Land Surveying Division
Sr Paul Tsui LSD Council Chairman

CSDI Unleashes the Power of GIS in Spatial Analytics

I was invited to the Technology Forum, organised by OGCIO, as a VIP speaker for the topic, "Innovate with CSDI Spatial Data to Enhance Public Services," on 9 March. The event was conducted in hybrid mode and attended by over 4,500 participants. I was asked to deliver a speech on one of two sub-topics: "Improving Decision-making Using Spatial Data Analysis". The organiser specifically wanted me to discuss GIS spatial analysis using CSDI data for public services.

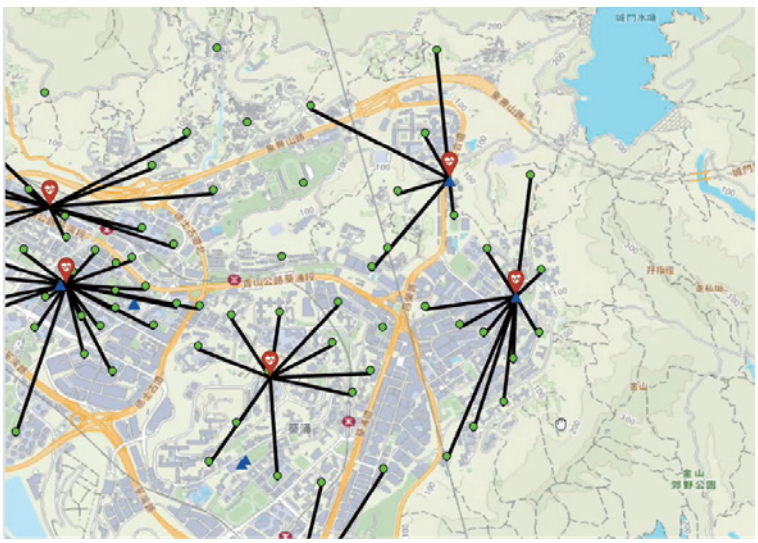
Government administrators always face the problem of how to utilise limited resources and facilities to meet maximal service demands from their people. This is obviously a spatial problem that can be solved by a classical GIS spatial analysis called location-allocation, which helps find the best locations for facilities to serve a set of demand locations. These locations may try to cover the greatest demand, minimise costs to meet such demand, or maximise market share. The analysis combines the power of GIS spatial analysis and operational research (OR) to offer an optimal solution. Users do not need to bother with the complex OR algorithms operating in the background. They just need to input the necessary datasets and location-allocation will do the rest.

After a few discussions with my colleague, we decided to adopt a use case of setting up vaccination centres to administer a post-Covid-19 vaccination programme for the public. We aimed to use a minimal number of facilities to fulfil Hong Kongers' vaccination demands.

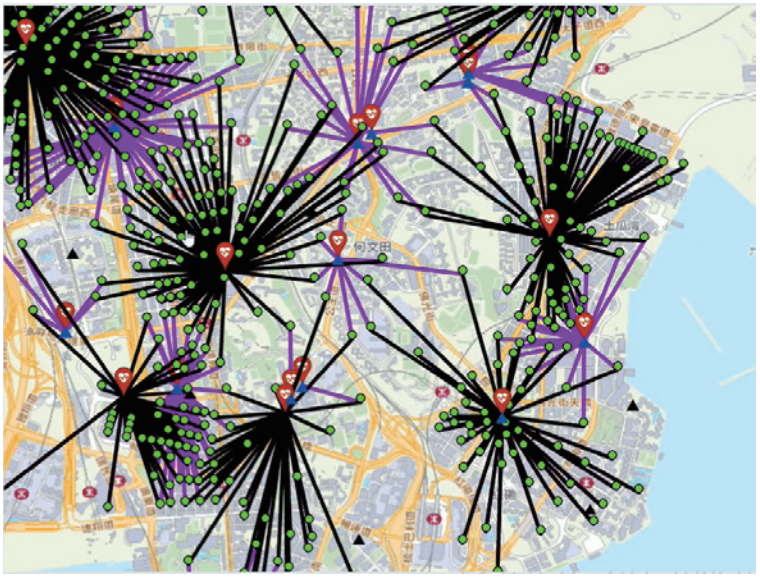
First, we generated the centroids of small TPU polygons as demand points and linked them to the population using census data, which could be obtained from the CSDI. Then we used all clinics operated by the Hospital Authority and Department of Health to fulfil the demand points. Clinic location information is also available from the CSDI. In order to make location-allocation analysis work, we had to prepare a network dataset that the analysis could use to compute a facility's service area based on driving or walking time. Hence, we used LandsD's 3D pedestrian network in the CSDI. Then we put the following CSDI data into the analysis:

- Clinic locations
- 3D pedestrian network
- Demand points generated from the centroids of small TPU polygons

The analysis selected 76 out of 213 clinics to fulfil 70 percent of the demand points based on 15 minutes of walking time from the demand points to the facilities. The diagram below shows the demand points served by each facility.



