SAS QUARTERLY

YOUR QUARTERLY NEWS, INFORMATION AND CAREER GUIDANCE SOURCE FOR THE MEMBERS OF THE SINGAPORE ACTUARIAL SOCIETY

2017-18 Qtr1 – ISSUE No. 1

EDITORIAL

Welcome to the third issue of the SAS Quarterly newsletter for 2017.

We are now in the midst of the SAS Conferences season: find out more about the recent GI Conference “Disrupt or Be Disrupted” in this newsletter and look forward to the coming updates from Life and Health & Retirement Conferences! Hopefully we will be able to reach greater heights in attendance this time round.

The Big Data Committee (the ex “BD Working Party” upgraded its status to become a Practice Committee) is gaining traction with the organization of the Big Data Bootcamp in June (Frank Devlin tells us more in his report) and the on-going Asia Actuarial Analytics Challenge. There’s still time to participate!

The Support Committees are also very active, with the Professional Affairs Committee organized the Practising Certificate Seminar in May, the International Committee strengthening partnership with ASEAN countries to support Actuarial Education, and the Education and Career Committee launching another batch of Speakers and Influencers sessions.

Finally I thank all current volunteers for making such a great job and encourage other members to step up and help the SAS raise the bar further.

Also note that the SAS will have the capability to host committee meetings in its brand new office!

Happy reading!

Frederic Weber
Vice President

Platinum Conference Sponsor

Gold Conference Sponsor

Upcoming Events

Silver Conference Sponsor

SAS Speakers & Influencers - Public Speaking Course
Jul 25-Sep 5, 2017

Health and Retirement Conference 2017
Oct 12-13, 2017

6th Practising Certificate Seminar
Nov 20, 2017

7th Practising Certificate Seminar
May 30, 2018

10th General Insurance Conference 2018
May 31-Jun 1, 2018

Bronze Conference Sponsor

Please go to www.actuaries.org.sg to register for the above events

MESSAGE FROM THE PRESIDENT

What is the future for the actuary? Having attended a number of conferences recently, the theme of disruption has made for some very interesting discussions.

Everyone expects Big Data, predictive analytics, automation and robotics to have a significant impact on the way actuaries work, but there still seems some debate on whether that will be positive or negative for the profession. While it may lead to a decrease in the number of junior actuaries that companies require to conduct the various analyses, it may also mean an increase in the number of experienced actuaries to interpret the results and explain to senior management. Exactly how we maintain the volume and quality of experienced actuaries as we slim down on the number of junior actuaries is one area that has yet to be addressed. Similar issues have occurred in other industries and professions and it is one the actuarial community will need to deal with sometime soon.

However, the one area I believe the Actuary can really add value is in the use of judgement. Machines, automation and even data scientists may remove a lot of the day-to-day technical analysis that is currently done by actuaries, with repetitive tasks like claim liability reserving being done by algorithm. However, while standard approaches work fine on standard data, when the data gets a little complicated or the underlying processes change, standard algorithms can fail and produce nonsense results. Hence there will be a reliance on experienced actuaries to look through the results and make sure it all 'makes sense'. There will also be a requirement for the Actuary to interpret those unusual results to other less technical decision makers to ensure optimal decisions can be made.

So while the role of the Actuary may change, and the skills required of the Actuary of the future may be different to the core skills now, there is likely to continue to be a need for the Business Scientist like the Actuary. It is up to each of us to ensure that we maintain and develop the skills required to keep us relevant.

Matthew Maguire
President

COUNCIL UPDATE

The SAS has started the Council Year 2017/2018 with some packed and exciting events over the last 3 months. First, we had our General Insurance Conference in May where we had a great time discussing and debating over how actuaries should “Disrupt or be Disrupted” in this fast and changing digital world. This was quickly followed by a Big Data workshop in June together with an afternoon talk on Big Data in the Southern Asian Insurance Industry just happened in early July. Indeed, there is an increasing convergence of the actuaries and the technology/data scientist communities and the SAS will continue to bring more of such interesting events and forums in future.

For the upcoming SAS events, following the Life Insurance Conference in August, the Retirement Conference will be held in October and surely not to be missed. We are also starting our second series of SAS Speakers and Influencers Public Speaking Course from end-July to September. If you are interested to sign up for these events, please check out more details at http://www.actuaries.org.sg/?q=current_events

Lastly, the SAS is looking to expand its office at Tras Street. The new office will be 1.5 times larger than the current space. The new office will be ready by end July, which includes a meeting room with a capacity of up to 15 people. More information will be shared with you over the course of next few weeks.

We welcome any feedback and suggestions on how we can serve you better in the SAS. Please email me at secretary@actuaries.org.sg or Patsy Lau, our Office Manager, at patsy@actuaries.org.sg for any SAS matters.

Raymond Cheung
Honorary Secretary

Life Insurance Committee

The life insurance industry continues to undergo changes this year. The Life Insurance Committee will try our best to ensure that our fellow actuaries in Singapore will be well equipped with the necessary knowledge.

The International Accounting Standards Board (IASB) published IFRS17 in May 2017. This will replace the current IFRS4 on the accounting standards for insurance contracts with an effective date of 1 January 2021. The clock is ticking – changes will be significant and implementation will be challenging with actuaries expected to play a significant part. The Life Insurance Committee is working with the industry experts and we are in the process of arranging an afternoon session to familiarize our members with IFRS17.

During the second half of 2017, the committee will further the discussion with MAS on RBC2 following QIS 2 from 2016. Matching adjustment, illiquidity premium, and ultimate forward rates are a few topics that are expected to be actively discussed.

Working closely with the Professional Affairs Committee, we are working towards the completion of the Guidance Notes update in Q3. This update will not only bring more clarity to all practicing members but also enhance the quality standard of the existing Guidance Notes.

Last but not least, the Life Insurance Committee hosted our 4th Life Insurance Conference on 17 and 18 August. This year, our theme was “Engage in the New Age – Be Part of the Change”. More updates are to be followed in next newsletter!

Lim Siang Thnia & Maple Lam
Chair of Life Insurance Committee

General Insurance Committee

For Q2 of 2017, the main progress we’ve made:

- Successful GI Conference on disruption
  - As a precursor to the conference, the GI Committee (as a representative sample) discussed whether we feel actuaries are being replaced. Many of the underlying themes such as the prevalence of data scientists, machine learning, robotics were contrast against the ability to exude technical judgement, the necessity of protected regulatory roles and ultimately the skills to communicate.
  - The conference was geared towards this theme, with interesting presentations from data analytics and artificial intelligence to alternative pathways for actuaries

(Cont.)

