ASSIGNMENT 2

Case Study: Royal Bank of Canada's new NLP Cloud Solutions

Author: Vinit Shashankbhai Mankad (0061072667)

Course: CIS5302 – Professional Skills for Business Analysis

Course Examiner: Professor Jeffrey Soar

Glossary of terms

RBC – Royal Bank of Canada

API – Application Performance Interface

CRM – Customer Relationship Management

NLP – Natural Language Processing

NLC – Natural Language Classifier

SMS – Short Message Service

CEO – Chief Executive Officer

WBS – Work Breakdown Structure

CIO – Chief Information Officer

AI - Artificial Intelligence

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Executive Summary

This business case focuses on the analysis of how Royal Bank of Canada (RBC) is improvising on the client relationships and how to build a better information system that can evaluate the business processes that can provide the operations and sales growth by reducing the requirements of human involvement. The resources and this innovative real-time idea is providing the business case a worthy attention for any businesses across the world. At present, the business model doesn't have any automated process, which creates the client-retention management tedious and impossible for newer clients to create relationships. The results are obvious and documented within the case as well as the RBC's new visions on the newer idea for the system to deliver value for the customers and organization itself.

Recommendations that were made incorporate following:

- Implementing a cloud bases system using Natural Language Processing (NLP) to improve system performance and operational level automation
- Developing a central data tool or plugin with control access to all levels of stakeholders of the organization
- Configure current system with the plugin as it can be used with full functionality as before
- Trace and align RBC clients with new developments
- Implement API integration and data management procedures

The main focus of this case study is to make sure that RBC can plan and implement better client services within and outside of the organisation and build strong relationships with its stakeholders. The only way is to install the plugin organization wide which uses a concept of mathematics called deep learning to mimic the user interactions with the organization from online forums, emails, Twitter feeds, SMS communications that provides what is being classified as client-value model.

Task 2.01 Project Journal

Date	Action Summary	Actions Taken	Actions Planned
17/03/2016	Data collection	Review of current system and its functionality in regards to the outcomes	Interviewing the staff and other key personnel to develop the project outline
18/03/2016	Drafting a System Vision Statement	Review the environmental factors that might affect the key concern of this new change	Drafting of problem or opportunity in the scheduling process for this case
20/03/2016	Drafting of current problems/opportunities	Reviewing and categorising the options in a tabular form	Developing the options matrix table with its problems as well as opportunities
21/03/2016	Creating a System Vision Statement	Reviewing the structure of current system and defining objectives and aligning the business outcomes	Designing the system vision statement that can show proper outcomes with the new solution
23/03/2016	Drafting of the project objectives	Reviewing the new vision and conducting an object related analysis	Creating the project deadline as well as listing of the options of the outcomes of new system
24/03/2016	Describing the scope	Reviewing the objectives as well as understanding the in scope and out of scope	Analysing the scope and define objectives for this task and view out of scope for the plugin
25/03/2016	Stakeholder analysis for this project	Assist and configure stakeholder for this new system	Analyse the stakeholder for a classified and proper justified requirements
28/03/2016	Design Work breakdown structure	Create a WBS by reviewing the scope and objectives defined	A WBS will focus on each task of the lifecycle of this project
30/03/2016	Drafting the interview with CEO and agenda of the project	Define the questions and finalise the appropriate set of questionnaire	Develop a full question set to ask CEO for the organizational-level information
31/03/2016	Finalize the case study	Arranging the document and	Describe each term efficiently and

Date	Action Summary	Actions Taken	Actions Planned
		prepare a formatted analysis	reviewing them as per the requirements of the new system
04/04/2016	Submitting the assignment to Turnitin	Finalizing the case study document and submit for originality report	The document is sent to review for the originality of the documentation provided
05/04/2016	Turnitin report generated	The report downloaded	Reviewing of the similarity report
10/04/2016	Submitting the assignment to the study desk	The assignment is sent to study desk for final grading process	The report is finished and submitted with Turnitin report as a single .pdf file

Table 1: Project Journal

Task 2.02 Background

The Royal Bank of Canada (RBC), has their headquarter in Toronto city in Canada with the largest corporation of its kind across country with $3 billion of net income on $403 billion worth of assets which employs 60,812 staff as per the records from the year 2003. The closest competitor and having revenue worth $285.9 billion of assists is $2.3 billion with TD following the Bank of Nova Scotia. RBC has services ranging from life insurance to trading and other general services (Historica Canada, 2016).

