The Possibilities of Artificial Intelligence Usage in Loyalty Programs

Andrii Kushnarevych and Daniela Kollárová
University of Ss. Cyril and Methodius in Trnava, Slovakia

kushnarevych1@ucm.sk
daniela.kollarova@ucm.sk

Abstract: From the year 2022, when the GPT 3 model became publicly available, Artificial intelligence (AI) has been a buzzword in marketing. To say it still is influencing the field would be an understatement with new models and technologies continuously emerging and existing ones getting better and better. Loyalty programs as a sales promotion tool have also undergone big changes in recent years and AI is bringing new opportunities and challenges to the field. In this paper, we investigate the possibilities of artificial intelligence usage in loyalty programs. We aim to showcase the diverse opportunities through which AI can enhance loyalty program experiences. Among those usage opportunities we put specific attention on AI personalization and predictive modelling. By harnessing AI capabilities, organizations can possibly find new ways to enhance customer engagement, satisfaction, and build stronger loyalty. In this paper we are also looking at the current state of loyalty programs in the selected market and the way AI is being used in them. It is important to note that we approach the topic from two points of view – customers` and brands`. That means that we are trying to highlight how certain AI technologies can possibly improve customers` experience as well as how AI may be a helpful tool for businesses who want to manage loyalty programs. The final part of our article includes information on the suggested ways AI technologies may be implemented into loyalty programs based on the information provided in previous parts of the paper. Suggested implementation strategies are also appropriate as a starting point for further research, where every single technology would be researched more in detail. The main goal of this article is to provide readers with a comprehensive overview of the possibilities of how Artificial Intelligence can be used in the context of loyalty programs today. The article is theoretical-empirical and is based on external information from trustworthy sources as well as our own research of certain AI technologies in the context of loyalty programs.

Keywords: Artificial Intelligence, Loyalty programs, Personalization, Predictive modelling, Marketing communication

1. Introduction

In recent years, Artificial Intelligence (AI) has significantly influenced the landscape of marketing, and among other fields that have been affected are loyalty programs. AI's implementation into various marketing tools has turned it from an operational tool into a powerful force that has an opportunity to enhance customer interactions and operational efficiencies. The capabilities of AI in general and in marketing are giant, extending from simple automation of repetitive tasks up to analysing giant sets of information in real-time and providing deep insights into customer behaviour (Mirwan et al., 2023). In today's marketing environment it seems increasingly important to not leave AI technologies out of sight, but rather to explore its possibilities and increase the competitiveness of the brand on the market by rapidly reacting to technological advancements.

For brands in the current marketing environment strategic deployment of AI into their marketing strategies is not only about increasing the efficiency of the workers, but also about understanding their customers in-depth, up to an individual level, and thus providing personalized experiences and better customer experience in general. This is particularly present in loyalty programs, where AI's ability to analyse vast datasets can be used to personalize offers and communications that may be uniquely appealing to each customer, thereby enhancing engagement and loyalty. Workers of the marketing departments are now expected to leverage AI tools to fulfill their work more efficiently and develop a deeper understanding of market dynamics and consumer behavior, ensuring that their outcomes are as relevant as they may be. As AI continues to evolve, its integration into marketing strategies, especially loyalty programs, is expected to deepen, making it a necessary tool for researching, implementing and business growth. In this paper we aim to focus on AI in loyalty programs. Among the topics we want to research are AI capabilities in the context of loyalty programs, benefits brands and customers may get by using them and case studies of current AI usage in loyalty programs on the selected market.

2. Theoretical Background

Loyalty programs as a sales promotion tool have undergone many changes over the last decade. Those were mainly caused by external factors, mainly changes in customer behaviour, technology and data analytics. From basic punch cards that may be printed on a thick carton to complicated multilevel systems, loyalty programs today have become widely used tools that have the goal of increasing customer satisfaction, customer loyalty and return purchases. Since technologies have advanced profoundly, data analysis has become another

important part of loyalty programs, which lets businesses to better understand and foresee customer behaviour and actions. As a result, this provides brands with the opportunity to personalize those programs and personalize their parts according to individual preferences. We can also trace this approach becoming more and more used in other parts of marketing and marketing communication, making it not limited to loyalty programs, but rather a general trend to the changes in customer behaviour and expectations (*The value of getting personalization right—or wrong—is multiplying*, 2021). In recent years, progress in new technologies like AI and machine learning has pushed this trend even further, making it possible to create flexible programs and be more reactive to customers' needs.