  - o Additionally the Singapore's Got Talent competition, focused on consumer analytics this year, was hotly contested by some talented teams and individuals
- Successful Practicing Certificate Seminar on 24 May – Yin Lawn went over dealing with regulations e.g. regulated filings, MAS notices and PPF
- Active working groups on Cyber Risk and Autonomous Vehicles continuing to make progress

Darren Ma
Chair of General Insurance Committee

Health Insurance Committee

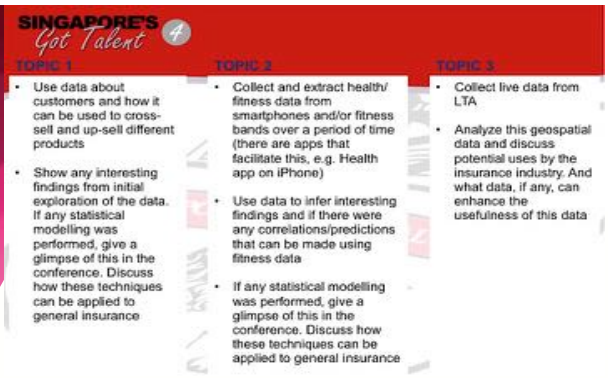
In the 2nd quarter, the committee has been following several projects:

- Co-organizing the Health & Retirement conference with the Retirement committee, now scheduled for 11 & 12 October
- Medisave projection taskforce has continued to work on the projection tool, which has been reviewed by the committee
- More collaboration with the IAAHS: a) our committee to sponsor a webcast in Q4 of 2017 on LTC and will source a local speaker; b) agreed to collaborate and jointly organize a Health conference with IAAHS in 2020

Siao Wearn Leong
Chair of Health Committee

ERM Committee

Some SAS members have been enquiring whether there will be an ERM Conference this year. Sorry to disappoint but the ERM Committee has decided to organise a ERM conference on alternative year instead. Therefore, the next ERM Conference will be held in 2018. Meanwhile, the ERM Committee has started to work on working parties that will focus on the following topics in 2017 including ORSA, Cyber Risk and Disrupted Technologies. We will share more information with you together with a call for volunteers soon. Meanwhile, if you are interested to participate in the ERM Committee please email me at secretary@actuaries.org.sg or Patsy Lau at patsy@actuaries.org.sg.



Education and Career Committee

In conjunction with the Big Data Working Party (now the Big Data Committee), ECC organised the 4th annual Singapore's Got Talent competition, attracting local talents from various universities to participate. With a focus on data analytics, students were invited to choose a topic of their choice from 3 options (as above).

Through a thorough selection and close mentoring from our dedicated volunteers, our bright-eyed finalists – Zhou Minjian (SMU), Clint Tan (NTU), Tan Zhang-You and Kelvin Tanidi (NUS) – presented their findings to a highly interactive audience at the General Insurance Conference on 26 May 2017. It was a well-received session appreciated by professionals and students alike; this continues to be a perfect platform to showcase our local talents and bridge the gap between the industry and students. Thank you to Frederic Bouillung, Yin Lawn and Huang Guoyu for their efforts in coaching these students.

➔ Finalists interacting with the audience during Q&A

🡻 Winner of Singapore's Got Talent – Clint Tan, receiving his prize

Additionally, the Speakers and Influencers sub-committee of the ECC hosted the 3rd public speaking course by external trainer and motivator, Claire Devine, in June 2017. The good attendance and response from participants of these courses motivated us to organise more of such sessions. We anticipate to host another 2 sessions for the rest of the year, so do sign up and not miss your chance!

The ECC would also like to thank Fred Weber, who has stepped down as Chairperson of the ECC, for the tremendous contribution to the committee over the past years!

Bernice Zhang
Chair of Education and Career Committee

What have been keeping us busy in the last few months?

Planning of Actuarial Training Seminar

The emerging markets in ASEAN are evolving fast! The International Committee has received interests from numerous individuals and insurance associations in these markets to assist them in various ways. Recently, at the request of a group of actuarial professionals in Vietnam, we have provided a letter to the Ministry of Finance in Vietnam to provide support for the establishment of the Actuarial Society in Vietnam.

We are also in talks to conduct a second actuarial training seminar in Myanmar, as well as organise an actuarial and insurance training seminar in Cambodia. These seminars are expected to be attended by insurance regulators, local insurance practitioners (from junior to management level) as well as university students interested in actuarial qualifications.

Call for Volunteers

To ensure the SAS is well placed to provide support on a sustainable basis, we would like to take this opportunity to call for volunteers to support our upcoming education initiatives. Whether you are an actuarial analyst or subject matter experts in Life, General Insurance, Health and Retirement, we are looking for help in conducting market research, preparing training/workshop materials and presentation slides, as well as speaking at the actuarial training seminars!

If you are interested or if you wish to find out more, please contact me at seeju@sompo-asia.com. The International Committee will work closely with the volunteers to scope and pitch the training at the right level to address the training needs of our target attendees. This is a good opportunity for the SAS members to contribute and get involved in the development of insurance market in other countries.

Actuaries without Borders (AWB)

Last but not least, if you are interested at contributing to actuarial profession but preferred no travelling, then you would want to check out the AWB project run by the International Actuarial Association (IAA). The AWB is regularly seeking volunteers to participate in its global remote mentorship program. This program is extended to cover remote exam tutoring for professional actuarial exams.

(Cont.)

The remote mentorship program provides assistance in the development of actuarial profession where there is a lack of such resources. It also contributes to the awareness of the actuarial profession and the spread of the actuarial education by encouraging qualified actuaries and academics across the world to volunteer in global mentoring, including actuarial exam tutoring, through a convenient platform available around the clock. Find out more at http://www.actuaries.org/index.cfm?lang=EN&DSP=AWB&ACT=GLOBAL_MENTORSHIP.

What motivates us thus far?
The Committee aims to provide support to the ASEAN countries in promoting the actuarial profession and education to meet the growing needs of actuarial knowledge and skills in view of the insurance market liberalisation. To this end, the SAS held a two-day Actuarial Training Seminar in Myanmar in October 2015 for the Burmese regulators from the Financial Regulatory Department. The training was very well received by the attendees. The SAS is keen to continue with our effort in Myanmar as well as extend our support to other emerging markets.

