LET'S TALK DIGITAL AUGUST 2020



CONTENT



Deploying Your Data Project





Enterprise Architecture and Your Digital Transformation Journey

Ian Goh Suan Hooi

Let's Talk Digital is a monthly newsletter that was created to build awareness on Digital Banking and provide a platform for industry practitioners to share insight and current trends on this exciting subject matter in relation to the Banking and Finance industry.

Deploying Your Data Project

By Koh Wyhow

What are the processes needed to bring a proof of concept version of your code, to deployment to achieve a business outcome? This article answers that question by providing examples, and highlighting the difference between two projects, one is customer-facing, and the other is for consumption by an app/website.

Enterprise Architecture and Your Digital Transformation Journey

By lan Goh Suan Hooi

A common problem in the corporate world is the disconnect between Business and IT. Business and IT tend to work in silos and quite often IT is perceived as a tactical or operational function rather than a strategic function within an organization.

Given how embed technology is in every aspect of our lives and business, this stance confirms a business' position as a laggard in the industry. This article discusses the discipline of Enterprise Architecture which promotes a mindset of value co-creation between business and IT functions within an organization.

> To find out more about the Digital Banking programmes that ABS offers, visit

www.asianbankingschool.com/our-programmes/centre-for-digital-banking



Koh Wyhow

Koh Wyhow is the manager of the data science team at Star Media Group Berhad. He focuses on delivering advanced analytics and business intelligence solutions for the organisation like chatbots and image recognition solutions. He consulted for client in the airlines, media, property, and FMCG industries during his time as a senior consultant at EY's Data and Analytics team.

He was one of the data scientists which implemented strategies to run a national data-driven campaign for INVOKE in the 14th General Elections. As an independent learner, he picked up basic Python programming skills after office hours during his days as a Further Mathematics lecturer at a private college. Wyhow holds a BSc in Mathematics from the National University of Singapore.



lan Goh Suan Hooi

With more than two decades in the industry, Ian's career spans multiple industries including Financial, Logistics, and Telecommunications both as a vendor and end user. He has held roles in multiple parts of the IT delivery value chain including operations, project and program management, systems integration and more recently IT strategy and architecture. He has experience in various domains including CRM, Business Intelligence and SOA.

Ian's current interest is in the impact of the digital economy on an organization. Given the need for agility within IT and the availability of Infrastructure, Platform and Software as near commodity services through cloud service providers, the lines between IT and business are blurring. Thus, requiring individuals to have a broader understanding of organizational dynamics and the need to embrace new approaches to service management such as bimodal IT, DevOps and Lean. Ian is passionate about helping IT professionals in redefining their role within this context.

Ian holds a master degree in electronics engineering and a bachelor degree in Information and Electronics Engineering from Curtin University, Western Australia. He also holds professional certifications from ITIL, TMForum, IASA and the Open Group.

A Case Study

By Koh Wyhow

In Deploying a Data Project



There are numerous sources (e.g. MOOCs like Coursera and edX, online labs like Qwiklabs, and bookstores like No Starch Press and O' Reilly) from which one can independently venture into areas such as Infrastructure & DevOps, Big Data, Websites & App Development etc. The resources I used to pursue my independent studies are available on my GitHub via tQR code on the right. Some of the resources are free, while others are paid (and those books are a lot cheaper than courses in physical classrooms).

- https://www.coursera.org/
- https://www.edx.org/
- https://www.qwiklabs.com/
- https://nostarch.com/
- https://www.oreilly.com/
- https://github.com/atlas-github/20190731StarMediaGroup/blob/master/7_Recommendations.ipynb

The variety of online courses cover the technical parts needed to achieve certain tasks like using Machine Learning APIs from Google Cloud Platform, Machine Learning Infrastructure, or classifying images into certain categories. The examples found in the books from the QR code, and exercises from Qwiklabs should be enough for you to build your own proof-of-concepts (POCs). However, online courses rarely cover the deployment bit as this varies depending on your organizational structure.



