

# ML & GenAI for Marketing

(40h / 5 Days)

## Description:

In today's competitive digital landscape, the integration of Machine Learning (ML) and Generative AI (GenAI) is revolutionising the field of **marketing**, enabling **businesses** to craft highly personalised, **data-driven** campaigns that enhance customer engagement and drive significant business growth. This course offers a comprehensive deep dive into the application of AI/ML in marketing, from predictive analytics and customer segmentation to the automation of personalised content creation using cutting-edge GenAI models. Participants will learn how to harness AI to decode key performance indicators (KPIs), optimise marketing strategies, and drive decisions through data analysis. With hands-on labs and real-world case studies, the course equips marketing professionals, data scientists, and business leaders with the tools to improve conversion rates, reduce customer acquisition costs, and implement targeted marketing strategies that resonate with diverse audiences.

The course also emphasises the ethical considerations of AI in marketing, addressing the importance of transparency, data privacy, and bias mitigation in AI-driven

marketing strategies. Participants will explore regulatory frameworks like GDPR and CCPA and learn to design AI systems that are not only effective but also responsible and compliant with industry standards. Through practical exercises, participants will gain experience in ethical AI model development, while the final capstone project enables them to design a marketing campaign that integrates AI and GenAI technologies. By the end of the course, participants will have a well-rounded understanding of how AI and ML are reshaping marketing, preparing them to lead innovative, customer-centric campaigns that are both impactful and ethically sound.

# Target Audience:

This course is designed for:

- Marketing professionals seeking to leverage AI/ML to enhance customer engagement and optimise campaigns.
- Data scientists and analysts looking to apply advanced AI/ML techniques to solve real-world marketing challenges.
- ML engineers and software developers interested in building or integrating AI-driven tools for marketing.
- Business leaders and entrepreneurs seeking to innovate and maintain a competitive edge in marketing using AI/ML.

# Training Expected Outcomes:

Upon completing the ML & GenIA for Marketing Training Program, participants will:

1. **Understand** the core principles of ML and GenAI and their application in marketing.
2. **Develop** personalised marketing strategies using AI-driven insights and predictive models.
3. **Apply** sentiment analysis to improve customer engagement.
4. **Use** AI tools for content creation, including zero-shot and few-shot learning models.
5. **Implement** AI techniques for customer segmentation, product recommendations, and micro-targeting.
6. **Ensure** responsible AI use through ethical considerations and compliance with data governance frameworks.

# Training Strategy

1. **Active Learning Approach:** This course uses hands-on labs and project-based learning. Participants will apply AI/ML models directly to real-world marketing scenarios, enabling immediate practical understanding.
2. **Interactive Sessions:** Each lesson incorporates case studies, discussions, and quizzes to reinforce learning. Group discussions will enable participants to share experiences and approaches.
3. **Incremental Complexity:** The course is designed to progressively increase in complexity, starting with Python basics and culminating in advanced AI/ML techniques like zero-shot and retrieval-augmented generation.
4. **Real-World Applications:** Each chapter integrates real-world examples and business case studies to demonstrate the practical application of AI/ML in marketing.
5. **Final Project:** The training ends with a comprehensive project where participants will design and implement an AI-powered marketing campaign, synthesising lessons learned throughout the course.
6. **Assessments and Feedback:** Participants will take quizzes and assessments after each chapter, with the final MCQ exam evaluating their understanding. Feedback will be provided after each practical exercise and assessment to guide improvement.

# Course Modules

1. **Introduction to AI for Marketing** – Overview of AI's role in transforming marketing strategies using data.
2. **Machine Learning Basics for Marketing** – Introduction to machine learning models and their application in marketing.
3. **Advanced Generative AI Models** – Explore generative AI models like GPT and how they can create personalised content.
4. **Predictive Analytics in Marketing** – Learn to use predictive models to anticipate market trends and customer behaviour.
5. **NLP for Customer Engagement** – Use NLP tools to improve customer interaction through sentiment analysis and chatbots.
6. **Computer Vision for Ad Personalisation** – Implement computer vision to optimise personalised ads through image analysis.
7. **Data-Driven Marketing Automation** – Automate marketing workflows using AI to enhance efficiency and results.
8. **Building Scalable AI Solutions with AWS** – Learn best practices for scaling AI solutions using AWS infrastructure.
9. **AI Ethics in Marketing** – Understand the ethical implications of using AI in marketing, focusing on fairness and transparency.
10. **Capstone Project: AI-Powered Marketing Campaign** – Design and implement a comprehensive AI-driven marketing campaign.

