Craftymano.ai

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INTRODUCTION

This report documents the final task of AI Product/Service prototype development and business or financial modeling for the service. It discusses the following points in a detailed format:

- Prototype Selection
- Prototype Development
- Business Modelling
- Financial Modelling with Data Analytics

The report aims to touch on the feasibility, viability, and monetization of the product "Craftymano.ai," – an AI product idea I chose for my first project report. The applicable constraints, regulations, concept generation, and development

Craftymano.ai is an AI-powered crafts marketplace and pricing tool designed specifically for SMBs in the crafts industry. Craftymano.ai aims to empower artisans, craftsmen, and SMBs by providing a comprehensive platform to showcase their unique creations, connect with a global customer base, and optimize their pricing strategies based on data-driven insights.

PROTOTYPE SELECTION

• The crafts industry has long been a testament to human creativity, craftsmanship, and cultural heritage.

• However, this industry's artisans and small to medium businesses (SMBs) often need help reaching a wider market, optimizing pricing strategies, and leveraging technology to expand their businesses.

• In today's digital age, harnessing the power of artificial intelligence (AI) and machine learning (ML) can provide innovative solutions to these challenges.

• Craftymano.ai aims to use the power of AI to address the challenges faced by artisans by offering an intelligent marketplace that bridges the gap between traditional craftsmanship and the modern digital landscape.

• Drawing upon the principles of AI and ML, Craftymano.ai leverages advanced algorithms and predictive models to provide personalized craft recommendations to customers, optimize pricing strategies, and facilitate

seamless transactions. Artisans can amplify their creative prowess by embracing technology while enhancing the customer experience.

Therefore, this prototype was considered most apt in harnessing AI to uplift the quality of livelihood for small to medium-scale handicrafts businesses.

PROTOTYPE DEVELOPMENT

Below is a wireframe of how the platform would be designed to look, and code snippets are also provided relevant to the functions done by the features.

1. Wireframe of the website

2. Here is a small-scale code implementation/model building of the prototype that might function to provide the following features:

-   **Personalized recommendations:** This code uses a simple collaborative filtering algorithm to generate personalized customer recommendations. The algorithm calculates the similarity between the customer profile and each craft. Finally, the algorithm sorts the crafts by similarity and returns the top 5 recommendations.

```python
1. import random
2. import numpy as np
3.
4. def personalized_recommendations(customer_id):
5.     """Returns a list of crafts that are likely to be of interest to the
customer."""
6.     crafts = ["Craft 1", "Craft 2", "Craft 3", "Craft 4", "Craft 5"]
7.     recommendations = []
8.     # Create a user profile for the customer.
9.     user_profile = {
10.       "past_purchases": ["Craft 1", "Craft 2"],
11.       "browsing_history": ["Craft 3", "Craft 4"],
12.       "interests": ["Crafting", "DIY", "Arts and crafts"]
13.     }
14.     # Calculate the similarity between the customer profile and each craft.
15.     similarities = np.zeros(len(crafts))
16.     for i, craft in enumerate(crafts):
17.       for item in user_profile:
18.         if item in craft:
19.           similarities[i] += 1
20.     # Sort the crafts by similarity and return the top 5.
21.     sorted_recommendations = sorted(zip(similarities, crafts), reverse=True)[:5]
22.     return [craft for similarity, craft in sorted_recommendations]
23.
```

-   **Optimizing pricing:** This code uses a simple formula to calculate the optimal price for a craft. The formula considers the cost of materials, the demand for the craft, and the level of competition.

```python
1. import random
2. import math
3.
4. def optimized_pricing(craft_id):
5.     """Returns the optimal price for the craft."""
6.     cost_of_materials = 10
7.     demand = random.randint(1, 10)
8.     competition = random.randint(1, 10)
9.     optimal_price = cost_of_materials * demand / competition
10.    return optimal_price
11.
```

-   **Seamless transactions:** This code uses the requests library to make a POST request to the Craftymano.ai API. The API will process the transaction and return the order status.

