Enhancing User Engagement in the Mobile App: An Agile Approach to New Product Development in the Queue App

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This case study examines the application of new product development (NPD) methodologies within the mobile application industry, focusing on the Queue app – a platform designed for social content discovery and sharing among movie and TV show enthusiasts. Despite initial success, the app encountered challenges in user engagement, social interaction, and retention. The study details the iterative process undertaken by the product team, guided by the NPD principles, to identify, prototype, and implement a new feature, 'Swipe with Friends.' This feature was designed to address the identified issues by transforming content selection into an interactive and social experience, ultimately leading to significant improvements in user metrics. The case provides insights into how theoretical frameworks in NPD can be practically applied to enhance user engagement and retention in a highly competitive digital landscape.

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IZBOLJŠANJE ANGAŽIRANOSTI UPORABNIKOV MOBILNE APLIKACIJE: AGILEN PRISTOP RAZVOJA NOVEGA IZDELKA V APLIKACIJI QUEUE

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Ključne besede:
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agilni procesi,
industrija mobilnih aplikacij,
angažiranost uporabnikov,
uporabniška izkušnja

Ta študija primera obravnava uporabo metodologij razvoja novih izdelkov (NPD) v industriji mobilnih aplikacij in se osredotoča na aplikacijo Queue – platformo, zasnovano za družabno odkrivanje in izmenjavo vsebin med ljubitelji filmov in televizijskih oddaj. Kljub začetnemu uspehu je aplikacija naletela na kritične izzive pri angažiranosti uporabnikov, družabni interakciji in zadrževanju. Študija podrobno opisuje iterativni postopek, ki ga je opravil produktni tim, da bi ob upoštevanju načel NPD opredelila rešitev, izdelala prototip in implementirala novo funkcijo 'Swipe with Friends'. Ta funkcija je bila zasnovana za reševanje ključnih težav s preoblikovanjem postopka izbire vsebine v interaktivno in družabno izkušnjo, kar je na koncu privedlo do znatnega izboljšanja uporabniških kazalnikov. Primer omogoča vpogled v to, kako je mogoče teoretične okvire na področju razvoja novih izdelkov praktično uporabiti za izboljšanje angažiranosti in zadržanja uporabnikov v zelo konkurenčnem digitalnem okolju.

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1 Literature Review

In the fast-paced and highly competitive landscape of the mobile application (mobile app) industry, new product development (NPD) plays a pivotal role in determining the success and longevity of companies. With consumer demands constantly evolving and technology advancing at an extreme rate, businesses are compelled to innovate continuously. Whether by launching entirely new developments or introducing innovative features within existing platforms, the ability to bring new products swiftly and effectively to market is critical. This is particularly true in the mobile app sector, where NPD is both an opportunity and a formidable challenge.

Mobile apps can be defined as software applications that can be executed on a mobile platform (Jabangwe et al., 2018) and can be viewed as one of the layers of the mobile eco-system, which alongside apps consist of mobile app developers, various platforms for the apps and app users (Lim et al., 2015). We can divide mobile applications into native, web, or hybrid. A native app is developed for a specific operating system platform (OS) (Phyo, 2014), such as Android OS or Apple iOS. Mobile web apps can be accessed through browsers, making them available across OS platforms, while missing out on some of the functionalities reserved for a particular OS. Finally, hybrid apps represent a mixture of both, however in terms of user experience more closely resemble mobile web apps than native apps (Phyo, 2014).

Either way, the popularity of mobile apps is unquestionable. Buildfire (2024) reports that more than 2.87 million apps are available. Statistics also show that the worldwide number of annual mobile app downloads has increased from almost 141 billion in 2016 to 257 billion in 2023 (Data.ai, 2024). Furthermore, Lindner (2024) reports that 89% of the time smartphone users spend on their mobile devices is used for apps and that an average American smartphone user has over 100 apps installed on their phone. We use mobile apps in all areas of our lives: to learn, lose weight, get fit and healthy, relax, access news, access information, meet people, manage people, manage ourselves, date, entertain ourselves, and even manage pain. Considering this, several classifications of mobile apps exist based on their functionality. Akdim et al. (2022) describe two broad categories, dividing mobile apps into informational and experiential apps, while Huang and Benyoucef (2023) list 11 categories, including productivity, tool-based apps, education, health and fitness, lifestyle, entertainment,

music and audio, business and commerce, games, social networking apps, and news apps. However, the harsh reality for mobile app developers is that a mere 0,5% of consumer apps manage to succeed (Wood, 2024). Gartner (2014) paints an even grimmer picture, assessing that only 0,01% are considered a financial success by their creators.

