

Digital Transformation Proposal for Atom Bank Marketing Operations

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1. Introduction

For successful marketing, banks leverage data science to tailor personalised offers that meet customer preferences and requirements(Qualetics,2022). Banks are collecting huge volumes of data through different platforms including social media, and surveys, to segment customers based on their requirements and preferences(ibid). Recent studies indicate that the banking industry has experienced notable enhancements in financial performance due to the progress made in digital marketing(Nurjannah et.al,2022).

2. Organisation Insights

Atom Bank is the first UK-based bank that operates entirely through online platforms and is accessible through different devices such as mobiles and tablets(Barton,2022). Fig.1 highlights the organisation portfolio of Atom Bank. The organisational objective is to achieve the IPO target in the upcoming years, however, the company is facing high competition from traditional banks and peer digital banks(Barton,2022). Hence, the management sensed the urge to formulate sophisticated marketing strategies by leveraging data science to gain more potential customers which will eventually attract potential investors.

Organisation Portfolio	
Organisation Name	Atom Bank
Founded Year	2014
Organisation Type	Challenger Bank
Key Offerings	Savings Account, Mortgage, Small Business Loans
Target Customer Segment	Individuals(B2C) and Small Businesses(B2B); Youngsters aged between 18 and 35
Organisation Objective	Become fastest growing lender in the UK
Major Revenue Sources	Loan Interest, Treasury Income from Bank of England, Service Fees and Commissions from Loan Brokers
Organisation Mission	Offer exceptional, simpler and faster banking experience to customers than others
Active Area of Interest	Achieve IPO target in the upcoming years
Valuation	\$465M as on Feb 16, 2022
Total Funding	\$731M
Funding Round	11
Latest Round	Series E, \$36.3M, Nov 25, 2022
Unicorn Rating	Soonicorn
Investor Count	18
Top Peer Competitors	Revolut, Monso, Starling Bank

Figure 1. Atom Bank-Organisation Portfolio(AtomBank,2022;Barton,2022; Petrova,2022; Tracxn,2023)

The organisation hired an external consultant to recommend a data science solution for effective and optimised marketing operations. Through this assessment, the management is attempting to seek the answers to the following questions:

- How can be data science leveraged to formulate effective marketing strategies?
- What are the benefits and limitations of the proposed system?
- How the proposed system can be implemented?
- What are the risks involved and their mitigation actions?

The answers to these questions will be covered in the upcoming sections. It is crucial to understand the organisation structure, existing system and the current market trends for recommending an effective solution for the company.

2.1. Organisation Structure

Currently, the company has 400-500 employees working in different departments and is managed by the board of directors(AtomBank,2022). The company follows the state-of-the-art technology business model(ibid). As illustrated in Fig.2, the company has different departments including a dedicated Technology team for software development and Insights & Intelligence team for developing data analytics products for the company. The IT team is following agile approach for software development(Careers,2023b).

Department	Functions
Audit	Offers assurance to Atom Bank's senior management, board, and regulatory bodies in crucial areas such as governance, risk management, and internal controls.
Commercial	Collaborates closely with the Strategy, Customer, and Finance departments to conduct comprehensive research, design innovative solutions, and develop diverse service recommendations for Atom Bank's valued customers. This encompassing portfolio includes Mortgages, Business Lending, Savings, and Partnerships. Additionally, the Intermediary team supports the team, which focuses on enhancing Atom Bank's product sales capabilities and nurturing relationships with brokers and other external stakeholders.
Corporate Services	Ensures seamless support to Atom Bank's Vendor Management and Procurement, Facilities, Legal, and Company Secretarial functions, delivering exceptional service to suppliers, shareholders, executives, and employees while maintaining uninterrupted operations.
Environment, Society & Government	leads initiatives, shapes policies, and directs investments that position Atom Bank as a significant contributor to addressing the future needs of society, the environment, customers, and the overall business.
Finance	Comprises sub-teams specialising in Financial Reporting and Control, Financial Performance and Analysis, Regulatory Reporting, and Treasury. They hold a pivotal role in capital and liquidity planning and evaluating financial performance. The team is poised to take the lead as we progress towards a listing on a public capital market, showcasing their expertise and driving financial endeavours.
Insights & Intelligence	Comprises Data Science Engineers, Data Scientists, Credit Risk Modellers, and Data Governance professionals. This team harnesses the power of data, visualizations, and predictive modelling to deliver optimized analytics and actionable insights. Their invaluable contributions support informed decision-making across all facets of business operations.
Operations	Delivers exceptional customer service, bringing together various teams such as Intermediaries, Originations, Customer Support, Operational Effectiveness, Payments, Fraud, Reconciliation, and Customer Administration. These teams work in harmony to ensure seamless operations and provide outstanding support to valued customers.
People Experience	An integral part of the Operations department is dedicated to cultivating an inspiring, challenging, and fulfilling working environment for the past, present, and potential Atom Bank employees. Comprising Recruitment, Human Resources, and Learning sub-teams, they work tirelessly to enhance the overall employee experience within the organization.
Technology	Comprises of Testing, Engineering, DevOps, Change, Service Management, and Architecture professionals, this team plays a pivotal role in designing, developing, and delivering a seamless customer journey that prioritizes user-friendliness and efficiency. Their efforts are instrumental in maintaining Atom Bank's position as a frontrunner in the fintech industry.

Figure 2.Departments of Atom Bank(Careers,2023a)

2.2. Existing System Study

The following sections will cover SWOT and PESTLE analysis tools to comprehensively explore the company's potential opportunities, vulnerabilities and challenges(Eichhorn et.al,2021).

2.2.1.SWOT Analysis

Fig.3 illustrates the SWOT Analysis of Atom Bank. While Atom Bank possesses several strengths as a challenger bank, there are also areas that require improvement, such as marketing strategies and engagement on social media platforms.

STRENGTHS
<ul style="list-style-type: none">• Customer Focused – B2B and B2C and offer fast, personalised and easy banking experience(AtomBank,2022).• First app-only bank in the UK(Barton,2022).• FSCS Protected - customers are covered for up to £85,000 if Atom Bank suddenly went insolvent(ibid).• Provides higher app security features such as face recognition and voice recognition(ibid).• Maintains a robust team culture and organizational structure that effectively governs the business and effectively manages risks(AtomBank,2022).• Customer Loyalty-80% of customers are willing to use Atom Bank services again(Kunst,2023a).• Partnerships with Loan Brokers(AtomBank,2022).
WEAKNESSES
<ul style="list-style-type: none">• Lack of Brand Awareness(Kunst,2023a).• Lack of physical bank branches may raise trust and accessibility issues for some customers(Bignell,2022;Tan,2022).• As a new challenger bank, the risk level is increasing due to heightened oversight and scrutiny, as well as the increased scope of regulatory requirements in 2022 and the introduction of the Consumer Duty in 2023. Furthermore, additional Consultation Papers (CP) are anticipated, which will require further action(AtomBank,2022).• Social media channels of the company have a relatively smaller number of followers(as shown in Fig.8), indicating the need to develop more engaging content and campaigns.• Current marketing strategies employed by the company are not as effective as those of its competitors, resulting in lower website traffic generation(SimilarWeb,2023a).
OPPORTUNITIES
<ul style="list-style-type: none">• Following the COVID-19 pandemic, there has been a notable surge in the number of customers opting for online banking services, driven by the desire for convenience(Bignell,2022).• Expand the business reach(Schmidt-Jessa,2022).
THREATS
<ul style="list-style-type: none">• Competition from peer digital-only banks such as Revolut, Monzo, and Starling Bank(Tracxn,2023).• Competition from traditional banks and their entry to offer e-banking services(Schmidt-Jessa,2022).• Changing economic environments such as living-cost crises (AtomBank,2022).

