Product Requirements Document (PRD) : Campaign Planning Agent

Product Title: Multi-Agent Marketing Campaign Planning System

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1. Overview

1.1 Problem Statement:

Performance marketing processes are time-consuming and inefficient, limiting strategic data-driven decision-making. Additionally, organizations face high costs managing campaign planners, analysts, and creative production without optimal data utilization.

1.2 Solution:

A pre-defined multi-agent marketing campaign planning system streamlines campaign design, planning, and deployment based on business goals. It organizes specialized agents into crews to generate recommendations for objectives, brand mapping, audience targeting, channel selection, scheduling, budget allocation, and campaign naming. The system integrates LLMs and custom Python models/API callouts for data-driven, context-aware decision-making.

2. Purpose and Scope

2.1 Purpose

- **Primary Objective:**

  To provide users with end-to-end recommendations for campaign planning and deployment. This includes:

  - Determining the best campaign objectives from a set of nine predefined industry campaign types.
  - Mapping the brand to its correct industry category.
  - Identifying the optimal audience segments.
  - Recommending the best channels for the campaign.
  - Suggesting an optimal campaign schedule.
  - Allocating budget appropriately across selected channels.
  - Generating a memorable campaign name.

- **Secondary Objectives:**
  - To support creative generation and campaign deployment (further details to be added in subsequent versions).

2.2 Scope

- **Crew: Objective Suggestion:** Single agent to suggest campaign objectives based on the user's marketing goal.
- **Crew: Campaign Planning:** A series of agents working sequentially to map the brand, identify the target audience, recommend channels, schedule the campaign, allocate budget, and finally name the campaign.
- **Integration with external tools/APIs:**
  - LLMs (for objective suggestion, audience identification in the absence of historical data, channel recommendation, schedule recommendation, and campaign name generation)
  - Custom Python functions that may include calls to existing models (for brand mapping, account integration checks, historical data analysis, budget allocation, etc.)

2.3 User Stories

- **As a marketing manager**, I want to receive AI-driven recommendations for campaign objectives, so that I can align my campaigns with business goals efficiently.
- **As a brand strategist**, I want the system to map my brand to the correct industry category, so that my campaigns target the right audience and channels.
- **As a performance marketer**, I want the system to suggest the optimal audience segments based on demographics and behavior, so that I can maximize engagement and conversions.
- **As a media planner**, I want the system to recommend the most effective ad channels for my campaign, so that I can optimize performance across different platforms.
- **As a campaign manager**, I want the system to propose the best scheduling and budget allocation for my campaign, so that I can ensure cost-effective and timely execution.
- **As a creative director**, I want the system to generate a relevant and engaging campaign name, so that it aligns with my brand messaging and strategy.
- **As a marketing analyst**, I want the system to validate outputs and provide fallback options when data is missing, so that I can make informed decisions without delays.

2.4 User Journey (UX Steps)

Since we are building an **autonomous agentic system** with minimal manual intervention required, we have made it so that the user journey is very short and simple, unlike traditional SAAS applications where multiple different steps and flows are used.

Step 1: Start

Step 2: Go to AI workflows Tab in website application

Step 3: Select a Workflow related to Ad campaigns

Step 4: Run the workflow and verify its final output.

Step 5: Stop

3. Overall Architecture and Workflow (Focus on campaign planning crew please)

3.1 Arrangement of Crews and their Agents (High level)

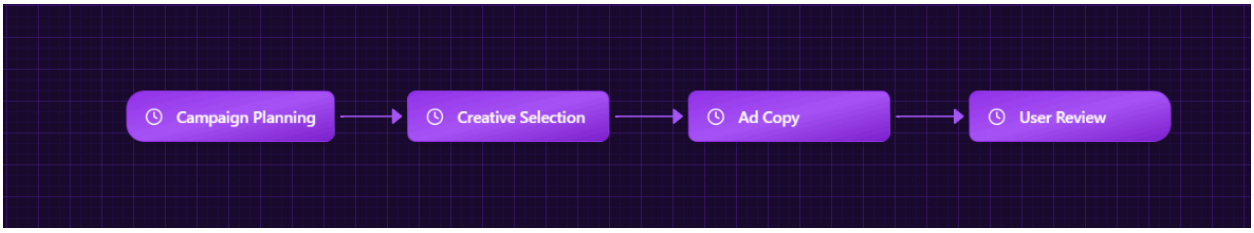
The system is organized into separate crews, each consisting of one or more agents and a crew acts like a specific team in an organization that works in one aspect or domain in performance marketing process