# Training Program

## ML & GenIA for Marketing

### Training Objectives:

- Provide an overview of AI/ML techniques and their importance in modern marketing strategies.
- Equip participants with hands-on skills in using Python for data analysis in marketing contexts.
- Introduce AI tools for sentiment analysis, predictive analytics, customer segmentation, and personalised marketing.
- Explore Generative AI models for content creation and their applications in marketing.
- Emphasise the importance of ethical AI use and adherence to privacy regulations such as GDPR and CCPA.

***Time***

***Modules***

4 Hours

## Module 1: The Evolution of Marketing in the AI Era and Preparing Your Toolkit

- 1.5h **Objective:** Provide participants with a comprehensive understanding of the role AI and ML play in transforming modern marketing practices and equip them with the foundational tools and environment setup for executing AI/ML-driven marketing projects.
- 2.5h

### Lesson 1 : Introduction to AI in Marketing

- Definition of AI and ML in the context of marketing.
- The role of AI in automating marketing processes.
- Historical evolution: From traditional marketing to AI-driven marketing.
- Case studies: Brands successfully using AI/ML.

### Lesson 2: Setting Up Your Python Environment for Marketing

#### Projects

- Introduction to Python for AI/ML.
- Installing necessary libraries (NumPy, pandas, Scikit-learn, TensorFlow, Keras).
- Setting up Jupyter Notebooks for marketing data analysis.
- Common tools and frameworks for AI/ML marketing projects.

#### Lab: Setting Up Python for Marketing Projects

**Objective:** Install and set up Python, along with the necessary libraries for AI/ML in marketing.

#### Steps:

1. Install Anaconda or Python on your system.

<p>4 Hours</p> <p>2h</p> <p>2h</p>	<h2>Module 2: Decoding Marketing Performance with KPIs</h2> <p><b>Objective:</b> Enable participants to identify key performance indicators (KPIs) and leverage AI/ML models to track, analyse, and predict marketing performance, optimising campaigns based on data-driven insights.</p> <hr/> <h3>Lesson 1: Importance of KPIs in Marketing</h3> <ul style="list-style-type: none"> <li>Defining KPIs (Key Performance Indicators) in marketing.</li> <li>How KPIs influence data-driven marketing strategies.</li> <li>Selecting the right KPIs based on marketing objectives.</li> </ul> <h3>Lesson 2: Using AI/ML to Track and Optimise KPIs</h3> <ul style="list-style-type: none"> <li>Introduction to AI/ML models for KPI tracking.</li> <li>Techniques for predicting future KPIs.</li> <li>Hands-on: Using regression analysis to predict KPIs.</li> </ul> <h3>Lesson 3: Interpreting Marketing Data through KPI Analysis</h3> <ul style="list-style-type: none"> <li>Best practices for interpreting KPI insights.</li> <li>Identifying trends and patterns through visualisations.</li> <li>Hands-on: Creating KPI dashboards using Python.</li> </ul> <h3>Lab: Analysing Marketing KPIs with Python</h3> <ul style="list-style-type: none"> <li><b>Objective:</b> Analyse marketing KPIs and use regression models to predict future trends.</li> <li><b>Steps:</b> <ol style="list-style-type: none"> <li>Load a marketing dataset (e.g., digital ad performance).</li> <li>Identify key KPIs like conversion rate, cost per acquisition (CPA), and return on investment (ROI).</li> <li>Use linear regression to predict future performance based on historical KPIs.</li> <li>Visualise results using <code>matplotlib</code> or <code>seaborn</code>.</li> </ol> </li> </ul>
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4 Hours	<h2>Module 3: Unveiling the Dynamics of Marketing Success</h2>
2h	<p><b>Objective:</b> Teach participants how to apply AI/ML techniques to analyse customer behaviour and interactions, uncovering the critical dynamics that drive successful marketing campaigns.</p>
2h	<hr/> <h3>Lesson 1: Analysing Customer Interaction Data</h3> <ul style="list-style-type: none"> <li>○ Importance of customer behaviour analysis in marketing.</li> <li>○ Techniques for analysing customer data (clickstream, website interactions, etc.).</li> <li>○ Introduction to Python libraries for customer behaviour analysis.</li> </ul> <h3>Lesson 2: Identifying Marketing Success Factors</h3> <ul style="list-style-type: none"> <li>○ Utilising AI/ML models to identify key marketing success factors.</li> <li>○ Techniques like decision trees and random forests.</li> <li>○ Hands-on: Building models to predict marketing success based on customer data.</li> </ul> <h3>Lesson 3: Optimising Campaigns through Data-Driven Insights</h3> <ul style="list-style-type: none"> <li>○ How AI can help refine and optimise marketing campaigns.</li> <li>○ Case studies: AI-driven campaign optimization.</li> <li>○ Hands-on: Optimising a campaign using A/B testing and AI techniques.</li> </ul>
	<h3>Lab: : Customer Interaction Analysis</h3> <ul style="list-style-type: none"> <li>● <b>Objective:</b> Analyse customer interaction data to identify key factors</li> </ul>

