

# **SmartCart Advisor: PowerBi Chat Integration**

Submitted in partial fulfillment of the requirements  
of the degree

## **BACHELOR OF ENGINEERING IN ARTIFICIAL INTELLIGENCE & DATA SCIENCE**

By

**Sanika M. Sarang 211101043/44**

**Ayushi S. Soni 211101032/49**

**Shreya L. Yewale 211101029/57**

Supervisor

**Prof. Prof. S. P. Bansu**



**Department of Artificial Intelligence &  
Data Science**

**A.C.Patil College of Engineering**

**Kharghar, Navi Mumbai**

**University of Mumbai**

**(AY 2023-24)**

# CERTIFICATE

This is to certify that the Mini Project entitled “**SmartCart Advisor: PowerBi Integration**” is a bonafidework of **Sanika M. Sarang (44)** , **Ayushi S. Soni (49)** and **Shreya L. Yewale (57)** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of “**Bachelor of Engineering**” in “**Artificial Intelligence & Data Science**” .

(**Prof. S. P. Bansu**)

Supervisor

(**Prof. S. P. Bansu**)

Head of Department

(**Dr. V. N. Pawar**)

Principal

# Mini Project Approval

This Mini Project entitled “**SmartCart Advisor: PowerBi Integration**” by **Sanika M. Sarang (44)** , **Ayushi S. Soni (49)** and **Shreya L. Yewale (57)** is approved for the degree of **Bachelor of Engineering in Artificial Intelligence & Data Science**.

## Examiners

1.....  
(Internal Examiner Name & Sign)

2.....  
(External Examiner name & Sign)

Date:

Place:

# Contents

<b>Abstract</b>	<b>ii</b>
<b>Acknowledgments</b>	<b>iii</b>
<b>List of Abbreviations</b>	<b>iv</b>
<b>List of Figures</b>	<b>v</b>
<b>List of Tables</b>	<b>vi</b>
<b>List of Symbols</b>	<b>vii</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Introduction	
1.2 Motivation	
1.3 Problem Statement & Objectives	
<b>2 Literature Survey</b>	<b>11</b>
2.1 Survey of Existing System	
2.2 Limitation Existing system or research gap	
2.3 Mini Project Contribution	
<b>3 Proposed System (eg New Approach of Data Summarization )</b>	<b>18</b>
3.1 Introduction	
3.2 Architecture/ Framework	
3.3 Algorithm and Process Design	
3.4 Details of Hardware & Software	
3.5 Code	
3.6 Experiment and Results	
3.7 Conclusion and Future work.	
<b>References</b>	<b>32</b>

# Abstract

In an era of digitization, the landscape of grocery shopping is evolving rapidly, with consumers increasingly turning to online platforms for their daily needs. This shift presents both opportunities and challenges for consumers seeking the best value for their purchases. To address this, our project focuses on the development of a '**SmartCart Advisor: Powerbi Chatbot Integration**' functionality, aimed at empowering consumers with insightful visualizations and personalized assistance to optimize their shopping experience.

The Smart Cart Online Grocery Dashboard, built using Power BI, serves as a comprehensive platform for consumers to compare and analyze various e-commerce grocery platforms based on key metrics such as price, discounts, product availability, and user ratings. Leveraging data visualization techniques, the dashboard offers intuitive displays of market trends, pricing fluctuations, and savings opportunities across different platforms.

Furthermore, the integration of a Chat Bot enhances user interaction by providing real-time support and guidance. Users can inquire about specific visualizations, seek recommendations tailored to their preferences, and receive assistance in making informed decisions. This innovative feature not only enhances user engagement but also fosters a seamless shopping experience by bridging the gap between data analysis and consumer decision-making.

Through this project, we aim to empower consumers with the tools and insights necessary to navigate the complex landscape of online grocery shopping efficiently. By leveraging the power of data visualization and artificial intelligence, our Smart Cart Online Grocery Dashboard with Chat Bot integration strives to redefine the shopping experience, enabling consumers to make informed choices and maximize savings while enjoying the convenience of online shopping.

## Acknowledgments

We would like to express our sincere gratitude to all those who have contributed to the successful completion of this project. Firstly, we extend our heartfelt thanks to our project supervisor '**Prof.S.P.Bansu**' for their invaluable guidance, support, and encouragement throughout the duration of this endeavor. Their expertise and insights have been instrumental in shaping the direction and execution of our work.

Additionally, we would like to extend our appreciation to E-commerce websites who allowed us requesting for providing access to the necessary resources, datasets, and tools required for the development of the Smart Cart Online Grocery Dashboard. Their collaboration has been essential in enriching the scope and functionality of our project.

Furthermore, we wish to thank our peers and colleagues for their constructive feedback, brainstorming sessions, and moral support throughout the project journey. Their diverse perspectives and collaborative efforts have significantly contributed to the overall success of this endeavor.

In conclusion, we express our sincere appreciation to all individuals and organizations who have played a role, however big or small, in bringing this project to fruition. Your contributions have been truly invaluable, and we are grateful for the opportunity to embark on this journey together.

# 1.Introduction

## 1.1 Introduction:

The digital revolution has transformed the way consumers shop for groceries, with online platforms offering unparalleled convenience and accessibility. In response to this paradigm shift, our project endeavors to revolutionize the online grocery shopping experience through the development of a Smart Cart Online Grocery Dashboard integrated with a Chat Bot interface. This innovative solution aims to empower consumers with actionable insights and personalized assistance, ultimately enabling them to make informed decisions and maximize savings in their grocery purchases.

As the demand for online grocery shopping continues to surge, consumers are faced with a myriad of choices across various e-commerce platforms. However, navigating through these options can be daunting, with factors such as pricing, discounts, and product availability posing significant challenges. Recognizing the need for a streamlined and user-centric approach, our project seeks to bridge this gap by providing a centralized platform equipped with advanced analytics and interactive features.

## 1.2 Motivation:

The motivation behind undertaking this project stems from the growing significance of online grocery shopping in today's digital age and the inherent challenges faced by consumers in navigating the plethora of available options. Traditional methods of grocery shopping are being increasingly supplanted by online platforms, offering unparalleled convenience, flexibility, and accessibility. However, with this convenience comes a myriad of challenges, including price comparison, product selection, and ensuring the best value for money.