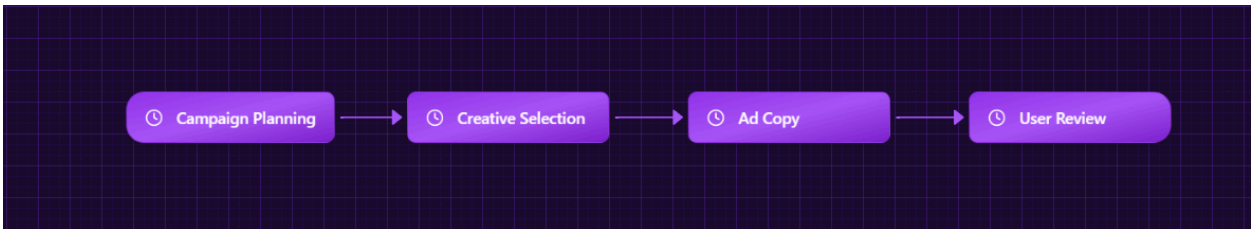
- ***Crew: Objective Suggestion***
  - Agent 1: Automatic Objective Suggestion
- **Crew: Campaign Planning**

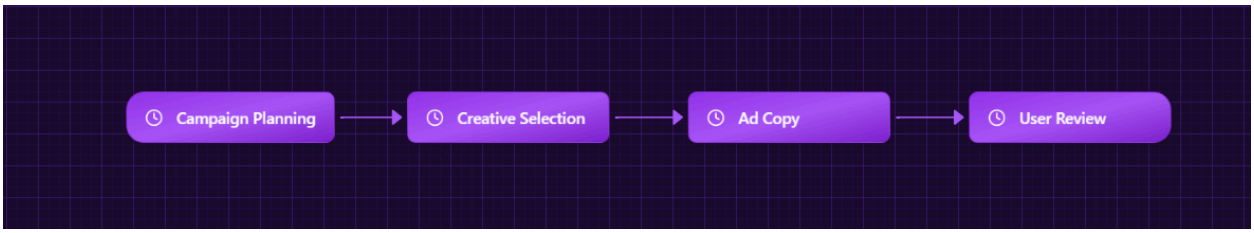
    - *Agent 1: Brand Mapping*
    - *Agent 2: Audience Identification*
    - *Agent 3: Channel Recommendation*
    - *Agent 4: Schedule Recommendation*
    - *Agent 5: Budget Allocation*
    - *Agent 6: Campaign Name Recommendation*
- **Crew: Creative Generation**
    - { Agent tasks and functions to be used are to be defined when this crew is being built}
- **Crew: Campaign Deployment**
    - {Agent tasks and functions to be used are to be defined when this crew is being built}

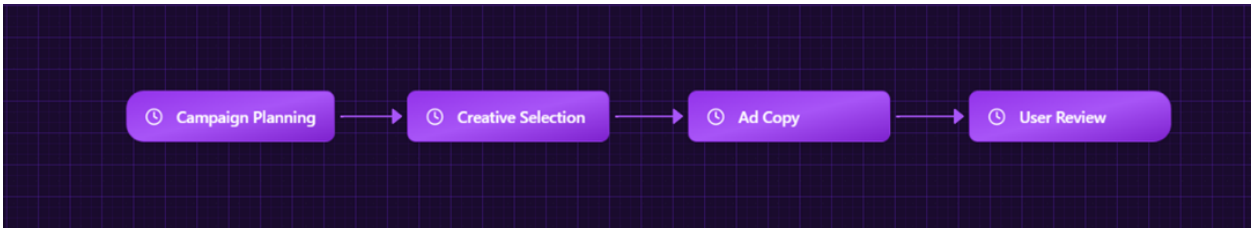
3.2 Workflow (How different crews work together in this workflow)

Each Crew performs a specific task and passes its output to downstream agents.