Figure 3.SWOT Analysis

2.2.2.PESTLE

Fig.4 depicts the PESTLE Analysis for Atom Bank. Unlike SWOT analysis, PESTLE analysis examines an organisation's environment by assessing the Political, Economic, Social, Technological, Legal, and Environmental factors that surround it(Eichhorn et.al,2021).

POLITICAL	<ul style="list-style-type: none"> The Russian invasion of Ukraine has had a significant impact on the price and accessibility of essential commodities like food and gas. It has also raised concerns about cyber-attacks, and these challenges are expected to persist for an extended period(AtomBank,2022). Additionally, certain aspects of the Brexit arrangements, particularly trade agreements with Europe, contribute to further complications in this environment (AtomBank,2022; Eichhorn et.al,2021).
ECONOMIC	<ul style="list-style-type: none"> Challenger banks are facing a number of regulatory challenges, which are making it difficult for them to grow and innovate. These challenges include the need to comply with complex regulations and the risk of being fined for non-compliance(AtomBank,2022). The Bank of England's decision to raise interest rates to control inflation lead to increased borrowing costs, potential loan defaults, and slower growth in the mortgage market(Thomas,2022).
SOCIAL	<ul style="list-style-type: none"> Despite the increasing willingness of people to embrace online banking services for convenience in the post-COVID era, when it comes to significant financial decisions, the majority of customers in the UK still place their trust in the in-person banking experience(Bignell,2022). Atom Bank primarily targets customers from the Gen Z and Millennial generations. Unlike older generations, who prioritize data protection concerns, Millennials are more inclined to manage their finances through smartphone apps(Eichhorn et.al,2021).
TECHNOLOGICAL	<ul style="list-style-type: none"> As a digital bank, Atom Bank recognizes that cyber-attacks pose a significant threat, with the sophistication of attacks continuously evolving. To address this, Atom Bank places a strong emphasis on implementing and maintaining robust controls to detect and prevent any attempts to compromise its systems. Continuous focus and mitigation efforts are undertaken to ensure the security of customer data and the integrity of the bank's operations(AtomBank,2022). After the pandemic, Atom Bank is facing challenges in recruiting and retaining highly skilled employees in technical roles, including Software Engineers, solution architects, and risk managers(AtomBank,2022; ScaleUp Stories with Atom Bank ,2021). For companies that heavily rely on technology, it is critical to consistently assess their business models to ensure they are in line with the latest technological advancements. As a digital bank operating within a fast-paced environment, the successful execution of Atom Bank's change and technology agenda is of utmost significance for the bank's growth and long-term sustainability(AtomBank,2022; Eichhorn et.al,2021).
LEGAL	<ul style="list-style-type: none"> Bank should comply with all legal and regulatory requirements such as GDPR, labour and employment rights. As a new challenger bank, the risk level is increasing due to heightened oversight and scrutiny, as well as the increased scope of regulatory requirements in 2022 and the introduction of Consumer Duty in 2023 (AtomBank,2022).
ENVIRONMENTAL	<ul style="list-style-type: none"> Atom Bank has implemented a robust governance framework to address the risks linked to climate change, ensuring that these risks are thoroughly discussed at senior levels within the organization(AtomBank,2022). there is an increasing expectation from customers, regulators, and investors for firms to respond effectively to climate change, which introduces the possibility of reputational risks(AtomBank,2022).

Figure 4.PESTLE Analysis

Based on the both analyses above, Atom Bank is currently focusing on IPO readiness and aims to enhance brand awareness to attract both customers and investors. Despite various factors influence growth and performance, the bank recognizes the importance of implementing effective marketing strategies that leverage the power of data analytics to accomplish its objectives while adhering to the legal and regulatory requirements.

2.3. Competitor Analysis

Having understood the organisation structure and existing system, this section will cover competitor analysis. According to the Statista report shown in Fig.5, 38% of UK residents are aware of Atom Bank, and 24% of them like the brand(Kunst,2023a). Furthermore, 80% of the customers are loyal to Atom Bank and are willing to leverage the services again(ibid). While its top peer competitor, Revolut has significantly higher brand awareness than Atom as illustrated in Fig.6(Kunst,2023b).

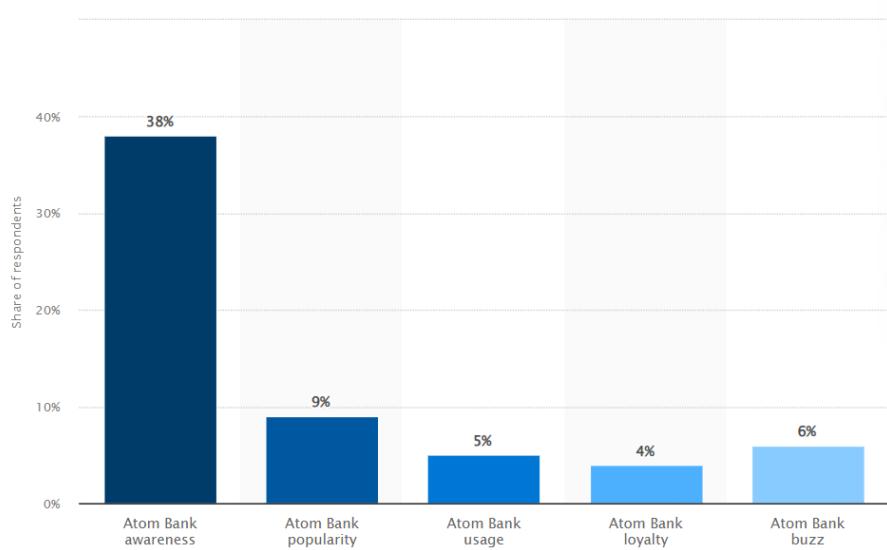


Figure 5. AtomBank-Brand Awareness in the UK(Kunst,2023a)

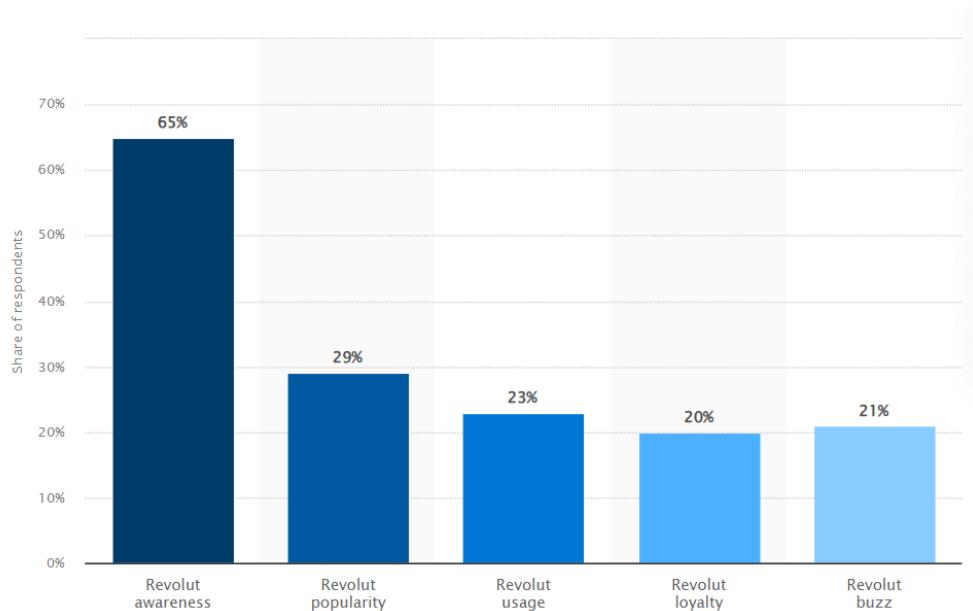


Figure 6. Revolut-Brand Awareness in the UK(Kunst,2023b)

	Atom Bank	Revolut	Monso	Starling Bank
Overall App Rating	4.8	4.3	4.3	4.3
Total App Review Count	10,370	134,877	27,296	35,854
Positive Review Percentage	94%	85%	85%	84%
Negative Review Percentage	6%	15%	15%	16%
Citation	(Trustpilot,2023a)	(Trustpilot,2023c)	(Trustpilot,2023b)	(Trustpilot,2023d)

Figure 7. Mobile App Review Comparison

Fig.7 illustrates the banking app review comparison between Atom Bank and its top 3 competitors. Although Atom Bank has the highest review, it has the least number of

reviews compared to the others. So, bank should formulate better marketing strategies to increase the product reviews.