In light of these challenges, we were inspired to develop a solution that not only simplifies the online grocery shopping experience but also empowers consumers with actionable insights and personalized assistance. The motivation for our project can be summarized as follows:

1. **Enhancing Consumer Convenience:** Online grocery shopping offers unparalleled convenience by eliminating the need for physical visits to stores. However, the process of browsing through multiple e-commerce platforms to find the best deals can be time-consuming and overwhelming. Our project aims to streamline this process by providing a centralized platform where consumers can easily compare prices, discounts, and product availability across different platforms.
2. **Optimizing Savings Potential:** Price comparison is a crucial aspect of grocery shopping, with consumers constantly seeking ways to optimize their savings. By leveraging data analytics and visualization techniques, our project aims to identify savings opportunities, promotional offers, and discounts available on various e-commerce platforms, enabling consumers to make informed decisions and maximize their savings.
3. **Empowering Consumer Decision-Making:** In the era of information overload, consumers are often inundated with choices, making it challenging to make well-informed decisions. Our project seeks to empower consumers by providing them with actionable insights and personalized assistance through the integration of a Chat Bot interface. This innovative feature enables users to seek real-time support, ask questions, and receive recommendations tailored to their preferences, thereby facilitating informed decision-making.
4. **Driving Innovation in E-Commerce:** As the e-commerce landscape continues to evolve, there is a growing need for innovative solutions that enhance user experience and drive customer engagement. Our project represents a convergence of cutting-edge technologies such as data analytics, artificial intelligence, and visualization techniques to deliver a seamless and intuitive online shopping experience.



## 1.3 Problem Statement & Objectives:

### **Problem Statement:**

The surge in online grocery shopping has presented consumers with a vast array of options across various e-commerce platforms. While the convenience of online shopping is undeniable, consumers often face challenges in navigating through the multitude of options to find the best deals, optimize savings, and make well-informed purchasing decisions. The lack of centralized platforms for price comparison and product analysis exacerbates these challenges, leading to inefficiencies and frustration among consumers.

### **Objectives:**

The primary objectives of our project are outlined as follows:

Centralized Price Comparison: Develop a Smart Cart Online Grocery Dashboard capable of aggregating data from multiple e-commerce grocery platforms and providing users with a centralized platform for price comparison, product analysis, and savings optimization.

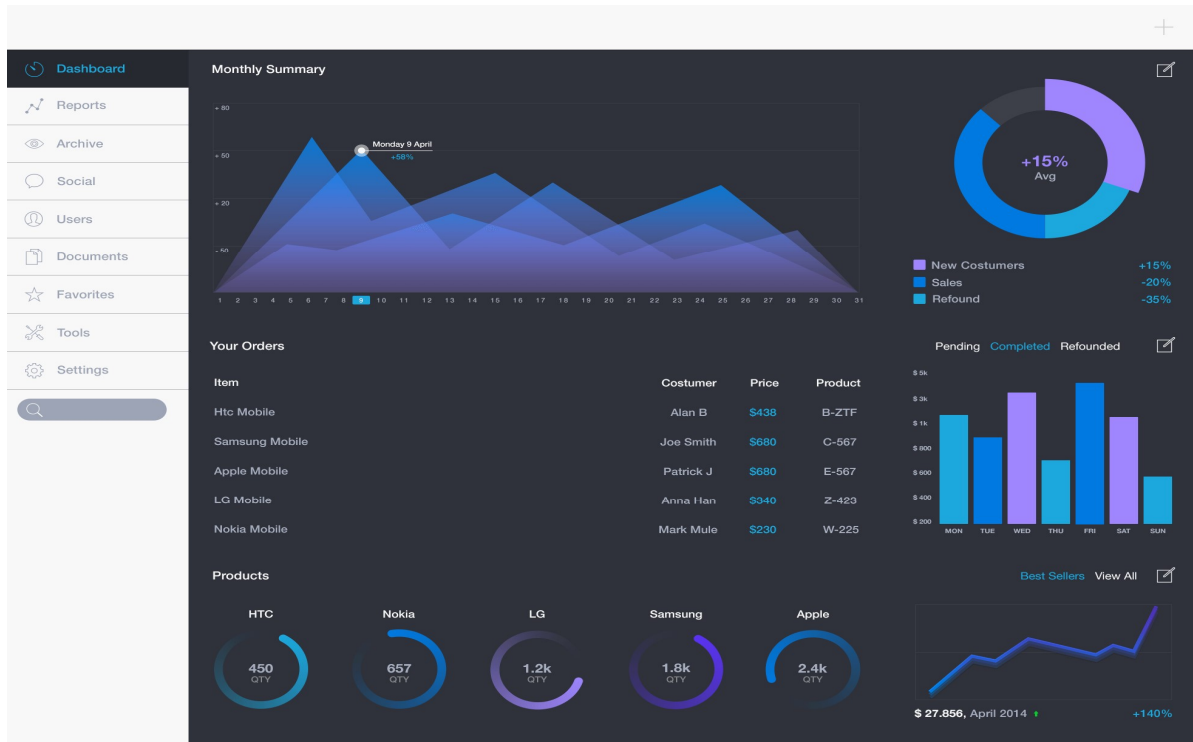
Data Visualization: Implement advanced data visualization techniques within the dashboard to present key metrics such as product prices, discounts, availability, and user ratings in a visually appealing and intuitive manner. Utilize interactive charts, graphs, and heatmaps to enhance user understanding and decision-making.

Chat Bot Integration: Integrate a Chat Bot interface within the dashboard using natural language processing (NLP) techniques to facilitate real-time communication with users. The Chat Bot will be capable of answering queries, providing recommendations, and offering personalized assistance based on user preferences and shopping behavior.

User Engagement and Feedback: Foster user engagement through interactive features, surveys, and feedback mechanisms integrated within the dashboard.

## 2. Literature Survey

### 2.1 Survey of Existing System:



2.1.1: sales of product revenue example



2.1.2: Company's sales revenue example

Existing survey systems are widely utilized by companies to gather feedback and insights from their customers, employees, and stakeholders. However, these systems typically focus on collecting data related to specific brands or products, often limiting their scope to the company's own ecosystem. In the context of sales revenue dashboards, companies primarily utilize these systems to track and analyze their own sales performance, without providing comprehensive insights into the broader market landscape.