It is important to discuss some basic aspects of AI as a technology in the communicated context. At the basis of the AI there is machine learning (ML) and its subset named deep learning (DL). Machine learning is the ability of the AI model to learn, predict or choose something based on the algorithm provided based on the data that it has to work with (Hamdan et al., 2023). The main idea of deep learning is to involve neural networks with different complexity levels with the goal of simulating the complicated decision-making of the human brain (Hosain et al., 2024). By leveraging these technologies AI models are capable of creating truly outstanding results and constantly keep evolving. However, another feature widely used in order to provide such results is natural language processing or NLP. It allows machines, and AI in our example to understand and interpret human language. By its usage, AI models are able to understand the sentiment or intents of the messages and thus provide an outcome that would take those things into account (Sharp et al., 2017). With the constant development of AI models, today many of them are also capable of computer vision which allows machines to see and interpret images in a similar way to humans, thus making it possible to appropriately work with not only textual, but also visual data inputs. These basics clarify how artificial intelligence works at a basic level and now we can look into how these technologies could be applied within a loyalty program setting.

3. AI Technologies in Loyalty Programs

Based on the technologies we mentioned in the previous chapter it is safe to assume that loyalty programs can benefit greatly from the usage of AI. Firstly, it opens the possibilities of creating loyalty programs that just wouldn’t be possible without an AI. By this we mean that due to the possibilities of data analysis and natural language processing that AI brings, unique, highly personalized loyalty programs based on a deep understanding of the customers may be created, which was much harder, or even impossible, to operate before. By personalizing the loyalty program itself, as well as its rewards, activities, tiers or other parts brand gets the possibility of making the relationship with the customers more personal, increasing their engagement and ultimately building loyalty which would make the customer come back over and over again to the brand. Additionally, AI can make the various operational parts of loyalty programs more efficient and user-friendly. As an example, it may help in handling reward distribution, gathering feedback, or better optimizing those processes, which leads to cost savings and better productivity.

Moreover, AI can assist in decision-making processes by analysing giant amounts of information and providing high-quality insights based on this information. For example, methods like predictive personalization enable brands to increase personalization levels at every step of a customer funnel, even without the exact data about the exact customer (Bhaskar et al., 2009). Thus, marketing activities, loyalty programs incentives and even marketing campaigns can achieve better results. Among other things, AI may play a crucial role in fraud detection within loyalty programs by leveraging its abilities to analyse data, mark certain activities as suspicious or fraudulent and communicate this in real-time with the brand in order to minimize the risks.

In this chapter, we want to describe in detail two of the potential AI usages in loyalty programs that, in our opinion, have the most usage potential as of today. Those two categories are personalization and predictive modeling. Starting with personalization, we find it important to mention customer segmentation as a closely connected term. In order to personalize the offer, many brands first need to segment their customers into appropriate groups (Allaway et al., 2014). Of course, the ultimate goal of AI in loyalty programs may be to create a unique personalization for every single customer, however, such a solution is very hard to implement, organize, and put into practice, and even if possible, for most brands such a solution will most likely not be the optimal one since it would require too much effort. On the other hand, AI may help to segment customers into relatively narrow groups with similar segmentation criteria, which allows brands to personalize on a broader scale while still keeping it personalized. It ensures that activities, incentives, promotions and messages are directed at certain customer segments, matching their requirements and interests.

On a general level, loyalty programs may use personalization to match experiences, offers, rewards, incentives and communications to the customer`s preferences based on the information collected about the customer. It

is important to note that personalization can be present in various ways, from a very simple personalized greeting to highly personalized offers at a certain time of the day. The goal is to make every customer feel special and appreciated. Personal touch may improve customer engagement with the brand and thus build a closer relationship (Bilal et al., 2024). In the context of loyalty programs, information up to a depth of scroll, or time spent on a specific part of the application can be analysed and used as valuable insights. Using machine learning algorithms can help in offering personalization instantly to the customers, for example, a customer who typically buys a certain type of product on a certain day or time of the day may be recommended another similar item or offered a discount on their next visit at this day or time. Another example can be, if the AI algorithm finds that a specific customer usually buys gifts at the start of May, then the loyalty program could proactively suggest gift options and unique offers during April. This way, not only customer needs are matched, but at the same time, the overall experience with the brand can be very positive, leading to building deeper connections and a feeling of mutual understanding. At the same time, such activities provide value to the customer at the right time, which increases the chance of purchase.