Fig.8 depicts the social media presence of Atom Bank and the top 3 peer competitors. Atom Bank has the least number of followers across popular social media platforms when compared to its competitors. Atom Bank needs improvement in this area to increase brand awareness and thereby attract potential customers.

Social Media	Atom Bank	Revolut	Monzo	Starling Bank	Citations
Facebook	10k	385k	84k	31k	(AtomBank ,2023a; RevolutApp,2023;Monzo,2023a; StarlingBank ,2023a)
LinkedIn	50k	688k	343k	180.6k	(AtomBank ,2023c; Revolut,2023b;Monzo,2023e; StarlingBank ,2023c)
YouTube	583	51.7k	8.52k	4.81k	(AtomBank ,2023d; Revolut,2023d;Monzo,2023d; StarlingBank ,2023e)
Instagram	3k	255k	84.9k	41k	(AtomBank ,2023b; Revolut,2023a;Monzo,2023b; StarlingBank ,2023b)
Twitter	Account Closed	346.1k	144.9k	68.1k	(Twiddy ,2022; Revolut,2023c;Monzo,2023c; StarlingBank ,2023d)

Figure 8.Social Media Followers Analysis of Atom Bank and Top 3 Peer Competitors

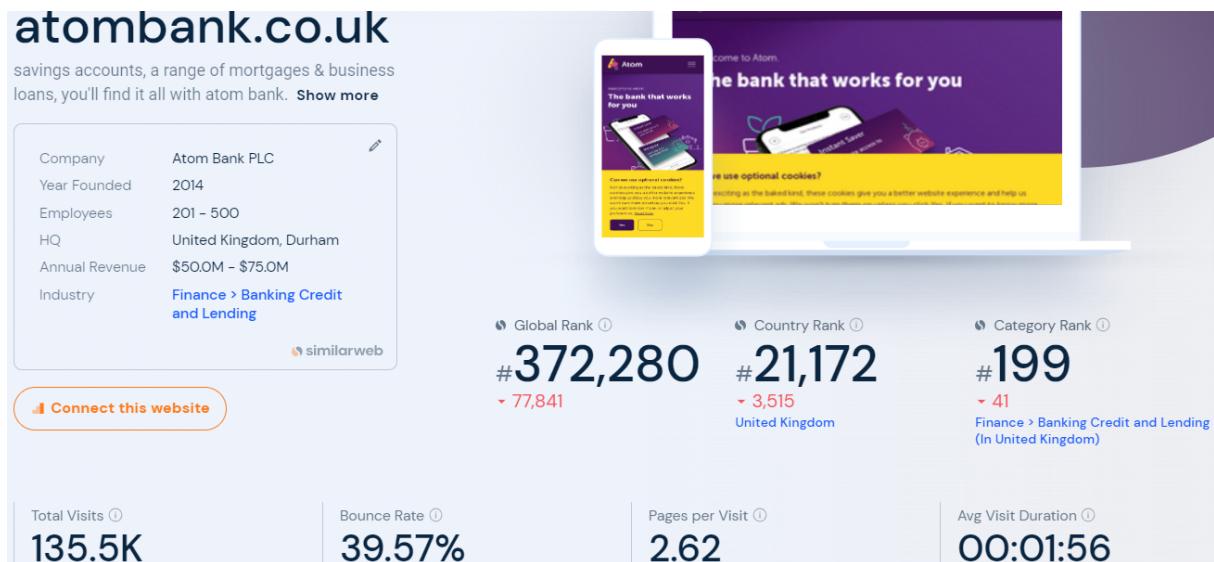


Figure 9.Web Traffic Analysis-Atom Bank(SimilarWeb,2023a)

Fig.9 and Fig.10 depicts the web traffic analysis of Atom Bank and Revolut. Although Atom Bank demonstrates a lower bounce rate compared to Revolut, the report shows that Atom Bank falls behind in terms of total visits and average visit duration. These findings strongly imply that the marketing strategies implemented by Atom Bank may not be as successful as those employed by Revolut. To improve conversion and lead

rates, it is crucial for Atom Bank to develop and implement more effective marketing strategies.

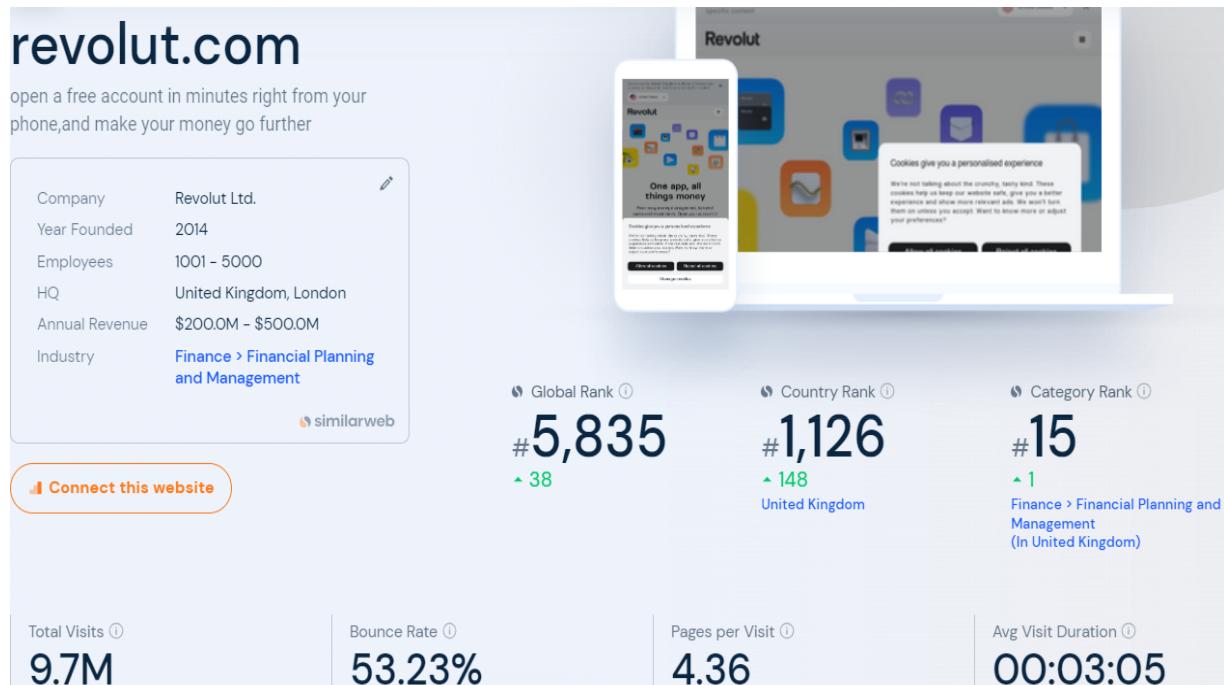


Figure 10. Web Traffic Analysis-Revolut(SimilarWeb,2023b)

3. Marketing Strategies for Atom Bank

The current trend of data analytics allows the banking industry to adopt a customer-centric approach driven by data(Indriasari,Gao and Matsuo,2019). Personalized services have emerged as a crucial strategy for maximizing customer engagement and attracting potential customers(ibid). Before making any recommendations to Atom Bank, it is crucial to conduct a Cost-Benefit Analysis(CBA). CBA helps assess whether the benefits of a project outweigh its costs, providing a decision-making tool to determine its desirability(Nas,2016).

