COGNITIVE COMPUTING IN ENTERPRISE APPLICATIONS

BITS ZG628T: Dissertation

By

SAI PRASAD ADDEPALLI

2015HT13456

Dissertation work carried out at
EdgeVerve Systems Pvt Ltd, Hyderabad

Submitted in partial fulfillment of M.Tech. Software Systems degree programme

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PILANI (RAJASTHAN)

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Under the Supervision of

SRUMITH U

EdgeVerve Systems Pvt Ltd, Hyderabad

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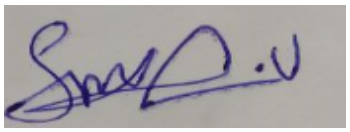
CERTIFICATE

This is to certify that the Dissertation entitled **COGNITIVE COMPUTIVE IN ENTERPRISE APPLICATIONS** and submitted by **SAI PRASAD ADDEPALLI** having ID-No. **2015ht13456** for the partial fulfillment of the requirements of M.Tech. in Software Systems degree of BITS, embodies the bonafide work done by him/her under my supervision.



Signature of the Supervisor

ACKNOWLEDGEMENTS

The satisfaction and euphoria that accompanies the successful completion of any task would be incomplete without mentoring the people who made it possible, because success is the epitome of hardwork, perseverance, undeterred missionary zeal, steadfast determination and most of all "Encouraging Guidance".

I express my gratitude to my supervisor **SRUMITH U** for providing me a means of attaining my most cherished goals.

I record my heart full of thanks and gratitude to my additional

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INTRODUCTION:

Cognitive Computing in enterprise application (CCEA) are now generating a great deal of excitement for organizations. By using CCEA applications in organizations, we can contribute to a company's business objectives, and of the challenges associated with implementing them. The goal of CCEA applications is to make business process more efficient, accurate and reliable.

Cognitive computing applications are those that utilize tools such as natural language processing, image recognition, intelligent search, and decision analysis to adapt their underlying computational and modeling algorithms or processing based on exposure to new data.

Many companies by now have invested in ECC applications, but most cannot point to significant goals. Te reason behind is the lack of understanding how CCEA applications can contribute to the business objectives. Our research suggests that many companies don't fully appreciate the challenges associated with implementing ECC solutions

In our research, we take consider below two Applications for studying Cognitive Computing

1. Banking Application.
2. E-commerce Application.

With Digitalization, banking plays the major role in the society. where everyone operates with their mobile in hand. We target 3 areas where cognitive computing can be applied:

1. Operation Excellence
2. Customer Experience
3. Employee Experience

2.1 Operation Excellence:

It is the key for organization's ability to execute its core business process in a reliable and repeatable way. Organizations that try to deliver superior operational excellence have stable core and routine processes. These included sophisticated search and retrieval from very large corpuses of technical information such as legal/accounting/financial laws and regulations and medical literature, predictive maintenance of machines, product classification, fraud detection, etc. In all of these examples, CCEA were used to enhance the speed, accuracy and reliability of various core processes of the organization, and therefore drive its operational excellence. The largest number of use cases we found was CCEA that enhanced an organization's operational excellence. Most Enterprises used text mining, pattern matching, search, and natural language processing in ECC applications to parse large volumes of information and identified case law pertaining to their cases, helping to drastically speed up the grunt work of their attorneys.

Bank's used Bayesian statistics and anomaly recognition for semi-automated fraud detection; the application was able to narrow down the list of probable cases for further consideration by the bank's risk managers, thus speeding up the fraud detection process.

We use genetic algorithm applications to develop models that could more accurately identify compounds that had the greatest likelihood of viability and success. For Accuracy, we can use pattern detection and data mining to quickly and reliably classify and categorize about new products for correct presentation. an online retailer and a consumer analytics firm used pattern detection and data mining to quickly and reliably classify and categorize new products for correct presentation

2.2 Customer Experience:

CCEA intended to delight customers by either offering superior products and services or fostering customer loyalty and engagement formed the second largest number of use cases. These included loan processing and delivery, call center support, claims processing, citizen tax services,

delivery of insurance products, and analysis of customer feedback. Several ECC applications allowed organizations to provide innovative, personalized and superior products or services to customers.

On of the online bank used Bayesian statistical modeling tools to understand customer behavior and demographics and offer loans in less than seven minutes to retail customers. The bank's leaders believed that providing loans to customers so easily and quickly gave them a significant edge over their competitors.

CCEA applications can be used to strengthen customer loyalty and trust.

2.3 EMPLOYEE EXPERIENCE:

CCEA applications can help create a superior employee experience. Also, in internal help desks help agents tackle a range of technical problems experienced by employees. Organization used natural language processing, text mining and pattern matching to provide employees solutions to problems with their devices and applications. Machines generated answers to standard problems, while handing off non-routine and complex problems to human experts, who were also supported by the CCEA.

