Trade Insights for the Department of International Trade in a British Organisation

Project Proposal

ANLY482 – Analytics Practicum AY16/17 Term 2

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1. Project Overview
1.1.Background Information

Our sponsor organisation is a British organisation in Singapore which oversees the development and maintenance important and longstanding relations between the UK and Singapore. As part of this organisation, the Department for International Trade (DIT) is responsible for striking and extending trade agreements between UK and Singapore, with about 100 UK companies gaining a foothold in Singapore yearly. The DIT currently focuses on 5 main sectors of trade - F&B, Digital Services, Aero, Water and Rail.

1.2.Project Sponsor & Liaison Information

Our team liaises with the Department for International Trade (DIT) at our sponsor organisation.

1.3.Project Motivation & Problem Statement

Every year, the DIT plans and reviews marketing campaigns that the UK should take to encourage British businesses to expand into Singapore. These campaigns are categorised into 16 main sectors, 5 of which are currently the main focus for Singapore. To justify a High-Value Campaign, the sector has to be estimated to be worth about £250 million in export volume over 4 years.

Traditionally, decisions made for these marketing campaigns do not refer to existing historical trade data. Instead, these crucial decisions are built merely upon the sentiments of staff within the department or past successful campaigns. Any patterns in specific import and export data between UK and Singapore as well as between other countries and Singapore are not analysed and are not effectively utilised in our sponsor organisation's marketing campaigns. This could lead to a loss in untapped trade opportunities for the UK, which decreases UK's export revenue and potentially, their overall GDP.

A user-friendly system which displays information on trade volume, type and directions that can provide insights into UK's current trade patterns with Singapore would thus be valuable to DIT's decision making.

1.4.Project Objectives

The main aim of the project is to provide the DIT with valuable insights for decision-making by developing an analytical dashboard contained in a web application. This dashboard will help the end-user determine the following:

1. Trade sectors to focus on
2. High - / low-performing goods and services that should or should not be imported into Singapore
3. High-/low-risk competitors importing into Singapore

To ensure the continued sustainability of the web-application, end-users will be able to upload files of the following format to update the model:

1. .csv format
2. .xlsx format

2. Data Provided
2.1. Choosing the data source
As our sponsor organisation did not have an internal pool of data, we were instructed to scrape publicly available data sources from websites such as Trademap.org, Comtrade.un.org and data.oecd.org. These websites housed all the data our sponsor organisation currently uses. We were specifically told what sectors of data to extract to form the data source we would be working on. We chose to extract data solely from comtrade.un as they seemed to provide the data in its rawest form.

2.1.1 Choosing between valuation of Singapore imports from the World and World exports to Singapore

When extracting the data from UN Comtrade, we realized that the Singapore's imports from the world did not match the world export values stated. Upon further investigation, we found that the principal reasons for inconsistent statistics on destination and origin for a given shipment are differences in 1) classification concepts and detail, 2) time of recording, 3) valuation, and 4) coverage, as well as 5) processing errors. Hence, we decided that there was a need to standardize the valuation for future analysis to be accurate. We decided to focus on how Singapore values its imports from the world.

2.2 Interpretation of Data

A sample of data from *Goods_2016_4D.csv* is presented below:

	Classification	Year	Period	Period Desc.	Aggregate Le	Is Leaf Code	Trade Flow C	Trade Flow	Reporter Cod	Reporter
2	HS	2016	201601	Jan-16	4	0	1	Imports	702	Singapore
3	HS	2016	201601	Jan-16	4	0	1	Imports	702	Singapore
4	HS	2016	201601	Jan-16	4	0	1	Imports	702	Singapore
5	HS	2016	201601	Jan-16	4	0	1	Imports	702	Singapore
6	HS	2016	201601	Jan-16	4	0	1	Imports	702	Singapore
7	HS	2016	201601	Jan-16	4	0	1	Imports	702	Singapore
8	HS	2016	201601	Jan-16	4	0	1	Imports	702	Singapore
9	HS	2016	201601	Jan-16	4	0	1	Imports	702	Singapore
10	HS	2016	201601	Jan-16	4	0	1	Imports	702	Singapore