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```
 1.  import requests
 2.
 3.  def seamless_transactions(customer_id, craft_id, price):
 4.      """Processes the transaction and returns the order status."""
 5.      order_url = "https://www.craftymano.ai/api/v1/orders"
 6.      data = {
 7.          "customer_id": customer_id,
 8.          "craft_id": craft_id,
 9.          "price": price
10.      }
11.      response = requests.post(order_url, json=data)
12.      order_status = response.json()["order_status"]
13.      return order_status
14.
```

This is just a small-scale prototype implementation, and there are many other ways that the features could be implemented. However, this gives you a general idea of how the prototype could be built.

BUSINESS MODELING

Since Craftymano.ai is based on spreading and connecting the artists to a global audience, it will cater its services keeping the artisans in mind.

The platform will allow sellers to showcase their work and market their handicrafts at appropriate prices to customers who love buying local artwork and supporting the livelihoods of such artists and artisans. It will be an online shopping place exclusively for crafts and local arts.

We will adopt a "Seller-aligned marketplace" for our product in the initial phase. We will offer free and priced services to the artisans who wish to use the platform.

Services for the sellers:

Free services include advertising, purchase order statistics, and limited market insights.

Priced services will include all free services, expert-backed market insights, and recommendations to improve their market reach.

However, a bi-weekly online exhibition will be organized for all artists and handicraftsmen to showcase their work per different art categories.

The team will also sponsor an artisan every week from each category to boost their sales and showcase their works at regional or state exhibitions.

Services for the customers:

- Variety of arts that range from rare or curated collections to monthly collections.
- Special buying and delivery packages for tourist customers.
- Lucky giveaways to win excursions or cultural trips to handicraft communities in India
- A monthly newsletter with all information on India's lively, forgotten, and endangered art forms.
- A generous gift or art-support service that customers can give to any artist of their choice via our platform.

Target audience: Art lovers, tourists, art colleges

Monetization channels:

- Craftymano.ai will earn from the various pricing plans offered to the sellers.
- It will also try to hold regular exhibitions and live events to earn entry fees and compensation fees from artisans to help them arrange and advertise their art stalls and works.
- It will earn from the commission that will be a part of sales made by each seller on the platform.
- Some donations will also be kept to maintain the supportive services we provide to the sellers. However, this part will be made transparent to the supporters and customers.
- We will also contact government services related to the art and human resources department for kind investment and donations.
- Entry fees for workshops and exhibitions held in schools and art colleges that will connect local artists to students and help them learn and support various forms of Indian handicrafts and arts.