I'll walk you through the process I went through to deploy my chatbot on The Star Online via Facebook Messenger . Some context is necessary for readers to understand this process:

- The social media team replies inquiries coming in via Facebook Messenger manually, and more often than not, the questions are rather repetitive
- The queries which come in can vary significantly, such as asking the Star's journalists to cover an event, reporting a mistake on an article, sponsorship inquiries and so on
- Not all inquiries receive replies from the social media team due to the sheer volume of questions from users
- The Star Online's registration wall came online sometime in November 2019, so the social media team will be overwhelmed with questions from users about technical problems like being unable to register, forgetting their passwords, etc.





The following lists the process I went through to deploy a chatbot.

1) IDENTIFY PROBLEM STATEMENT



The volume of inquiries from users is expected to increase once the registration wall comes up, and the team won't be able to get back to users in a timely manner.

It is difficult for inquiries from users to be routed to the correct department as there is no such capability within Facebook Messenger, while creating additional usernames and passwords to be shared between the social media and customer service teams may risk coordination problems.

2) CONDUCT BUSINESS AND TECHNICAL DILIGENCE

BUSINESS DILIGENCE

TECHNICAL DILIGENCE



3) CONCLUDE INITIAL ASSESSMENT AND BUILD POC



Compile research work and present proposed solution.

Get green light to proceed with POC development work.

Aim to complete POC within a few days, and demonstrate POC to management for approval to proceed with further development work

4) PROJECT PLANNING AND DEVELOPMENT



Plan milestones and timelines for chatbot project.

Inform product owners about your proposed solution, and get their input on what other features should be included.

Think about what makes users interact with chatbot frequently, and include or stagger the deployment of such features.

Alert IT and Corporate Communications of proposed solution, so they can support with the deployment bit of the project.

Develop chatbot and review progress of work every few days with colleagues to minimise mistakes.

5) FINAL REVIEW OF PROJECT AND TEST



Have your own team test the chatbot before presenting to external stakeholders.

If testing goes well, inform IT to assist with deployment.

6) ASSESS ACCURACY OF RESPONSES AND ENHANCE CHATBOT



Monitor user interactions and chatbot responses over the next month, to ensure there are no post-deployment mistakes.

Begin development work of other features to be included in the chatbot.

You'll notice there is significant stakeholder management work in a data project, with product owners, management, IT, and Corporate Communications. A number of data projects fail or stall as there is no buy-in from stakeholders other than your team, and this is a fact that online courses seldom highlight. It is good to be technically capable, but you will also need to balance it out with the business side of data projects.

I'll also highlight another type of data project, one which depends on externally available information and deploying it into your organisation's systems. External datasets can be obtained via two common methods: publicly available Application Programming Interfaces (i.e. APIs) and webscraping.

A good analogy of an API is a customer walking into a restaurant and receiving the menu from the waiter.

- The customer gives his order (which is his parameter) to the waiter, and the waiter returns with the customer's order (which is the result) later on.
- The waiter is the equivalent of an API: the user of the API provides the parameters to the function, and the function returns the value to the user.

An example of a publicly available API is Bank Negara Malaysia's Open API. Let's use this API to get some information about current base rates and base lending rates from retail banks in Malaysia. We'll start by breaking this problem into smaller pieces using Google Colab as follows:

- 1) Call BNM's OpenAPI
 - a) Install a Python library called requests to make the API call

!pip install requests

b) After installing the Python library, import the requests library onto your Notebook

import requests

c) Write the 1-2 lines of code needed to make the API call. How the headers parameter is written usually depends on the documentation of the API call, which is in the BNM Open API Base Rates/BLR/Effective LR page, under the latest header.

```
headers = {"Accept": "application/vnd.BNM.API.v1+json"}
response = requests.get("https://api.bnm.gov.my/public/
base-rate/", headers = headers)
```

d) Verify the connection is successful by getting a Response [200] result from the API call

response
<Response [200]>

- 2) Verify you have the data from the API call
 - a) The data from API calls are usually in a json format it looks intimidating to read at first, but spend a few minutes to understand the structure of the json format, and you'll quickly understand how the data is organised in the json file.

```
base_rate = response.json()
base_rate
```