While not every mobile app is intended to generate profits directly, and profits might not be the only measure of mobile app success, the fact remains, that due to heavy competition, rising customer expectations, and rapid technological evolution, developing an engaging and successful mobile app is an immense challenge.

This case study examines the various aspects of new product development to help students understand what it encompasses, the factors that affect its success, and the steps that should be followed. In the remainder of this paper, we present a theoretical background on new product development, new product conceptualization, and new product development processes, followed by our case study on the development of the Queue application alongside discussion questions.

1.1 New Product Development

New product development (NPD) is a significant challenge for every organization, as the success or failure of new products often determines the future of the organization. In today's business environment, companies constantly face change due to the continuous introduction of new and modified products with significantly shorter lifecycles than in the past (Cordero, 1991; Millson et al., 1992).

The significance of NPD is at least two-fold. On one end, to stay competitive, companies must innovate, either in terms of completely new products or by modifying existing products. On the other side, developing a successful product is an extremely challenging affair. The formidable nature of this task is best illustrated by the work of Stevens and Burley (1997), who observed that out of 3000 raw (unwritten) product ideas, only 300 progress to a formal selection process. Out of these 300, 125 entered the initial development phase, and only 9 of these became significant development projects. The authors found that out of 3000 original ideas, companies on average achieve 1,7 successful product launches. Even then, a

compelling percentage of new products will inevitably fail (Pisnik, 2021). The latest reports indicate that the failure rate for new products is over 95% (Taylor, 2023).

Companies that focus on the development of digital products face similar challenges. Due to instant access enabled by digital channels, new products can be developed even more rapidly, as it is possible to test new ideas and concepts and explore different product options through online market research (Chaffey & Ellis-Chadwick, 2022). While the success rate for mobile apps is even lower, compared to more conventional consumer products (Gartner, 2014), it is also worth noting, that mobile app developers face additional challenges, among which, customer retention is critical. Estimates show, that an average mobile app loses around 77% of its daily active users within the first 3 days after installation (Tafradzhiyski, 2024).

To improve their prospects, companies may follow different NPD processes. However, before we investigate various frameworks, we first need to determine what constitutes a new product.

1.2 What is a New Product?

New products can be viewed from different points of view. Marketing literature primarily refers to the typology by Booz, Allen, and Hamilton (1982, in Cooper, 2011) who classify new products based on the perspectives of the organization and target groups (market), meaning that a new product can be new to the organization but already known by the target group or vice versa (see Figure 1).

According to Booz et al. (1982, as cited in Cooper, 2011), there are six types of new products. First, the new-to-the-world products which create a whole new market. Second, new-to-the-firm products (new product lines) that are not new to the world but are new to the firm. Third, the additions to existing product lines or line extensions are designed to extend or deepen the product line. Fourth, improvements and revisions to existing products, fifth, the repositionings which entail products that are retargeted for a new use or application, and finally cost reductions. These include products that simply replace existing products in the line, providing the customer with similar performance but at a lower cost.

Additionally, Cooper (2011) proposed three classes of new products based on their level of innovativeness. Products can be highly innovative, moderately innovative, or low-innovation products. This classification matters because it is important to note that the higher the innovation level, the greater the risk for the company.

