

Let's Talk Digital Series #5

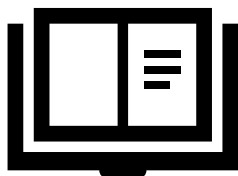
A Case Study in Deploying a Data Project



A Case Study

In *Deploying* a Data Project

By Koh Wyhow



There are numerous sources (e.g. MOOCs like Coursera¹ and edX², online labs like Qwiklabs³, and bookstores like No Starch Press⁴ and O' Reilly⁵) 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 GitHub⁶ 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).

¹ <https://www.coursera.org/>

² <https://www.edx.org/>

³ <https://www.qwiklabs.com/>

⁴ <https://nostarch.com/>

⁵ <https://www.oreilly.com/>

⁶ 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 Messenger⁷. 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.

DEPLOYING

PROOF-OF-CONCEPTS

Here are a few checkpoints you should consider before deploying a POC.


1) Once the POC is completed, what insights are expected to be generated?



1


It's good that you've learnt something new via online courses or books, but you also need to describe or quantify the value your insights give to your business.

For example, creating a chatbot allows an organization to reply to customers quickly and funnelling the correct inquiries to the relevant departments instead of solely depending on the customer service team.



2


My CS team would only have to focus on questions the chatbot cannot answer.



3


An insight a chatbot can give you from its logs are what types of questions customers ask via various social media platforms, so you can plan on augmenting or enhancing your knowledge base accordingly.

2) Can the POC be scaled up to production-grade code, and where do I house the code? Can the code be integrated with existing systems, legacy or otherwise?




1

It's entirely possible for an organisation's IT infrastructure to rely on legacy systems, and the vendor would have to be called in to integrate your code to a legacy CRM or ERP software via APIs.



2



The impact of relying on vendors for integration work is the need to obtain budgetary and IT approval, and this process is often cumbersome and lengthy.



3


The insight of your POC should yield more value than the effort invested in the development and integration work for the POC to be considered feasible by your organisation's management.

⁷ m.me/TheStarOnline


DEPLOYING
A CHATBOT


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
 <p>Wall Street Journal and AirAsia created their chatbots to circulate content every morning, and answer FAQs from their users respectively. This allows users to read articles on their way to work or while having their breakfast, and get answers to their questions quickly.</p>	 <p>Google has a Natural Language Processing engine called Dialogflow which can be integrated with Facebook Messenger. This POC should take only 2-3 days to develop. There are also sample bots available within Dialogflow to speed up your development work.</p>
 <p>The conversations seem to be guided using the conversation bubbles located at the bottom of the chatbot interface. This allows users to just click buttons to achieve their intent with minimal typing effort.</p>	 <p>Dialogflow is free until you hit 180 conversations a minute, and a Facebook page and app will need to be created for testing and demonstration purposes.</p>  <p>No coding work involved, unless you would like to connect the chatbot to an external database.</p>

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 web-scraping.

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 API⁸. 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 Colab⁹ 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
```

⁸ <https://api.bnm.gov.my/portal>

⁹ <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 Scheduler¹⁰, 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 right¹¹. 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.

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.

¹⁰<https://cloud.google.com/scheduler>

¹¹<https://colab.research.google.com/drive/1aZicfZX5SLLwKjRXIhBDeJksScfA48bo>



ASIAN
BANKING
SCHOOL

This article is part of the Digital Banking Learning Series, 'Let's Talk Digital', an initiative by the ABS Center for Digital Banking. It is written by industry practitioners and are aimed at educating the general public on the intricacies of digital applications in banking and other related industries, including the latest insights and trends of Digital Banking.

As the industry's preferred partner in learning and development, ABS offers relevant training programmes that covers a comprehensive list of banking areas that are designed and developed in-house by our Specialist Training Consultancy Team or in collaboration with strategic learning partners that includes some of the top business schools in the world. It also provides specialised consulting services and tailored learning solutions to meet the specific needs of its clients.

For more information, visit our website at www.asianbankingschool.com or email us at digitalbanking@asianbankingschool.com