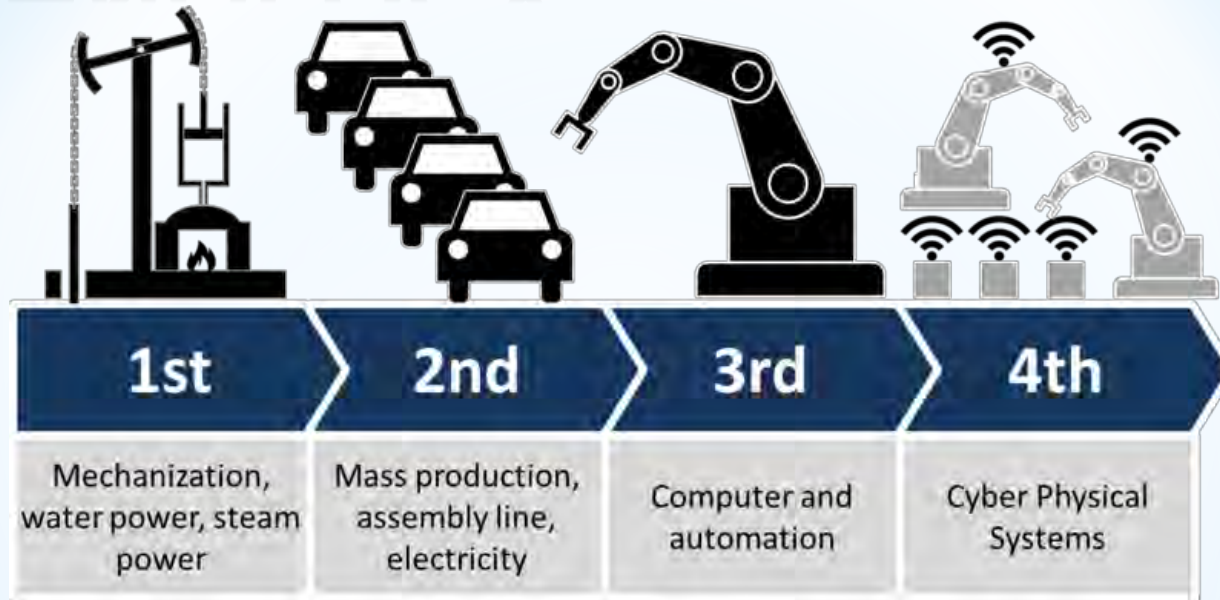
The term "21st-century skills" is generally used to refer to certain core competencies such as collaboration, digital literacy, critical thinking, and problem-solving that advocates believe university/college need to teach to help students thrive in today's world.

## The 21<sup>st</sup> C Learner is . . .





# TECHNOLOGY



## Industrial Revolution

“The Malaysian Ministry of International Trade and Industry (MITI) tabled the the National Policy for Industry Revolution 4.0 to help advance the countries’ businesses and factories. This will ideally help the local industries to increase productivity, efficiency, quality, and to also develop new skills and talent with the people.”

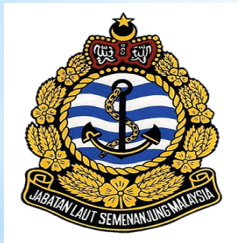
# \* AUTHORITY



\* **KATS:** Providing a comprehensive and integrated **geospatial defence** services for the purpose of defence and security.