- 3) Process the resulting data into a structured table
 - a) You'll need to import another Python library called pandas

import pandas as pd

https://api.bnm.gov.my/portal

https://colab.research.google.com/

b) Select the data you would like to convert into a table and store the data in the variable base_rate_table.

base rate table = pd.DataFrame(base rate['data'])

c) Verify the tabular structure of your data

base_rate_table

4) The next step is usually to upload your table into a data warehouse, where the data is used by your app or web service. The code can be run on a weekly basis using Google Cloud Platform's Cloud Scheduler, or a your preferred cron job scheduler. The Python code above has been written in a Google Colab notebook accessible via the QR code on the right. There is a section at the end of the notebook on how to upload base_rate_table into Google's BigQuery data warehouse.

Notice a difference in stakeholder management from the first project, and the one involving Bank Negara's OpenAPI. This contrast stems from the fact that chatbots are customer facing projects, while calling external APIs tends to be more of a backend solution. The stakeholder management part of the second project would come from integrating with your organisation's internal systems, which is mainly the IT or Technology department. When your project caters to external customers, do expect more stakeholder management work.

SCAN ME

Don't worry if solving problems using data and unfamiliar methods is intimidating for you, whether you have experience or not. My latest adventure involves building a POC for augmented reality applications. This required me to learn how to use a Unity Engine with Vuforia, and some C# programming, all over the course of a week. Take it as a step to learn something new in your lifelong quest to upgrade yourself. The sooner you get used to taking that leap of faith when dealing with new methods, the faster you get to upskill.

https://cloud.google.com/scheduler

https://colab.research.google.com/drive/1aZicfZX5SLLwKjRXIhBDeJksScfA48bo

ENTERPRISE ARCHITECTURE AND YOUR DIGITAL TRANSFORMEY

By Ian Goh Suan Hooi

Probably one of the hottest industry buzz words over the past 5 years has been "Digital Transformation", and for good reason, technologies such as a relatively stable and reliable internet, mobile computing devices and enhancements in machine learning have meant that new business models have become possible, sometimes, at the expense of more traditional business models. Companies such as Grab, Airbnb, Alibaba have shown how these new technologies can disrupt long established business models in various industries.

The financial Industry has not been spared either. With the emergence of eWallet and remittance services, virtual banks and other online financial services providers, banks are finding that their revenue streams are being eroded by some of these niche service providers who are more flexible, asset light and cater to a niche clientele.

Fundamentally, digital transformation happens when an organisation figures out how to leverage technology in order to drive business goals; whether this means developing new business models, digitalisation of existing processes, transforming customer experiences or developing insights through data.

This requires tight integration between the business and IT organisations within a company. The challenge is that this is not how companies normally operate.

Traditionally, IT was seen primarily as a tool to improve business efficiencies. IT systems basically automated the work that could have already been done by a human, did it faster, and with fewer errors. Thus, the operating model in most organisations was that business would develop requirements and this was then passed to IT to execute.

Business and IT essentially worked in silos, by and large this model worked as businesses knew what they wanted, and IT would build a system to do it. Thus, businesses would develop the requirements, get IT to fulfil them and when the project was completed, pass "the system" to businesses as seen in Figure 1.



Figure 1: Traditional Business and IT working model

However, technology has evolved beyond merely the ability to automate. Technology capabilities, the pervasiveness of technology in our everyday lives, the shortening of time frames to respond, and market uncertainties mean that if we are to succeed, much tighter integration between business and IT functions are going to be required. (Figure 2)



Figure 2: Value Co-creation between business and IT

The table below illustrates some of the shifts that are going to be required in how we think about business and IT functions within an organisation.