Obviously, 70 percent coverage was not ideal. So we added library locations from the CSDI as temporary vaccination centres and saw the coverage improve. Our analysis selected 40 out of 169 libraries and increased the demand point coverage to 84 percent. Below is the diagram showing those clinics and libraries that covered the demand points.



However, we lacked the resources to run 40 additional vaccination centres. So we re-ran the analysis by adding ten libraries, which increased the coverage to 80 percent. It was obviously not cost-effective to add 30 libraries for just a four percent increase in coverage.

In conclusion, the CSDI unlocked the power of GIS spatial analysis, which we could not fully take advantage of due to the lack of appropriate data. There are much more spatial analyses that GIS offers, which can be explored when the availability of geospatial data brought about by the CSDI becomes available.

CPD Highlights

"A Multidimensional, Dynamic, and Scene-oriented Cloud-native Spatial Database Engine for Digital Twins"

On 22 March, Dr SONG Zhen, an experienced spatio-temporal database expert from Alibaba Beijing, conducted a CPD for HKIS members on the development and applications of spatial data engines and spatial databases.

The capabilities of Alibaba's cloud-native spatial Relational Database Management System, which was developed in-house, were fully demonstrated through various real-world applications and user scenarios.


THE HONG KONG INSTITUTE OF SURVEYORS
香港測量師學會
土地測量組 Land Surveying Division

CONTINUING PROFESSIONAL DEVELOPMENT

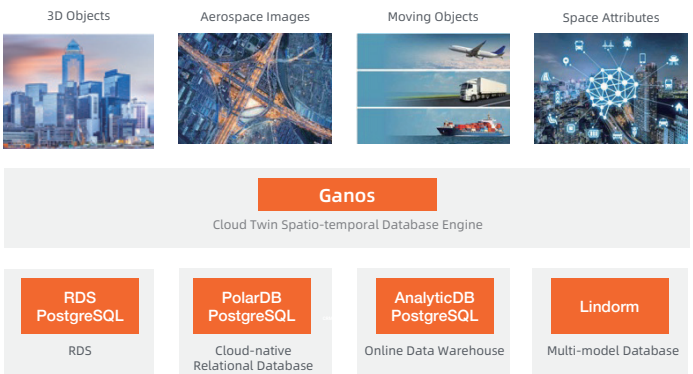
Dr SONG Zhen

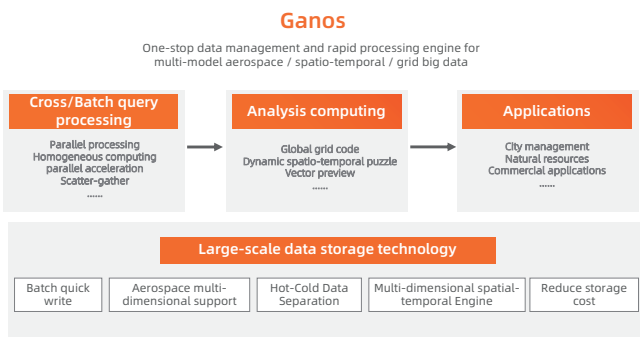
is hereby granted the

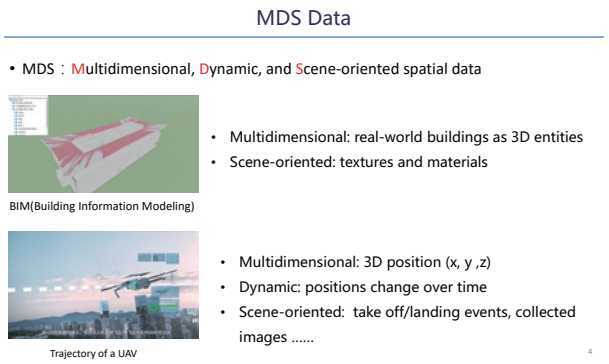
Certificate of Appreciation

for participating as the guest speaker in the seminar
"A Multidimensional, Dynamic, and Scene-Oriented Cloud-Native Spatial Database Engine for Digital Twins"
on 22 March, 2023