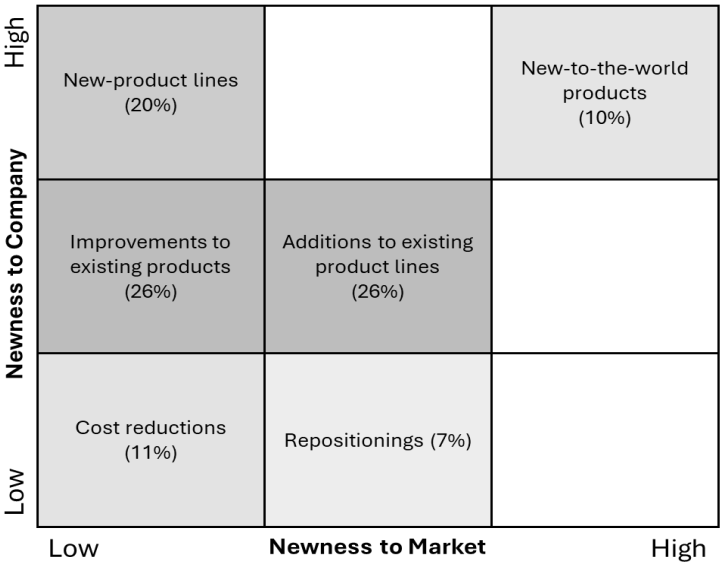

Figure 1: Types of new products on two dimensions – new to the company and new to the market

Source: (Booz et al., 1982, as cited in Cooper, 2011).

Due to lower risk, companies often choose to modify their existing products rather than create new ones. This approach is also common among mobile app developers, who frequently release updates with new app features. These innovations can significantly enhance the user experience and create new sources of revenue for the company.

1.3 New Product Development Process

Although there are instances where a remarkable individual's rare flash of brilliance has led to significant and successful innovations, most innovations require deliberate effort. They often follow a formal, cross-functional, phase new product process (Crawford & Di Benedetto, 2015; Drucker, 2002).

New product development (NPD) models can be regarded as guidelines that can be used to describe and guide the activities required to bring a new product from an idea or opportunity to an actual product launch. Literature provides a wide range of frameworks and guidelines for developing new products. In the most general terms, the NPD process consists of the following stages (Crawford & Di Benedetto, 2015): (1) opportunity identification and selection, (2) concept generation, (3) concept/project evaluation, (4) development (technical and marketing), and (5) product launch. Authors concur that between each major phase are evaluation tasks or decision points. The decision-makers must determine whether the project appears promising enough to proceed to the next phase. Additionally, companies nowadays do not adhere strictly to the stepwise logic of these processes; instead, they see new product development as a set of interdisciplinary, simultaneous, and iterative activities (Pisnik, 2021). Pisnik (2021) also highlights some widely accepted characteristics of these processes:

- NPD is an iterative and interlinked system.
- There are no clear and precise boundaries between the stages.
- Every stage affects all other stages.
- Every stage and its results should be market-tested.
- NPD requires collaboration among various company levels and departments.
- Every stage can be repeated until a product launch decision is made.
- The results of the stages should be exact, written, and operationalized.

These principles can be observed in mobile app development as well. However, due to the unique aspects of this field including rapid technological change (new OS updates, hardware changes, emerging technologies), strong user-centric design and frequent feedback, intense competition and short market lifecycles, platform fragmentation, and others, mobile app developers have widely adopted lean and agile approaches to new app development. Lean and agile frameworks have become fundamental in managing development projects across various industries. The Agile approach highlights flexibility, collaboration, and customer-centric development. On the other hand, Lean methodology focuses on maximizing value while minimizing waste, through efficiency, reducing unnecessary processes, and delivering only what is needed, when needed. Both approaches commit to continuous improvement, frequent feedback loops, and a strong focus on offering high-quality outcomes quickly.

One of the pioneering examples of incorporating agile practices into mobile app development was a Mobile-D approach (Abrahamsson et al., 2004). This approach is structured in five sequential phases: explore, initialize, produce, stabilize, and system fix. It does, however, encourage iterations. Another approach is MASAM (Mobile Application Software development based on Agile Methodology), by Jeong Lee, and Shin (2008). MASAM is based on a four-stage life cycle: preparation, embodiment, development, and commercialization. Scrum methodology has also penetrated the field of mobile app development. Corral et al. (2013) describe Scrum as an iterative and incremental framework commonly used with other agile practices. The key elements of Scrum are sprints – iterations with a fixed duration, a predetermined number of tasks, backlogs, and charts for monitoring pending work and time. However, the literature suggests that Scrum should be used in small teams and for short periods, for the development of simple, activity-centred mobile apps, with a restricted number of actions (Corral et al., 2013). Some companies may also use an extension of Scrum methodology by incorporating the principles of Lean Six Sigma. In that way, the sprint backlogs also serve as a means for statistic-based process improvement.