**Popular Survey Systems:**

1. **SurveyMonkey:** SurveyMonkey is a versatile survey platform used by companies to gather feedback from customers and employees. However, its focus is primarily on creating surveys tailored to the company's specific needs, such as customer satisfaction surveys or employee engagement surveys. It lacks features for aggregating and analyzing data from external sources, such as sales data from various e-commerce websites.
2. **Qualtrics:** Qualtrics offers advanced survey capabilities for market research, customer experience management, and employee engagement. While it provides powerful analytics tools for analyzing survey responses, its functionality is limited to data collected within the company's own ecosystem. It does not offer integration with external data sources such as sales data from multiple e-commerce platforms.
3. **Google Forms:** Google Forms is a simple and intuitive survey tool commonly used by businesses and organizations. It allows users to create surveys and collect responses easily, but its capabilities are limited to basic survey functionality. Like other survey systems, Google Forms does not provide integration with external data sources for comprehensive market analysis.
4. **SurveyGizmo:** SurveyGizmo offers advanced survey features such as conditional logic and branching, making it suitable for complex survey projects. However, similar to other survey systems, its focus is on gathering feedback from customers and employees within the company's own ecosystem, rather than aggregating data from external sources.
5. **Typeform:** Typeform is known for its visually appealing and interactive survey design, which enhances user engagement. While it offers customization options for creating surveys, its functionality is limited to data collected within the company's own environment.

## 2.2 Limitation Existing system or research gap:

**1.Limited Scope:** Existing survey systems primarily focus on gathering feedback related to the company's own products or services, without providing insights into the broader market landscape. This limitation restricts their usefulness in analyzing sales data from multiple e-commerce websites.

**2.Lack of Integration:** Most survey systems do not offer integration with external data sources, such as sales data from various e-commerce platforms. As a result, companies are unable to leverage survey data in conjunction with external market data for comprehensive analysis.

**3.Manual Analysis:** Survey systems typically require manual analysis of survey responses, making it time-consuming and labor-intensive to derive insights from the data. Without automated analysis capabilities, companies may struggle to extract meaningful insights from survey data in a timely manner.

**4.Contextual Relevance:** Survey systems may lack contextual relevance, as they do not provide insights into the broader market landscape or competitor performance. This limits their ability to provide actionable recommendations that are relevant to the company's strategic objectives.

**5.Smart Cart Advisor:** Smart Cart Advisor aims to address these limitations by providing a comprehensive sales revenue dashboard that aggregates data from various e-commerce websites. By offering insights into top-selling products across multiple platforms, Smart Cart Advisor empowers users to make informed purchasing decisions and optimize their shopping experience. Unlike existing survey systems, Smart Cart Advisor leverages external market data to provide actionable recommendations that are relevant to the user's needs and preferences.

## **2.3 Mini Project Contribution:**

### **Ayushi Soni:**

Ayushi played a crucial role in collecting and organizing the data necessary for the project. She meticulously sourced relevant data from various e-commerce websites, ensuring its accuracy and completeness. Then undertook the task of cleaning and preprocessing the data to remove any inconsistencies or errors, ensuring that the dataset was suitable for analysis. Additionally, she was responsible for compiling the project report and documentation, summarizing the project's objectives, methodology, and findings in a clear and concise manner. Done with data collection, cleaning, and documentation laid the foundation for the successful execution of the project.

### **Sanika Sarang:**

Sanika spearheaded the data visualization efforts and dashboard integration using tools such as Power BI. She meticulously cleaned the datasets and applied formulas to ensure the creation of effective datasets for visualization purposes. Identifying common attributes, she transformed them into uniform units, facilitating the establishment of relationships between different dataset tables. Through this process, she built robust relationships between tables and transformed the cleaned dataset into visually appealing and informative dashboards. Her contributions extended to creating a new dataset for platform comparison, comprising 450 rows based on common products sold by the platforms. This dataset enabled a highly effective comparison among the platforms, offering valuable insights into their performance. She expertly designed interactive charts, graphs, and statistics to visualize key metrics such as sales revenue, top-selling products, profit, and market trends. She ensured that the dashboard not only provided valuable insights but also offered a seamless and intuitive user experience. Her attention to detail and expertise in data visualization were instrumental in making the retail analytics platform a user-friendly and informative tool for decision-makers.

### **Shreya Yewale:**

Shreya led the development and integration of the chat bot system with the Smart Cart Online Grocery Dashboard. Drawing on her expertise in natural language processing and chat bot development, built a robust and intelligent chat bot capable of understanding user queries and providing personalized assistance. Designed and implemented the chat bot's architecture, incorporating features such as natural language understanding, intent recognition, and response generation. Integrated the chat bot with the dashboard, allowing users to interact with the system in real-time and receive relevant recommendations and assistance.

## 3. Proposed System

### 3.1 Introduction:

"SmartCart Advisor" is a groundbreaking retail analytics system that seamlessly integrates Power BI's visualizations with platform-specific dashboards for Blinkit, Amazon, Dmart, Grofers, Flipkart, and Zepto. This innovative platform provides users with a comprehensive visual interface to explore sales revenue, top-selling products, and market trends effortlessly. Dive into visually appealing Power BI dashboards that offer detailed insights into each platform's performance, enabling informed decision-making. The system also includes an overall dashboard for a consolidated view, allowing businesses to compare platforms for profitability. "SmartCart Advisor" empowers users with actionable retail data insights, making it the go-to tool for optimizing retail strategies. It also provides a chatbot service for ease of user.

### 3.2 Architecture/ Framework:

#### Data Collection:

- **Web Scraping:** Utilize web scraping techniques to collect data from various e-commerce grocery platforms. This can be achieved using Python libraries such as BeautifulSoup or Scrapy.
- **API Integration:** Explore APIs provided by e-commerce platforms for accessing data in a structured format.

#### Data Preprocessing:

- **Data Cleaning:** Remove duplicates, handle missing values, and standardize data formats to ensure consistency.
- **Data Transformation:** Perform transformations such as normalization or scaling to prepare the data for analysis.

#### Data Storage:

- **Database:** Store the cleaned and processed data in a database for efficient retrieval and management. Consider using relational databases like MySQL or PostgreSQL for structured data storage.

#### Data Analysis and Visualization:

- **Algorithmic Analysis:** Apply algorithms for analyzing sales data, identifying trends, and generating insights. This may include statistical analysis, machine learning algorithms, or time series analysis.
- **Visualization:** Use data visualization libraries such as Matplotlib, Seaborn, or Plotly to create interactive charts, graphs, and dashboards for visualizing the analyzed data.