The second technology we`ve mentioned is predictive modelling. This technology takes advantage of using historical data collected from different sources, in our case mainly from loyalty programs to forecast the most probable future customer behaviours and preferences (Nsakanda et al., 2011). By leveraging this technology brands have unique opportunities to enhance strategic marketing and customer engagement efforts. Predicting future customer behaviours also mean it provides brands with an opportunity to predict customer churn, making it possible for brands to react swiftly to different triggers that may cause it, enabling them to intervene proactively, for example with personalized offers to retain those customers. Another possible implication is lifetime value prediction with the help of AI technologies, which may help brands estimate the long-term value of certain customers or groups of customers, as well as products or product categories, so the brands may focus their efforts on the most profitable products or groups of customers.

Another part that can be used in predictive modelling is sentiment analysis. In the online environment, it takes into account customer feedback, customer reviews, and even social media posts and sentiments used in them, which makes it possible for brands to adjust their strategies and communication in real-time in order for communication to be appropriate to the current customer sentiments (Liberati & Camillo, 2014). To summarize, the combination of personalization and predictive modelling in loyalty programs helps to enrich customer experience and improve the effectiveness of marketing campaigns. By accurately predicting and addressing customer needs, brands have an opportunity to develop targeted strategies that enhance customer satisfaction, increase retention rate and boost overall profitability.

4. Benefits to Brands and Customers

In this part of our paper, we want to briefly mention the ways in which AI usage in loyalty programs may benefit brands and customers. Firstly, we want to list the primary benefits for businesses, among which are:

- **Increased interaction and customer retention:** Based on the information provided above, it is safe to assume that personalization and other AI technologies are capable of increasing interaction, and, as a result, customer retention. Since in today's world customers expect personalization, its greater level can also cause a higher customer lifetime value, as well as loyalty improvements.
- **Operational efficiency:** AI, even in its current state is capable of automating many tasks within loyalty programs, from customer segmentation and incentives division to customer complaint service management. There are many tasks that may be automated by AI and thus reducing the need for manual work and funds required for it.
- **Data-based decision-making:** Since AI is capable of analysing giant datasets, it is capable of providing unique and in-depth insights into anything connected to brands` marketing activities. Based on those insights, brand managers can make better assumptions, and ultimately more profitable decisions that reflect the current state of loyalty programs.
- **Fraud prevention:** AI is useful in stopping fraud by recognizing and preventing fraudulent activities with the help of its data analysis and potential for harmful patterns detection, making sure that loyalty programs stay as safe and trustworthy for customers as possible.

It is also important to mention what benefits may AI in loyalty programs bring for the customers. Among them are:

- **Customized experiences:** Implementation of AI can offer customers personalized deals, suggestions and rewards matched to their individual tastes and buying preferences. Mostly it is the result of the above-mentioned ability of AI for in-depth personalization.
- **Greater convenience:** Since certain AI models are capable of not only working with text input but also visual or audio, technologies like voice control or visual assistance can bring greater convenience for their users.
- **Improved satisfaction:** If the purchasing process is more personalized and in the case a customer needs help there is a tool that is capable of providing it immediately, it is safe to assume that the general customer satisfaction would grow higher over time.
- **Trust and security:** Since AI is capable of fraud detection, it may provide a feeling of safety not only to the brands but also to the customers, since they would know that their information is stored safely.

AI in loyalty programs is beneficial for both brands and customers, with the advantages overlapping in enhancing engagement and efficiency. Brands gain from the operational efficiencies and strategic insights provided by AI, which result in cost savings as well as improved customer retention. Customers on the other hand may get the benefit of interactions that are more personalized and satisfying to make their experiences more rewarding. The inclusion of AI within loyalty programs gives a kind of win-win situation for both sides of B2C relations.