See Ju Chua
Chair of International Committee

Professional Affairs Committee

Practising Certificate Seminar

The 5th PCS was held on 24 May 2017. Judging by the feedback it was a success. Thoughts move to the next Seminar, slated for 20 November 2017. This will be the seminar that must be attended to ensure continuity of Practising Certificates for those AAs and CAs who automatically received a Practising Certificate at the start of the scheme.

It was also noted that not all CAs and AAs are aware of the need to have a Practising Certificate.
Better communication in this area will be introduced.

Guidance Notes

The PAC reviewed the Standard of Actuarial Practice (SAS SAS 01). After further discussion, this will be recommended to Council along with a revised structure for Guidance Notes.

CPD and Disciplinary Scheme

A review of our CPD requirements as well as the introduction of a formal disciplinary procedure are still work in progress.

Frank McInerney
Chair of Professional Affairs Committee

Actuaries of the Fifth Kind

Reported by
Frank Devlin
on behalf of the SAS
Big Data Committee

The start of June was a big moment for the Singapore Actuarial Society Big Data Working Party (now the Big Data Committee) when it held its first two-day event – The Boot Camp. The format was one day of speakers giving an overview of how big data was being used in the Asia insurance industry and other sectors and another day of workshop explaining how to use predictive analytics tools using R. The Singapore Management University lecture hall was packed on both days.

In the first morning we heard from Ankur Agrawal regarding car telematics and the synthesis of telematics data with external data such as road types and weather conditions to produce a product proposition. It was interesting to learn about the behaviour modification that can happen and how it may reduce over time. We then had Mudit Gupta, Tan Wei Chyin and Huang Guoyu presented short vignettes on implementing simple techniques to better understand motor insurance data – what a novice would be able to do after the following day's workshop – and also the pilot study of a research project that the Big Data Committee has started in visualising Singapore traffic incident data.

Colin Priest challenged us as to whether actuaries are ready for Data Science – are our programming skills too rusty or mathematical abilities too old-fashioned? He concluded that computers should be left to get on with the routine tasks (and computers can do mathematics as well!) and let actuaries **focus on creativity, context of the project, communications and empathy** – not words that many outside of the profession might first choose to use to describe the profession. He then showed us an automatic analytics program (DataRobot) which could greatly automate predictive analytics and so free up actuaries to focus on the new skills they need (always needed).

The organisers of the workshop believed that it was important to ensure that actuaries were not too insular in considering big data and so we were very fortunate to hear from two non-actuaries applying predictive analytics in other industries. Kelly Yoong of SmartHub (a division of Singapore telecoms company StarHub) showed how StarHub was using mobile data to help Singapore become a smart nation – whether it was looking at footfall and behavioural analysis in shopping malls or providing targeted public safety announcements to support crisis management.

Dr Clifton Phua, Associate Director at NCS limited, talked about something close to many insurance professionals' hearts – fraud detection – whether in procurement, claiming of government grants or insider threats to an organisation. Many of the ideas would be easily applied in an insurance company.

Gavin Maistry gave us a pragmatic overview of big data predictive analytics – how it had been used in optimising medical underwriting application forms and lapse propensity models. He stressed the importance of context and not to put blind faith in models – **expert judgment and ability to ask the right questions is essential** whereas the models can help challenge our biases.

Saliya Jinadasa closed the first day by talking about how big data and predictive analytics could be used in a broker business. He showed how data continued to develop across Asia for use in catastrophe models and tools available for companies to understand their risk exposure in various locations e.g. industrial sites within x km of a volcano. He almost blew us away when he showed a model of roof types in Japan and how each type had a differing vulnerability to strong winds. He showed how it was possible to use satellite photographs and deep learning to assess roof types across Japan so that the likely damage in a typhoon could be accessed.

The Day 1 presentations can be found in the following link http://actuaries.org.sg/?q=node/16617

↑ Huang Guoyu of Munich Re sharing insights from visualising Singapore traffic incident data

↑ Ankur Agrawal of AXA sharing behavioural insights from big data to Boot Camp participants

↓ Kelly Yoong of StarHub sharing big data applications of telecommunication data

↓ Mudit Gupta of Sompo sharing practical applications of big data techniques to motor insurance

← Colin Priest of DataRobot teaching the machine learning workshop on Day 2

On day 2, Colin Priest, a stalwart of providing training to SAS members over the years, patiently and enthusiastically led the workshop to teach the participants how to use various predictive analytic techniques to analyse a dataset of diabetic readmissions to hospital with the aim of trying to predict those who are most likely to be readmitted within thirty days.

In the United States, if an individual is readmitted within 30 days to the hospital for the same cause, the hospital, apparently, cannot charge the individual for the second visit. Colin explained that GLMs were at best slow to use and at worst misleading. Regularised GLMs were introduced, then decision trees, and then Gradient Boosted Machines. But this was a workshop – participants had to get their hands dirty by running R code to use these techniques and also making changes in the code to highlight some particular aspect. His pop quizzes occurred frequently to test participants and so to reinforce the learning. It was a tiring day learning new skills but worth it.

The Big Data Committee is also running a Kaggle competition where participants can apply the techniques they learnt from the workshop and other techniques to a bank telemarketing dataset to see if they can predict who will purchase a bank deposit. Please do read the challenge update following this article as it's open to all to participate.

As to the title of this piece - actuaries of the first kind were the 17th century life actuaries using deterministic methods; the second kind were general insurance actuaries using probability distributions in the early 20th century; the third kind were actuaries using stochastic processes to evaluate assets and liabilities in the 1980s and the fourth kind were those involved in ERM in the early 21st century. **Actuaries of the fifth kind are definitely going to be those using Big Data in the second decade of the 21st century.**

The Big Data Committee would like to thank all the speakers for providing their time to speak and especially Colin for running the workshop. Also, we would like to thank SMU for the use of their lecture hall and of course Patsy and Linda for all the logistics arrangements.