Finally, one of the most marketing-oriented frameworks in mobile app development was proposed by Zeidler et al. (2007) (Figure 2).

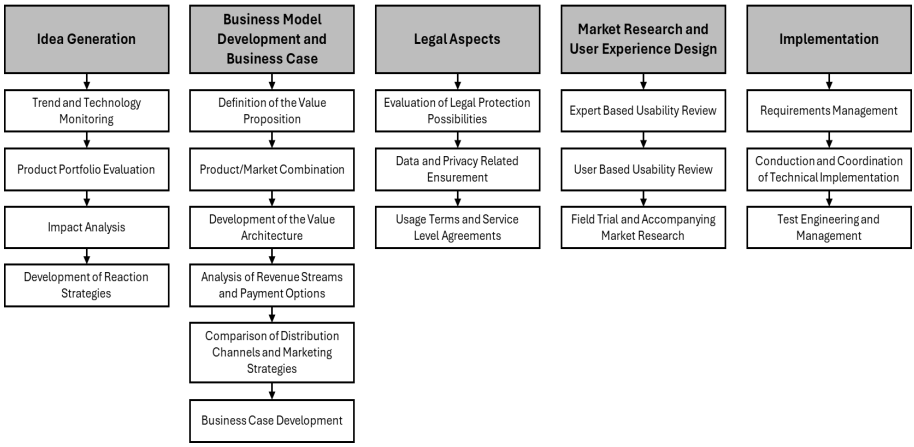

Figure 2: The new product development process for mobile software and services
Source: (Zeidler et al., 2007).

This framework offers a holistic approach to new app development, considering the dynamic competitive environment and using common tools for strategic analysis and product development. Each of the five phases can be run iteratively. The first stage of this model is the idea generation stage which incorporates trend and technology monitoring, product portfolio evaluation, impact analysis, and the development of reaction strategies. This is followed by business model development, and the creation of a business case where developers must define the value proposition, clarify the product/market combination, develop the value architecture, analyse the revenue streams and payment options, and compare the distribution channels and marketing strategies. It represents the economic foundation of the new product. Third, the company should focus on the legal aspects (evaluating legal protection possibilities, data, and privacy requirements, usage terms, and service level agreements) to ensure the project's and the product's continuity. The fourth stage is about market research and user experience design and usually includes expert-based usability review, user-based usability review, field trial, and accompanying market research. The final stage is implementation which also entails requirements management, conduction and coordination of technical implementation, test engineering, and management. Zeidler et al. (2007) also highlight the importance of gathering user input before, during, and after implementation.

2 Case Study

2.1 Learning Outcomes

By the end of this case study, students should be able to:

Learning Outcome 1: Recognize the unique challenges of new product development, particularly in the mobile application industry.

Learning Outcome 2: Critically assess the application of NPD theoretical frameworks, including Agile and Lean, in real-world scenarios.

Learning Outcome 3: Analyse the decision-making process involved in selecting and developing new features within a mobile app, such as the "Swipe with Friends" feature.

Learning Outcome 4: Understand the role of NPD frameworks, and related concepts in developing new products.

2.2 Introduction to Queue App

The Queue app serves not just as a medium for movie and TV show enthusiasts to discover and share content, but also as a comprehensive tool to enhance their overall viewing experience. At its core, Queue aims to socialize the content discovery process using features such as a dynamic feed and interactive multiplayer components to foster interaction and discussion among users. The platform also introduces elements of gamification into the mix, providing fun and varied ways to discover new content. A major distinguishing factor is Queue's integration of streaming platform availability information for each title. This allows users to easily locate where they can access their chosen content, combining social interaction, content discovery, and practical information within a single platform. Another noteworthy attribute is Queue's extensive, localized database, catering to a diverse user base across more than 150 countries. With initial success, the Queue app also faced various challenges, primarily regarding user engagement and social interaction. This case study discusses these challenges and the subsequent solutions.

2.3 Problem Definition and Analysis

In 2023, four years after the launch of the Queue app, the product team encountered issues related to the app's user base that posed a threat to their growth and user engagement objectives. Despite the unique social features of the app, they noticed a lack of social engagement among users, with most users not following anyone within the app. This resulted in a less-than-optimal "K-factor" – a metric used to measure the growth rate of apps and websites, especially those that rely on user referrals for expansion. The app's K-factor was hovering close to zero, far from the desired levels.