### **Chat Bot Integration:**

- **Natural Language Processing (NLP):** Implement NLP techniques to understand user queries and intents. This involves tokenization, entity recognition, and sentiment analysis.
- **Chat Bot Framework:** Choose a chat bot framework such as Rasa or Dialogflow to build and deploy the chat bot. These frameworks provide tools for training the bot, handling conversations, and integrating with external systems.

### **Dashboard Development:**

- **Dashboard Tools:** Use tools like Power BI, Tableau, or Dash to develop the Smart Cart Online Grocery Dashboard. These tools offer drag-and-drop interfaces for creating interactive dashboards with visualizations and filters.
- **Integration:** Integrate the chat bot functionality into the dashboard interface to provide users with real-time assistance and recommendations based on their queries.

### **User Interface:**

- **User Experience Design:** Design an intuitive and user-friendly interface for the dashboard and chat bot. Consider user personas, user journey mapping, and usability testing to optimize the user experience.

## **3.3 Algorithm and Process Design:**

### **Sales Prediction Algorithm:**

**Time Series Forecasting:** Implement time series forecasting algorithms such as ARIMA (AutoRegressive Integrated Moving Average) or Prophet to predict future sales trends based on historical data.

**Machine Learning Models:** Train machine learning models such as Linear Regression, Random Forest, or Gradient Boosting Regressors to predict sales based on factors such as product attributes, pricing, promotions, and seasonality.

**Ensemble Methods:** Combine multiple algorithms using ensemble methods like Stacking or Boosting to improve prediction accuracy and robustness.

### **Recommendation Algorithm:**

**Collaborative Filtering:** Use collaborative filtering techniques such as User-Based or Item-Based filtering to recommend products based on user preferences and past purchases.

**Content-Based Filtering:** Implement content-based filtering to recommend products similar to those already purchased by the user, based on attributes such as product category, brand, or price.

**Hybrid Approaches:** Combine collaborative filtering and content-based filtering using hybrid recommendation algorithms to provide more personalized and accurate recommendations.

By following this architecture and framework, you can effectively develop and deploy the Smart Cart Online Grocery Dashboard with integrated chat bot functionality, providing users with actionable insights and personalized assistance for their online grocery shopping needs.

### 3.4 Details of Hardware & Software:

#### **Hardware Requirements:**

**1. Server Infrastructure:**

- High-performance servers to host the centralized platform.
- Sufficient storage capacity to store and manage large volumes of data.
- Scalable infrastructure to accommodate increasing user demand and data processing requirements.

**2. Networking Equipment:**

- Reliable network infrastructure to ensure seamless communication between servers, clients, and external data sources.
- High-speed internet connectivity to support real-time data processing and user interactions.

**3. Client Devices:**

- Desktop computers, laptops, tablets, and smartphones for accessing the Smart Cart Online Grocery Dashboard and Chat Bot interface.
- Compatibility with various operating systems (Windows, macOS, iOS, Android) to cater to a diverse user base.

**4. Peripherals:**

- Input devices such as keyboards, mice, and touchscreens for user interaction with the dashboard and chat bot.
- Output devices including monitors, displays, and speakers for viewing visualizations and receiving responses from the chat bot.

#### **Software Requirements:**

**1. Operating System:**

- Server: Linux distributions (e.g., Ubuntu Server, CentOS) or Windows Server for hosting the platform.
- Client Devices: Compatibility with major operating systems including Windows, macOS, iOS, and Android.

**2. Database Management System (DBMS):**

- Relational Database: MySQL, PostgreSQL, or SQL Server for storing structured data related to products, prices, and user preferences.
- NoSQL Database: MongoDB or Cassandra for handling semi-structured or unstructured data such as customer reviews and feedback.

**3. Data Integration and ETL Tools:**

- Apache NiFi, Talend, or Informatica for extracting, transforming, and loading data from various online grocery platforms into the centralized data repository.

**4. Analytics and Visualization Tools:**

- Power BI or Tableau for developing interactive dashboards that visualize key metrics, trends, and patterns in online grocery shopping behavior.
- Python libraries such as Matplotlib, Seaborn, and Plotly for advanced data visualization and analysis.

**5. Natural Language Processing (NLP) Framework:**

- NLTK (Natural Language Toolkit), SpaCy, or TensorFlow for implementing NLP algorithms to understand user queries and provide relevant responses within the chat bot interface.



## 3.5 Code:

### 3.5.1 Code for web scrapping:

```
from bs4 import BeautifulSoup
import pandas as pd
import requests

url = 'https://quotes.toscrape.com/'

# Send a GET request to the URL
response = requests.get(url)

# Parse the HTML content
soup = BeautifulSoup(response.content, 'html.parser')

# Locate quote elements
quote_elements = soup.find_all('div', class_='quote')

# Initialize a list to store extracted quotes
quotes_list = []

# Extract quotes from each quote element
for quote_element in quote_elements:
    # Find the quote text within the current quote element
    quote_text = quote_element.find(class_='text').get_text(strip=True)
    quotes_list.append(quote_text)

# Print the extracted quotes
for quote in quotes_list:
    print(f'Quote: {quote}')

# Store the extracted quotes in a DataFrame and Excel file
df = pd.DataFrame({'Quotes': quotes_list})
df.to_excel('quotes.xlsx', index=False)
```

mini project • Last saved: 4/19/2024 at 2:22 AM

File Home Help

Clipboard Get data Excel OneLake SQL Server Enter data Datasense Recent sources Transform Refresh data Queries Manage relationships New measure column Calculations New table Manage roles View as QI/A setup Language Linguistic schema QI/A Sensitivity Publish

comparison Blinkit DMart Flipcart cost revenue platform comparison

Amazon Amazon profit Blinkit.Blinkit profit Blinkit.discounted\_price DMart.DMart DMart.DMart Profit Flipcart.Flipcart profit Flipcart.Flipcart profit Grofers.Grofers

Blinkit Blinkit profit category discounted\_price MRP mrp(VAL) product\_name quantity

DMart Brand Category Column9 Column10 Column11 Column12 Column8 Column9 Flipcart profit Flipcart item\_no

Flipcart category Column10 Column11 Column12 Column8 Column9 Flipcart profit Flipcart item\_no

cost revenue Blinkit DMart Flipcart Grofers year

platform comparison A profit Amazon B profit Blinkit D profit DMart F profit Flipcart