3.1. Cost-Benefit Analysis(CBA)

Fig.12 showcases various marketing strategies and their corresponding advantages, while Fig.11 provides a CBA of these strategies. Out of the seven strategies, six are recommended for implementation at Atom Bank, excluding strategy number 2 due to its low cost and limited benefits, making it unsuitable for the current circumstances.

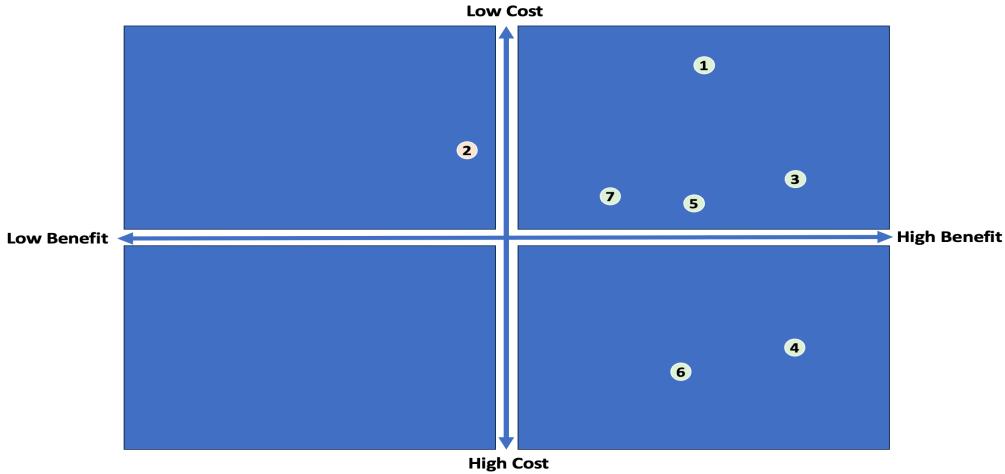


Figure 11.Cost-Benefit Analysis of Marketing Strategies(Foy,2023;Greene,2022; Maitra,2019;Qureshi,2022)

No.	Description	Benefit	Ranking	Recommended
1	Improve the existing social media channels including Facebook, LinkedIn with more customer engaging content to promote visibility.	<ul style="list-style-type: none"> Brand awareness and visibility Enhance customer engagement Increased web traffic Promote lead rates 	1	Yes
2	Expand social media presence to more channels such as TikTok	<ul style="list-style-type: none"> Brand awareness and visibility Enhance customer engagement Increased web traffic Promote lead rates 	7	No. Atom Bank should focus on enhancing the existing channels over expanding to new ones.
3	Implement CJM for improving customer experience across all online platforms such as website, mobile app and social media channels.	<ul style="list-style-type: none"> Deeper understanding of customer Seamless and consistent customer experience Improved customer retention Data driven decision making 	4	Yes
4	Implement predictive model for CLTV analysis.	<ul style="list-style-type: none"> Identification of high-value customers for targeted retention efforts Personalized service offerings based on customer preferences Improved understanding of customer segments and associated profitability Tailored marketing strategies for different customer segments Optimized resource allocation for acquisition, retention, and cross-selling activities Revenue growth driven by effective customer targeting Increased customer satisfaction through personalized experiences Enhanced long-term profitability through improved customer retention strategies 	5	Yes
5	Motivate customers to provide product reviews through exceptional customer service, simplified review processes, personalized requests, and offering incentives.	<ul style="list-style-type: none"> Enhance SEO, Brand reputation and visibility Influence customer buying decisions Promote conversion rates Identify improvement areas from feedback. Build trust and confidence 	3	Yes
6	Implement market attribution model to determine the effectiveness of different marketing channels and campaigns.	<ul style="list-style-type: none"> By tracking and analyzing marketing attribution data, Atom Bank can allocate marketing budgets more efficiently, focusing on the channels and campaigns that generate the highest return on investment (ROI). 	6	Yes
7	Collaborate with influencers or industry experts who align with Atom Bank's values and target audience. Seek partnerships for sponsored content, guest blogging, social media collaborations, or endorsements to expand reach and credibility.	<ul style="list-style-type: none"> Brand awareness and visibility Enhance customer engagement Increased web traffic Promote lead rates 	2	Yes

Figure 12.Marketing Strategies(Foy,2023;Greene,2022; Maitra,2019; McKinsey&Company,2023;Qureshi,2022)

In the following sections, this report provides detailed coverage of strategy number 3, 4, and 6, as they are more complex compared to the other strategies.

3.2. Customer Journey Mapping(CJM)

As mentioned earlier in Fig.9, approximately 39% of website visitors leave without engaging in any business with Atom Bank. To address this issue, implementing a Customer Journey Map(CJM) can provide valuable insights into the user experience through visual representations(Qureshi,2022). CJM will assist Atom Bank in identifying areas of improvement on the website, mobile app and social media channels, enabling targeted enhancements to increase conversion rates and customer retention(ibid). Fig. 13 illustrates the CJM project analysis and Fig.14 shows the CJM implementation steps. Fig.15 highlights the CJM risk assessment.

Project Scope	Current Situation	Value/Benefit	Resources Required
<ul style="list-style-type: none"> Customer Journey Map for mobile apps, website and social media channels CJM should be performed in regular intervals to understand customer pain points and continuous improvement of process, systems and tools. 	<ul style="list-style-type: none"> Based on the analysis of website traffic, it has been observed that 39% of visitors exhibit a bounce rate, indicating that they leave the website without engaging further. Compared to its competitors, Atom Bank has a significantly lower number of followers on its social media channels. 	<ul style="list-style-type: none"> Enhanced user experience across online platforms including website, apps and social media channels. Improved conversion rates and customer retention. 	<ul style="list-style-type: none"> Implementation of CJM for each platform might take 2 to 4 weeks. Given that the company possesses internal expertise, there is no need to outsource or recruit new personnel for this task. However, if the staff encounters any technical difficulties, they can seek assistance from the support team of the tool. Additional expenses include licensing fees for the analytics and tracking tools employed, as well as the costs associated with conducting customer research and gathering data.