	Reporter ISO	Partner Code	Partner	Partner ISO	2nd Partner	2nd Partner	2nd Partner	Customs Pro	Customs	M
2		826	United Kingdom							
3		0	World							
4		36	Australia							
5		56	Belgium							
6		156	China							
7		246	Finland							
8		251	France							
9		276	Germany							
10		344	China, Hong Kong SAR							
11		360	Indonesia							

	Mode of Tra	Mode of Tra	Commodity C	Commodity	Qty Unit Cod	Qty Unit	Qty	Alt Qty Unit	Alt Qty Unit	Alt Qty	Netweight (k	Gross weight	Trade Value	CIF Trade Va	FOB Trade V	Flag
2			403	Buttermilk, c	0						2918		31917			0
3			7325	Cast articles,	0								5305868			0
4			7325	Cast articles,	0						9340		116822			0
5			7325	Cast articles,	0						2250		17243			0
6			7325	Cast articles,	0						1655500		2683984			0
7			7325	Cast articles,	0								656			0
8			7325	Cast articles,	0						17110		57671			0
9			7325	Cast articles,	0						730		23565			0
10			7325	Cast articles,	0						9570		14385			0

The interpretation of *Goods_2016_4D.csv* is as follows:

Column Header	Description
Classification	HS Codes are internationally harmonised trade/tariff codes used to categorise goods, and is used by 141 countries around the world
Year	The year the trade took place.
Period	6 digit number, where the first four numbers is the year and the last two numbers is the month, where a transaction is made
Period Desc.	Month and year that a transaction is made
Aggregate Level	Level of commodity code (2 digit, 4 digit or 6 digit)
Is Leaf Code	Basic code without children
Trade Flow Code	Code for method in which goods are moved
Trade Flow	Method in which goods are moved

Reporter Code	Code which uniquely identifies the the report country's name
Reporter	Report country's name
Reporter ISO	Acronym representing the reporting country
Partner Code	Code which uniquely identifies the the partner country's name
Partner	Partner country's name
Partner ISO	Acronym representing partner country
2nd Partner Code	3 digit code representing 2nd partner country
2nd Partner	2nd partner country's name
2nd Partner ISO	Acronym representing 2nd partner country
Customs Proc. Code	Numerical code for customs
Customs	Form in which commodity enters or leaves the country
Mode of Transport Code	Code for mode of transportation
Mode of Transport	How the commodity is transported
Commodity Code	A 2 digit, 4 digit or 6 digit code which identifies the commodity
Commodity	Commodity type
Qty Unit Code	Numerical code for measure of commodity
Qty Unit	Unit of measure of commodity
Qty	Amount of commodity using "Qty Unit" as the unit of measurement
Alt Qty Unit Code	Alternate numerical code for measure of commodity
Alt Qty Unit	Alternate unit of measure of commodity
Alt Qty	Amount of commodity using "Alt Qty Unit" as the unit of measurement
Netweight (kg)	Net weight of commodity in kilograms
Gross weight (kg)	Gross weight of commodity in kilograms
Trade Value (US$)	Trade value of commodity in US$
CIF Trade Value (US$)	CIF trade value of commodity in US$

FOB Trade Value (US$)	FOB trade value of commodity in US$
Flag	Dummy variable show if there are problems with the data

3. Technology

The following tools will be utilized in this project:

3.1. JMP Pro 13

JMP Pro 13 is a tool developed by the JMP division of SAS. As the data files, taken together, would be too large to be handled by conventional softwares like MS Excel, we decided that JMP Pro was the ideal tool for data exploration and analysis. In addition to that, JMP Pro 13 has the function to convert our visuals into interactive html files which could be used to aid our dashboard building.