All tables

83°F Haze

mini project • Last saved: 4/19/2024 at 2:22 AM

File Home Help Table tools

Name Blinkit

Mark as date table Manage relationships New measure column Quick measure column New table

Structure Relationships Calculations

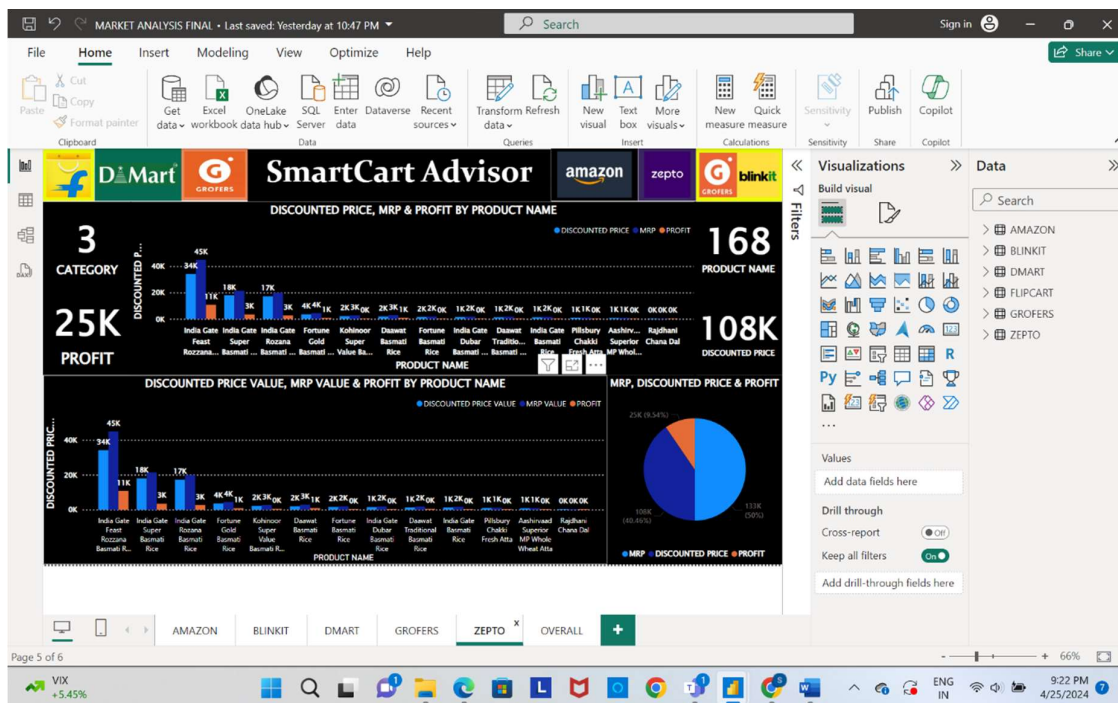
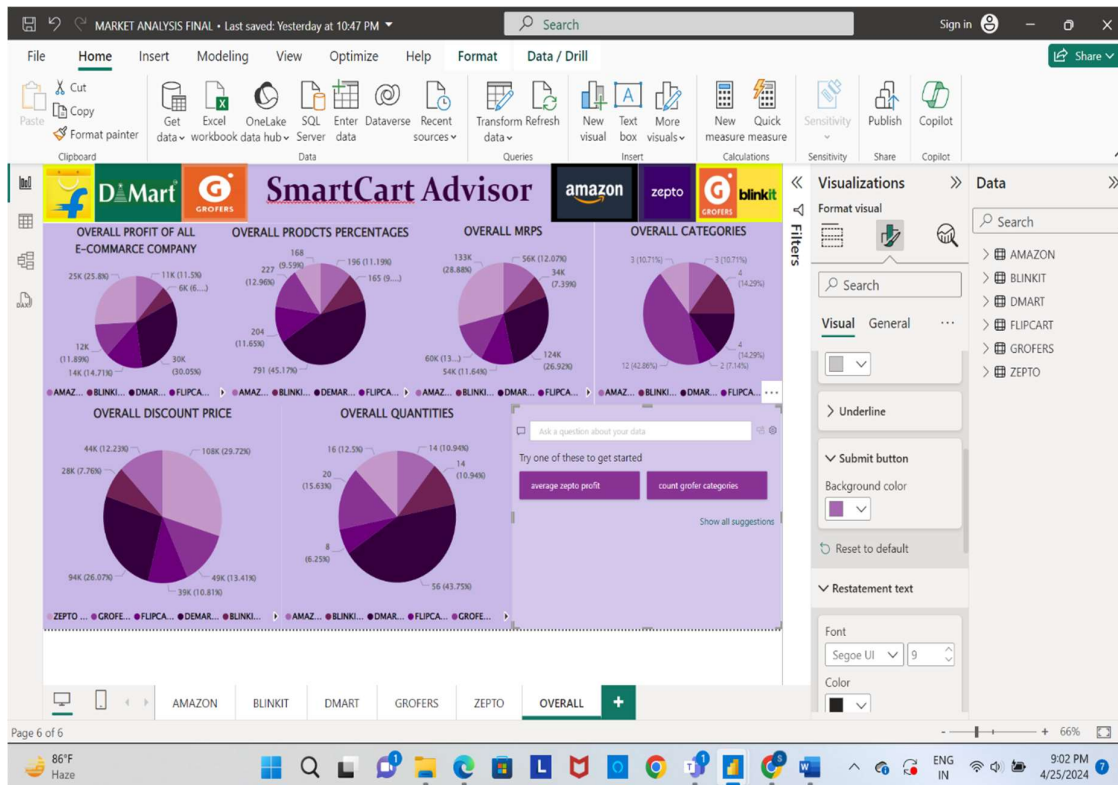
product\_name quantity category discounted\_price MRP mrp(VAL) Blinkit Blinkit profit

