TECHX

Asia's Largest

AI & Cloud

Conference 2024

15 - 16, November 2024

Chennai Trade Center, Chennai

It’s me

Prem Kumar S. R.

Chief Technology Officer — XERAGO | The Science of Digital | Digital Impact Consulting & Services

Co-Founder & Chief Technology Officer — inuAid™ LEARN FROM EXPERTS

Full-Stack AI/ML Cloud Solutions Productionizing Expert

- With 26+ years of experience in IT industry solutions, I bridge the gap between technology innovation and business growth
- My unique blend of expertise spans tech solutioning, delivery, business development, and strategic client relationships
- Developed through excellent experiences with Tata Consultancy Services (TCS), Photon Interactive, Fortune 100 MNC clients, and 6 years with Startups and visionary founders
- Lived in the US & South Africa for 7 years for global client engagements

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AI/ML Solutions Engineering

Data Analytics

GenAI Conversational Chatbot

Healthcare

Respiratory disease prediction using Chest X-rays with abnormalities marked

Marketing

GenAI Data-driven Insightful Marketing Content Generator

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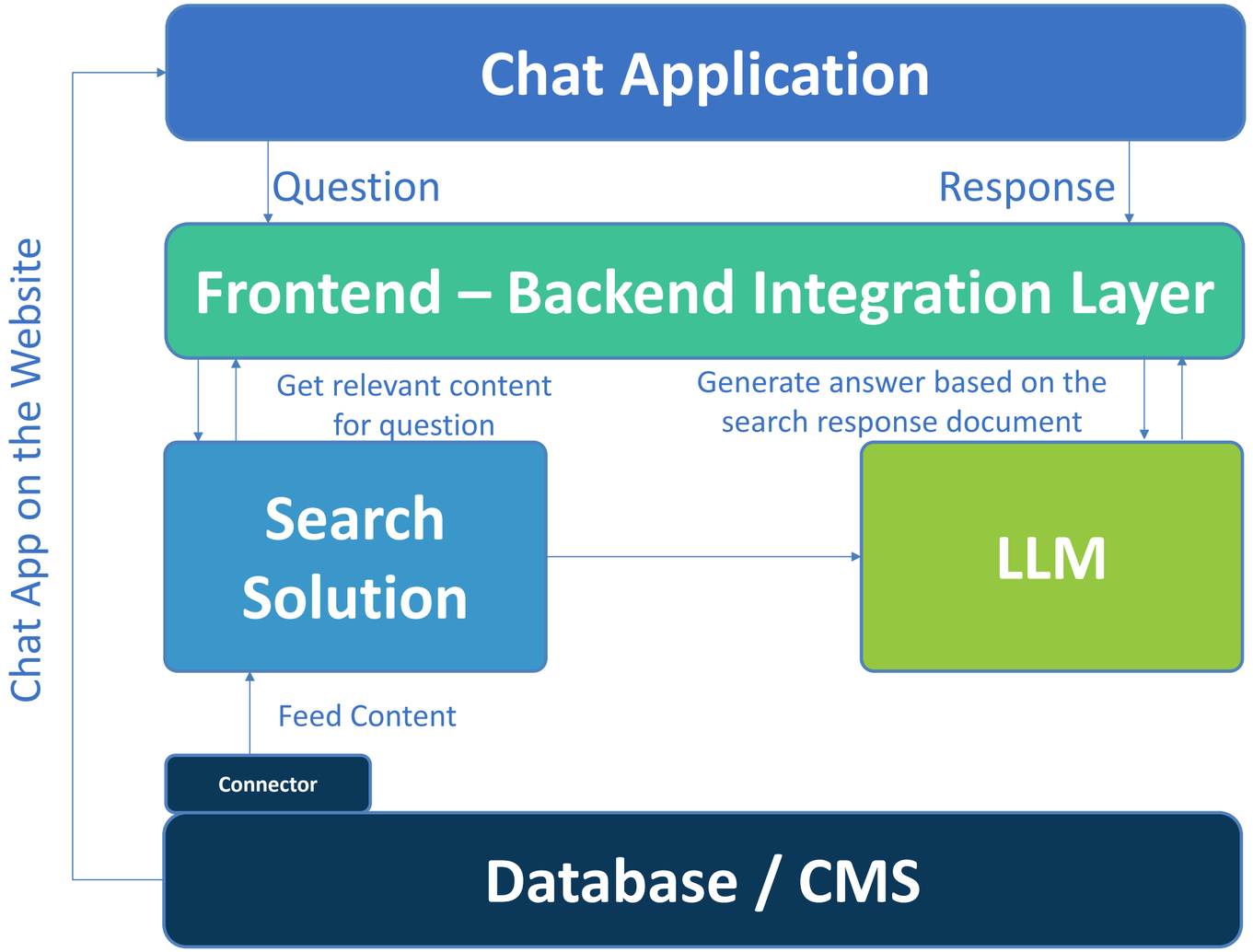
GenAI Conversational Chatbot