In terms of user interaction within the app, the company was operating at 20% of social interactions, far from their target of over 40%. Furthermore, the Week 6 retention rate – a key measure of user stickiness to the app – was at 25%, falling short of the company's goal of 35% or higher.

In summary, the main challenges were:

- Low social interaction: only 20% of users interact socially on the platform (goal: > 40%).
- Low K-factor: minimal user referrals posing a significant barrier to the user base growth.
- Lower than desired the Week 6 retention rate: at 25% (goal > 35%).

These problem areas signalled a pressing need to improve user engagement and social interaction within the Queue app.

2.4 Goal and Search for the Solution

The search for potential solutions was guided by a series of questions and objectives that focused primarily on improving user engagement, interaction, and retention. One key question was: "How could the product team introduce a compelling feature that would not only retain users but also encourage them to interact more with each other and invite others to use the app?"

The potential solution had to meet several criteria to address the challenges. These criteria included:

- *Increase friending*: The new feature should encourage users to connect with others on the platform, boosting the social interaction metrics and improving the K-factor.
- *Increase queuing titles*: An indication of a "healthy" user is the number of titles they have queued. By encouraging users to queue more titles, user engagement could improve, and this could also enhance the social aspect of the app.
- *Increase inviting*: to improve the K-factor, the new features should motivate users to invite others to join the app. This would not only increase the user base but also create a more vibrant and active community.
- *Improve retention*: the feature should be engaging enough to keep users returning to the app, improving the Week 6 retention rate.

- *Easy to build & fast time-to-market*: given business constraints, it was crucial that the solution is feasible to implement quickly without significant resource allocation.

With these goals and criteria in mind, the team began exploring potential features that could address these objectives.

After identifying the core problem to focus on – deciding what to watch – the team started brainstorming potential solutions that would not only address this issue but also meet the objectives of increasing user interaction, engagement, and retention. To facilitate this, the team held an in-person workshop, with founders flying in from the USA to participate. At the workshop, key stakeholders such as the CEO, CPO (Chief Product Officer), User Experience Designer, and User Interface Designer, along with the development team, quality assurance personnel, and the project manager were present. This diverse blend of professionals brought a multifaceted approach to the new feature development, highlighting that the effort involved in building a new feature is deeply interdependent, requiring a well-coordinated process that spans beyond just the development stage.

The brainstorming session generated several innovative ideas:

- *Watch Club*: this feature would allow users to form clubs and nominate their first title to watch. Club members can then upvote, veto, and comment to choose the title of the week. This solution could encourage social interaction and increase queueing titles.
- *Climb Together*: This gamified feature involves completing challenges and 'climbing a mountain'. Users can pick a challenge or set their own, invite friends, and watch and comment on titles to advance. The social and competitive aspects of this feature could help increase user engagement and referrals.
- *Title Fight*: In this approach, users would choose a theme, invite friends, and each would nominate a title in secret. After watching their friends' picks before a set deadline, users would rank what they watched. The person who picked the favourite title would win. This feature could promote friendly competition and further social interaction among users.

– *Shared Queue*: This feature would allow users to create a shared list of titles. For example, users could create their TOP 10 best Christmas movies or low-key scary movies. This solution could promote increased queueing of titles and social interaction.

Each of these solutions was analysed for their feasibility, potential impact, and alignment with the user engagement and retention goals (Table 1), leading to the selection of the final solution.

Table 1: The analysis of the proposed solutions for their feasibility, potential impact, and social aspects

Feature	Overall note	Potential impact	Social aspect[1]	Effort
Watch Club	No direct and intimate interaction between users.	Mid	Mid	High
Climb Together	Hard to promote due to complexity and no clear user interaction.	Mid	Mid	Mid
Title Fight	Direct user interaction, but substantial time passes between interactions.	Mid	High	High
Shared Queue	No direct interaction between users	Low	Low	Low