5. The Current State of AI Usage in Loyalty Programs on the Selected Market

We found it interesting to look at the examples of AI usage in loyalty programs on the selected market, and we decided to choose the US market as an object of our interest. In the United States, AI integration into loyalty programs is particularly advanced, with many leading brands leveraging this technology to enhance customer engagement and operational efficiency. The application of AI in loyalty programs typically involves different approaches, from personalization strategies, and predictive analytics to customer data management. In this chapter, we want to look at specific examples of how brands use AI in their loyalty programs.

Generally speaking, Starbucks approaches AI as the future of their marketing communication and tries to embed it into various activities of the brand. Deep Brew has become the center of this strategy, and mainly it is using AI capabilities for data analytics and to provide personalized customer experiences, including personalized marketing messages and personalized menu recommendations. This approach of making data-driven decisions is also used in their Starbucks Rewards program, in which, with the help of an AI, they are capable of identifying customer preferences and providing rewards that have a higher chance of being appropriate. Thus, they also aim to encourage return visits, enhance customer lifetime value and ultimately, build a strong loyalty towards the brand (Zaytsev, 2024).

The information they do analyse is not being used only for personalization purposes, but also serves as a great insight for their menu management or updating product offers. Most of their newest products, whether included in the regular menu or as a part of seasonal offers are created based on the information collected and analysed in order to make them as appropriate to the general public as possible. According to Kotorchevikj, the company has discovered from its data analytics that approximately 43% of tea drinkers prefer not to add sugar to their tea, while approximately 25% of users don't add milk to their iced coffee while drinking at home. Based on these results, two new products were created, that were aimed at customers with the above-mentioned preferences (Kotorchevikj, 2021).

As we can see, Starbucks is one of the companies that truly leverages the possibilities of AI and tries to take advantage of the technology in whichever form it is present today. It is also possible to find information about Starbucks planning or actively using AI while deciding on the new store location, employers management or drive-thru experience personalization. All of this makes this brand an interesting one to follow on the topic, and further research can be useful and insightful as an example of AI usage in a brand.

Another example of AI usage in loyalty programs can be found in Wyndham hotels & resorts. Their approach was a little different than in our previous example since they first decided to make a full renovation to make the loyalty program architecture fully cloud-native. They made it in order to automate various different systems they had in use, so they could be made more efficiently and with more precision. They also noted that previously, since their operations were related to manual data processes there was more space for potential human errors or inefficiency, which was eliminated by automation. This rework of the loyalty program also brought many benefits to their customers. They started using not only in-depth data analytics but also techniques of predictive modelling to anticipate not only customers' needs at this exact time but also what

they may search for in the near future. According to PwC, after automation was put in place, the satisfaction rate on both sides got bigger, with fewer issues appearing and their faster resolution (PricewaterhouseCoopers, n.d.).

The last example of AI usage in a loyalty program we want to mention in this part of our paper Is from Lyft, a ride-sharing service operating in the US. In their loyalty program Lyft rewards they started using AI algorithms in order to be able to detect fraudulent or potentially dangerous activities and to prevent them. Mostly they focused on analysing rider behaviours and trip data, and in case there were data inconsistencies with normal usage patterns, algorithms noticed that. Among such unusual behaviours were, for example, many rides taken from the same location or usage of multiple accounts with the goal of misusing promotions. After the algorithms noticed such activities, Lyft team was notified, had to look at the case, check its details and, if needed, take appropriate actions. This way, the company was able to ensure the loyalty program and its benefits stay effective as well as protect themselves from potential financial losses from misusing parts of it (Thurman, 2023).

While not part of a loyalty program as of yet, Lyft is another company that puts a big emphasis on AI usage in many parts of its business. For example, as of 2023, they have already used AI technologies for getting and providing more accurate times of arrival thanks to machine learning combined with real-time data analysis, optimizing ride routes based on the real-time information on other drivers' behaviours and events happening, predicting the drive destinations based on machine learning of previous information and coordinating rider pickup in the places it may not be so evident (Conlisk, 2023). Some of these technologies may be pushed even further and be implemented within loyalty programs. For example, predicting the ride destination may provide loyal customers with specific new recommendations based on the data about specific customers, their preferences, preferences of similar users etcetera. As of today, we find Lyft to be an interesting example of creative AI usage and a brand that deserves further research in this context.