4 Hours	<h2>Module 4: Harnessing Seasonality and Trends for Strategic Planning</h2>
2h	<p><b>Objective:</b> Empower participants to detect and predict seasonal trends and customer behaviour patterns using AI/ML, and strategically plan marketing campaigns that capitalise on these insights.</p>
2h	<p><b>Lesson 1: Understanding Seasonality in Marketing</b></p> <ul style="list-style-type: none"> <li>○ Defining seasonality and its importance in marketing.</li> <li>○ Examples of seasonal trends affecting customer behaviour.</li> </ul> <p><b>Lesson 2: Using AI to Detect and Predict Seasonality</b></p> <ul style="list-style-type: none"> <li>○ Techniques for identifying seasonality using AI models.</li> <li>○ Hands-on: Applying time series analysis for seasonal trends.</li> </ul> <p><b>Lesson 3: Strategic Campaign Planning Using Trend Insights</b></p> <ul style="list-style-type: none"> <li>○ Aligning marketing strategies with detected seasonal trends.</li> <li>○ Planning campaigns for specific seasons using AI predictions.</li> <li>○ Hands-on: Creating a seasonal campaign strategy using AI tools.</li> </ul> <p><b>Lab: : Time Series Analysis for Seasonality</b></p> <ul style="list-style-type: none"> <li>● <b>Objective:</b> Use time series analysis to detect seasonal trends in customer behaviour.</li> <li>● <b>Steps:</b> <ol style="list-style-type: none"> <li>1. Load a time series dataset related to sales or customer interactions over time.</li> <li>2. Decompose the time series to extract trend, seasonality, and residuals.</li> </ol> </li> </ul>

4 Hours

## Module 5: Enhancing Customer Insight with Sentiment Analysis

**Objective:** Equip participants with the skills to apply sentiment analysis to customer feedback and social media data, using AI to improve customer engagement and tailor marketing strategies based on sentiment insights.

2h

### Lesson 1: Introduction to Sentiment Analysis

2h

- Definition and importance of sentiment analysis in marketing.
- How sentiment analysis affects customer engagement and brand perception.

### Lesson 2: Applying Sentiment Analysis to Customer Feedback

- Using Natural Language Processing (NLP) for sentiment analysis.
- Analysing customer reviews, social media comments, and feedback.
- Hands-on: Performing sentiment analysis using NLP in Python.

### Lesson 3: Leveraging Sentiment Data for Improved Engagement

- How to use sentiment insights to improve marketing strategies.
- Case studies: Brands that improved engagement through sentiment analysis.
- Hands-on: Improving engagement strategies based on sentiment insights

### Lab : Sentiment Analysis with NLP

4 Hours

## Module 6: Leveraging Predictive Analytics and A/B Testing for Customer Engagement

**Objective:** Enable trainees to create and utilise digital twins for real-time monitoring and simulation of industrial systems using AWS IoT TwinMaker.

2h

### Lesson 1: Introduction to Predictive Analytics in Marketing

2h

- Definition and use cases of predictive analytics in marketing.
- Techniques for predicting customer behaviour using AI/ML models.

### Lesson 2: Designing Effective A/B Tests

- Introduction to A/B testing and its importance in campaign optimization.
- How to design, run, and analyse A/B tests using AI.
- Hands-on: Running A/B tests on customer engagement campaigns.

### Lesson 3: Combining Predictive Models with A/B Testing

- How predictive analytics enhances A/B testing.
- Best practices for combining predictive models with A/B tests.
- Hands-on: Using AI to design more effective A/B tests.

### Lab : Predictive Analytics with Regression Models

- **Objective:** Use predictive models to forecast customer engagement.
- **Steps:**
  1. Load a marketing campaign dataset with customer interaction data.
  2. Apply regression models (e.g., linear regression, random