The RBC operations include, banking (51% of the net income), insurance (8%), capital markets (16%), investments (14%) as well as other global services (6%) with a high number of about 5 million clients that they take pride for and the offers that they provide on insurance services. These insurance services include life, travel, home and other type of areas of human interactions including wealth management services that has brokerage, investment and financial planning with the sales representatives. Its capital services range from equity to debt till treasury management followed by transaction processing services with ensured security and cash management (Historica Canada, 2016).

In this business case, our focus is on the new functionality that API integration from user level Meta data parsing from all forms of communications with providing analytics with IMB Bluemix provided NLP Cloud Solutions. The existing problem with the system is there is no ability to connect sales relationship map with the existing and new clients, which results in poor client relationships across business. We will be assisting key personnel as IT management as well as sales leader to acknowledge us and guide us with preparation of this document by providing in-depth information on stakeholders as well as information systems level data access (Historica Canada, 2016).

Task 2.03 Draft a System Vision Statement

In this task, the analyst will define the vision for the new or proposed system as ‘The ability to find connection between individuals at the company and clients to develop introduction to increase the odds of sales.’ To maximise the term and define agility of the processes, RBC has requested the research and documentation with appropriate envisioned new sales figures (Coplien, 2010). Additionally, the information will be communicated with various forms of

communication methods which then can be parsed with API integration within the web-based and mobile-based environments and later be sent to the NLP Cloud server for future analysis and create business outcomes aligned with sales CRM (CustomerThink Corporation, 2016).

RBC's customer-centric value model can be described as:

- Creating a well-defined customer experience
- Building more informal relationships
- Lower costs
- Capital management with effective risk management

The process automation for the new client-retention model has set a life stage segmentation and campaign automation in early 20's. Additionally, in the new system the enterprise-wide solutions will be prioritised with the idea on creating a personalised assessment to gain more insights for each customer with strong relationship with the organization as well as what exactly the customer wants from the organization, which the NLP Solution reports shows clearly (CustomerThink Corporation, 2016).

Task 2.04 Define options to address problems/opportunities

RBC has a current system where they are contacting their clients as well as creating new relationships with a streamlined processing with human involvement as to visit their homes or sites if required, which is fairly time consuming as the transportation and other timely processes are just reducing the sales rep outputs as an individual on a daily basis. Also, the client's recent condition and interest is also a key criterion to escalate this issue further.

In addition to this, the inefficiency to reach the client physically due to severe weather conditions is also a concern in the current system. It can take the system to rely on the clients to reply with their feedback which may not sound good considering being faced these conditions. The proposed new system will eliminate this issue as all that is required is the client details as well as relationship status with the organization to follow-up and get better feedback.

The client referral is an addition to this matter as the service offerings being received by the current client will be easier to get feedback on how the functionality actually is and not how it is being shown by the sales reps or the website. The new information system will have resolution with API integration with the client Meta data from all forms of communications and the automation of the process also includes NLP based Cloud Solutions which will provide analytics reports for the top management to get more insights and to create strong client relationships and sales CRM.

Pros	Cons	Risks	Benefits	Costs
Option #2.01: Sales force with on premise NLP Solutions				
Currently Easy to find connection with the out of the box working model and support services	Introduce through an old client as per the newly proposed system however with less functionality as the communication metadata has to be defined manually	Reduced risks of cloud based NLP solutions but data storage is located locally at a geographical location, which may be affected with act of God	CIO will have security wide data of all stakeholders as no data sovereignty issues	Refer Appendix A along with the proposed description i.e. - This case may take up to 20 weeks of time to reach final stage of SDLC lifecycle