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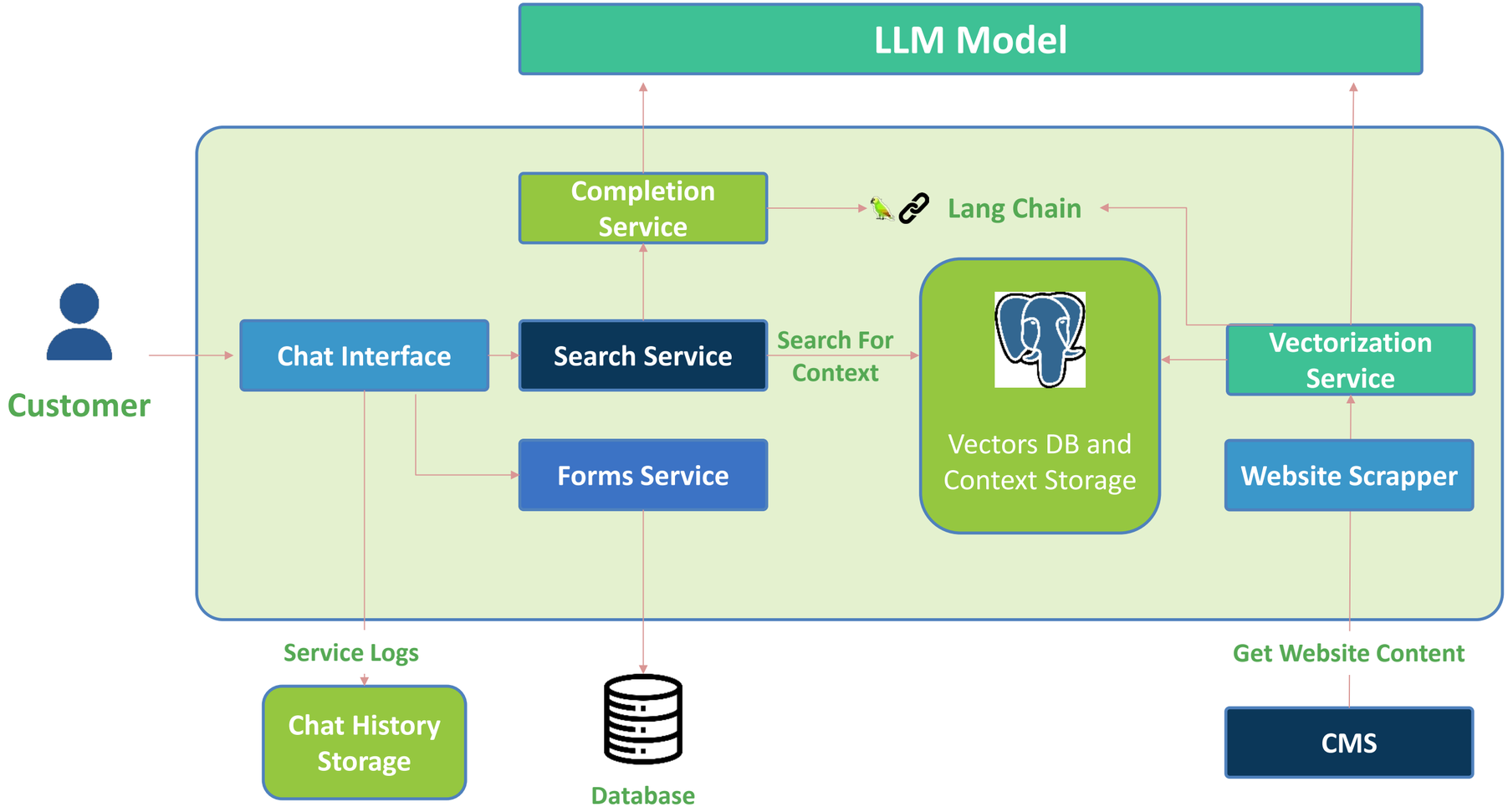
GenAI Conversational Chatbot