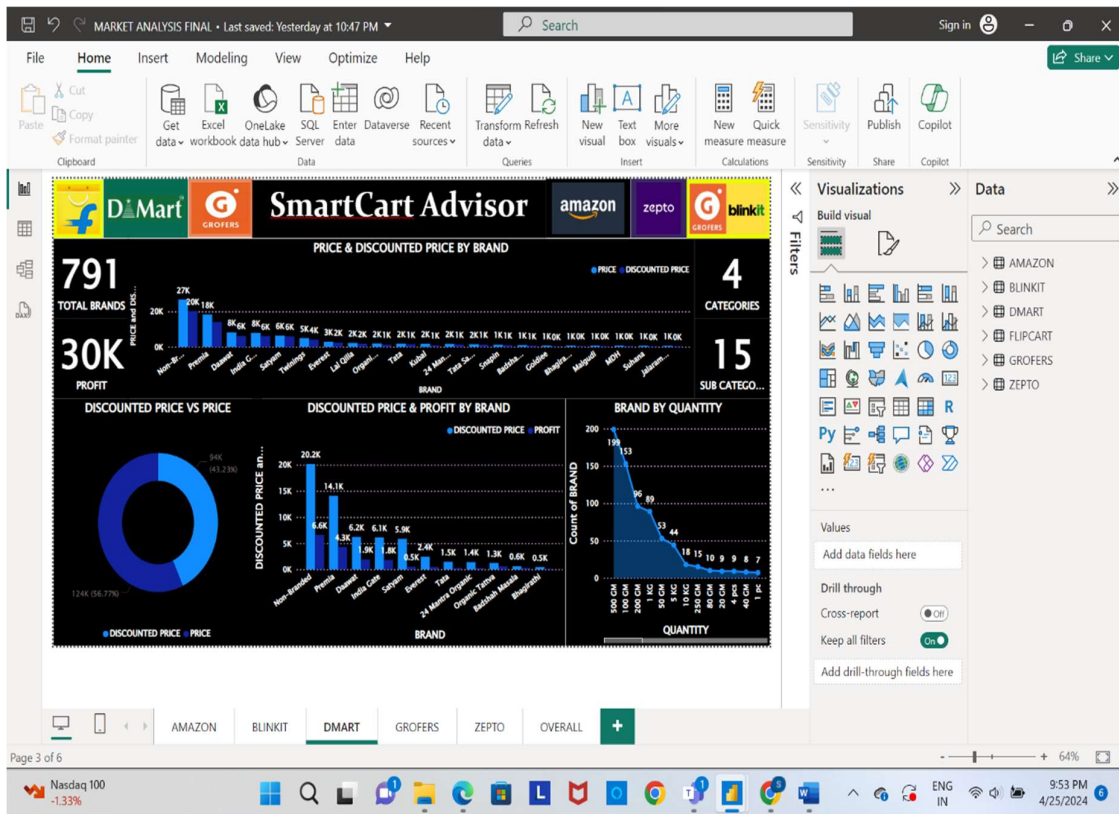
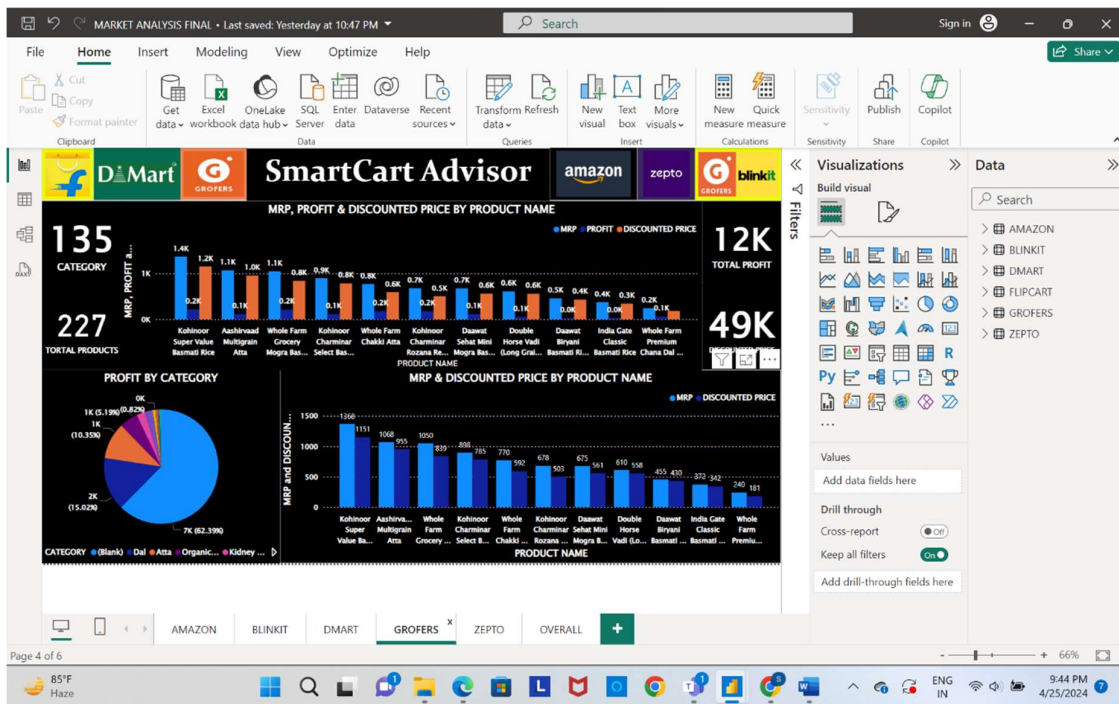
Bhagirathi Multigrain Bhakri Atta	500 g	Atta	₹43	₹48	48	43	5
Tata Sampann Unpolished Yellow Moong Dal (Dhuli) Split	500 g	Pulses	₹98	₹105	105	98	7
Tata Sampann Unpolished Masoor Dal	500 g	Pulses	₹72	₹82	82	72	10
Tata Sampann Unpolished Green Moong (Sabut) Whole Dal	500 g	Pulses	₹92	₹99	99	92	7
Tata Sampann Unpolished Green Moong Dal (Chilka)	500 g	Pulses	₹97	₹104	104	97	7
Whole Farm Premium Black Masoor Dal	500 g	Pulses	₹60	₹110	110	60	50
Satyam Black Masoor Dal	500 g	Pulses	₹80	₹83	83	80	3
Satyam Yellow Moong Dal (Dhuli)	500 g	Pulses	₹123	120	120	123	-3
Whole Farm Premium Masoor Dal	500 g	Pulses	66	₹133	133	66	67
Satyam Green Moona (Sabut) Whole	500 g	Pulses	₹151	₹159	159	151	8
Satyam Green Moong Dal (Chilka) Chilti	500 g	Pulses	₹144	₹152	152	144	8
Whole Farm Premium Malka Masoor	500 g	Pulses	₹75	₹120	120	75	45
Organic Tattva Organic Moong Dal (Dhuli) Split	500 g	Pulses	₹119	₹155	155	119	36
Organic Tattva Organic Masoor Sabut Whole	500 g	Pulses	₹105	₹135	135	105	30
Organic Tattva Organic Moong Sabut	500 g	Pulses	₹110	₹145	145	110	35
Organic Tattva Organic Masoor Dal Split	500 g	Pulses	₹109	₹140	140	109	31
Organic Tattva Organic Moong Dal (Chilka) Split	500 g	Pulses	₹119	₹155	155	119	36
Natureland Organic Moong Sabut	500 g	Pulses	₹103	₹128	128	103	25
24 Mantra Organic Moong Dal (Dhuli)	500 g	Pulses	₹140	₹150	150	140	10
24 Mantra Organic Moong Dal (Chilka) Split	500 g	Pulses	₹140	₹150	150	140	10
Conscious Food Urad Dal Split White	500 g	Pulses	₹124	₹160	160	124	36
Natureland Organic Masoor Dal Split Washed	500 g	Pulses	₹103	₹130	130	103	27
Natureland Organic Malka Masoor	500 g	Pulses	₹100	₹124	124	100	24
Tata Sampann Unpolished Kabuli Chana (Big Size)	500 g	Pulses	₹141	₹160	160	141	19
Whole Farm Premium Kashmiri Red Raima	500 g	Pulses	₹86	₹105	105	86	19