	in the local server			(Satzinger & Jackson, 2012).
Option #2.02: Client retention				
Sales leader will contact users that are existing within the system with the pre-defined procedures and common interface that was being used	Acknowledgement tools can still be defined as to speed up the slow follow-up process	Risk losing client as the system will perform slowly which will reduce interface performance and unsatisfied clients, unnecessary more time invested with BA and workforce	Rebuilding the client relationships as well as ensuring the reliability of the current system with future business objectives explained and lower development costs with agility in workforce as the similar standard environment to work for IT staff	This case may take up to 6-8 weeks of time to reach final stage of SDLC lifecycle (Satzinger & Jackson, 2012).
Option #2.03: New client development with strong informal referral				
Sales leader will contact users that are new to the system with the pre-defined procedures and common interface that was being used, will require remote mobility of the sales reps	Acknowledgement tools can still be defined as to speed up the slow follow-up process	No prior connection with client resulting in losing client before creating any relationships with them, unnecessary more time invested with BA and workforce	Formulating new client relationships as well as ensuring the reliability of the current system with future business objectives explained and lower development costs with agility in workforce as the similar standard environment to work for IT staff	This case may take up to 10 weeks of time to reach final stage of SDLC lifecycle (Satzinger & Jackson, 2012).
Option #2.04: Do nothing				
Saves training costs for team and management at zero cost	Higher production loss	Risk losing old clients as well as no prior connection with new clients, risk	Maybe the lower level staff get some benefits with this option as no	Upfront at zero cost as well as a higher loss of production will create a massive

		of falling behind with newer developments	extra efforts to understand the use of the system	cost within the organization

Table 2: Options for the new system requirements

Task 2.05 Write the key objectives and a scope statement

Objectives:

In this business case, the requirements for the proposed new system for Royal bank of Canada will be discussed as well as the references will be provided for the technological terms and functionality of the system as it has a new functionality with the business wide solutions provided with IBM NLP Cloud Solutions which are measured within the scope in-depth (Coplien, 2010).

The objectives of this task will be:

- Review the new plugin offered by IBM and analyse to make a better on-premise of use-as within the new system of RBC
- Increase workplace agility
- Improve communication methods with strong client relationships
- Trace the meta data from all forms of communication and access it from the NLP cloud to get analysed reports
- System must automatically create user specific reports without any collision

Project Scope:

Ningbo Virtual Elder Care Service has requested a proposal to develop an information system to deliver key capabilities to its new service. The goal of the scope definition process is to describe the project in much smaller pieces, or work packages (Kendrick, 2004). The following outlines the in-scope and out of scope components of project.

In this system analysis, RBC has accepted and forwarded the system requirements for the delivery of the proposed functionality in more advance level as they bank has a high number of clients, however their relationships are not that strong and that requires in-scope and out-of-scope defined to get a clear understanding (Kendrick, 2004).

In-scope:

In scope is defined for this proposal as the ability to parse the metadata data from individuals email and other communication channels by Natural Language Processing, which includes following list of tasks to get done:

- The system will develop a new functionality of the system as the efficiency and communication is the key criterion
- Add the plugin to the existing Web application and mobile application
    - Developing the enlisted front end web apps:
        - ❖ Working enquiry and meta data parsing
        - ❖ Servicing the gathered data to the server
        - ❖ Accessing the specific information from the clients' accounts
        - ❖ Enquiring the clients' contact details
        - ❖ Family member contact details
        - ❖ Messaging detection with segregating the patterns
        - ❖ Following the uses meta data from various forms of communication channels associated with the system

- ❖ Reporting the data parsed with API integration and sending it to the cloud
- ❖ Viewing the sales patterns of the existing system
  - ✓ Access user account details
- ❖ Creating a deep learning based analysis on the meta data

○ Developing the system admin phase

- ❖ Administration users and super users
- ❖ Allocating permissions
  - ✓ Role based permissions
  - ✓ User level permissions according to their roles
- ❖ Automation control using NLP Cloud Solutions
  - ✓ NLP Data gathering from the meta data on the server
  - ✓ Automation of the client relationships and their connections to the old users

Out of Scope:

The out-of-scope will discuss the on premise Solutions of NLP using in-house processing, as current solutions are by default cloud-based, rather than Cloud based to enhance security concerns for the stakeholders of the system, for which a few more details as follows:

- Any stated solutions not discussed in this scope
- Extra efforts apart from work hours for better results
- Installing on premise work environment
- Creating in-house solutions for the analysis of the data
- Installing the new solutions within in-house application server platforms
- Creating an app store based plugin availability for all users
- More secure solutions compared to cloud-based, so less security concerns with certificates

With an additional cost to his, if requested or else suggested during the documentation of the body of the document, for explicit information apart from the scope defined above can be added.

Task 2.06 Conduct stakeholder analysis

The table shown below illustrates the various system level and external stakeholders that may have interest in the projected system including the key players of the new proposed system.

Note: In this case, stakeholders have to agree with the value proposition of referral sales channels.