Technical Solution Architecture – Illustrative Example



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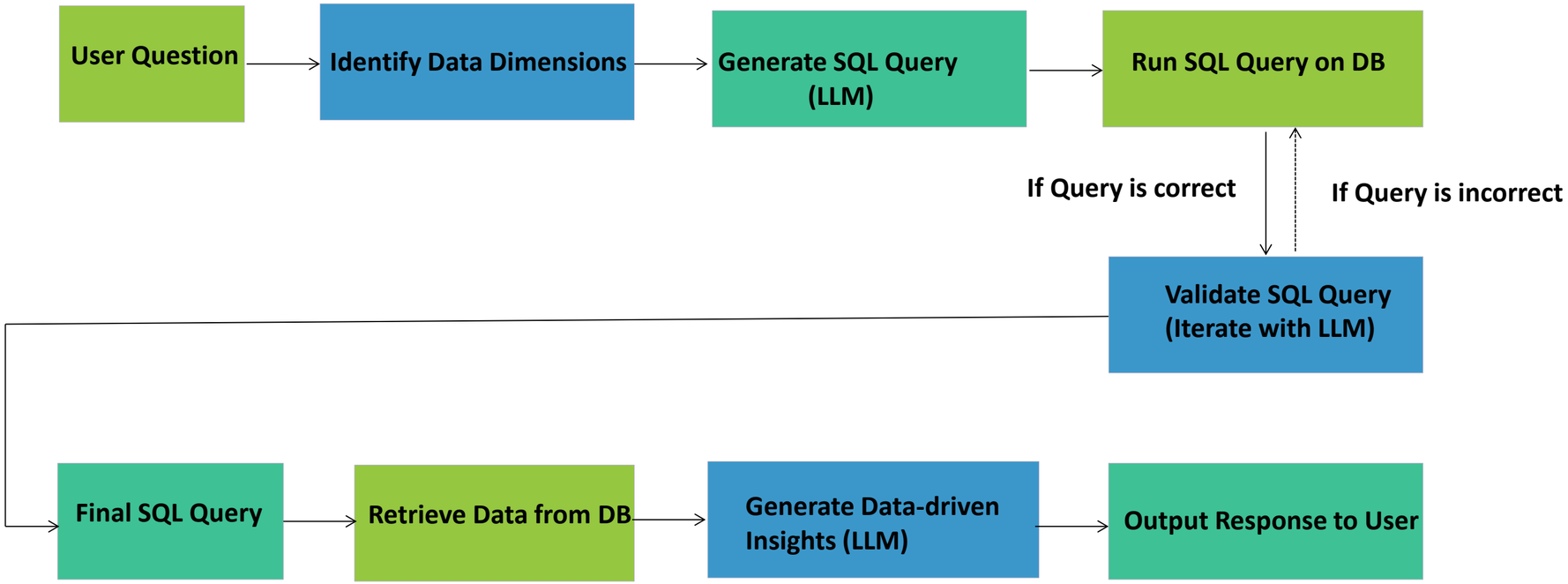
GenAI Data-driven Insights

Tech. Solution Components



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AI/ML Solution for Healthcare

Respiratory disease prediction using Chest X -rays with abnormalities marked

1. Critical dependence on manual diagnosis by radiologists. 5 minutes per X-ray on an average to determine normal vs. abnormal condition.
2. Lack of automated system for analyzing Chest X-rays - Diagnosis of pneumonia, lung inflammation, abscesses, and enlarged lymph nodes
3. Lack of specification of locations of abnormalities in existing methods lead to inexplicable outcomes & patient care
4. Lack of easy to use secure openly accessible Chest X-rays AI solution for hospital communities

- ***Developed easy to use and deployable automated analysis system using AI***
- ***To assist and save radiologists valuable time and towards improving triaging, tele-radiology practice and patients care***

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Respiratory disease prediction using Chest X-rays with abnormalities marked

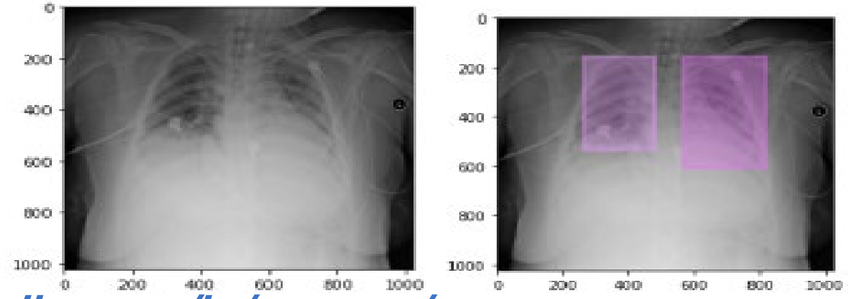
Technical Solution Approach

- **Classification on the available dataset**
  - Dataset preparation
  - Training the model
  - Transfer learning
- **Segmentation on the available datasets**
  - Data description
  - Exploratory data analysis
  - Loading pneumonia locations
  - Data generator and model building
- **Loss functions IOU**

Images with Target = 0 (Class = Not Normal/ No Lung Opacity and Normal).