\* **MINDEF:** Safety Marine Navigation, National Defence, National Development

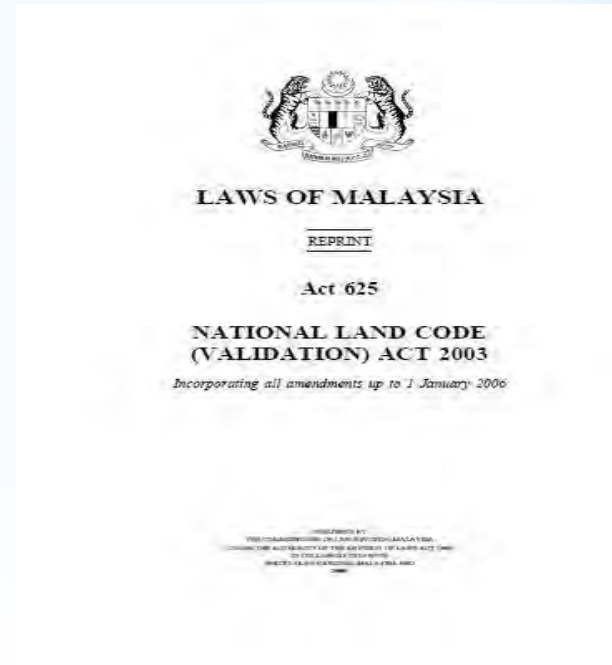
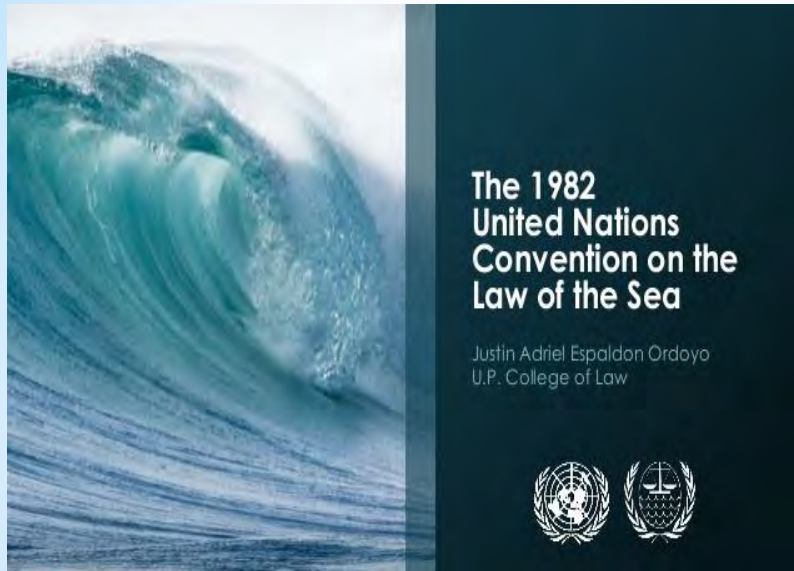


\* **MOT:** to administer matters related to shipping and ports including **maritime affair** within Malaysian waters



\* **PM Dep.:** tasked with maintaining law and order, and coordinating search and rescue operations in the Malaysian **Maritime Zone** and on the high seas.

# LAWS AND REGULATIONS



- \* Law of The Sea 1982
- \* EEZ Act 1984 (Act 311)
- \* National Land Code 1965
- \* Malaysian Maritime Enforcement Agency Act 2004
- \* Merchant Shipping Ordinance 1952 [Ord. 70/1952]

Hydrographic  
Surveying Act???



# Take Home Notes



- \* The Licensed land Surveyor Act 458 (LLSA1958) should be reviewed to accommodate and to regulate a bigger scope of land survey work such as hydrographic survey, GIS, remote sensing, utility survey, engineering survey, mapping and etc instead only cadastral survey. Review of the LLSA1958 is urgently needed to cater for the development of marine cadastral in near future.
- \* The Proposal / Draft of Hydrographic Surveying Act should accommodate, adopt and facilitate of the current practicing of the Licensed Land Surveyors and other practitioner activities in Hydrographic surveys .

grazie 谢谢 ขอบคุณ  
 merci Σας ευχαριστώ tákk bedankt  
 Спасибо धन्यवाद ありがとう  
 tack terima kasih  
 gracias **thank you** obrigado  
 teşekkür ederim شكرا 고마워요  
 danke kiitos köszönjük



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