Figure 13.CJM Project Analysis(Kaplan,2022)

1. Establish Objectives and Scope
<ul style="list-style-type: none"> Outline the goals and boundaries that should be accomplished through Customer Journey Mapping (CJM), such as enhancing conversion rates or obtaining customer reviews. Determine the relevant factors that facilitate the attainment of these objectives.
2. Develop Buyer Persona
<ul style="list-style-type: none"> Conduct a comprehensive study on the target customer segments, analysing their overall characteristics and behaviour, and categorize them into distinct groups. Developing buyer personas will empower the marketing team to provide personalized promotions and product services, leading to improved conversion rates.
3. Capture Data
<ul style="list-style-type: none"> Utilize tools like Google Analytics to record the customer journey within the mobile app. Capture data from customers in different ways such as feedback forms, surveys or focus group etc.
4. Identify Customer Touch Points
<ul style="list-style-type: none"> Identify various touchpoints where customers engage, such as completing transactions, contacting customer support, or interacting with the social media page. This process is crucial for mapping user journeys as it provides valuable insights into customers' actions.
5. Identify Improvement Areas
<ul style="list-style-type: none"> By breaking down the customer journey into distinct stages, the company can identify pain points experienced by customers at each stage. Also, it provides insights to the expectations or goals of customers at each stage.
6. Implement Changes
<ul style="list-style-type: none"> Develop an action plan for the identified improvement areas and opportunities. Update the process, systems and touchpoints to enhance customer experience to boost conversions and improve customer retention.

Figure 14.CJM Implementation Steps(PostGrid,2022; Qureshi,2022;Shirsath,2021)

CJM Risk Assessment

- **Risk Category:** Implementation
 - **Risk Level:** High
 - **Risk:** Effective implementation of CJM requires cross-functional support, which can be challenging if the company operates in business silos.
 - **Mitigation Actions:** CJM should be placed and discussed within a collaborative environment to enable different teams to access and work together on it. Without collaboration, it may fail to deliver the expected value to the business.
-
- **Risk Category:** Implementation
 - **Risk Level:** Medium
 - **Risk:** Generating multiple CJMs tailored to different personas can be a time-intensive and resource-demanding task. In many cases, CJMs may fall short in capturing individual customer preferences, instead offering generalized preferences or behavior patterns of customer segments.
 - **Mitigation Actions:** Conduct extensive research to gather more detailed customer insights.
-
- **Risk Category:** Implementation
 - **Risk Level:** High
 - **Risk:** Customers do not always strictly adhere to the CJM; they frequently skip steps, loop back, or redo certain stages.
 - **Mitigation Actions:** Continuously monitor and update the CJM to reflect changes in customer behavior, market trends, and industry dynamics. Stay engaged with customers through feedback mechanisms and ongoing research to understand their evolving needs and expectations.
-
- **Risk Category:** Data Collection
 - **Risk Level:** High
 - **Risk:** Data sources may be incomplete or biased, potentially leading to inaccurate representations of the customer journey. Furthermore, during the customer research phase, handling a large volume of data and analysing it effectively to derive meaningful insights that add business value can be a challenging task.
 - **Mitigation Actions:** Utilize multiple data sources, such as customer surveys, interviews, analytics data, focus groups and feedback channels, to gather a comprehensive view of the customer journey. Regularly validate and cross-reference data to ensure accuracy. Additionally, conduct thorough analysis of the data to determine its usefulness in deriving meaningful insights that align with the objectives of CJM.
-
- **Risk Category:** Data Privacy and Ethics
 - **Risk Level:** High
 - **Risk:** Adhering to data privacy and protection rules is crucial when collecting data for CJM. Failure to do so can lead to security breaches and potential non-compliance with GDPR regulations, which may result in hefty fines.
 - **Mitigation Actions:** Ensure compliance with data privacy regulations and maintain ethical practices in data collection, storage, and usage. Safeguard customer data and communicate transparently about how data is being utilized. Obtain explicit consent from customers for collecting and using their personal data. Collect only the necessary data required for CJM. Avoid collecting excessive or sensitive information that is not directly relevant to the mapping objectives. Implement techniques to anonymize or pseudonymize customer data to reduce the risk of identifying individuals. Remove or encrypt Personally Identifiable Information (PII) whenever possible. If third-party vendors are involved in data collection or processing, conduct due diligence to ensure they have appropriate data privacy and security measures in place. Use data processing agreements or contracts to clearly define roles, responsibilities, and data protection obligations.

Figure 15.CJM Risk Assessment(Mäki and Alamäki,2019;Ramshaw,2023)

3.3. Predictive Model for Customer Lifetime Value(CLTV) Analysis

Predictive analytics is an advanced data analytics approach that leverage techniques such as Big Data Mining, Statistical Analysis, Modelling, Machine Learning(ML), and Artificial Intelligence(AI) to analyse huge data volumes and provide insights that

enable accurate predictions regarding future events or behaviours of customers(Sarda,2023). Prediction analytics can be leveraged to build ML model for CLTV analysis(Maitra,2019).

Customer Lifetime Value (CLTV) is a critical metric in modern customer-centric business landscape, particularly within the banking industry(Maitra,2019). However, numerous banks have overlooked the importance of this metric and failed to prioritize it effectively(Nichols,2022).It stands out as the most influential performance metric, exhibiting a remarkable 88% correlation with long-term bank profitability. Its significance surpasses that of other crucial factors such as margin, cost of funds, non-interest income, and loan profitability when considered collectively(ibid).

Atom Bank aims to differentiate itself by providing a superior customer experience and building long-term relationships with its customers(AtomBank,2022). CLTV helps Atom Bank assess the value of its customers over their entire lifecycle, enabling the bank to make informed decisions about customer acquisition, retention, and cross-selling strategies(Maitra,2019). Furthermore, a study conducted by Bain & Company revealed that a mere 5% improvement in the customer retention rate can potentially lead to a significant increase in profits, ranging from 25% to 95%(Haponik,2021). Hence, the adoption of a prediction model for CLTV analysis can yield long-term advantages for Atom Bank.

Project Scope	Current Situation	Value/Benefit	Resources Required
<ul style="list-style-type: none"> CLTV analysis can help to determine the most profitable customers, optimize offerings, segment customers effectively, and provide insights into customer acquisition costs. 	<ul style="list-style-type: none"> While it focuses on providing exceptional customer experiences, there is a need to enhance its understanding of customer value and optimize business strategies accordingly. The current customer base and their behaviour will serve as the foundation for the CLTV analysis. 	<ul style="list-style-type: none"> Enable the bank to identify its most valuable customers, allowing for targeted retention efforts and personalized service offerings. The analysis will help in market segmentation, allowing the bank to understand different customer segments and their associated profitability. This knowledge will guide the bank in tailoring marketing strategies and resource allocation for acquisition, retention, and cross-selling activities. CLTV analysis will help drive revenue growth, customer satisfaction, and long-term profitability. 	<ul style="list-style-type: none"> Determining the exact resources required for this project implementation can be influenced by various factors such as data volume, ML model batch size, epoch time, and overall complexity. As a result, providing a precise estimate for time and cost is challenging. On average, however, the implementation of this project may take approximately 6 to 12 months. Costs associated with the project would typically involve resources for ML model training, subscription fees for cloud services, expenses related to data gathering, and other relevant expenditures.