Images with Target = 1 (Showing Class = Lung Opacity).

Following is the infected image with bounding boxes showing Lung Opacities.



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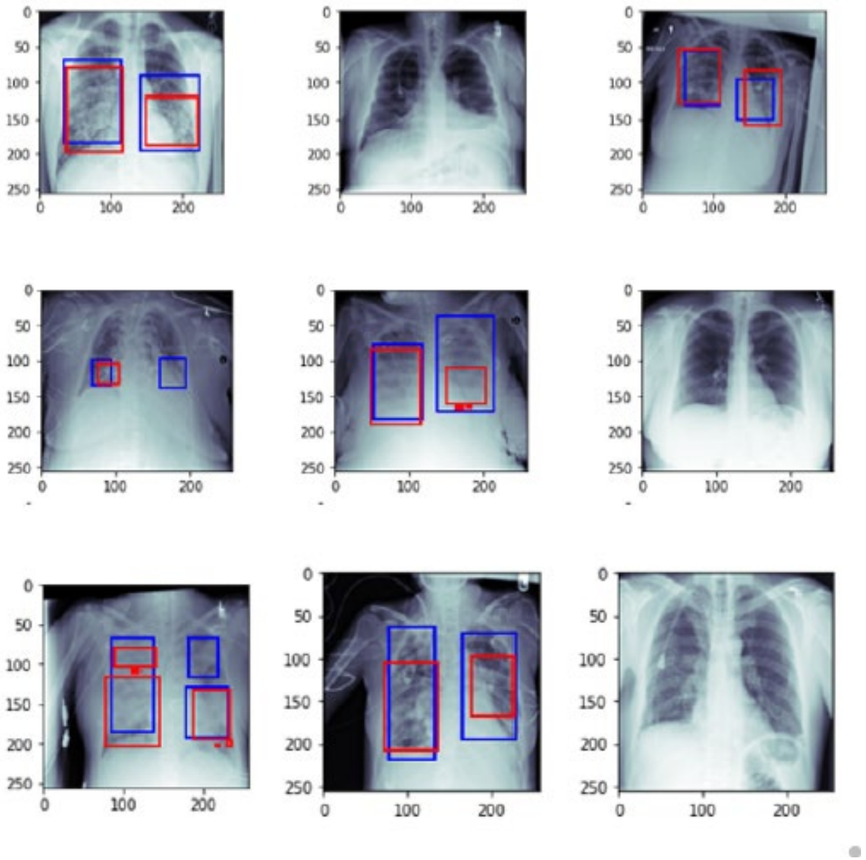
Respiratory disease prediction using Chest X-rays with abnormalities marked

Results & Inference



- **On classification**
  - VGG16 & VGG19
    - 140 million parameters
  - MobileNetV2
    - Lightweight
    - 3.4 million parameters
    - Validation
      - Loss 0.3
      - Accuracy 87%
    - AUC 0.988 - Plotted on random threshold values
- **After performing Transfer Learning**
  - Validation
    - Loss 0.19
    - Accuracy 93%
  - AUC 0.998
- **On Segmentation**
  - 40th epoch
    - Training Loss 0.605 & IOU 0.92
    - Validation Loss 0.669 & IOU 0.91

Respiratory disease prediction using Chest X-rays with abnormalities marked

Summary

- Experiments on different CNN models to classify & segment abnormal regions
- Determining best model involves lot of trials
- Balance complexity & efficiency during training process
- Automate diagnosis & test real-life implementation to improve model accuracy
- Few healthcare regulations and certain measures to ensure testing & standardizing quality assurance