Stakeholder entities	Goals and Interests	Influence level	Interest level	Actions performed
Governing Board of RBC	To make sure the new system meets the governing rules and regulations	High	High	Key player
CEO	Reviews the system requirements from the board and signs the paperwork for new system	High	High	Key player
IT management	Configures the new plugin and tests before it is installed to live environment	High	High	Key Player
Sales leader	Assigns new client partnerships	Medium	High	Key Player

	and tests the plugin on client level and performs general analysis with reporting			
Other Management	Makes sure the system functionality is as promised and useful for the staff	Medium	Medium	Meets basic requirements
Office staff of RBC	Checks the operationally if the system works with the output of the old system and capabilities will not be compromised as before	Low	Low	Meets basic requirements
External clients (including old and new users)	They will be interested in making the relationships based on the existing relationships of the system with previous stakeholders and create individual relationships	High	Medium	Shows consideration

Table 3: RBC Stakeholder Analysis for new system

Task 2.07 Work Breakdown Structure (WBS)

In this task, the system analyst will be developing a work breakdown structure with defining the system resources as well allocated and estimated as per the discussions from (Haugan, 2003). He says in his book that it is a project-focused tool for grouping similar elements and then organizing them into the defined scope of the system. The sub-levels describes an increase in the defined task of the project work structure.

Note: Time allocated from the day of the project initiation, hence days remaining defines the actual completion time for the subsequent process.

1. **Initialization of the business case**
   1.1 Identifying the problem, status: completed
   1.2 Processing and defining the higher-level issues, status: completed
   1.3 Vision defining, status: completed
2. **Planning phase**
   2.1 Objects defining for the business case, status: completed
   2.2 Scope defining process, status: completed
   2.3 Analysing the stakeholders of the system, status: completed
   2.4 Creating a work breakdown structure, status: completed
   2.5 Scheduling and creating a Gantt chart, status: 1 day remaining
3. **Analysis and discussions phase**
   3.1 Classifying the scope and its substituting processes, status: 1 day remaining
   3.2 Accessing the resources, status: 2 days remaining
   3.3 Defining the users of the system, status: 2 weeks remaining
   3.4 Classifying the success ratio, status: 1.5 day remaining
4. **Designing phase**
   4.1 Designing the plugin for the system, status: 10 days remaining
   4.2 Designing the mobile application for the plugin, status: 5 days remaining
   4.3 Designing and developing the metadata parsing documentation for the new system, status: 2 weeks remaining
   4.4 Database designing and defining schemas, status: 5 days remaining

4.5 Applying and assigning the permissions for the system and creating the new roles required, status: 2 days remaining

5. **Development phase**
   5.1 Creating the web and mobile based plugin for the system, status: 3 days remaining
   5.2 Database parsing and linking it to the NLP server to trace meta data, status: 4-5 days remaining
   5.3 Developing the programming code for the application on web, status: 10 weeks remaining
   5.4 Developing the programming code for application for mobile users, status: 6 weeks remaining
   5.5 Testing the sample data, status: 2 days remaining
   5.6 Proofing the data for the test environment, status: 3 days remaining
   5.7 Planning the test phase for the live environment, status: 2-3 days remaining
6. **Deployment phase for the RBC system**
   6.1 Testing a trial run on the live environment, status: 2 days remaining
   6.2 Database sampling off the production environment, status: 1 day remaining
   6.3 Assigning new roles and setting up previous users to the new system, status: 1 day remaining
   6.4 Installing the plugin into live environment, status: 2 days remaining
   6.5 Deploying the code to the live mobile apps, status: 1 day remaining
   6.6 Testing the performance of the new system, status: 4 days remaining
   6.7 Documenting the user characteristics in the new system, status: 4-5 days remaining
   6.8 Finalising the documentation for the completion of the project, status: 1 day remaining
7. **Handing over the project and delivery of the plugin**
   7.1 Skill based testing and transferring them to the super users, status: 2 days remaining
   7.2 Completing the formalities for the project and presenting the documentation to the CEO, status: 1 day remaining
8. **Supporting phase**
   8.1 On-going phase as the system runs on a regular basis and training the staff as the plugin starts functioning fully to the production and supporting with regular follow-ups, status: ongoing process

Task 2.08 Interview Draft with CEO of RBC

In this task, the focus is onto developing the proper interview with the CEO and addressing the questions to RBC and its implication to the existing system as well as the structuring of the current functions that maybe affected with the new developments.