Figure 16.CLTV Prediction Model Project Analysis(Karaman,2019; Maitra,2019;Martinez,2023)

1. Establish Objectives and Scope
<ul style="list-style-type: none"> Define the objectives and boundaries of the CLTV analysis, including factors such as acquisition costs, promotions, discounts, etc. Determine the desired timeframe for CLTV calculation (e.g., 3, 6, or 12 months) and identify the necessary formulas for accurate calculation.
2. Data Preparation
<ul style="list-style-type: none"> Collect the relevant data required for prediction, such as customer age, total deposited amount, and duration of the customer's relationship with the bank. If the necessary data already exists in the customer database, utilize it for the analysis. Conduct a comprehensive analysis of the data to ensure its completeness, accuracy, and consistency. Additionally, perform data cleaning procedures to rectify any inconsistencies or errors before proceeding with further processing.
3. Feature Engineering
<ul style="list-style-type: none"> Identify the relevant features and parameters needed for accurate prediction.
4. Build and Train the ML Model
<ul style="list-style-type: none"> Once the data preparation phase is complete, select a suitable algorithm, such as a Linear Regression Model, to construct the ML model. Split the data into training and testing sets to train the model and evaluate its performance. Perform hyperparameter optimization to enhance the accuracy and performance of the ML model during training.
5. Evaluate and Deploy the ML Model
<ul style="list-style-type: none"> Thoroughly assess the ML model to determine its effectiveness. Identify evaluation parameters, such as Root Mean Squared Error (RMSE), Mean Squared Error (MSE), or Mean Absolute Error (MAE), and assess the model's performance based on these identified parameters. Usable model is deployed for predictions.
6. Model Monitoring and Retraining
<ul style="list-style-type: none"> Once the model is deployed, it is essential to establish a monitoring system to assess its performance and accuracy in making predictions. Regular monitoring allows for a comprehensive understanding of how well the model is performing and helps identify any potential issues or deviations from expected outcomes. Additionally, to ensure the model remains effective over time, it should be retrained at regular intervals. This retraining process allows the model to adapt and learn from changing customer trends and patterns. By incorporating new data and retraining the model periodically, it can continue to provide accurate and up-to-date predictions, maintaining its relevance in the evolving business landscape.

Figure 17.CLTV Prediction Model Implementation Steps(Adachi,2021;Karaman,2019;Maitra,2019;Martinez,2023)

CLTV Prediction Model Risk Assessment	
Risk Category: Adoption.	Risk Level: High
Risk: The ML prediction model for CLTV analysis may fail to deliver any value to the business if it is not implemented correctly, lacking a clear understanding of the business requirements, expected outcomes, and associated risks.	
Mitigation Actions: Before adopting the prediction model, conduct a thorough analysis to ensure it aligns with business requirements and can deliver expected outcomes. Proper design and implementation are crucial to avoid undesired results. Also, continuously monitor and evaluate the model after adoption to ensure it adds value and identify areas for improvement.	
Risk Category: Data Collection and Preparation.	Risk Level: High
Risk: Insufficient high-quality data for training the ML model poses a significant challenge. If the model is not trained on a suitable dataset, it may result in inaccurate predictions and compromised performance.	
Mitigation Actions: Ensure robust data collection and preparation. Conduct data quality assurance and cleaning. Employ data augmentation techniques if data is limited. Foster collaboration between data scientists, domain experts, and stakeholders to ensure a comprehensive understanding of the data requirements and model objectives. Domain experts can provide valuable insights and guidance for data selection, interpretation, and validation. Establish mechanisms for continuous feedback and improvement. Regularly review and update the training data to incorporate new information and evolving business dynamics. Monitor the model's performance and retrain as necessary to improve its predictions over time.	
Risk Category: Data Collection and Preparation	Risk Level: High
Risk: Insufficient good features and a lack of reliable ground truth data can adversely impact the performance of the algorithm and limit the capabilities of the model.	
Mitigation Actions: Allocate additional time and resources to enhance feature engineering efforts. This may include activities such as transforming, combining, or generating new features to improve the predictive capabilities of the ML model. Apply transfer learning, where a pre-trained model on a related task or domain is fine-tuned using the limited ground truth data available. This leverages the knowledge captured by the pre-trained model and enhances the model's performance.	
Risk Category: Implementation	Risk Level: High
Risk: Different ML algorithms possess varying degrees of interpretability, with deep learning models being particularly challenging in this aspect. The complex structure and intricate internal representations of deep learning models make it difficult to ascertain the specific factors that contribute to their final decision-making process. This lack of transparency and interpretability can hinder the understanding and trustworthiness of the model's outputs, potentially posing risks in scenarios where explanation and interpretation are crucial.	
Mitigation Actions: Conduct feature importance analysis to identify the input features that have the most influence on the model's predictions. This can help understand which factors are driving the model's decisions, even if its internal implementation is complex. Explore strategies to simplify the model architecture, such as reducing the number of layers or parameters. This can result in a more interpretable model while still maintaining reasonable performance.	

Figure 18.CLTV Prediction Model Risk Assessment(Brownlee,2020; Elia,2020;Stewart,2019;Tamura,2023)

Fig.16 illustrates the CLTV Prediction Model project analysis and Fig.17 depicts the project implementation steps. Fig.18 highlights the risks involved in this project and their mitigation actions. Given that Atom Bank is currently leveraging Google Cloud for its development activities, the deployment of the ML model can be seamlessly facilitated through Google Cloud's suite of services, which offers a wide range of tools and resources specifically designed for developing and deploying ML projects(Engineering,2020;Google-Cloud,2021)

3.4. Marketing Attribution ML Model

Marketing attribution involves tracking and analysing the effectiveness of various marketing activities and their outcomes(Foy,2023). The use of marketing attribution models enables the allocation of credit for conversions to specific touchpoints and marketing channels(ibid). This empowers marketers to identify the strategies that are most effective in driving both short-term and long-term conversions(ibid). Through the careful tracking and analysis of marketing attribution data, Atom Bank can optimize the allocation of their marketing budgets(ibid). This allows them to prioritize channels and campaigns that deliver the greatest return on investment (ROI), leading to more efficient marketing strategies(ibid).

The marketing attribution models are broadly classified into two – single-touch and multi-touch models(Marketing Evolution,2022). Fig.19 and Fig.20 shows different sub-categories in single-touch and multi-touch attribution models respectively.

First Touch

- First-touch attribution operates under the assumption that the consumer's decision to convert was solely influenced by the first advertisement they encountered. As a result, it assigns full credit to this initial touchpoint, disregarding any subsequent messaging they may have encountered.
- Although first-touch marketing attribution is simple to implement by tagging the lead source and attributing it to the final conversion, it overlooks any customer interactions that occur after the initial touch. This limitation can distort the perceived effectiveness of other channels involved in the customer journey.

Last Touch

- Last-touch attribution assigns full credit to the last touchpoint that the consumer engaged with before making a purchase, without considering any prior interactions.
- This could be call from sales team or a sales pitch, but it disregards any previous interactions such as website visits or interactions with the lead qualification team, resulting in a lack of valuable insights about other effective marketing channels.

Figure 19. Single-Touch Attribution Models(Marketing Evolution,2022; Rheinlander,2019)

Linear
<ul style="list-style-type: none"> • Linear attribution assigns equal credit to each touchpoint that the consumer engages with leading up to a purchase, considering all interactions to be equally influential in driving the conversion.
U-Shaped
<ul style="list-style-type: none"> • The U-Shaped attribution model evaluates engagements separately, recognizing that certain touchpoints have a greater impact on the path to purchase. It assigns 40% credit to both the first touch and the lead conversion touch, while the remaining 20% is distributed among the touchpoints engaged with between the first and lead conversion touch.
Time Decay
<ul style="list-style-type: none"> • The time decay model assigns varying weights to each touchpoint on the path to purchase. It gives more weight to the touchpoints engaged with closer to the conversion, assuming that they had a greater impact on the sale compared to those engaged with earlier.
W-Shaped
<ul style="list-style-type: none"> • The W-Shaped model builds upon the concept of the U-Shaped model by adding another key touchpoint, the opportunity stage. In this model, the first touch, lead conversion, and opportunity creation each receive 30% of the credit and the rest 10% is distributed among the additional engagements.
Full Path
<ul style="list-style-type: none"> • The full path attribution model extends the W-shaped model by incorporating the final close as a significant milestone in the customer journey. It primarily attributes credit to the major milestones, while assigning relatively lower weight to the touchpoints in between. One of the notable advantages of this model is that it considers the post-opportunity follow-up interactions by the sales team, giving them equal weight as early-stage marketing activities.
Custom
<ul style="list-style-type: none"> • The custom attribution model provides the flexibility to assign personalized attribution weights based on factors such as industry, marketing channels, and buyer behaviour. This highly adaptable approach allows teams to tailor the weighting percentages according to their specific requirements, making it one of the most advanced attribution models available.
Weighted Multi-Touch
<ul style="list-style-type: none"> • Implementing a weighted multi-touch attribution model enables the consideration of all interactions during the sales cycle, with a focus on assigning higher weights to the touchpoints that played a more significant role. While this approach provides the most accurate representation of the customer journey, it can be challenging to implement. Weighted touchpoint modeling involves allocating a percentage of the revenue credit to various touchpoints, as determined by the specific multi-touch attribution model chosen by the organization.