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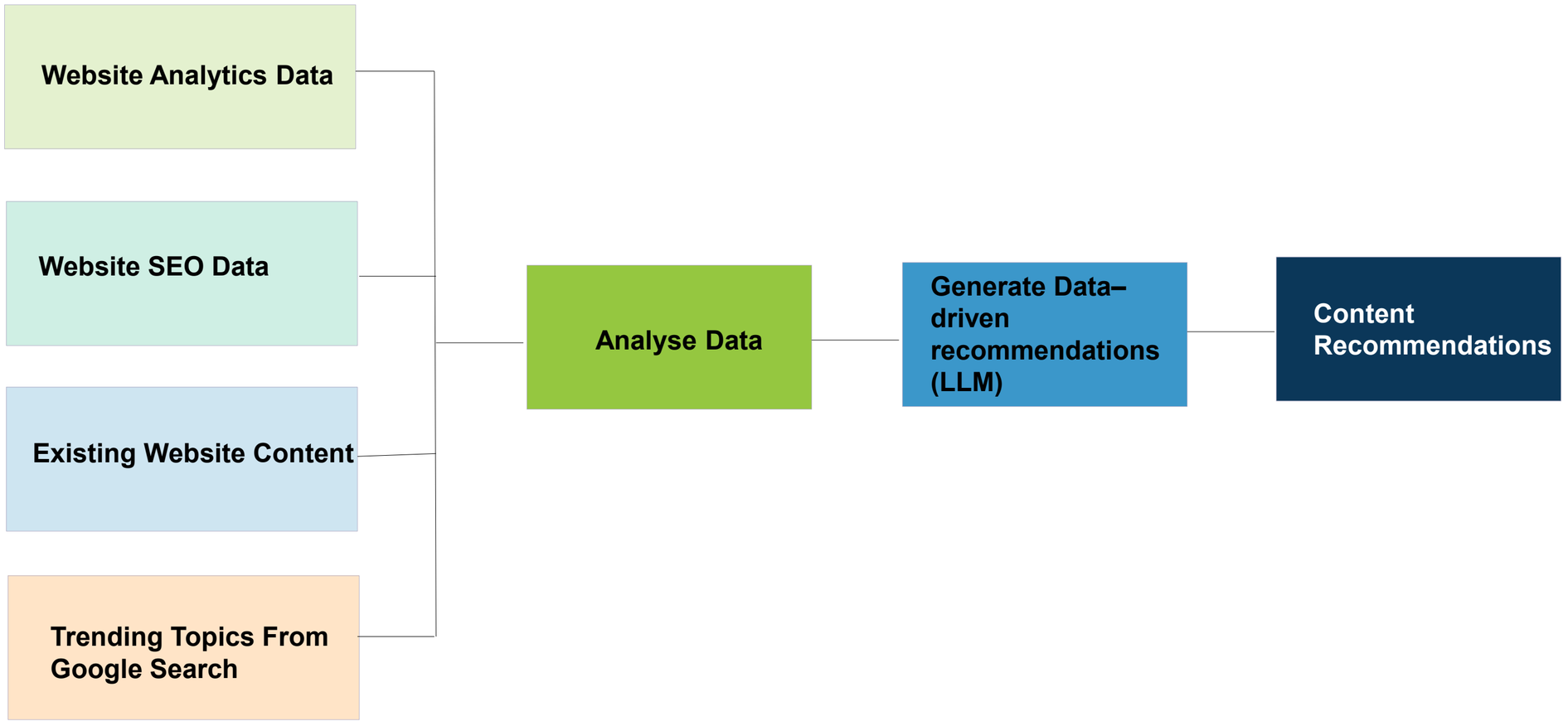
AI/ML Solution for Marketing