2.08.1 Interview questions

The following list describes the information to create the proposed outcomes to the system classifications and desired functionality. The questions focuses on the mix of open-closed and scaled answer based with can describe a clear picture direct as well as details for the documentation.

Questions	Answers (format)
What is the number of participated user in the RBC's daily communications?	Number
What is the required process to synchronise all the user communications?	Open

Which department has more interactions with the clients?	Department name
How many staff communications are made outside the organization?	Number
Is current system efficient/satisfactory for RBC?	Yes/No
What are the supported social media or other forms of communication apart from RBC?	Open
Who is the non-functional team leader of RBC?	Name
What are the future requirements of RBC in terms of client retention?	Open
What is the number of staff focused on current client-relatioship model of RBC?	Number
How many minutes are taken by an average communicaton from start-to-finish with the sales representatives/lead?	Number (minutes)
On what basis would you recommend the improved system to create the outcomes?	1 to 10 scale
How is the client information stored and where?	Open
What are the most frustrating client faced opportunities that RBC is lacking?	Open
Is the staff computer literate enough for the new advancement and/or use of plugin and analytics tool	Yes/No
Describe the common client retention techniques used currently by the system?	Open
What are the human errors involved with this current system?	Open
What is the status of current system at present for this functionality?	Open
No physical/virtual system boundries defined and user roles defined.	1 to 10 scale
What is the process to become a sales/customer representative?	Open
It would be more suitable for the system to identify new and attract the new clients with this new system.	1 to 10 scale

Table 4: Type of interview questionnaire for the CEO

These questions will scale the output with clearly identified business functionalities of current system and it will provide better view on pit-falls that can be measured and solved with new NLP Cloud Solutions.

Task 2.09 Write a list of the key functionalities of the system

In this task, analyst is trying to focus on the illustrating the functional level of the system, which is API integration from sales force/sales CRM with meta data parsing from all form of communication channels using a plugin/tool and analysing the client relationships using NLP application, which should address the new system capabilities as described as follows:

Functionality of data collection and analysis requirements:

- Collection and analysis of recent communications with old clients
- Collection and analysis of recent communications with new clients
- Collection and analysis of past communications with users
- Collection and analysis of meta data of the users

Functionality of Communications:

- Selecting the communications that are most frequent and informal
- Selecting the communications that are most frequent and formal
- Selecting the communications that are done in past and are informal
- Selecting the communications that are done in past and are formal

- Connect to meta data of the communications channels and integrating the data within the plugin analysis datasheets
- The plugin is functioning sa an individual module in both web and mobile interface
- Plugin is able to display, transmit, and modify communication meta data using API integration

User Connectivity:

- Connect via website as well as mobile application
- Connect via 3G/4G and transmit the resulting data to the server to analyse and perform parsing using NLP Solutions
- Functions as a single user GUI for a new client who does not have prior communication channel

Stakeholder Management:

- Lodgement of the user data as per the requirements of the system for sales CRM
- Deliver information on the client-based requirements as the plugin processes
- Connect to client's next of kin, relatives or external stakeholders
- Manage client information with authorised access control mechanisms
- Deliver tracking of meta data and analysis reports to the super users

Functionality of the interface:

- Connect to various governing bodies to make confirmation on the accepted system capabilities
- Lodge reports on the analytics from the meta data to NLP Cloud Services
- Download reports for super users and IT management for further analysis
- Connect new users with old partners of the RBC and build strong relationships

Functionality in terms of security:

- Configured super user access
- Configure IT administrator roles access
- Configure general admin access
- Define meta data access as per the user access to the system

As per the requirements of the case study, the functional requirements are discussed as above and the systems are now capable for new challenges as an independent work flow and outputs are met at the testing level.

Business Benefits for RBC:

In the business goals, these requirements are now implemented and as they are being accessed by the streamlines of stakeholders the RBC client-retention will be enhanced and improved at an optimum level including following advantages apart from simplicity and regardless of the form of communication:

- Effective meta data parsing and automated process to align the workflow of the external stakeholders
- Maximising the user level interaction on digital form rather than in person as other businesses are moving to an online presence
- Limiting the risk of losing the new clients and retention of the existing with strong communication links
- Improved service level to all forms of communications from internal/external stakeholders

- Enhancing workflow operability
- Ensured security of data with in-house NLP rather than Cloud based

These benefits will provide an interactive system that all the stakeholders across all the businesses will be benefited.