FINANCIAL MODELLING

When launching our product, performing state-wise analysis and checking statistics for careful market selection is important. It would be beneficial for the initial growth of the product if it is launched in a state with a greater number of artisans.

I collected open datasets on government websites and extracted some tables from other websites to get more numbers. I performed EDA and found a target market for the product's successful launch. However, there is a need for more datasets in the handicraft sector.

Below are some of the graphs:

Statewise distribution of artisans in India
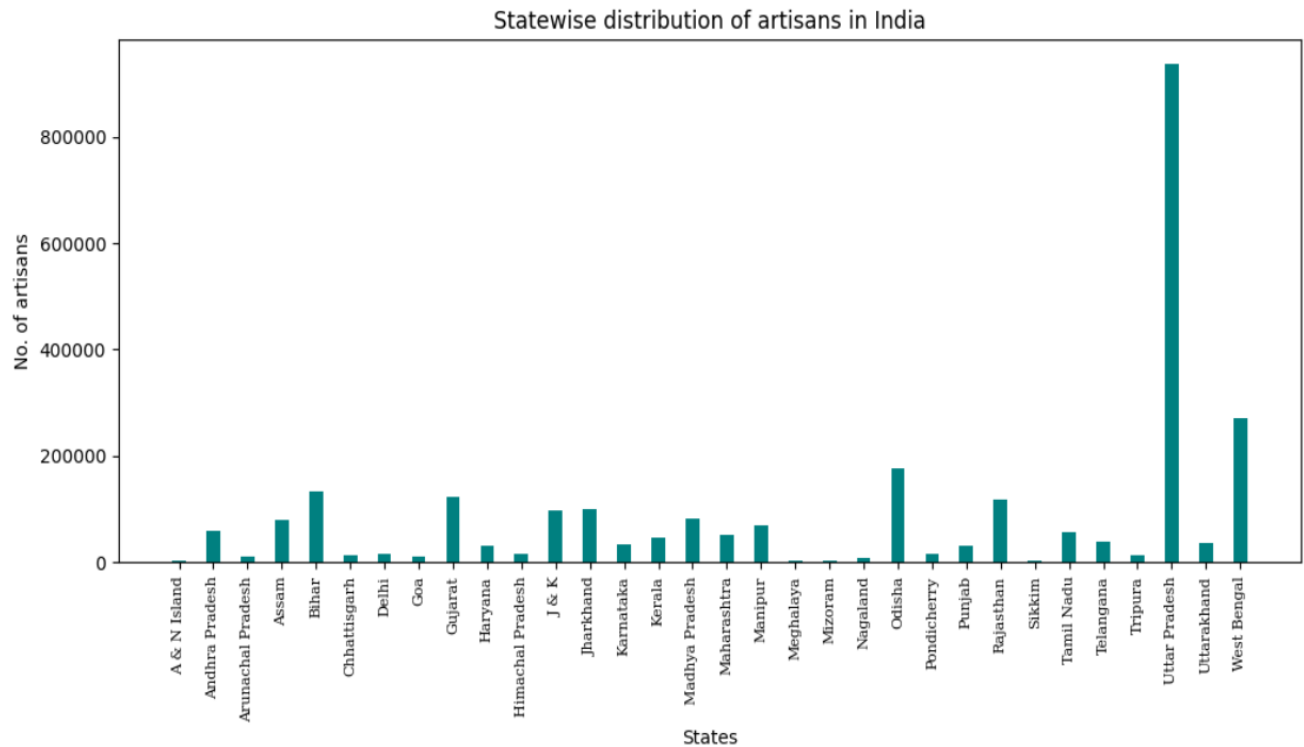
The above chart shows Uttar Pradesh and West Bengal as favorable markets for the initial launch.

Statewise analysis of handicraft products in the market
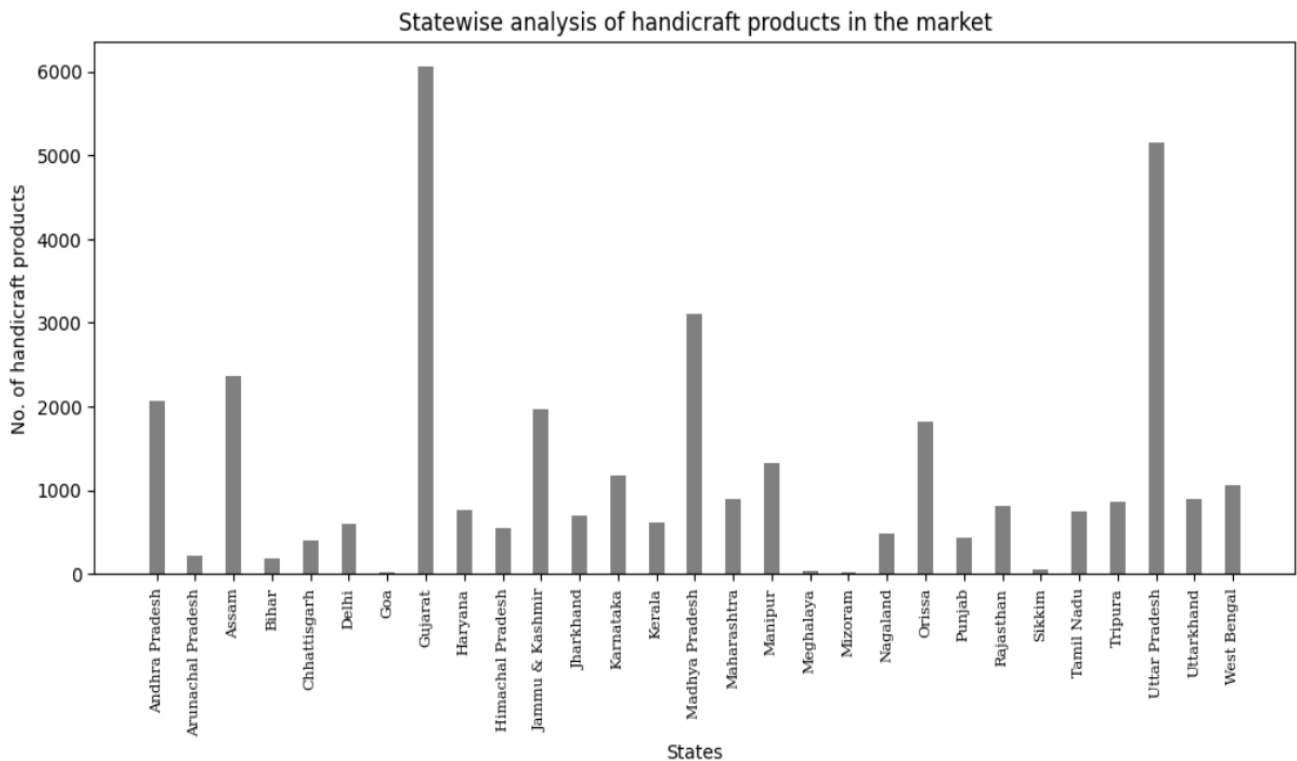
The above chart displays the number of handicrafts present in the markets in each state. Gujarat and Uttar Pradesh sell more products in the market. It would benefit the product's initial growth to provide them with the digital marketplace and support.

The yearly average production value (Rs. Lakhs)

The yearly average sales value (Rs. Lakhs)
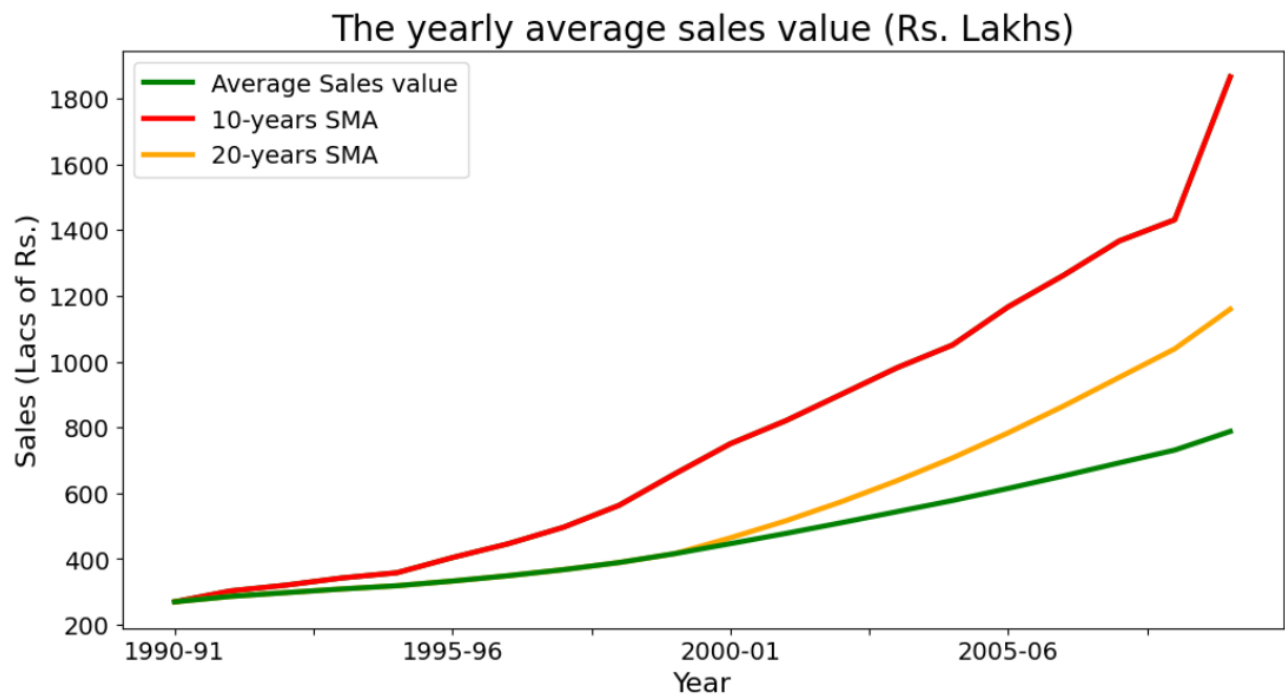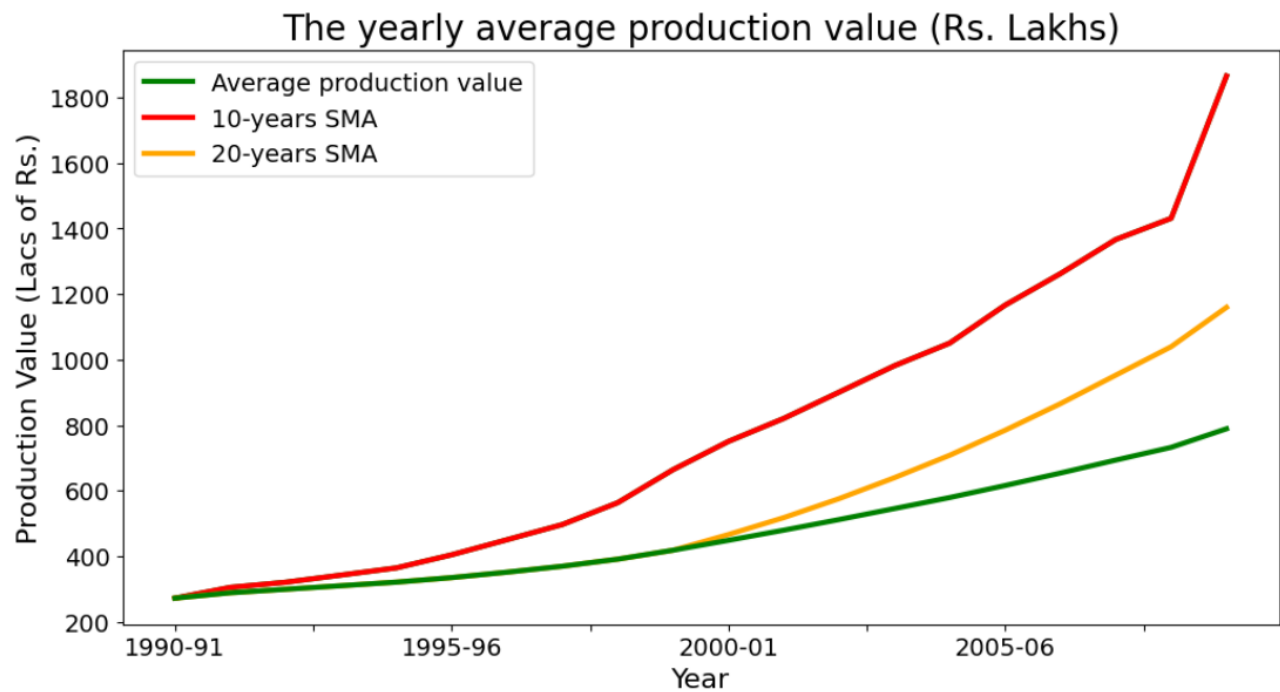
The above charts show that production and sales growth in the handicraft industry is almost linear.

Observing individual graph trends of yearly production and sales value in the form of graphs below:
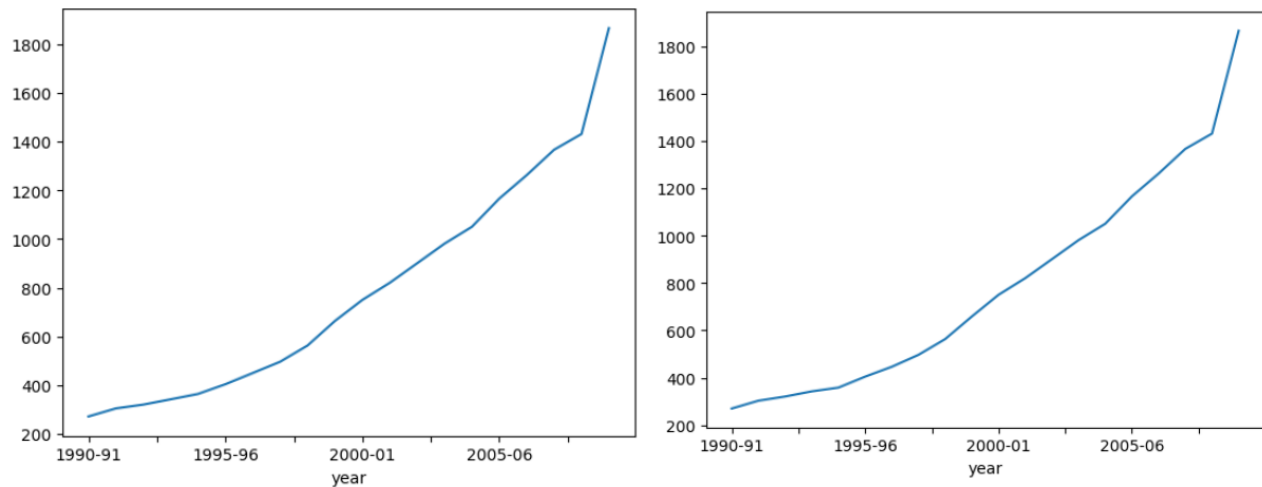