GenAI Data -driven Insightful Marketing Content Generator



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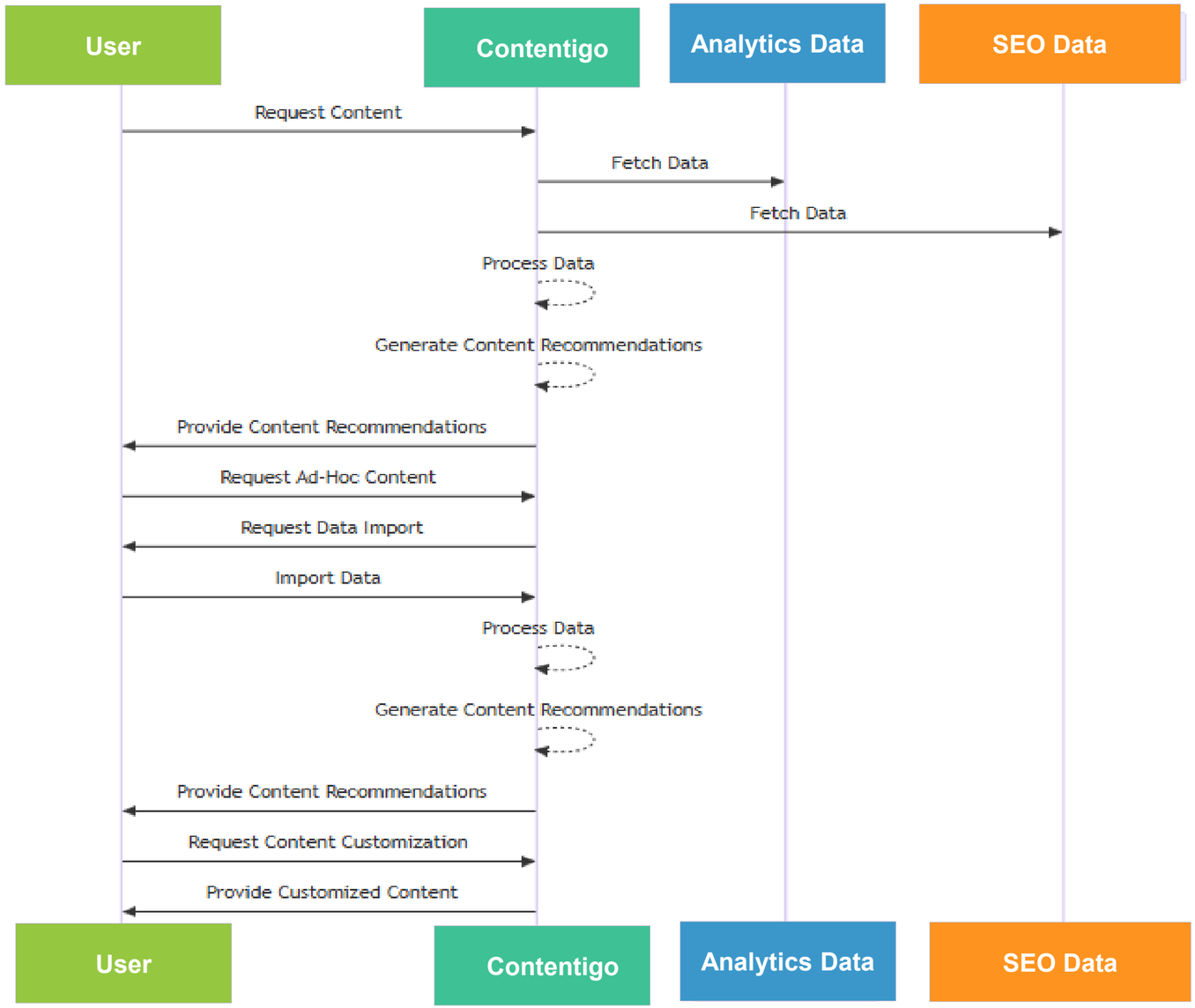
GenAI Data-driven Insightful Marketing Content Generator

Sequence Diagram



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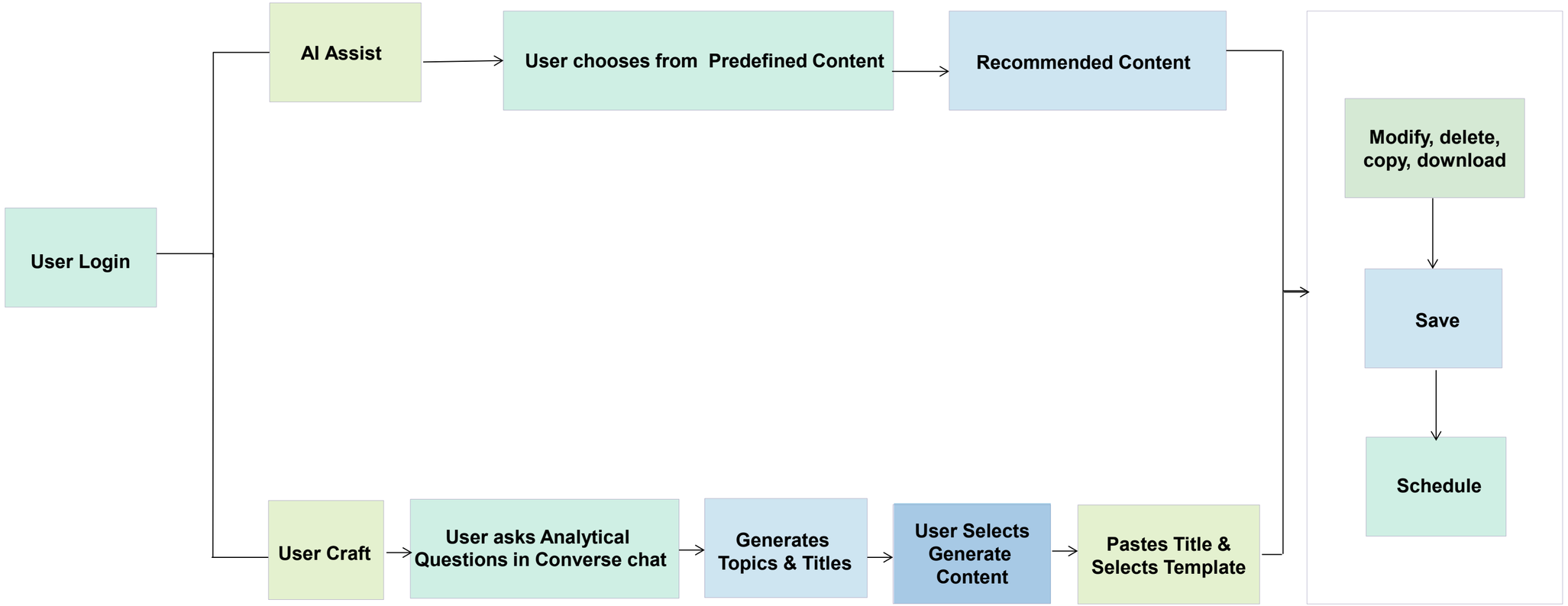
GenAI Data-driven Insightful Marketing Content Generator