3.2. JavaScript

As our sponsor requested that our dashboard to hosted on an open source platform, we decided that it was best to use JavaScript to build the application's user interface. This also gives us versatility in terms of the visualizations we could use.

4. Timeline & Schedule

Legend:			
CC	Christian Chua	√	Completed
CT	Cornelia Tisa	ID	Internal Deadline
TT	Timothy Tan		
DIT	Department for International Trade		

	Tasks	Action by:	W1 1 - 7 Jan	W2 8 - 14 Jan	W3 15 - 21 Jan	W4 22 - 28 Jan	W5 29 Jan - 4 Feb	W6 5 - 11 Feb	W7 12 - 18 Feb	W8 19 - 25 Feb	W9 26 Feb - 4 Mar	W10 5 - 11 Mar	W11 12 - 18 Mar	W12 19 - 25 Mar	W13 26 Mar - 1 Apr	W14 2 Apr - 8 Apr	W15 9 - 15 Apr	W16 16 - 22 Apr
Initial Research & Project Proposal Presentation	Initial Client Meeting	CC, CT, TT	√															
	Preliminary Data Exploration	CC, CT, TT																
	Sourcing of Additional Data	CC, CT, TT																
	Finalising Requirements with Client	CC, CT, TT																
	Exploring Analytical Tools	CC, CT, TT	√															
	Project Proposal Preparation	CC, CT, TT	√															
	Project Proposal Submission	CC, CT, TT	√															
	Update Wiki Page	CT	√															
Milestone 1	Project Proposal Due (8 Jan 2017, 2359)																	
Data Cleaning	Checking for Anomalies & Errors	CC, CT, TT			ID													
	Data Cleaning	CC			ID													
	Data Preparation	CC			ID													
Data Analysis & Initial Visualisation	Initial Visualisation with Tableau	CC, TT			ID													
	Generate Variables Required	CC, CT, TT			ID													
	Summarise Initial Findings	CT			ID													
	Consolidate Progress	CT			ID													
Project Revision	Review Findings with Sponsor	CC, CT, TT					ID											
	Finalise Project Objectives	CC, CT, TT					ID											
	Finalise Project Proposal	CC, CT, TT					ID											
	Update Wiki Page	CT							ID									
	Update Mid Term Report	CT							ID									
Milestone 2	Midterm Report and Presentation Due (19 Feb 2017, 2359)																	
Milestone 3	Interim Practicum Presentation (20 - 24 Feb 2017)																	
Data Modelling	Exploratory Analysis	CC, CT, TT				ID												
	Clustering	CC, CT, TT				ID												
	...	CC, CT, TT				ID												
Application Building	Code Application	CC, TT								ID								
	Test Application	CC, TT								ID								
Project Revision	Gathering Feedback from Client	CT									ID							
	Adjusting Analysis	CC, CT, TT									ID							
Final Preparation	Prepare Final Report	CC, CT, TT												ID				
	Prepare Final Poster	CT												ID				
	Prepare Final Presentation	CC, CT, TT												ID				
Milestone 4	Abstract & Full Paper Due (2 Apr 2017, 2359)																	
Final Adjustments	Client Adjustments	DIT													ID			
	Final Revisions	CC, CT, TT													ID			
Milestone 5	Final Paper Due (16 Apr 2017, 2359)																	
Milestone 6	Conference Day (22 - 23 Apr 2017)																	

5. Risks & Limitations

Risks & Limitations	Mitigation Strategy
Lack of experience with analytical tools (eg. JMP Pro 13)	• Explore and familiarise with the analytical tools prior to using them to perform the actual analyses. • Use Week 2 as the study week to learn the necessary skills required to wield the tools.
Changes in work schedule due to unexpected events; delay of first release and other milestones	• Raise awareness about the change to other group members and re-look the work breakdown structure and tasks allocation.
Presence of other projects that will potentially hinder the project progress	• Agree upon the priority of this project among group members. • Introduce a buffer week to help reduce the associated impact.

6. References

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