Asia Actuarial Analytics Challenge 2017

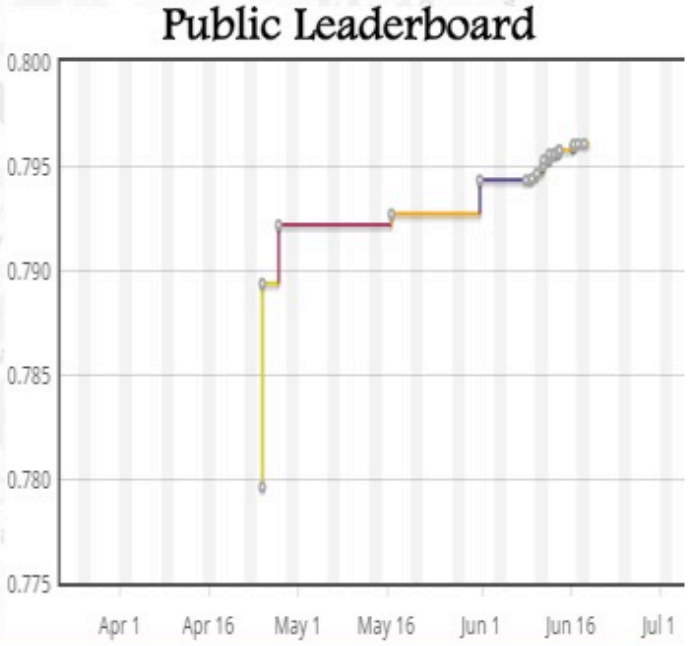
Have You Signed Up ?

We are half way through the competition and here are some interesting facts! (as at 19 June 2017)

123 Individuals accepted Invitation

44 Teams/**49** Individuals submitted solutions

Total of **479** Submissions



First Prize SIN $700 sponsored by Swiss Re

Second Prize SIN $500 sponsored by AXIS

Third Prize SIN $300 sponsored by Allianz

Forum prize of SIN $100 sponsored by Institute and Faculty of Actuaries

To sign up:
Ensure you have a Kaggle account, then use the following invitation link. https://kaggle.com/join/SASInvite2017
You may extend this invitation to relevant persons interested in participating.

Link to the competition webpage:
https://inclass.kaggle.com/c/asia-actuarial-analytics-challenge-2017

The competition is now open. Deadline: 30 September 2017

Feature Article

by Big Data Committee

(Authors) Huang Guoyu, Tan Wei Chyin, Jerry Yu, Paul Wang

VISUALISING TRAFFIC INCIDENTS IN SINGAPORE WITH PUBLIC DATA

Introduction

Insurance professionals have been studying geospatial traffic incident data to understand whether there is any correlation between one traffic incident and another within geographical and time proximity, or whether there is any external factor that could explain the traffic incidents. However, due to the large data volume and complexity, it is challenging to view such data using spreadsheets and perform data analysis. Therefore, it would be useful to visualise these incidents on a mapping dashboard to help insurance professionals uncover insights from the geospatial data. In this article, we will illustrate how to build such dashboard from scratch using traffic incident data that is publicly available and open source statistical programming tools (Python and R).

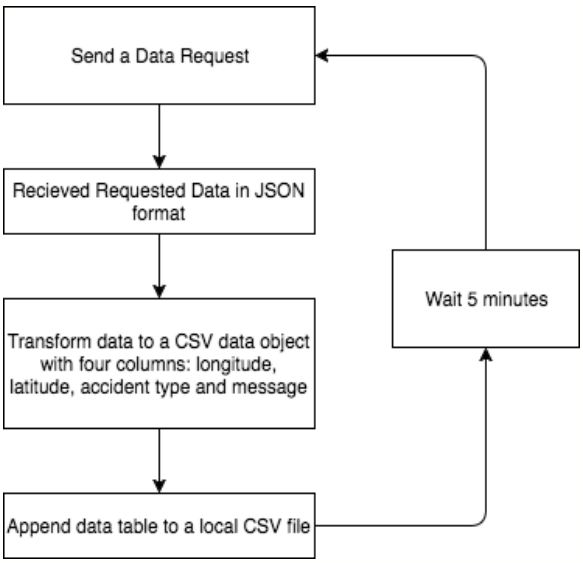
Objectives

Let's start by defining the objective of this dashboard. As a start, we hope that the dashboard can achieve two practical functionalities:

- Given a specific vehicle collision case, the Claims Department of an insurer can verify submitted accident report by querying the data published by accident time and location
- A visualisation map of surrounding traffic conditions can be drawn to better understand the circumstances of the traffic incidents

Let the (Free) Data Flow

Thanks to Singapore's "Smart Nation" initiative, we were able to download traffic incident data directly from the Land Transportation Authority (LTA)[1]. However, these LTA data was only available through live feed API (application programming interface) and did not support manual download. Hence, we wrote a Python programme to download the live feed data from LTA programmatically. The Python programme was set to request the data periodically using a virtual machine hosted in Amazon Web Service (AWS). The flow chart below illustrates the design of our programmatic data request from LTA:



An Illustration of Data Requester (getData.py)

In our trial, we collected a month's worth of data in June 2016. As the data requests were sent repeatedly, it is possible that duplicated data were being downloaded into the dataset. Therefore, we carried out data de-duplication using Python programme. After de-duplication, 7,371 data lines were left with columns for latitude, longitude, and incident types. Incident types include accident, heavy traffic, obstacles, roadwork, vehicle breakdown and unattended vehicles. A short description of the incident, including time and location of the incident, is included in the "Message" column. Please see below for a sample data output.

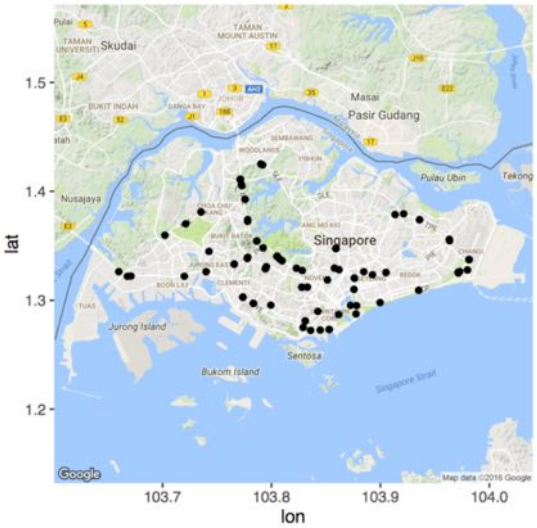
Latitude	Longitude	Message	Type
1.2989112600097892	103.90230629416956	(24/7)10:11 Vehicle breakdown on ECP (towards Changi Airport) before Still Rd Sth Exit.	Vehicle breakdown
1.32014514078768	103.82534070264181	(24/7)10:03 Roadworks on Stevens Slip Road near Bukit Timah Road/Stevens Road Junction.	Roadwork
1.318496195703828	103.82568134881181	(24/7)10:03 Roadworks on Stevens Road (towards Margoliouth Road) after White House Road. Avoid left lane.	Roadwork
1.3268951155998907	103.73401154964131	(24/7)10:02 Vehicle breakdown on AYE (towards MCE) after Yuan Ching Entrance.	Vehicle breakdown
1.336136968166833	103.97955037177108	(24/7)9:58 Roadworks on ECP (towards City) after PIE(Tuas) Exit. Avoid lane 3.	Roadwork
1.3444226710864855	103.86026319609486	(24/7)9:56 Heavy Traffic on CTE (towards AYE) at Upper Serangoon Rd Exit.	Heavy Traffic