As we can see, in our case examples were mainly connected to the hospitality industry, which was not defined in advance. However, this raises the room for further research on AI usage in loyalty programs in various industries and comparisons between them. Those examples emphasize how AI technologies are being effectively utilized to not only personalize customer experiences but also improve operations and data management in loyalty programs. The use of AI allows brands like Starbucks, Lyft and Wyndham to maintain a competitive edge by adapting to consumer needs rapidly and efficiently.

6. Challenges and Considerations

Since the adoption of AI into loyalty programs is still in its early stages and not much research has been done in this narrow context, it is natural that many challenges and considerations may occur. One of such challenges are ethical concerns, since the question of regulating AI technologies is still to be solved. Also, since many AI use cases in loyalty programs are centered around data analytics, machine learning and predictive modeling, concerns about data privacy and security of data handling are also present (Mogaji et al., 2020). If certain program collects more personal or sensitive data from the user, concerns about how ethical it is to use such information are also present. Last but not least, there is a risk of bias in AI algorithms, since many of them are making decisions based on the information collected and certain offensive or even discriminative decisions can be made on such basis.

Difficulties in adding AI to loyalty programs also lie in the technological factor - especially in making new AI technologies work well with present systems (Kutz et al., 2022). While currently, many AI tools offer their services on a subscription basis and only require input from a customer while all the computational work is done by the company itself, this solution may not be appropriate in our researched context. If the company wants to manage certain AI technology internally, it may become very expensive and hard to operate, making it a huge barrier, especially for small and medium companies that may not have enough resources at their disposal.

Often, a company's change aversion from inside its own structure can slow down the adoption process too. This could be because workers and management need time to adapt to new processes or technologies being introduced within their workplace, as well as the need for employees to learn new skills and optimize their work routine in the context of AI presence.

To effectively address these challenges, it is crucial to:

- **Practice AI transparency and collect customer consent:** It is crucial for brands to clearly explain the ways in which customer data is being used, analysed, and processed in any way, and the first step should be gaining their approval, which helps to establish trust, make the whole process clear, allow those, who don't want there data to be processed to do so and adhere to privacy laws which are constantly evolving.
- **Provide employee training and management corrections:** AI systems are influencing the work routines of professionals in different fields, and marketing is not an exception. Providing the employee team with thorough training and assistance may help them to get all the necessary skills and thus make the adoption process less complicated.
- **Manage AI systems audit:** Setting up periodic checks to make sure that AI systems are running free from prejudice and following moral rules seems to be crucial in the modern context of AI.
- **Choose scalable and integrable solutions:** Today, AI is the field that is developing very rapidly and new solutions are being created constantly. Selecting AI solutions that are able to grow along with the business, fitting in smoothly with the current structure as well as the vision of the brand may reduce future disturbances and increase the effectiveness of those AI solutions.

7. In Conclusion

In this paper, we tried to present the topic of how Artificial Intelligence can enhance loyalty programs through its various opportunities like data analysis, personalization and predictive modelling. We covered basic theoretical background on the topics of loyalty programs and artificial intelligence, usage of AI in loyalty programs, its benefits for brands and customers, the current state of AI usage in loyalty programs on the United States market, as well as challenges and considerations that companies face in the context of AI implementation into loyalty programs. We can state that the topic of AI usage in loyalty programs has not been researched enough yet, which provides many opportunities for further research. At the same time, in practice, some brands leverage AI capabilities on a decent level, while others may struggle to implement one due to the limitations or scepticism of new technologies.

However, in our opinion, it is clear that in the following years, the role and impact of AI on loyalty programs will only grow bigger, especially through new technological advancements and improvements in machine learning, natural language processing and real-time data analysis. There is also a possibility of more independent AI systems appearing, managing all parts of activities within the loyalty program on an automated basis. While it is hard to predict which direction this development will take in the future, it is clear that the technology is here to stay, and further research on the topic would be essential for its better understanding.