Employees had access to an application that used text mining and pattern matching to provide answers to questions about work related travel such as passport and visa applications, currency, and airline tickets.

3 CHALLENGES:

Challenges in Implementing Enterprise Cognitive Computing in Enterprise Applications Although we sensed a lot of enthusiasm for the potential of CCEA to deliver business benefits, there was a sobering recognition that achieving these benefits requires the organization to address multiple challenges. We observed that failure to acknowledge, understand and tackle these challenges resulted in glacially paced implementations, failed implementations, and in the worst cases, a strong disenchantment with, and deep skepticism of, CCEA applications.

Four challenges are particularly important. To take advantage of CCEA's ability to process massive amounts of data, business leaders must (a) choose the right tools, and (b) make sure needed data is available to those tools. To take advantage of increased automation, organizations must -

i)consistently supervise the applications.

ii) appropriately allocate responsibilities between humans and machines.

4 TOOLS ANALYSED to USE:

Cognitive Computing Tool Type	**Open Sourced Tool**
Point solutions that execute focused and relatively narrow tasks	**Tensor Flow**: Helping systems transition from prototype to production **Spark**: Anti malware **Apache OpenNLP**: Natural **Language Processing Emdros**: Text mining **WordNet**::similarity : semantic pattern matching
Broad-based tools that offer a suite of solutions	Internally developed CCEA tool, leveraging many open source tools

5 GETTING RIGHT DATA:

Getting right data is always a critical task which grows drastically to ensure correct output

The first challenge is identifying the right data. A particular CCEA might require external data, such as legal documents, libraries, journals, consumer reports, or real time information

feeds, or the organization's internal data, such as product manuals, troubleshooting databases, operational databases, and subject matter expert knowledge.

For example, an audit firm procured large external databases of bank and financial statements for its data analysis of CCEA.

The second is making sure that needed data are available. For instance, search and query ECC applications require significant amounts of test data to train the model.

The third challenge is getting the data into the right format. ECC applications require data that is appropriately cleaned, formatted and structured.

A bank deployed an ECC loan processing application from a vendor that used another vendor's program to scrape financial statement data from the websites of applicants' banks. This was done in real time and saved the bank the cost and effort of acquiring the data. Another way to acquire external data is to deploy ECC applications that can interface with high traffic websites such as Flipkart and Amazon, to analyze data during the flash sale using techniques like text mining.

Scenario 1: HOW ECCEA help in Internet Banking?

Now a days with increasing digitalization, all the payments and transactions are happening on mobile in hand. So banks are required to serve different types of customers ,based on their usage.

Here I mentioned Internet Banking, which applies to Mobile banking also, so what ever I talk about here are referred to both . For what purpose customers try to login, can we simplify the approach for login.

So we tries to capture the request at particular interval like starting, middle, end of the months. So to track the customer behavior. By gathering all the data set populated, we could find the below results.

As Bank Data is critical to gather, we have formulated different possibilities to serve the customer Better. Results are below:

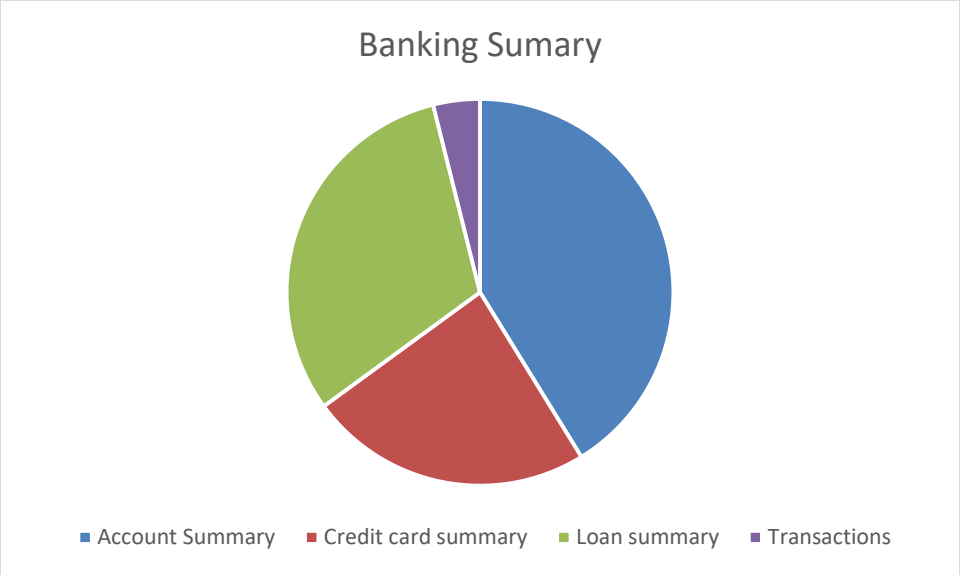

Fig 1: Banking data summary

The above diagram illustrates the processed data per user during the start of the month.