4 Hours	<h2>Module 7: Personalised Product Recommendations</h2>
2h	<p><b>Objective:</b> Teach participants to develop AI-driven personalised product recommendation systems, enhancing customer experience and driving sales by aligning marketing efforts with customer preferences.</p>
2h	<p><b>Lesson 1: Overview of AI in Personalized Marketing</b></p> <ul style="list-style-type: none"> <li>○ How AI personalises customer experiences.</li> <li>○ The role of recommendation engines in enhancing sales and engagement.</li> </ul>
	<p><b>Lesson 2: Building Recommendation Engines Using AI</b></p> <ul style="list-style-type: none"> <li>○ Types of recommendation systems (collaborative filtering, content-based, hybrid).</li> <li>○ Hands-on: Building a recommendation engine using collaborative filtering in Python.</li> </ul>
	<p><b>Lesson 3: Optimising Product Recommendations</b></p> <ul style="list-style-type: none"> <li>○ Improving recommendation accuracy through AI models.</li> <li>○ Hands-on: Fine-tuning a recommendation engine for improved personalization.</li> </ul>
	<p><b>Lab: : Building a Recommendation Engine</b></p> <ul style="list-style-type: none"> <li>● <b>Objective:</b> Create a personalised product recommendation engine using collaborative filtering.</li> <li>● <b>Steps:</b> <ol style="list-style-type: none"> <li>1. Load a dataset containing customer purchase history.</li> <li>2. Implement a collaborative filtering algorithm (e.g., matrix factorization).</li> <li>3. Build and train a recommendation engine to suggest products for individual customers.</li> <li>4. Evaluate the engine's accuracy and effectiveness.</li> </ol> </li> </ul>

4 Hours	<h2>Module 8: Segmenting Customers with Machine Learning</h2>
1.5h	<p><b>Objective:</b> Enable participants to use machine learning techniques to segment customers based on various behavioural and demographic factors, allowing for more targeted and personalised marketing strategies.</p>
2.5h	<p><b>Lesson 1: Understanding Customer Segmentation</b></p> <ul style="list-style-type: none"> <li>◦ Why customer segmentation is critical for marketing.</li> <li>◦ Introduction to AI techniques for customer segmentation.</li> </ul> <p><b>Lesson 2: Using Clustering Algorithms for Segmentation</b></p> <ul style="list-style-type: none"> <li>◦ Overview of clustering algorithms (K-means, hierarchical clustering).</li> <li>◦ Hands-on: Segmenting customer data using K-means clustering.</li> </ul> <p><b>Lesson 3: Leveraging Large Language Models (LLMs) for Advanced Segmentation</b></p> <ul style="list-style-type: none"> <li>◦ How LLMs improve customer segmentation insights.</li> <li>◦ Hands-on: Using LLMs for deeper customer segmentation analysis.</li> </ul> <p><b>Lab: : Customer Segmentation with K-means Clustering</b></p> <ul style="list-style-type: none"> <li>● <b>Objective:</b> Apply K-means clustering to segment customers based on behavioural data.</li> <li>● <b>Steps:</b> <ol style="list-style-type: none"> <li>1. Load a dataset with customer purchase behaviour.</li> <li>2. Apply K-means clustering to identify distinct customer segments.</li> <li>3. Visualise the clusters and analyse customer profiles in each segment.</li> </ol> </li> </ul>

4 Hours	<h2>Module 9: Creating Compelling Content with Zero-Shot Learning</h2>
1.5h	<p><b>Objective:</b> Provide participants with an understanding of zero-shot learning and its applications in marketing, allowing them to create relevant, engaging content without needing direct training data for specific categories..</p>
2.5h	<hr/> <p><b>Creating Compelling Content with Zero-Shot Learning</b></p> <p><b>Lesson 1: Introduction to Zero-Shot Learning in Content Creation</b></p> <ul style="list-style-type: none"> <li>○ What is zero-shot learning (ZSL) and how it applies to content generation.</li> </ul> <p><b>Lesson 2: Using ZSL to Generate Marketing Content</b></p> <ul style="list-style-type: none"> <li>○ Techniques for using ZSL to create dynamic content for new categories.</li> <li>○ Hands-on: Generating product descriptions using ZSL models.</li> </ul> <p><b>Lesson 3: Optimising Content for Engagement Using AI</b></p> <ul style="list-style-type: none"> <li>○ How AI-generated content boosts customer engagement.</li> <li>○ Hands-on: Using AI models to optimise content for different audience segments.</li> </ul> <p><b>Lab: : Content Creation with Zero-Shot Learning</b></p> <ul style="list-style-type: none"> <li>● <b>Objective:</b> Use zero-shot learning to generate product descriptions for new categories.</li> <li>● <b>Steps:</b> <ol style="list-style-type: none"> <li>1. Load a pre-trained zero-shot learning model.</li> <li>2. Generate product descriptions for a set of products in a new category.</li> </ol> </li> </ul>

4 Hours

## Module 10: Enhancing Brand Presence with Few-Shot Learning and Transfer Learning.

**Objective:** Teach participants to apply few-shot and transfer learning techniques to refine AI models for new marketing tasks with limited data, enhancing brand presence and personalising marketing strategies.