Figure 20. Multi-Touch Attribution Models(Marketing Evolution,2022; Rheinlander,2019)

Marketing attribution has evolved into a comprehensive process that includes various aspects of branding, campaigns, and customer experience(Rheinlander,2019). Implementing multi-touch and weighted multi-touch attribution models requires collaboration across departments, with IT playing a role in implementation and finance teams contributing to goal setting and ROI analysis(ibid). Integration with the company's CRM system is crucial for multi-touch attribution programs(ibid). By directly feeding attribution data into the sales process, sales and marketing teams can leverage the same tool to track, monitor, and evaluate campaign performance and strategy(ibid). Without this integration, the collected data remains isolated within departments, making it challenging to apply for future campaign optimization(ibid).

Implementing a marketing attribution model at Atom Bank would leverage the collaborative nature of its departments, enabling the tracking and analysis of marketing activities' effectiveness across various touchpoints and channels to optimize customer acquisition, retention, and overall business success. The ML marketing attribution model addresses the limitations of traditional attribution by leveraging behavioural data collected from the website and applying ML algorithms to assess each visit, assign a monetary value, and predict future conversions(Garina,2023). The model generates enables advanced marketing analysis, performance reporting, and optimization of advertisement campaigns through feedback signals sent to advertising platforms for enhanced bidding and targeting algorithms(ibid).

Fig.21 illustrates the Marketing Attribution ML Model project analysis and Fig.22 depicts the project implementation steps. The implementation steps for both the marketing attribution ML model and CLTV prediction model are nearly identical, with the only differences lying in the objectives, data utilized, machine learning algorithms employed, and the metrics used to evaluate the models. Fig.23 highlights the risks involved in this project and their mitigation actions.

Project Scope	Current Situation	Value/Benefit	Resources Required
<ul style="list-style-type: none"> • Implement an ML marketing attribution model at Atom Bank to enhance the effectiveness of marketing efforts, improve ROI, and optimize campaign performance. • The model will utilize machine learning algorithms to analyse behavioural data from the website, assign value to each visit, and predict future conversions. It will provide actionable insights for advanced marketing analysis, reporting, and optimization of advertising campaigns. 	<ul style="list-style-type: none"> • Traditional attribution methods face challenges due to tracking and cookie use regulations, resulting in limited data availability. • This hampers the bank's ability to accurately measure the impact of marketing activities and make data-driven decisions for campaign optimization. 	<ul style="list-style-type: none"> • Optimised Marketing Spend • Increased ROI • Improved Personalisation • Enhance Product development • Improved accuracy of analysis • Real-time insights into marketing performance • Better targeting and bidding • Increased efficiency of marketing teams • Compliance with privacy regulations 	<ul style="list-style-type: none"> • Determining the exact resources required for this project implementation can be influenced by various factors such as data volume, ML model batch size, epoch time, and overall complexity. As a result, providing a precise estimate for time and cost is challenging. On average, however, the implementation of this project may take approximately 6 to 12 months. Costs associated with the project would typically involve resources for ML model training, subscription fees for cloud services, expenses related to data gathering, and other relevant expenditures.

Figure 21. Marketing Attribution ML Model Project Analysis(Garina,2023;Marketing Evolution,2022)

1. Establish Objectives and Scope
<ul style="list-style-type: none"> Define the objectives and scope of the project such as effectiveness of marketing campaigns or find any gaps in customer journey etc.
2. Data Preparation
<ul style="list-style-type: none"> Collect the relevant data required for training and prediction of the model. If the necessary data already exists in the customer database, utilize it for the analysis. Conduct a comprehensive analysis of the data to ensure its completeness, accuracy, and consistency. Additionally, perform data cleaning procedures to rectify any inconsistencies or errors before proceeding with further processing.
3. Feature Engineering
<ul style="list-style-type: none"> Identify the relevant features and parameters needed for accurate prediction.
4. Build and Train the ML Model
<ul style="list-style-type: none"> Once the data preparation phase is complete, select a suitable algorithm, such as a Logistic Regression or Classification Model, to construct the ML model. Split the data into training and testing sets to train the model and evaluate its performance. Perform hyperparameter optimization to enhance the accuracy and performance of the ML model during training.
5. Evaluate and Deploy the ML Model
<ul style="list-style-type: none"> Thoroughly assess the ML model to determine its effectiveness. Identify evaluation parameters, such as Area under the Curve(AUC) or pseudo R squared, and assess the model's performance based on these identified parameters. Usable model is deployed for predictions.
6. Model Monitoring and Retraining
<ul style="list-style-type: none"> Once the model is deployed, it is essential to establish a monitoring system to assess its performance and accuracy in making predictions. Regular monitoring allows for a comprehensive understanding of how well the model is performing and helps identify any potential issues or deviations from expected outcomes. Additionally, to ensure the model remains effective over time, it should be retrained at regular intervals. This retraining process allows the model to adapt and learn from changing customer trends and patterns. By incorporating new data and retraining the model periodically, it can continue to provide accurate and up-to-date predictions, maintaining its relevance in the evolving business landscape.

Figure 22. Marketing Attribution ML Model Implementation Steps(Staron, 2019)

Marketing Attribution Model Risk Assessment	
Risk Category: Adoption	Risk Level: High
Risk: The ML prediction model for Marketing Attribution analysis may fail to deliver any value to the business if it is not implemented correctly, lacking a clear understanding of the business requirements, expected outcomes, and associated risks.	
Mitigation Actions: Before adopting the prediction model, conduct a thorough analysis to ensure it aligns with business requirements and can deliver expected outcomes. Proper design and implementation are crucial to avoid undesired results. Also, continuously monitor and evaluate the model after adoption to ensure it adds value and identify areas for improvement.	
Risk Category: Implementation	Risk Level: Medium
Risk: During the implementation of attribution models, various types of biases may arise, including correlation bias and in-market bias. <i>Correlation bias</i> occurs when analyzing the customer journey, leading to the misconception that one event caused another, even if it may not be true. <i>In-market bias</i> occurs when attributing customer actions to specific ads, even if the customers would have made the purchase regardless of seeing the ad.	
Mitigation Actions: Conduct rigorous data validation and quality checks to ensure the accuracy and reliability of the data used in attribution modeling. This includes verifying data sources, cleansing and standardizing data, and addressing any data inconsistencies or errors. Also, ensure the model is implemented correctly to measure the attribution accurately.	
Risk Category: Implementation	Risk Level: High
Risk: Attribution models frequently fail to fully consider the connection between brand perception and consumer behaviour, or only examine them at a high-level regression level.	
Mitigation Actions: It is crucial for marketers to ensure that their attribution models have the capability to identify the connections between brand building efforts and conversions. Failing to comprehend how the attribution model measures the impact of branding can be a significant and harmful mistake, as it can result in decisions based on incomplete recommendations that undermine the value of brand building.	
Risk Category: Data Privacy and Ethics	
Risk Level: High	
Risk: Adhering to data privacy and protection rules is crucial when collecting data for Marketing Attribution model. Failure to do so can lead to security breaches and potential non-compliance with GDPR regulations, which may result in hefty fines.	
Mitigation Actions: Ensure compliance with data privacy regulations and maintain ethical practices in data collection, storage, and usage. Safeguard customer data and communicate transparently about how data is being utilized. Obtain explicit consent from customers for collecting and using their personal data. Collect only the necessary data required for the model. Avoid collecting excessive or sensitive information that is not directly relevant to the mapping objectives. Implement techniques to anonymize or pseudonymize customer data to reduce the risk of identifying individuals. Remove or encrypt Personally Identifiable Information (PII) whenever possible. If third-party vendors are involved in data collection or processing, conduct due diligence to ensure they have appropriate data privacy and security measures in place. Use data processing agreements or contracts to clearly define roles, responsibilities, and data protection obligations.	