Feature List



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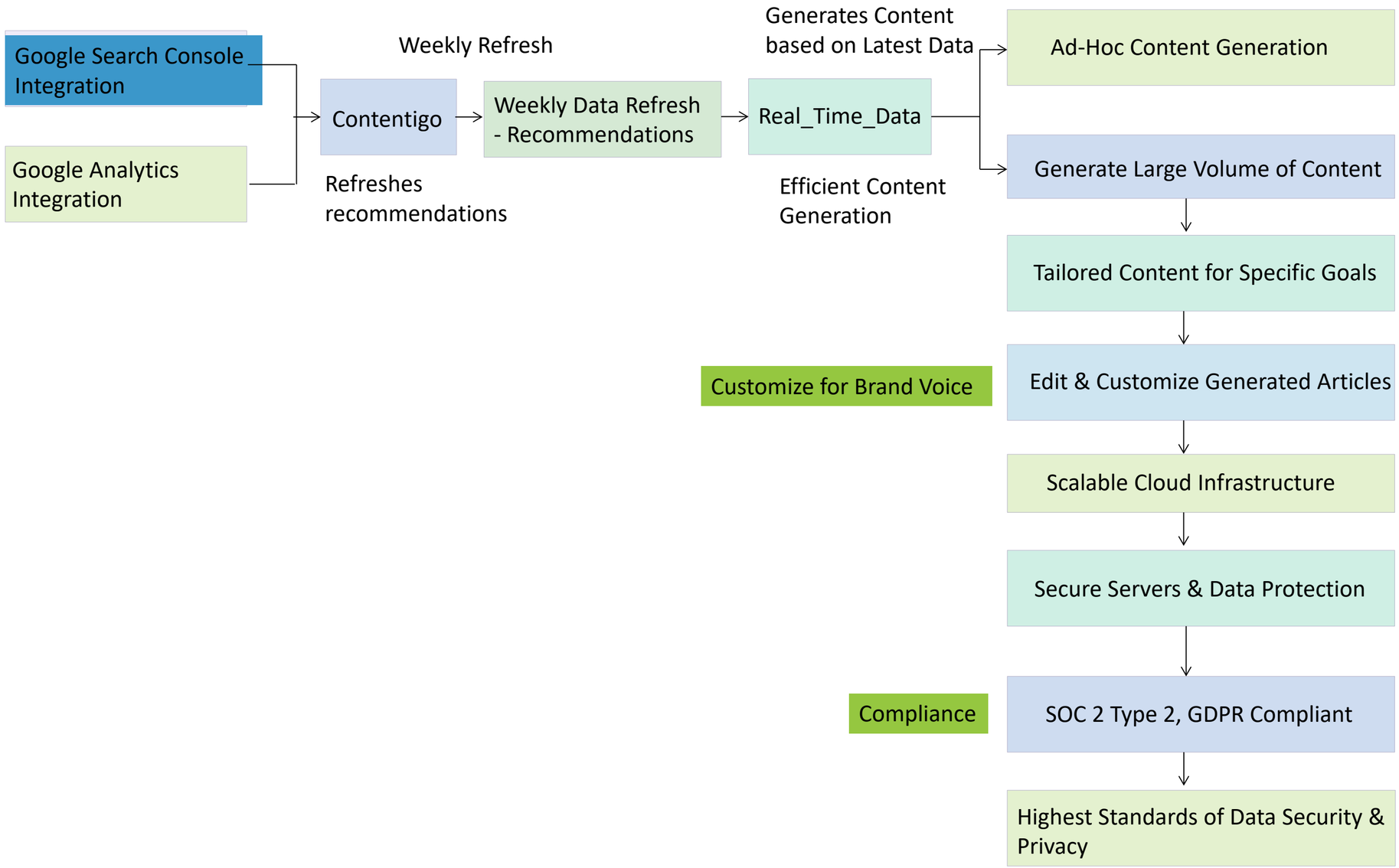
Tech. Solution