Fig 2: Negative Product review

The above diagram illustrates the processed data output for a product.

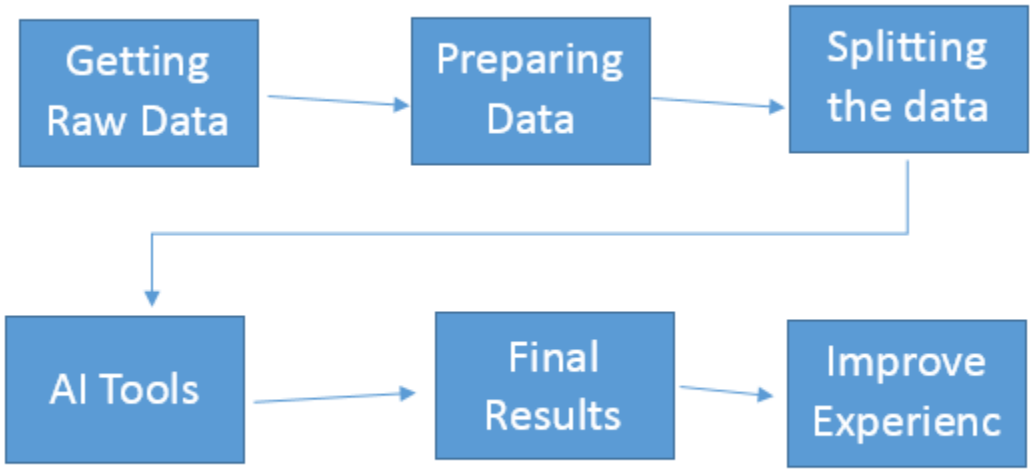

Fig 3: Steps involved for getting results

6 Summary

By the study and learning's done here for the particular scenario, we can observe how well we can help the customers to have the better relationship with banks. So by reading the trends from the previous behavior, we can help them before login or while login of the application.

7 Conclusions and Recommendations:

We can conclude this by saying applying CCEA in different streams can help the various levels of customers to fulfill their relationshiop with vendors

8 References:

Dery, K., Sebastian, I.M., and van del Meulen, N., "Building Digital Value from the Digital Workplace," MIT Center for Information Systems Research Briefing, Volume XVI, Number 9, September 2016.

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9 Checklist of items for the Final Dissertation Report

This checklist is to be attached as the last page of the report.

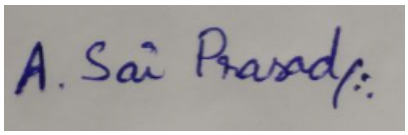
This checklist is to be duly completed, verified and signed by the student.

1.	**Is the final report neatly formatted with all the elements required**	Yes

	for a technical Report?	
2.	Is the Cover page in proper format as given in Annexure A?	Yes
3.	Is the Title page (Inner cover page) in proper format?	Yes
4.	(a) Is the Certificate from the Supervisor in proper format? (b) Has it been signed by the Supervisor?	Yes Yes
5.	Is the Abstract included in the report properly written within one page? Have the technical keywords been specified properly?	Yes Yes
6.	Is the title of your report appropriate? **The title should be adequately descriptive, precise and must reflect scope of the actual work done.** Uncommon abbreviations / Acronyms should not be used in the title	Yes
7.	Have you included the List of abbreviations / Acronyms?	Yes
8.	Does the Report contain a summary of the literature survey?	Yes
9.	Does the Table of Contents include page numbers? (i). Are the Pages numbered properly? (Ch. 1 should start on Page # 1) (ii). Are the Figures numbered properly? (Figure Numbers and Figure Titles should be at the bottom of the figures) (iii). Are the Tables numbered properly? (Table Numbers and Table Titles should be at the top of the tables) (iv). Are the Captions for the Figures and Tables proper? (v). Are the Appendices numbered properly? Are their titles appropriate	Yes Yes Yes Yes Yes Yes
10.	Is the conclusion of the Report based on discussion of the work?	Yes
11.	Are References or Bibliography given at the end of the Report? Have the References been cited properly inside the text of the Report? Are all the references cited in the body of the report	Yes Yes Yes
12.	Is the report format and content according to the guidelines? The report should not be a mere printout of a Power Point Presentation, or a user manual. Source code of software need not be included in the report.	Yes

Declaration by Student:

I certify that I have properly verified all the items in this checklist and ensure that the report is in proper format as specified in the course handout.



Place: HYDERABAD

Date: 28/10/2017

Signature of the Student

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