

## **ASSIGNMENT II: MIS 64038 ANALYTICS IN PRACTICE**

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As per the assignment instructions in this assignment I have mentioned my explanation for case 2 to 6 with my answers, reasons with explanations.

### **CASE 2: Fraud Detection in Banking**

In this case, the community bank faced a major problem is algorithm slowness in the production environment and ATM withdrawal requests were time-out. So, customers are not able to withdraw money. In this project the issue originated from phase 6 "Operation". Community Bank significantly experienced failure as the result of model's acceptable performance during testing but not translating to the real deployment. The analytical provider and bank failed to consider the fraud detection algorithm's performance, scalability and real time processing. I suggest this model should be thoroughly tested and validated before the deployment of the ATM machines.

As per my observations, The Community Bank and analytical solution provider should conduct extensive performance and load testing to identify any latency and scalability issue before deployment. They need to optimize the algorithm for real time processing to meet operational requirements and provide seamless customer experience.

### **CASE 3: Amazon Rekognition**

The Amazon Rekognition software provider number of computer vision capabilities with 2 categories. This scenario states that the problem is the software misidentified darker-skinned women as men 31% but no mistakes were made on lighter skinned men. It appears that the problem stems from oversight in multiple phases of analytical projects. In phase 1 (Discovery) the train data made some partiality toward white people, particularly men and it was not sufficiently investigated. In phase 2 (Data Preparation) the training data was not curated to ensure that it was representative of diverse populations. In phase 3 & 4 (Model Planning & Building) It lacked rigorous testing and evaluation of the model's performance on underrepresented groups especially the people with darker skin tones, which led to the significant misidentification issues later found. I think that there was an ignorance in phase 5 (Communication). They failed to proactively disclose the system's limitations, leading to it controversial use by government agencies. Finally, failure in phase 6 (Operation) is not properly monitor and adjust the system's deployment to address emerging societal and ethical concerns only led to the public backlash.

For resolving this issue, the company should take a comprehensive approach to rectify the ignorance of the failure in multiple phases. For example, in phase 1 a complete analysis should be done to address the bias in demographics. In phase 2 curate a more diverse and representative dataset to train the model. In phase 3 & 4 need to implement rigorous testing and evaluation procedures to assess the system's performance. In phase 5 proactively disclose the system's limitations and potential biases to promote transparency. In phase 6 some modifications need to be made in model to enhance ongoing monitoring and evaluation. So, fixing these errors should help the model to delivery expected performance.

## **CASE 4: IBM Watson in Healthcare**

Since this scenario issues are also associated with multiple phases of analytical projects. IBM Watson failed to analyze huge volumes of patient's health data and publish studies to offer cancer treatment options. It is supposed to accelerate the decision-making process of physicians while treating cancer tumors. In scenario they clearly stated IBM rushed to launch Watson as a solution to the complex healthcare domain, without adequately understanding the specific challenges and requirements. This should be tackled in phase 1 (Discovery) so the diversity of cancer cases and the limitations of existing data sources could have helped to identify the issue that would need to be addressed. In phase 2 (Data Preparation) IBM relying solely on data from the development partner and failed to consider other hospital data so it resulted in a biased dataset that did not represent the broader cancer patient population to solve this issue a more comprehensive data gathering effort, incorporating data from multiple hospital and smaller clinical facilities would help to train the model and delivery improved performance.

They failed in phase 3 & 4 as well the planning to develop a universal solution that could accept patient information and offer treatment suggestions, but it ignored the complexity and customization that are necessary for cancer care. So, a more targeted and efficient strategy might have resulted from a more nuanced model planning phase that considered the various needs of different types of patients. The model building phase was probably hurried and insufficient because there was not enough time or coordination with healthcare providers to guarantee Watson's correct operations. Iterative testing and system refinement process are needed to overcome this flaw in building phase. In phase 5 Unrealistic expectations were raised by the aggressive marketing of Watson's capabilities, without a clear understanding of its limitations, among healthcare providers. Setting more reasonable expectations and preventing the eventual letdown may have been accomplished by having more open and honest communication about the system's strengths and limitations as well as its current state. IBM failed to put adequate attention to the integration and ongoing support required for the successful implementation of Watson in the healthcare. Also, they failed to implement the continuous monitoring, feedback incorporation and adaptation. By addressing the key problems in each phase would help to improved the IBM Watson's performance in the healthcare industry.

## **CASE 5: AI for University Admission**

The Todai robot project that were likely ignored some important phases in analytical lifecycle. They tried to compete with human brain to improved and make the robot to understand the smartness of the question. Unfortunately, it failed to grasp the meaning in broad spectrum. I could say the researchers would fail to follow the proper aspects in phase 2&3. In Data preparation, it seems to have provided the Todai Robot with a limited and narrowly focused dataset and failed to tackle the necessary of wide range of topics and question types. Lack of curate a comprehensive and representative dataset that could expose robot to the broader spectrum of knowledge required to understand the meaning and context behind the exam.

In Model planning, it appears to have been oversimplified by the researchers, who assumed that human-level performance on the entrance exam could be replicated solely through machine learning, without considering the higher-order reasoning and language understanding skills required. Failing to create a more comprehensive and diverse model that could incorporate different facets of AI, like knowledge representation, contextual reasoning, and natural language processing. So, fixing these flaws would help Todai Robot to crack the entrance test with smartness.

## **CASE 6: Mars Orbiter**

This scenario clearly states that the loss could be primarily attributed to the failure to address the measurement unit inconsistency between Lockheed Martin and NASA teams, which was an “end-to-end process problem” that should have been caught and fixed earlier in the project lifecycle. I consider this issue involves multiple phases in analytical lifecycle. Firstly phase 1 (Discovery) Insufficient research or ignorance of the dangers and difficulties that could arise from Lockheed Martin and NASA teams using disparate measurement systems. Also, inadequate knowledge of the significance of using uniform units of measurement in a complicated, mission-critical project.

In phase 2 (Data Prep) failure of the cooperating teams (Lockheed Martin and NASA) to create a single, uniform system of measurement and data formats. Inadequate procedures for data conversion and validation to guarantee interoperability across the various measurement systems in use. In phase 3 (Model Planning) Inadequate preparation and cooperation to handle possible problems brought on by the engineering teams' disparate measurement units. Absence of well-defined procedures and benchmarks to confirm measurement system alignment. Finally, in phase 6 (Operation) lack of ongoing oversight and feedback systems to spot and resolve any new problems arising from inconsistent measurement units while the Mars orbiter is in operation.