[1] User engagement and retention goals

2.5 Chosen Solution

The final choice for the solution was the 'Title Fight' feature. The team believed it had the potential to increase user engagement, social interaction, and content queuing, based on the engaging and competitive nature of the feature. To validate this, the team initiated the testing process with a minimalistic approach. At first, a proof of concept was set up using PowerPoint, with one user acting as the moderator. This method allowed for testing the core loop of the feature with minimal resource expenditure. Encouraged by the positive feedback from the initial participants, the team moved forward with the creation of a more sophisticated, interactive prototype using Figma (an online tool for designing user interfaces). This

clickable prototype was then tested in user testing sessions. User testing sessions refer to a process where a product or service is evaluated by testing it with representative users. In these sessions, potential users of the system perform specific tasks to measure the product's usability, and user satisfaction and identify any potential issues or problems. This can be performed at any stage of the development process, including pre-release, to ensure the product meets user needs and expectations. User testing sessions are a vital part of User-Centered Design, helping to improve the overall user experience and increase the product's effectiveness. The results from these sessions can guide developers in making necessary adjustments to enhance the performance, usability, and accessibility of the product. During the user testing sessions, the 'Title Fight' feature received positive feedback.

However, despite the favourable responses, the team realized that the feature's full implementation would be significantly larger in scope than initially anticipated. The feature required too much development effort, and the cost-benefit analysis did not justify the expense.

In response to this, the team decided to gather more information to better understand users' interest in the feature, as well as the other potential alternatives. They created a dedicated spot within the 'Friends' tab in the app to showcase all four potential features, complete with a 'Notify me' option for when the feature would become available. This strategy aimed to gauge user interest in these features and identify which one was the favourite, helping the team make a more informed decision about which feature to develop further.

In the quest to find the perfect feature that would enhance user engagement and interaction, the search resulted in the "Swipe with Friends" feature. It neatly dovetailed with the requirements, employing the universally understood swiping mechanism with no need for extra onboarding or explanations. The feature was designed as an engaging 2-player game, running simultaneously on each user's device. During a focused 60-second round, users would swipe through a shared stack of movie and TV show titles, swiping right for titles they wanted to watch and left for those they didn't. The highlight of each round was the 'matches' – titles both users expressed interest in by swiping right. Matches were showcased on a Results screen at the end of the round. For rounds yielding multiple matches, the team used

an existing 'Spinner' feature, turning the selection of a title to watch into a game of chance.

'Swipe with Friends' effortlessly transformed the often-daunting task of choosing a title into a fun, shared experience. The feature not only made the process of deciding what to watch more interactive and enjoyable but also significantly encouraged social interaction within the app. As a result, user engagement and retention have increased notably, and the K-factor received a significant boost as users were motivated to invite friends to join the experience. As a result, daily active users increased by 71% over the next two months after releasing the new feature. In addition to solving the core problem and fulfilling the objectives, 'Swipe with Friends' also saw massive promotion success on social media platforms (multiple 5M+ views Reels, and TikToks), leading to a significant improvement in the new user acquisition rates. New acquisition rates saw a significant rise of approximately 794% when comparing the two months leading up to the new feature release (21,900 downloads) and the two months following the release (196,000 downloads). The simplicity, interactivity, and social dynamics of this feature resonated incredibly well with the user base, proving 'Swipe with Friends' to be the ideal solution for the company's challenges.

3 Discussion Questions

1. What specific challenges in the mobile application industry make Agile and Lean methodologies particularly suitable for new product development, as demonstrated in the Queue app case?
2. How did the theoretical principles of the NPD process discussed in the introduction guide the development and successful implementation of the "Swipe with Friends" feature?
3. In what ways did the developers utilize iterative testing and user feedback to refine their solutions?
4. Considering the theoretical background provided, how might the Queue app's development process differ if it were approached using a more traditional, non-Agile NPD model? What could be the potential outcomes?
5. How can the lessons learned from this case study be generalized to other areas of new product development? What might need to be adapted when applying these methodologies in different contexts?

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Didactic Use: This case study is useful for courses in marketing and digital product management, where students explore the application of New Product Development (NPD) methodologies in the mobile app industry. The study is particularly relevant for topics covered in FEB courses such as *Fundamentals of marketing*, *Introduction to marketing*, *Digital product marketing*, *Data analysis in marketing*, and *Consumer behavior research* on undergraduate and master's programs.