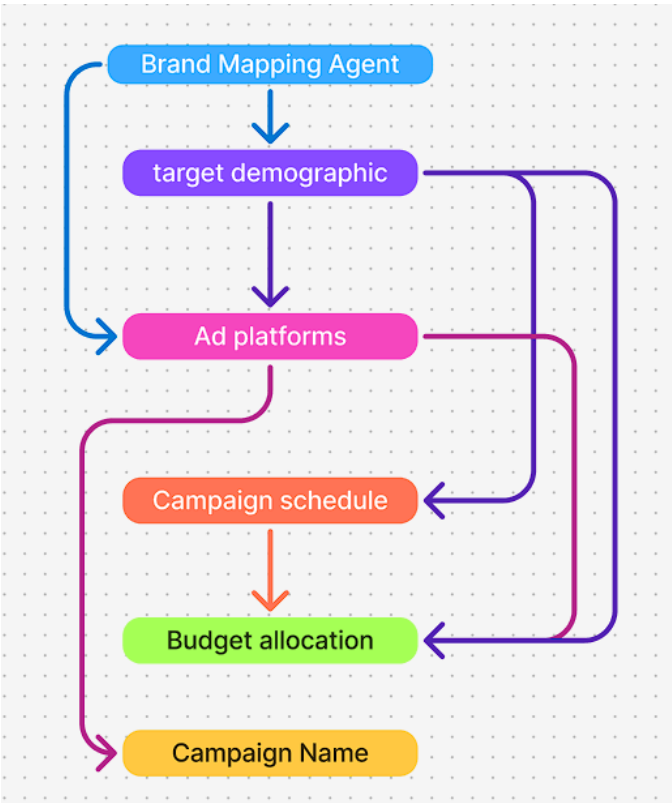






3.3 Campaign Planning Crew Input output flow between agents.

Below is a visual representation of how the output of one agent is to be used by other agents to complete their tasks properly. (colored arrow signifies the output of that colored agent is passed on to other agents.)



- **Agent 1's output (Industry Type)** is used by both Agent 2 and Agent 3.
- **Agent 2's output (Audience Segments)** is used by Agents 3, 4, and 5.
- **Agent 3's output (Channel Recommendation)** is used by Agent 5.
- **Agent 4's output (Campaign Schedule)** is used by Agents 5 and 6.
- **Agents 5 and 6** produce final outputs that are then used downstream in the overall campaign deployment process.

4. Detailed Functional Requirements

NOTE: You can find detailed specifications for agents in campaign planning crew here!

4.1 Crew: Objective Suggestion:

- **Purpose:** Analyze the user's marketing goal and select the most appropriate campaign objectives.

- **Results:** Provides a list of recommended campaign objectives aligned with the business goal.

4.2 Crew: Campaign Planning:

- **Brand Mapping (Agent):**
  - **Purpose:** Classify the brand into the correct industry category.
  - **Results:** Identifies the industry type for the brand.
- **Audience Identification (Agent):**
  - **Purpose:** Identify key audience segments based on demographics, interests, and behaviors.
  - **Results:** Recommends audience segmentation tailored for the campaign.
- **Channel Recommendation (Agent):**
  - **Purpose:** Suggest the most effective advertising channels for the campaign.
  - **Results:** Outputs a list of recommended ad channels that are integrated and optimized for performance.
- **Schedule Recommendation (Agent):**
  - **Purpose:** Propose the most optimal start (and optionally end) dates for the campaign.
  - **Results:** Provides a recommended campaign schedule with key dates.
- **Budget Allocation (Agent):**
  - **Purpose:** Determine the optimal total daily budget and its distribution across selected ad channels.
  - **Results:** Delivers a total budget recommendation along with channel-specific allocation details.
- **Campaign Name Recommendation (Agent):**
  - **Purpose:** Generate a memorable and relevant name for the campaign.

- **Results:** Provides a campaign name that encapsulates the campaign's focus and strategy.

5. Non-Functional Requirements

- **Reliability & Error Handling:**
  - Each agent output must be verified/ validated by automated checks and qa system to mitigate potential risks.
  - Each Python function and API call must include exception handling with error codes.
  - When historical data is not available or an integration check fails, fallback logic must be applied.
- **Client Data confidentiality.**
  - Whenever historical data is being utilized, it should be ensured that this data is not provided or shared with any application / system that exists outside of NYX Infrastructure. (If being passed into LLMs then that LLM Should be hosted locally)
- **Performance:**
  - Each agent should process its inputs and return recommendations within an acceptable timeframe {add info: specific performance targets}.

6. Dependencies & Assumptions

6.1 Dependencies:

- Access to a robust LLM (e.g., GPT-4 or equivalent) with custom prompt configurations.
- Existing classification models and budget allocation models or APIs.
- API for verifying ad channel integration, fetching and using data from database tables for historical references of a specific brand campaigns.
- Clear validations to be applied to verify the results of each agent to mitigate risks.

6.2 Assumptions:

- The list of available campaign types is predefined and maintained.
- Integration platforms (Meta, Google, LinkedIn) are regularly updated in the system.
- Historical data, if available, is in a consistent and accessible format.