Sr TSUI Hoi Yuen, Paul
Chairman of Land Surveying Division

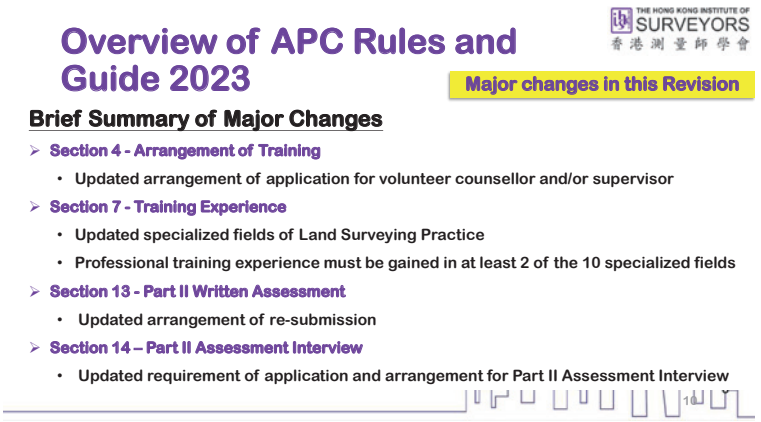


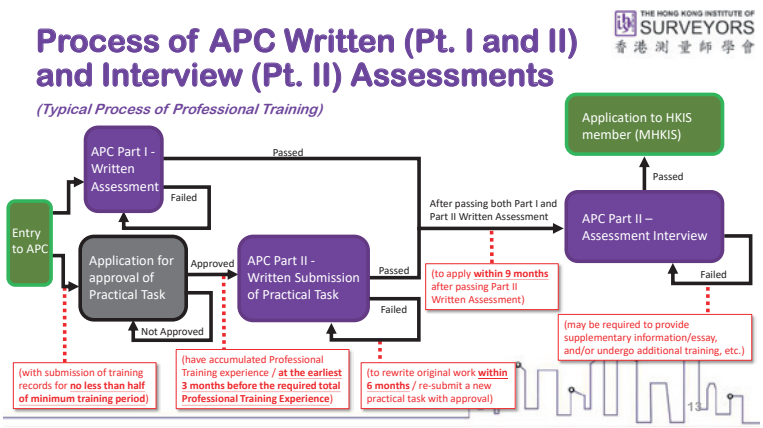


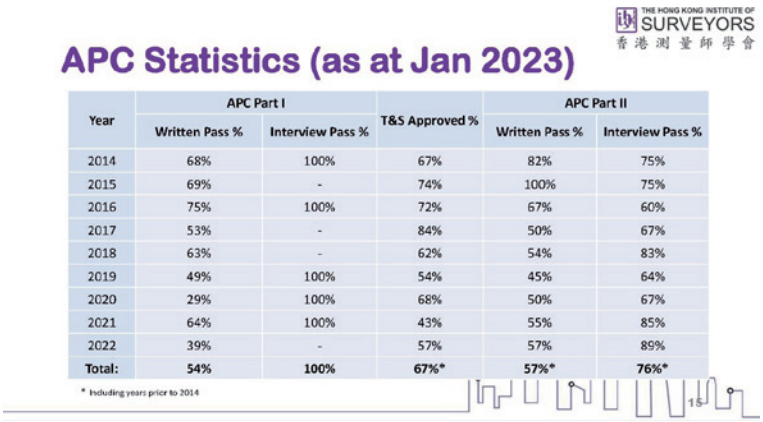


"Briefing on the LSD APC Rules and Guide 2023"

On 27 March, led by Sr CHAN Yue-chun and Sr CHOW Kwan-lam, the LSD's Education Committee (LSDEC) delivered a briefing on the LSD's Rules and Guide of the Assessment Professional Competence (APC) to over 200 HKIS members. The speakers discussed the processes of the APC written (Parts I and II) and interview (Part II) assessments and some APC statistics. At the end of the briefing, LSDEC members suggested several typical "should-avoid" scenarios and shared with the audience their views and observations on the way to become corporate members.







Year	APC Part I		T&S Approved %	APC Part II	
	Written Pass %	Interview Pass %		Written Pass %	Interview Pass %
2014	68%	100%	67%	82%	75%
2015	69%	-	74%	100%	75%
2016	75%	100%	72%	67%	60%
2017	53%	-	84%	50%	67%
2018	63%	-	62%	54%	83%
2019	49%	100%	54%	45%	64%
2020	29%	100%	68%	50%	67%
2021	64%	100%	43%	55%	85%
2022	39%	-	57%	57%	89%
Total:	**54%**	**100%**	**67%***	**57%***	**76%***

* Including years prior to 2014

Note: The revised Rules and Guide will come into effect on 1 April 2023 and apply to those applications for APC entry submitted after that date.

The APC Guidelines and Forms are available online at:

https://www.hkis.org.hk/en/professional_apc.html?division=LSD&S=5