### Lesson 1: Introduction to Few-Shot Learning in Marketing

- What is few-shot learning (FSL) and how it can be applied to marketing.

### Lesson 2: Using FSL to Adapt AI Models to New Marketing Tasks

- Principles of transfer learning and its use in brand presence campaigns.
- Hands-on: Applying FSL to create marketing strategies based on minimal data.

### Lesson 3: Meta-Learning for Brand Refinement

- How meta-learning enhances brand identity and personalization.
- Hands-on: Applying meta-learning techniques to improve brand presence.

### Lab : Few-Shot Learning for Branding

- **Objective:** Apply few-shot learning to refine marketing content with minimal labeled data.
  - **Steps:**
    - Load a few-shot learning model.
    - Provide a small dataset of labelled marketing examples.
    - Train the model to generate brand-specific marketing content.
    - Test the model's ability to generalise to new branding



## Module 11: Micro-Targeting with Retrieval-Augmented Generation (RAG) Factory.

**Objective:** Equip participants with the skills to use retrieval-augmented generation (RAG) to create precision-targeted marketing campaigns, combining real-time data retrieval with AI-generated content for maximum personalization and engagement.

### Lesson 1: Introduction to Retrieval-Augmented Generation (RAG)

- Overview of RAG and its importance for precision marketing.

### Lesson 2: Building Micro-Targeting Campaigns with RAG

- How RAG enhances micro-targeting efforts using real-time data.
- Hands-on: Building a RAG-powered micro-targeting campaign.

### Lesson 3: Measuring the Effectiveness of RAG-Based Strategies

- **Objective:** Use RAG to create highly personalised micro-targeting campaigns.
  - Techniques for evaluating the success of RAG-based campaigns.
  - Hands-on: Analysing the performance of RAG-driven marketing efforts.

**Lab:** Use RAG to create highly personalised micro-targeting campaigns.

- **Steps:**
  - Set up a retrieval-augmented generation pipeline using Python.
  - Load a customer dataset with real-time data.
  - Generate personalised marketing content based on retrieved information.
  - Evaluate the effectiveness of the micro-targeted content.

## Module 12: The Future Landscape of AI and ML in Marketing.

**Objective:** Provide participants with insights into emerging AI/ML technologies and trends, enabling them to conceptualise future marketing strategies that leverage cutting-edge innovations such as multi-modal AI, augmented reality (AR), and virtual reality (VR).

### Lesson 1: Exploring Emerging AI Technologies in Marketing

- Future trends in AI/ML for marketing (multi-modal GenAI, AR/VR integration).

### Lesson 2: The Role of AI in Shaping Future Consumer

#### Experiences

- How AI advancements will impact customer journeys and brand interactions.

### Lesson 3: Planning for AI-Driven Marketing in the Future

- Practical strategies for future-proofing marketing strategies using AI.
- Hands-on: Conceptualising a future marketing strategy using AI technologies.

### Lab : Conceptualizing Future AI Marketing Strategies

- **Objective:** Design a marketing strategy using future AI/ML trends like AR/VR or multi-modal AI.
- **Steps:**
  1. Research emerging AI technologies in marketing (e.g., multi-modal AI, AR/VR).
  2. Conceptualise a futuristic marketing strategy using AI.
  3. Design a prototype campaign leveraging these technologies.
  4. Present your strategy to the class.

### Assessment: Future AI Marketing

- **Question 1:** What are the most promising AI/ML trends in

## Module 13: Ethics and Governance in AI-Enabled Marketing.

**Objective:** Teach participants to understand and implement ethical AI practices in marketing, ensuring compliance with data privacy regulations and mitigating risks related to algorithmic bias, transparency, and consumer t r u s t .

### Lesson 1: Ethical Considerations in AI Marketing

- Importance of ethics in AI-driven marketing.
- Key issues: Data privacy, bias, algorithm transparency.

### Lesson 2: Regulatory Compliance (GDPR, CCPA)

- Overview of major regulatory frameworks governing AI in marketing.
- How to ensure compliance with data governance regulations.

### Lesson 3: Building Responsible AI Marketing Strategies

- Practical guidelines for ethical AI deployment.
- Hands-on: Auditing an AI marketing strategy for ethical concerns.

### Lesson 3: Meta-Learning for Brand Refinement

- How meta-learning enhances brand identity and personalization.
- Hands-on: Applying meta-learning techniques to improve brand presence.

### Lab : Ethical Auditing of AI Marketing Models

- **Objective:** Audit an AI marketing strategy for ethical compliance (privacy, bias, transparency).