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Appendices

Appendix A

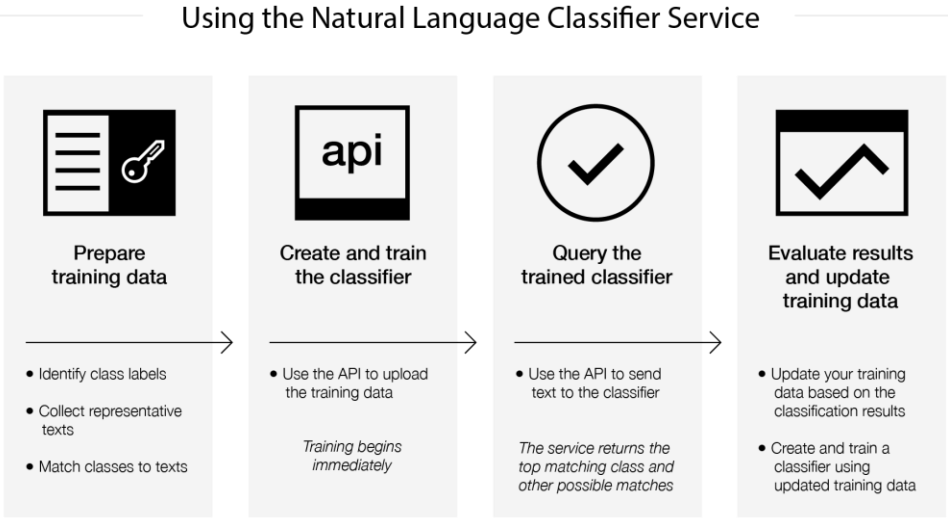

Fig 1: Natural Language Classifier (NLC) defined by IBM Bluemix

In addition to the provided services from the application interface of the languages that are being used by the users across various forms of communication channels such as short texts that can be predicted and analysed with the use of NLC. Also, these technologies can be used with several languages including English, French, Italic, Japanese, Arabic, Portuguese and Spanish as well, where the classifier traces the metadata with API integration and parse information on unknown text messages (IBM Watson Developer Cloud, 2016).

IBM Bluemix states that use of "deep learning" can be very useful such as in this application tool to gather best performance metrics in such a way that can predict the human brain capabilities formerly known as Artificial Intelligence (AI). The algorithms will simplify the outputs from images and voice recognition tools to text form to help the machine learning approach much better – benefits of using NLC. The next best thing to know is the API is so automated that user don't require prior knowledge on the NLP or and machine learning techniques, even programmers will use basic code and logic to build the application and run (IBM Watson Developer Cloud, 2016).

This parser is well defined as the users can learn quick and easily as well as data entry is automated and the background process can also return 'unknown user-texts' which aren't hosted to IBM's cloud interface; which is improved with every upgrade as well as to ensure the high-availability of the data from the 'not-so-required' IT Infrastructure for the organization including staff (IBM Watson Developer Cloud, 2016).

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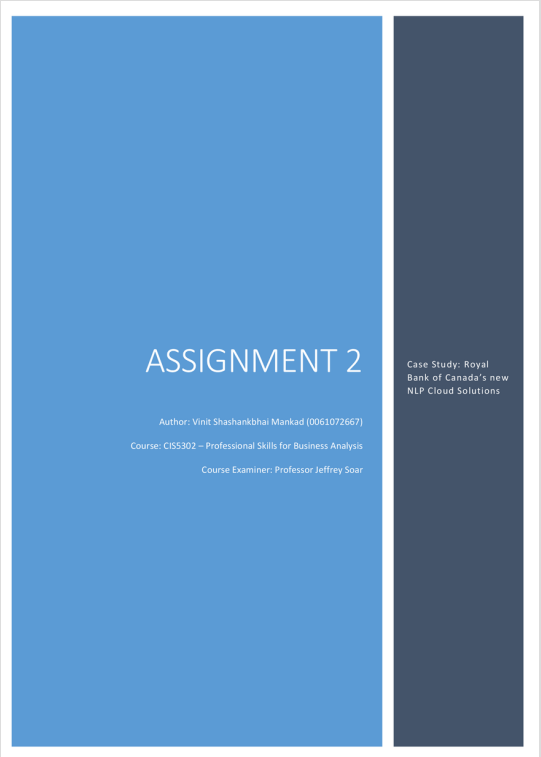

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