Traditional	Digital Age
Business Decides, IT creates	Value Co-creation between business and IT
Do it right the first time	Produce a minimally viable product and evolve
Inside out (the inner strengths and capabilities of the organisation will make the organisation prevail)	Outside in (customer value creation, customer orientation and customer experiences are the keys to success)
Command and Control	Sense and Respond
IT is an Operational Necessity	IT as a Strategic Enabler
Segregation of Functions between business and IT	Integration of Skills across the enterprise

Table 1: Traditional versus Digital Age IT

ENTERPRISE ARCHITECTURE

The reality today is that business transformation should not be seen as an activity that is undertaken once every 5 to 10 years, rather it is a continual process of evolving the business to ensure its relevance in the environment. The need for Enterprise architecture is to ensure that this continuous process is part of an organisation's culture and way of work.

Enterprise Architecture is about strategy realisation. It bridges the business goals and strategy to the execution activities by identifying the gaps between the target and current state of an enterprise and the recommended actions required to close those gaps across four domains; Business, Data, Applications and Technology.



Figure 3: Enterprise Architecture Domains

Enterprise Architecture is guided by a business' goals and strategy. It defines how transformations in the business data, applications and technology domains should happen and the relationships between the domains. This is especially relevant today as enterprises are trying to decide how new technologies such as machine learning, blockchain and other emerging technologies can be leveraged in their digital transformation journey.

Some of the benefits of Enterprise Architecture include: -

- Allowing more open collaboration between IT and business units
- Giving businesses the ability to prioritise investments
- Making it easier to evaluate existing architecture against long-term goals
- Establishing processes to evaluate and procure technology
- Giving comprehensive view of IT architecture to all business units outside of IT
- Providing a benchmarking framework to compare results against other organisations or standards

Source: https://www.comptia.org/content/research/planning-a-modern-it-architecture

POPULAR EA FRAMEWORKS

As with other disciplines such as project management, process improvement and IT Operations, over the years, several frameworks have emerged for Enterprise Architecture.

According to COMPTIA, the following are the leading Enterprise Architecture Frameworks.

Source: https://www.comptia.org/content/research/planning-a-modern-it-architecture

TOGAF: The Open Group Architecture Framework (TOGAF) is a framework for enterprise architecture that provides an approach for designing, planning, implementing, and governing an enterprise information technology architecture. The Open Group claims that TOGAF is employed by 80% of Global 50 companies and 60% of Fortune 500 companies.

Source: https://en.wikipedia.org/wiki/The_Open_Group_Architecture_Framework

Zachman: The Zachman Framework for Enterprise Architecture, named after one of its founders, John Zachman is best described as a taxonomy or a collection of views of an Enterprise Architecture across six architectural focal points and six primary stakeholders. The framework does not do much from the perspective of methodology or process on how to create and maintain EA.

FEAF: In 1996, The National Association of State Chief Information Officers (NASCIO) created a framework which eventually became the Federal Enterprise Architecture Framework (FEAF) under the Office of Management and Budget (OMB) in response to the Clinger Cohen Act. FEAF is focused on the U.S. government, but the taxonomy and process can also be applied to private companies.

Gartner: After acquiring the Meta Group in 2005, Gartner established best practices in enterprise architecture and applied them to the company's consulting practices. While not strictly providing a methodology or a taxonomy, it focuses on bringing the business owners, information specialists, technology implementers together and unifying them behind a common vision.

Source:

http://www3.cis.gsu.edu/dtruex/courses/CIS8090/2013Articles/A%20Comparison%20of%20the%20Top%20Four%20Enterprise-Architecture%20Methodologies.html



To summarise, in order to effectively embrace the digital transformation,

- The siloed working mentality (business decides, IT builds) between business and IT needs to be replaced with a more cooperative approach (we co-create)
- IT needs to position itself as a strategic capability rather than a tactical enabler of business demands.

Recognising the importance of the integration of skills and capabilities within an Organisation, Bank Negara Malaysia has provided guidance that "A financial institution should establish an enterprise architecture framework (EAF) that provides a holistic view of technology throughout the financial institution" in their Risk Management in IT policy document (July 2019).

For training enquiries, please contact:

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