Table: Blinkit (165 rows)

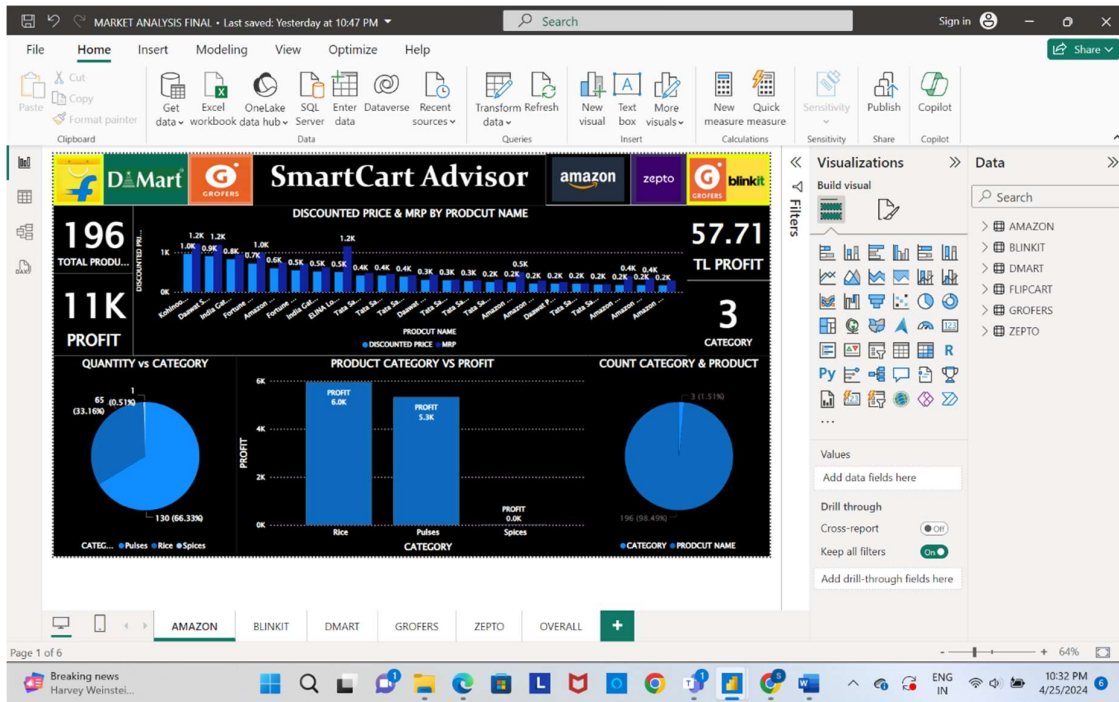
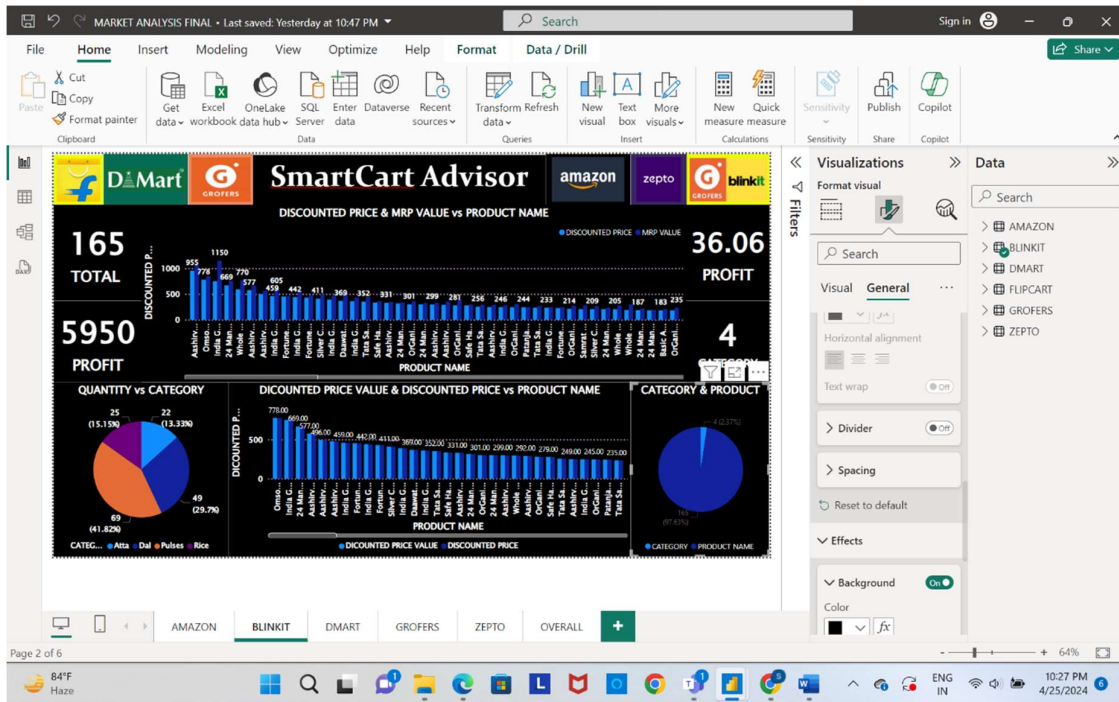
83°F Haze