LTA Traffic Data

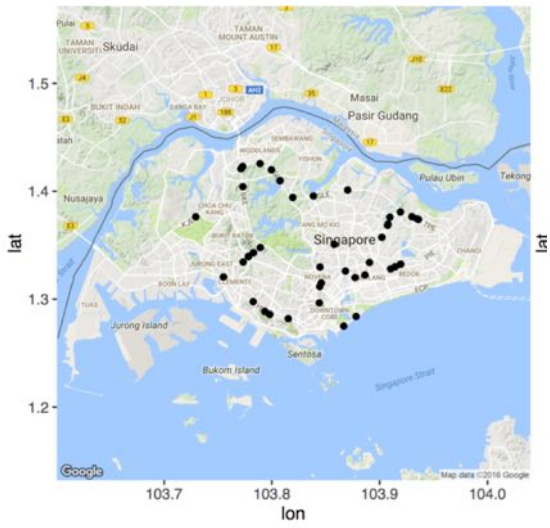
[1] https://www.mytransport.sg/content/mytransport/home/dataMall.html

Visualising Data

There are many variations of map type available in the internet, such as: roadmap, terrain and satellite, etc. We used R programme and "ggmap" (a package in R) to download base maps from Google and plot the collected traffic incidents on it. The mapping dashboard is now completed and able to provide visualization of various traffic incidents that occurred during the trial period. Examples for "Roadwork" and "Vehicle breakdown" incident type are shown below:



Roadwork Incidents



Vehicle Breakdown Incidents

Summary

This article discussed a case study of visualising traffic incident data using API provided by Singapore Land Transport Authority (LTA) and open source statistical programming tools (Python and R). The article also provided several useful cases of how insurance professionals would benefit from such data visualisation. Lastly, as the financial and insurance industry is gradually building up data exchange based on enterprise and government API, we hope that this article will also serve as a primer for colleagues who would like to explore the vast opportunities provided by API in the future.

To download code used in this analysis, please refer to below link:

Python Code Download and Clean Data

http://actuaries.org.sg/files/events/2017%20Other%20seminars/VoTD2017/PythonCodeDownloadandCleanData.rtf

R Code for Incidents Visualization

http://actuaries.org.sg/files/events/2017%20Other%20seminars/VoTD2017/RCodeforIncidentsVisualization.rtf

[REPORT BY EDITOR]

To recognise the force of disruption from within and outside of the insurance and reinsurance industry, the Singapore Actuarial Society (SAS) held its 9th General Insurance Conference with the theme "Disrupt or be Disrupted" on 25th and 26th of May and co-invited speakers with the Casualty Actuarial Society (CAS) from different background to drive the discussion, aiming to seek the way out for the actuarial profession in the uprising trends.

Mr Matthew Maguire, President of the SAS, brought upfront a research done by Flaspohler, showing that most actuaries found the day-to-day competition (e.g. on pricing) more pressing than challenges in the coming future. Mr Maguire tried to lead the audience rethink their role in the industry, by pointing out the difference between a craftsman and an artist, and the reason why history tends to remember the latter.

AI replacing actuarial suggestions/indications?

The first speaker, Mr Nicolas Yeo, actuary and founder of IBNR Robot, demonstrated how technology was evolving to generate actuarial solutions, without human intervention. One of his focuses was looping in Artificial Intelligence (AI) with step-by-step tests to develop fully automated calculation and judgment. Mr Yeo had a vision for AI, as the absence of human judgment enabling the delivery of consistent, independent and objective results could be used as good benchmarks for the industry. He pictured future actuaries to apply critical judgment and derive recommendation based on the AI-generated actuarial report.

Contain disruption with actuarial strength

With a clear goal to drive profit for its Singapore market, Mr Frederic Weber, Chief Actuary of AXA Insurance emphasised the importance for actuaries to be familiar with business language and link up actuarial activities. From sales projection, spotting profitability to commercial lines pricing, actuaries were advised to go on top of the cycle to remain consistent and bring value to business planning.

🡻 Mr Matthew Maguire, also a partner of NMG Actuarial, presented on "Little Data", illustrating the decision flow of existing AI experts.

Looking into disruption at corporate level, Ms Valerie Gilles-Coeur, Senior Business Development Manager at Swiss Re, restated disruption a risk management issue. On one hand, it was important for pricing and reserving actuaries to understand how it impacts the risks they measure; on the other, reinsurance could help risk management by building and validating models based on the challenging scenarios.

🡹 Mr Colin Priest, Director, Customer Access, Asia at DataRobot shared as well his experience in working with AI, from an actuary to a data scientist on the 2nd day of the conference.

🡸 Mr Frederic Weber presenting on "Actuarially Disrupting"

🡻 Panel Discussion on the Adaptation of Disruption by Actuary

🡹 Ms Valerie Gilles-Coeur from Swiss Re

🡺 Mr Toby Weston, Director, Singapore at Oliver James Associates, suggested the profession had to be creative enough to use extra knowledge & Mr Jim Attwood, Principal Consultant of 66 Squares Consulting, emphasised that first-mover could and always had advantages when strange things happen.

Peer-to-Peer (P2P) Disruptions – Opportunities for Actuary

The CAS led the presentations in the afternoon. According to Ms Mary Frances Miller, Past President of the CAS, although there were uncertainties lying under the self-governing model of P2P disruptions such as questionable premium adequacy and improper claims handling, P2P disruptions had a market advantage over loyalty and renewal. Based on actuary's existing calibre in analysing reinsurance coverage to minimise loss (pricing), quantifying impacts in product design, ensuring reserve adequacy and implementing strategies towards identified risks, she was confident that actuaries could take up roles in the new insurance space.