The trend appears linear since most data points are arranged in a straight line. This suggests that a linear regression model would fit the data well.

"Linear regression is a statistical model that predicts a continuous outcome variable from one or more predictor variables. It is a simple model that assumes that the data points are arranged in a straight line. The model can predict future values by extrapolating the line."

The financial equation for linear models is represented as:

$$Y = m(X) + c$$

Here, Y = production/sales value, X = year, c = material cost, average costs in total, etc.

The slope of the line represents the rate of change of the average production/sales value over time. The slope is positive in this case, meaning the average production/sales value increases over time.

The y-intercept represents the average sales value at a specific time, such as the beginning of the data collection period.

Here are some other possible parameters that could be used as **independent variables** in the linear equation:

- **Time:** This could be used to represent the number of years since the beginning of the data collection period.
- **Season:** This could be used to represent the season of the year.
- **Economic factors:** This could be used to represent economic factors such as GDP growth or unemployment rate.

The parameters will depend on the specific data set and the research question being addressed.

It is important to note that there is some volatility in the graph trend, which certain social, economic, or seasonal factors could cause. Potential factors include a rise in Chinese exports, plastic decorative items, loss of small markets, and an increase in malls and high-end shopping places. So, we need to understand that **a linear equation is only a prediction**. The average sales value's actual value may differ from the predicted value. The linear equation is based on historical data, and the future may differ from the past.

However, the linear equation can be a useful tool for predicting future values of the average sales value. It can also identify data trends and make informed decisions about the handicraft industry. Linear regression is a mathematical model that would accurately represent the graph trend.

I must gather more data and perform statistical analysis to identify the mathematical model that fits the graph trend. I also need to consider the factors that could be causing the volatility in the data.

Also, it is important to note that no mathematical model can perfectly fit the graph trend. The model can only make predictions based on the data it has been trained on. If the data changes, the model's predictions may be inaccurate.

Here are some other possible mathematical models that could be used to represent the graph trend:

•   **Exponential smoothing:** This is a more complex model that allows for some volatility in the data. The model can predict future values by smoothing out the data and then extrapolating the smoothed line.

•   **ARIMA:** This is a very complex model that can account for various factors that could be causing the volatility in the data. The model can predict future values by fitting the data to a set of equations.

However, these models are more complex and may not be necessary if the data is relatively stable.