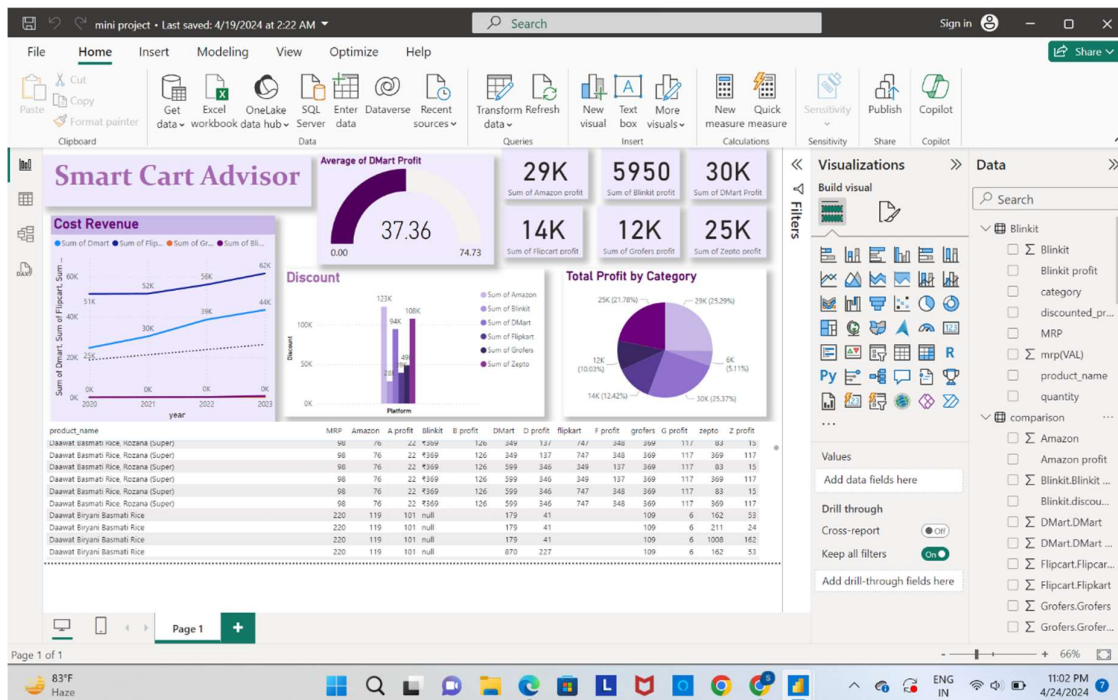
### 3.6 Experiment and Results:











### 3.7 Conclusion and Future work:

#### Future Work:

##### **Advanced Chat Bot Features:**

Implement Natural Language Understanding (NLU) techniques to enhance the chat bot's ability to comprehend complex user queries and context.

Integrate sentiment analysis to gauge user satisfaction and sentiment during interactions, allowing for more personalized responses and proactive assistance.

Incorporate machine learning algorithms for chat bot training and continuous improvement, enabling the bot to learn from user interactions and adapt its responses over time.

##### **Dynamic Data Integration:**

Develop mechanisms to work with dynamic data sources, such as real-time updates from e-commerce platforms, to ensure that the Smart Cart Dashboard provides up-to-date information to users.

Implement streaming data processing techniques using technologies like Apache Kafka or Apache Spark Streaming to handle continuous data streams and maintain dashboard freshness.

##### **Personalization and User Profiling:**

Enhance the dashboard and chat bot capabilities to offer personalized recommendations based on user preferences, shopping history, and behavior.

Implement user profiling techniques to segment users into distinct groups based on their shopping habits, demographics, and preferences, enabling targeted recommendations and promotions.

**Integration with External Services:**

Explore integration with external services such as payment gateways, delivery services, or

loyalty programs to offer a seamless end-to-end shopping experience for users.

Collaborate with third-party data providers or analytics platforms to enrich the dashboard with additional insights, market trends, or competitive intelligence.

**Mobile Application Development:**

Extend the project by developing a mobile application version of the Smart Cart Dashboard and chat bot, catering to users who prefer mobile devices for their online shopping activities. Ensure cross-platform compatibility and a consistent user experience across web and mobile platforms, leveraging frameworks like React Native or Flutter.

**Feedback Mechanisms and User Engagement:**

Implement feedback mechanisms within the dashboard and chat bot interface to gather user feedback and suggestions for continuous improvement.

Leverage gamification techniques or rewards programs to incentivize user engagement and promote active participation within the platform.

**Enhanced Data Analytics Capabilities:**

Integrate advanced analytics tools and algorithms for deeper data analysis, such as predictive analytics, clustering, or anomaly detection, to uncover hidden patterns and insights in the data. Explore machine learning-driven approaches for data-driven decision-making and automated insights generation, empowering users with actionable recommendations and strategies.

**Conclusion:**

The Smart Cart Online Grocery Dashboard integrated with a Chat Bot interface represents a significant advancement in the online grocery shopping experience, leveraging technology to empower consumers with actionable insights and personalized assistance. By centralizing pricing, promotions, and product information from various e-commerce platforms, the system simplifies the shopping process and helps users make informed decisions to maximize savings.

As the demand for online grocery shopping continues to grow, there is immense potential for further innovation and enhancement of the platform. Future work could focus on areas such as advanced AI-driven recommendations, integration with emerging technologies like AR, and expansion into new markets through localization and internationalization efforts.

Ultimately, the Smart Cart project is poised to revolutionize the way consumers shop for groceries online, providing a seamless and intuitive platform that meets the evolving needs and preferences of modern shoppers.

## References

Datasets collected from:

1. **Dmart:** [Dmart Official Website](#)
2. **Blinkit:** [Blinkit Official Website](#)
3. **Grofers:** [Grofers Official Website](#)
4. **Amazon:** [Amazon Official Website](#)
5. **Zepto:** [Zepto Official Website](#)
6. **Flipkart:** [Flipkart Official Website](#)

- Course: "Data Visualization and Communication with Power BI"
  - Platform: Coursera
  - Link: [Coursera](#)