← Ms Mary Frances Miller from the CAS

➔ Mr Lei Yuxiang demonstrated how Internet of Things (IoT) totally separated ownership and use of the property and transformed insurance format – short term, smart contract (self execute, self-enforce). He elaborated on reinsurance's role in IoT with the application of blockchain.

So, what did they say: more or less jobs for actuary?

On the panel discussion led by Ms Miller, there were two important questions raised:
1. Will there be more jobs or less jobs for actuary? 2. Is an actuarial qualification a positive or negative background for employers in the future?

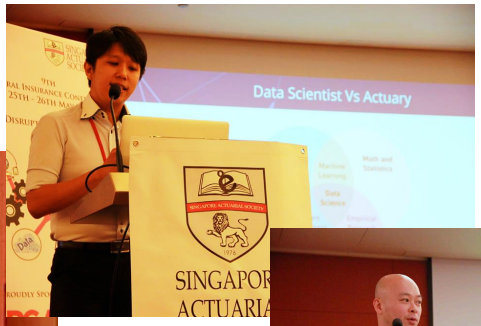
For the first question, Mr Walter de Oude, founder and CEO of Singapore Life. an on-demand platform on life and savings solutions, foresaw there would be a reduction in actuarial usage with the technological replacement. Mr Lei Yuxiang, Chief Data Officer at Ant Financial Insurance Group, believed that there would be more jobs for actuaries, especially in technology companies, but the requirement was deemed to be completely different from now. And Mr Jiang Guanjun, Principal and Consulting Actuary at MIlliman expected actuarial skills would be in demand and it could be acquired by talents who can think from actuary's angle, but not necessarily by actuaries.

On the second, Mr Maguire, as Chairman of the SAS, reaffirmed the professionalism of actuary, who was abided to follow code of conduct guided by IFoA/SOA in work at all times. Mr Lei agreed the authority and the exams they held for actuaries could help employers to identify the suitable candidate, however, it was important for the exams to cope with changes in the industry, from value, capability to process involved. He quoted those Fintech companies set up by Insurance/reinsurance companies as examples to show that in order to get rid of the slow-moving structure inside a traditional insurance company, it was indeed more preferable to set up a whole new division to work on innovation. He inferred the importance for actuaries to speed up and catch these arising opportunities in the field. It was supported by Mr Jiang that the profession had to be aware of jobs being taken up by data scientists.

Analytic Disruption: Machine Learning

The second day of the conference had a strong focus on the fields of machine learning and motor insurance, zooming into disruptions that actuaries are facing. Mr Jiang Guanjun from MIlliman presented on how machine learning brought better insights over traditional generalised linear modelling with proven case studies from China, Europe and the US. For instance, in the workers' compensation case, machine learning, allowing data to interact naturally to find patterns, made early identification possible of previously undetected problematic claims. On the other hand, Mr Wong Ling Yit, Winner of the first Data Challenges (2016) and Data Scientist of Holmusk, demonstrated how his team used machine learning algorithm to handle data from different sources and increase the analytic accuracy in identifying high-risk readmission diabetes patients.

➔ Mr Wong Ling Yit



🡻 Mr Roberto Malattia

🡹 Mr Raymond Cheung

🡹 (Right) Mr Jiang Guanjun

Distribution Disruption: Motor Insurance

Beyond the analytic disruption by machine learning, the rapidly changing motor insurance landscape attracted attention of the industry. Mr Roberto Malattia, Director of General Insurance Consulting for South East Asia at Willis Towers Watson, emphasised the distribution space was where the disruption would be, as motor insurance had to be designed to cater more fragmented needs, for which customer insights were critical. Mr Malattia foresaw giant conglomerates e.g. Amazon, Alibaba, with existing customer bases, ownership of data and better understanding of the risks involved would be the disruption to the industry. Mr Raymond Cheung, Regional insurance Lead of Grab, shared his vibrating moments working with the giant in car-sharing and the insurance disruption (by innovation, quality, service and value) he witnessed inside the technology start-ups.

The conference was concluded with regulatory updates on IFRS17 by Ms Anupama Kapoor and Ms Keri Lee from Ernst and Young and results announced from the audience poll of "Students Got Talents" – the university finalists were given opportunities to present on how they used creativity, data and modelling to solve an issue or a problem in the GI arena.

➔ The SAS presenting souvenirs to Ms Keri Lee and Ms Anupama Kapoor from EY

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Actuarial Profession in the Age of Artificial Intelligence and Process Automation

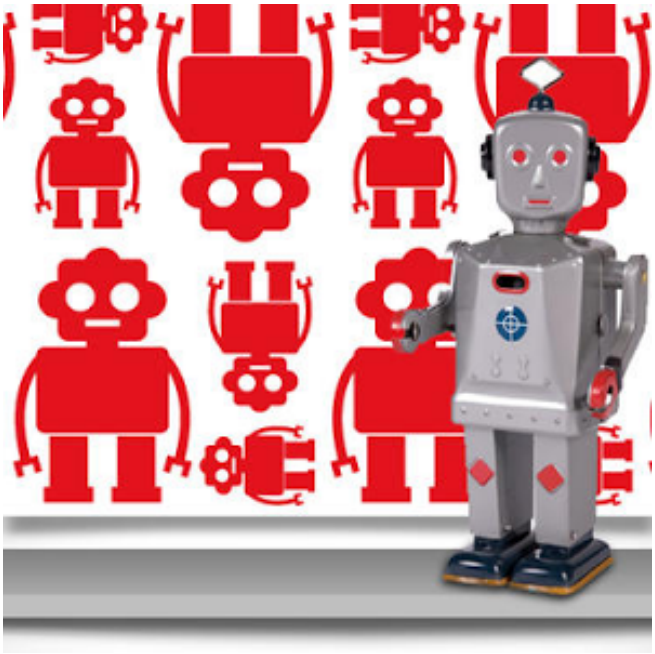
The combination of artificial intelligence and process automation is revolutionising how actuarial work is performed. Artificial intelligence will be the brains underlying new age actuarial work whilst process automation techniques and technology will be the brawn. Actuarial work will become instant, efficient and error-free. The actuarial profession will benefit significantly from this technological advancement. Actuaries will be freed up from crunching numbers and producing reports. Instead, actuaries will focus on performing value adding analysis and making useful recommendations, as well as in higher value activities for the enterprise such as business development and risk management.