Acknowledgements

The paper is a partial output of the project VEGA No. 1/0334/24 Meaning of Interactive Ties Influencing the Purchasing Decision-Making Process in the Selected Consumer Segment in the Context of Identifying Key Communication and Performance Metrics of the B2C Market.

References

Allaway, A. W., D'Souza, G., Berkowitz, D., and Kim, K. (2014), "Dynamic segmentation of loyalty program behavior.", *Journal of Marketing Analytics*, Vol 2, pp 18–32.

Bhaskar, T. G., Subramanian, G., Bal, D., Moorthy, A. R., Saha, A., and Rajagopalan, S. (2009), "An optimization model for personalized promotions in multiplexes.", *Journal of Promotion Management*, Vol 15, Issue 1–2, pp 229–246.

Bilal, M., Zhang, Y., Cai, S., Akram, U., and Halibas, A. S. (2024), "Artificial intelligence is the magic wand making customer-centric a reality! An investigation into the relationship between consumer purchase intention and consumer engagement through affective attachment.", *Journal of Retailing and Consumer Services*, Vol 77, pp 1-11.

Conlisk, S. (2023) "How Lyft uses AI to get you where you want to go, faster.", [online], Lyft. https://www.lyft.com/blog/posts/how-lyft-uses-ai-to-get-you-where-you-want-to-go-faster.

Hamdan, I., Othman, M., Hassim, Y., Marjudi, S., and Yusof, M. (2023), "Customer Loyalty Prediction for Hotel Industry Using Machine Learning Approach.", *JOIV : International Journal on Informatics Visualization*, Vol 7, Issue 3, pp 695-703.

Hosain, M. T., Jim, J. R., Mridha, M. F., and Kabir, M. M. (2024), "Explainable AI approaches in deep learning: Advancements, applications and challenges.", *Computers & Electrical Engineering*, Vol 117, pp 1-28.

Kotorchevikj, I. (2021) "Deep Brew: Transforming Starbucks into an AI & data-driven company.", [online], Hyperight. https://hyperight.com/deep-brew-transforming-starbucks-into-a-data-driven-company/.

Kutz, J., Neuhüttler, J., Spilski, J., and Lachmann, T. (2022), "Implementation of AI Technologies in manufacturing - success factors and challenges.", *The Human Side of Service Engineering*, Vol 62, pp 256-261.

Liberati, C. and Camillo, F. (2014), "Subjective business polarization: sentiment analysis meets predictive modeling," in *Advances in intelligent systems and computing*, pp. 329–338.

Mirwan, S., Ginny, P., Darwin, D., Ghazali, R., and Lenas, M. (2023), "Using Artificial Intelligence (AI) in Developing Marketing Strategies.", *International Journal of Applied Research and Sustainable Sciences*, Vol 1, No 3, pp 225-238.

Mogaji, E., Soetan, T., and Kieu, T. (2020), "The implications of artificial intelligence on the digital marketing of financial services to vulnerable customers.", *Australasian Marketing Journal*, Vol 29, Issue 3, pp 235 - 242.

Nsakanda, A., Diaby, M., and Cao, Y. (2011), "An aggregate inventory-based model for predicting redemption and liability in loyalty reward programs industry." *Information Systems Frontiers*, Vol 13, pp 707-719.

"Reinventing Wyndham's loyalty program technology." (n.d.), [online], PwC. https://www.pwc.com/us/en/library/case-studies/wyndham-loyalty-program-technology.html.

Sharp, B., Sedes, F., and Lubaszewski, W. (2017) *Cognitive approach to natural language Processing*. ISTE Press - Elsevier.

"The value of getting personalization right—or wrong—is multiplying." (2021), [online], McKinsey & Company. https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/the-value-of-getting-personalization-right-or-wrong-is-multiplying.

Thurman, T. (2023) "How AI Will Shape the Future of Loyalty Programs.", [online], Stampme. https://www.stampme.com/blog/ai-loyalty-programs.

Zaytsev, A. (2024) "Case Study: Starbucks Revolutionizes the Coffee Experience with AI.", [online], AIX | AI Expert Network. https://aiexpert.network/case-study-starbucks-revolutionizes-the-coffee-experience-with-ai/.