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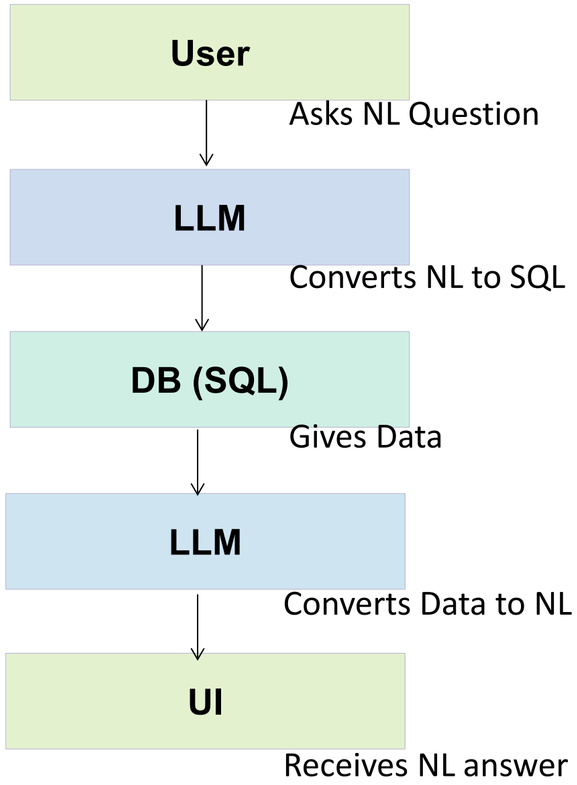
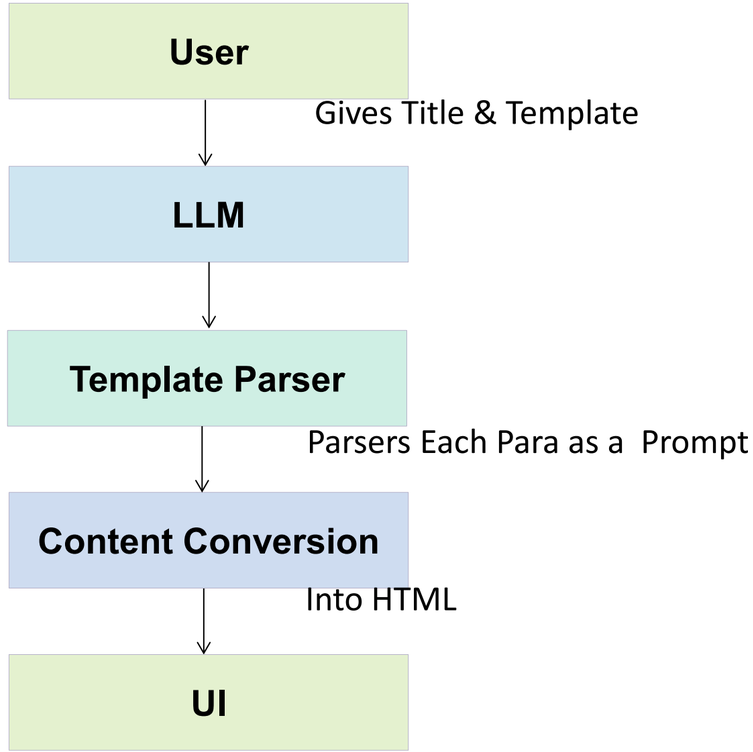
GenAI Data-driven Insightful Marketing Content Generator

Tech. Solution Components

AI Assist



User Craft



Contentigo Demo

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THANK YOU!

Any Questions?

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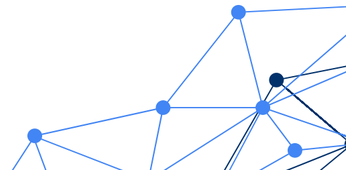
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