It was not too long ago when I was a fresh graduate crunching numbers required for actuarial reporting on MS-DOS based programmes, receiving data from and saving results into CD-ROMs. Late nights, early mornings and entire weekends around reporting periods went into running and rerunning data validation and valuation model routines, at times manning multiple CPUs and often only barely making the reporting timelines. The way actuarial work is performed has evolved significantly since.

With the introduction of process automation into actuarial work, those days are now far behind us. Risk Based Capital, Solvency II and various other reporting requirements left insurance companies no choice but to invest in technology that churns out results efficiently. Enhancements such as cloud computing, data warehousing as well as streamlined actuarial modelling software, have led to significant improvements. Run times of complex models are now measured in hours if not minutes. The quality of actuarial work has hence improved significantly, with much more time freed up to analyse the figures and make useful recommendations. Actuarial work has certainly become less brawn intensive.

Nonetheless, actuarial work has remained very manual. This is because, despite the implementation of cutting edge process automation, actuarial judgment is still applied at every single step of the process, be it data manipulation, assumption setting as well as methodology selection (mainly for non-life insurance reserving). Without artificial intelligence i.e. the brains, the upside to process automation is limited.

The introduction of artificial intelligence into actuarial science is altering this landscape. Artificial intelligence brings to the actuarial profession a structured, consistent and unbiased way to perform actuarial work, combining statistical optimisation techniques and pragmatic solutions, without any human intervention required. Coupled with process automation techniques and technology, the entire process of actuarial work shall be completed in seconds.



This is not science fiction. IBNR Robot, proprietary to Nicholas Actuarial Solutions, has already been developed and implemented in actual pricing and reserving work. Based on statistical techniques including jack-knifing, runs test, hypothesis testing, the method of Lagrange multiplier, the method of moments as well as pragmatic solutions, ultimate loss ratios and loss reserves and its range, are determined in seconds without any human intervention required. With the IBNR Robot, data reliability is automatically ensured, actuarial assumptions such as development factors, tail factors and seed loss ratios are automatically selected, actuarial methodologies ie paid vs incurred data, link ratio vs Bornhuetter-Ferguson methods are optimally selected and reserve range is automatically calibrated.

These elements which traditionally requires human actuarial judgement can now be automated. Instead of downloading data from the IT system, the actuary would be able to receive draft results. It is not to say with the introduction of a “straight-through” process human actuarial judgement is now redundant. This is certainly not the case. Actuarial judgement remains very valuable. However, instead of making a micro-decision at every step of the actuarial work process, actuaries only need to make decisions at the final stage, overwriting the artificial intelligence only where required (from our experience overwriting the artificial intelligence is rare as our IBNR Robot has a self-correcting feature). For example, there could be qualitative information not captured in the data, or there could arise subsequent events. Effectively, downsides of human biases and errors are removed, whilst the upsides of superior human actuarial judgment could remain.

With process automation and artificial intelligence, actuaries’ time would no longer be unnecessarily spent in processing data and crunching numbers. This frees up time for actuaries to perform more detailed analysis and to make useful recommendations, as well as to acquire and implement higher order technical skills, ultimately increasing the value proposition of the actuarial profession. Actuaries can also participate more actively in higher impact areas of the business. One example is with the actuarial profession’s strong understanding of the financial systems, devoting more actuarial resources to developing, proliferating and marketing financial products would ultimately increase consumer utility. Another example is, with the long-term sustainability perspective that actuaries bring to the table, involving actuaries more in actively managing enterprise risks shall maximise profit and reduce earnings volatility, ultimately driving up shareholders’ value.

Regulatory UPDATE

IFRS 17 Insurance Contracts: Implications for Singapore Insurers

Author:
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Manager in Ernst & Young Actuarial Services (Singapore)

Introduction

The recent release of IFRS 17 Insurance Contracts ("the Standard") in May 2017 represents the most significant change in insurance accounting requirements for Asia-Pacific insurers in over 20 years.

The new Standard is to be applied for reporting periods starting on or after 1 January 2021 and will require insurers to entirely overhaul their financial statements. The complexity of the Standard will require advanced valuation and reporting expertise, updated actuarial models, and supporting financial systems, processes and controls. Hence the Standard has other important implications for insurers' businesses, including the capital, product and investment management strategies needed to remain competitive and successful in target markets.

The Standard at a glance

The Standard uses three measurement approaches:

The General Model (also referred to as the "Building Block Approach" or "BBA") – applicable for most long-term contracts

- This is the default valuation approach where insurance contracts are valued using 'fulfilment cash flows' i.e. the present value of expected future cash flows, plus a risk adjustment
- For non-onerous contracts, the day-one resulting profit is offset by a 'contractual service margin' provision ("CSM"), which represents unearned profit the insurer recognises as it provides services under the contract
- For onerous contracts, the loss is recognised at inception

Premium Allocation Approach ("PAA") – applicable for most short-term contracts

- This is an optional simplified approach for contracts with durations of one year or less where insurance contracts are valued as a pre-claims coverage liability and an incurred claims liability i.e. similar to the existing measurement of non-life insurance contracts, with the added requirement of including a risk adjustment and discounting
- It can also be applied if it provides a reasonable approximation to the General Model
- Many non-life and some life insurance contracts are expected to meet the criteria for this approach

Variable Fee Approach ("VFA") - for contracts with direct participation features

- It applies to participating contracts as defined by three criteria, based on policyholders having a significant share in the profit from a clearly identified pool of underlying items
- The insurance contract liability is based on the obligation of the entity to pay the policyholder an amount equal to the value of the underlying items, net of a consideration charged for the contract — a 'variable fee'.

Key implications

The principles underlying these measurement approaches result in a fundamental change to current accounting practice, particularly for long-duration contracts, that will change profit emergence patterns, potentially increase loss recognition based on more granular grouping of contracts, and add complexity to valuation processes, data requirements, assumption setting and the requirements for analysing and communicating results.

The key implications of the new Standard include the following.

Profit emergence

- The release of the CSM based on the passage of time and expected number of in-force contracts will give some products unexpected profit emergence patterns.
- Some life insurance contracts will be considered short-term, accelerating profit recognition and amortisation of acquisition costs.
- Contract aggregation at a cohort level will be much more granular than current practice, which could lead to generate more onerous contracts compared to the current Liability Adequacy Test

Data, models and processes

- Some general insurance contracts (such as engineering, bonds and maid insurance) will be considered long-term, becoming subject to a more complex valuation methodology as the General Model is considerably different from the current gross premium valuation used in Singapore. The methodology will result in different profit outcomes and require new modelling, data and processes.
- As a result of more granular contract aggregation than current practice, combined with the need for probability-weighted expected cash flows, this will add significant effort and complexity to the valuation.