Figure 23. Marketing Attribution ML Model Risk Assessment(Aukstikalnyte, 2020; Elia, 2020; Garina, 2023; Mäki and Alamäki, 2019; Marketing Evolution, 2022)

While the above mentioned marketing strategies may involve a higher level of complexity and investment compared to other discussed strategies, implementing all the recommended approaches in different phases will enable Atom Bank to gain a competitive edge in the market and accelerate its journey towards IPO readiness.

4. Action Plan

The provided Fig.24 illustrates the short-term, mid-term, and long-term marketing strategies. To effectively implement these strategies, Atom Bank should follow a structured approach with agile team.

- 1) **Project Planning:** Atom Bank should conduct thorough project planning for each strategy, ensuring the availability of resources such as manpower, computational power, and budget before proceeding with implementation.
- 2) **Technical and Risk Assessment:** Prior to implementation, Atom Bank should conduct a comprehensive technical and risk assessment for each strategy, identifying potential challenges and developing mitigation actions to address them and minimize any undesired outcomes.
- 3) **Employee Training:** If required, Atom Bank should provide necessary technical training to employees who may lack the required knowledge and skills in the respective areas of the strategies.
- 4) **Proof-of-Concept (POC):** For complex projects, if time permits, Atom Bank can perform a Proof-of-Concept to validate the feasibility and effectiveness of the strategies before full-scale implementation.
- 5) **Strategy Implementation:** Based on timelines, priorities, and resource availability, Atom Bank should initiate the implementation of the strategies as discussed in previous sections, following a structured and agile approach to ensure successful execution.
- 6) **Continuous Monitoring and Evaluation:** After implementation, Atom Bank's marketing team should continuously monitor and evaluate the impact of the strategies on the business, assessing their effectiveness and making any necessary adjustments to maximize value.

4.1. Marketing Strategy RoadMap

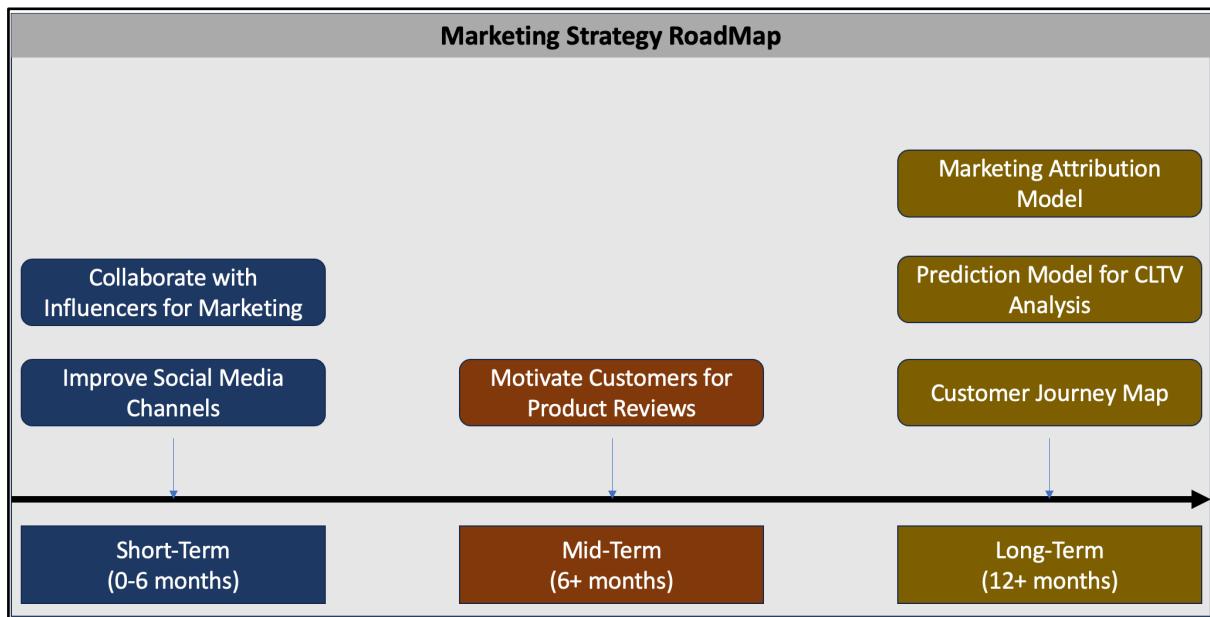


Figure 24. Marketing Strategy RoadMap

As illustrated in Fig.24, the company's roadmap begins with short-term plan that is enhancing social media channels to increase brand visibility and awareness among the target customers. Collaborating with influencers to promote Atom Bank's banking services is also recommended as it can also boost the followers in social media channels. In the mid-term, the focus should shift towards obtaining more customer reviews for the mobile app on platforms like Trustpilot. Encouraging reviews through incentives and streamlining the review process will be crucial. In the long-term, implementing a Customer Journey Mapping (CJM) strategy across various online platforms, with the mobile app and website as the highest priority and social media channels as the lowest priority, can be done in different phases. Following that, the implementation of a CLTV prediction model and a marketing attribution model is advised to assess the effectiveness of marketing strategies and make improvements accordingly.

5. Discussion

After implementing the customer data collection methods as part of the earlier discussed marketing strategies, Atom Bank can proceed with the implementation of a product recommendation model in future. This model will enable personalized recommendations of banking services to customers. Research indicates that the

implementation of a product recommendation system can lead to a significant increase in a bank's revenue, with potential growth of up to 30%(Bouvier,2021). Considering the current market trend, it is important to focus on the target customer segment who belongs to millennial and Gen Z generations who predominantly use smartphones and expect round-the-clock customer support(Ceci,2021;Mogaji,2021). To enhance the customer experience and improve conversion and lead rates, implementing an AI-driven chatbot in future is highly recommended(Shalimov,2022).

6. Conclusion

The requirement of Atom Bank's management was to propose effective marketing strategies utilizing data science. To begin, this study analysed the organizational structure and objectives, conducting SWOT and PESTLE analyses to understand the current system. Additionally, a competitor analysis was conducted to determine the bank's market position and identify opportunities for gaining a competitive edge. After identifying areas for improvement, the report proposes several marketing strategies. A cost-benefit analysis was conducted to select the most suitable solutions for the bank, and to prioritize and classify these strategies into short-term, mid-term, and long-term activities. The report focuses on three data science-driven strategies in detail, providing project analysis, implementation steps, and risk assessment for each. Finally, a high-level action plan for Atom Bank is outlined, and potential future projects are also discussed.

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