Calculating the discount rate and risk adjustment could require new techniques and application of considerable judgment.

Presentation and disclosure

- For BBA or VFA, premium revenue based on premiums written during the period will no longer appear on the P&L, and will be replaced by an "insurance contracts revenue" item. This is calculated based on movements in the CSM, risk adjustment, expected claims and expenses, and requires stakeholder education about its meaning and importance.

- Extensive new disclosures will be required, showing how the components of recognised amounts have moved during the period. These new disclosure requirements will be more detailed and complex to prepare than current disclosures.

Business unit engagement

- There is a risk that not all business units will feel engaged in the transition process or convinced it is useful, which may result in a disconnect between business unit and Group expectations of outputs.

Transition and resources

- Given the complexity of the changes, there may be a lack of key individuals within Companies with knowledge of relevant processes and systems to effectively implement the new Standard.
- In principle, the Standard needs to be applied retrospectively, with entities required to restate comparative information about insurance contracts. For the BBA this involves determining the original fulfilment cash flows for each portfolio of insurance contracts — including the inception discount rate and the original CSM – and then rolling this forward for each portfolio to the transition date. While a number of transition options have been provided to simplify the approach, preparing to apply and transition to the Standard will be an enormous undertaking, affecting many parts of the organisation, particularly finance and actuarial resources.

Transition and implementation

Given the scale of the above changes, investors and other stakeholders will expect insurers to explain the likely potential impacts and implementation program plans as early as possible. In our experience, proactively maintaining market confidence in an insurers' ability to execute these programs is essential. Hence, insurers should begin formally assessing impacts and mobilising their organisations now, starting with the following seven actions:

1. Conduct a gap analysis to understand key differences against current accounting / actuarial and reporting practices.
2. Educate the executive team and board on the new requirements and implications.
3. Understand interpretative issues and analyse the financial, operational and system implications of the new Standard on the organisation.
4. Consider interaction with other new accounting standards.
5. Draft budget and plan resourcing requirements.
6. Assess implications for other current or planned programs of activity in the next 3-4 years.
7. Assess strategic and product implications.

For actuaries in particular, we suggest the following proactive responses:

- Allocate time and resources to projects to design, build and test new data, modelling, and systems capability.
- Update methodology guidance for discount curve and assumption setting.

- Think about creating a new or revising the existing calculation engine for amortising and adjusting the contractual service margin.
- Work with the finance team to estimate impacts on transition and design optimal approaches.
- Assist in ensuring the reported figures are auditable.

Conclusion

IFRS 17 will result in a profound change to the accounting in IFRS financial statements of insurance companies. This will have a significant impact on data, systems and processes used to produce financial reporting as well as on the people producing it.

The effective date of 1 January 2021 will provide entities with an implementation period of around three and a half years. Whilst this implementation period appears relatively long compared with other standards, the complexity of IFRS 17 is such that companies cannot afford to wait and should start preparing for implementation now. Impact assessment studies will be required to plan implementation steps, to identify the extent of effort necessary to achieve compliance, and to understand and explain the financial impacts. In particular, the requirement to restate the opening balance sheet as if the standard had always applied to existing business on the implementation date is expected to require significant effort.

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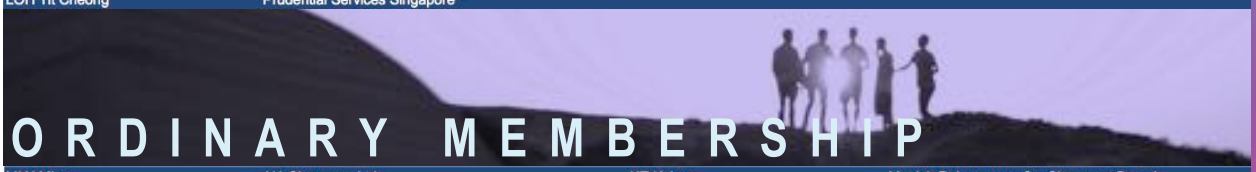

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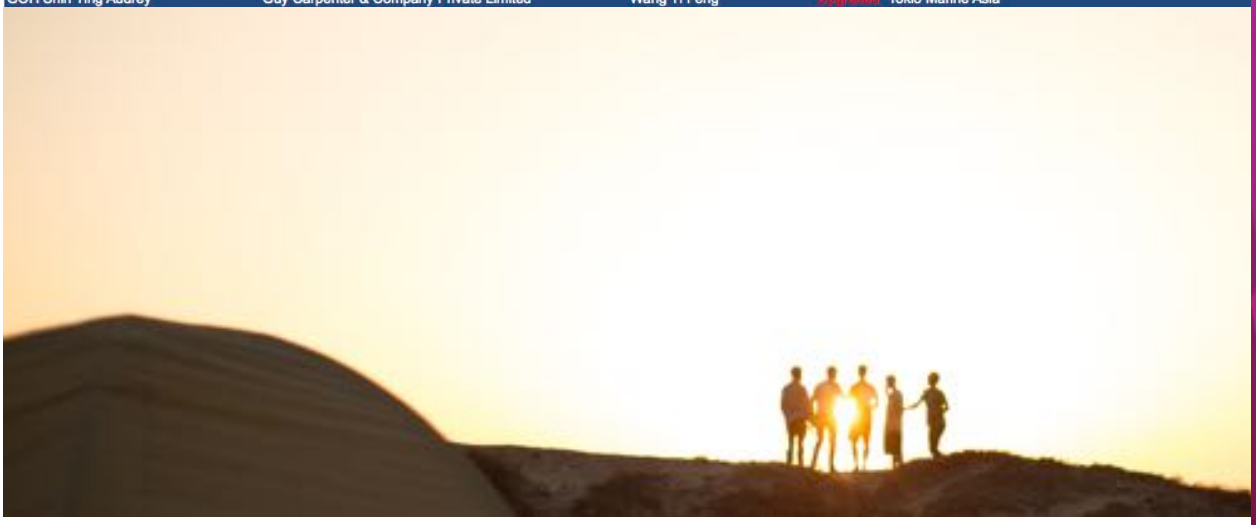

End of the list and the Issue, thank you!