

# AI-Driven Disruption in Retail and Education Featuring Chegg, Stack Overflow, RWS, and Duolingo

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## ABSTRACT

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*The artificial intelligence (AI) revolution has brought significant disruption to the digital business industry, including the online retail education services sector. On the one hand, the application of AI in the corporate environment is often followed by a reduction in human labor. On the other hand, the use of AI by consumers challenges the existence of digital service companies, especially those engaged in online education. This research analyzes how business sustainability in this sector is not enough to adapt to AI, but needs to adopt AI strategically to create added value and stronger competitiveness. Through case studies on Chegg, Stack Overflow, RWS, and Duolingo; this research evaluates the impact of AI on business models, effective adaptation strategies, and growth opportunities amid the threat of disruption. The results show that companies that are able to integrate AI as part of product and service innovation are not only able to survive, but also have the potential to expand market share and create new trends in the online education industry.*

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SARI PATI

Revolusi kecerdasan buatan (AI) telah membawa disrupsi signifikan dalam industri bisnis digital, termasuk sektor jasa edukasi retail daring. Di satu sisi, penerapan AI di lingkungan perusahaan seringkali diikuti dengan pengurangan tenaga kerja manusia. Di sisi lain, penggunaan AI oleh konsumen justru menantang eksistensi perusahaan jasa digital, terutama yang bergerak dalam bidang edukasi daring. Penelitian ini menganalisis bagaimana keberlanjutan bisnis di sektor ini tidak cukup hanya dengan beradaptasi terhadap AI, tetapi perlu mengadopsi AI secara strategis untuk menciptakan nilai tambah dan daya saing yang lebih kuat. Melalui studi kasus pada Chegg, Stack Overflow, RWS, dan Duolingo; penelitian ini mengevaluasi dampak penggunaan AI terhadap model bisnis, strategi adaptasi yang efektif, serta peluang pertumbuhan di tengah ancaman disrupsi. Hasil penelitian menunjukkan bahwa perusahaan yang mampu mengintegrasikan AI sebagai bagian dari inovasi produk dan layanan tidak hanya mampu bertahan, tetapi juga berpotensi untuk memperluas pangsa pasar dan menciptakan tren baru dalam industri edukasi daring.

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## INTRODUCTION

The disruption caused by artificial intelligence (AI) in digital business has fundamentally transformed various industrial sectors, including online retail education (Dantsoho et al., 2021; Darmawan, Arimbawa, et al., 2024). Over the past decade, AI has evolved from a niche technology to a cornerstone of innovation, reshaping how businesses operate and deliver value to consumers (Heptariza et al., 2024; Pertiwi et al., 2023; Wang, 2025). In the context of online education, AI has introduced unprecedented levels of efficiency, personalization, and scalability. For instance, AI-powered platforms can now analyze vast amounts of data to tailor learning experiences to individual needs, automate administrative tasks, and provide real-time feedback to users (Alubthane, 2024). This shift has not only improved the quality of education but has also made it more accessible to a global audience.

However, the rapid adoption of AI has also created significant challenges for traditional education providers. Companies that once relied on human-driven services are now facing intense competition from AI-based solutions that offer faster, cheaper, and more personalized alternatives (Wijaya et al., 2022). This has forced many businesses to rethink their strategies and adapt to the new realities of an AI-driven market. The integration of AI into online education is no longer a luxury but a necessity for survival in an increasingly competitive landscape.

The disruptive impact of AI on businesses and consumers is evident in several high-profile

cases, such as those experienced by Chegg, Stack Overflow, and RWS (Sewpersadh, 2023). Chegg, an online learning platform that was once a go-to resource for students seeking academic assistance, has seen a significant decline in users due to the emergence of generative AI tools like ChatGPT (Kim et al., 2024). These tools provide instant, contextually accurate answers to academic questions, rendering traditional homework help services obsolete. Similarly, Stack Overflow, a popular platform for programmers to share knowledge and solve coding problems, has faced challenges as users increasingly turn to AI for coding solutions (Antelmi et al., 2023). AI-powered tools can now generate code snippets, debug errors, and even explain complex programming concepts without the need for human intervention.

RWS, an online translation company, has also struggled to compete with AI-powered translation tools like Google Translate and DeepL (Gašparić, 2023). These tools offer instant translations with ever-improving accuracy, making them a more attractive option for consumers. The decline in demand for human translation services has forced RWS to reevaluate its business model and explore new ways to integrate AI into its offerings. These examples highlight the risks of relying on outdated business models without incorporating AI into core services. Companies that fail to adapt risk losing their competitive edge and, in some cases, may face complete business failure.

The integration of AI in digital business has been widely discussed in recent literature, with a particular focus on its impact on education and retail (Jankovic & Curovic, 2023). Studies have shown that AI-driven personalization and automation are reshaping consumer expectations and service delivery. For

example, generative AI models like ChatGPT are revolutionizing the way digital services are offered, enabling businesses to provide more personalized and efficient solutions (Yenduri et al., 2024). Similarly, the role of AI in automating repetitive tasks and enhancing the overall learning experience (Arya & Verma, 2024).

In the context of online education, literature underscores the importance of proactive AI adoption. Duolingo has successfully integrated AI into its platform to create personalized and interactive learning experiences (Vega et al., 2024). By leveraging AI, Duolingo has been able to retain existing users and attract new ones, even as other companies struggle to adapt. The concept of AI as a driver of innovation, arguing that businesses that view AI as more than just a tool for efficiency are better positioned to create long-term value and sustainable growth (Jorzik et al., 2024).

To address the challenges posed by AI disruption, online education providers must adopt a proactive and strategic approach to AI integration. This involves leveraging AI to create personalized learning experiences by analyzing user data and tailoring learning paths to individual needs and preferences. For instance, AI algorithms can identify areas where a student is struggling and provide targeted resources to help them improve, enhancing both the learning experience and user engagement. Additionally, AI can automate repetitive administrative tasks such as grading, scheduling, and content delivery, freeing up time for educators to focus on more strategic activities while reducing

operational costs. This automation not only improves efficiency but also makes education more affordable and accessible to a broader audience.

Furthermore, online education providers should focus on developing interactive and engaging content using AI, such as quizzes, simulations, and games, to make learning more enjoyable and effective. For example, platforms like Duolingo use AI to generate personalized language exercises that adapt to the user's skill level and learning pace. To stay ahead of technological advancements, companies must also invest in AI research and development, exploring new applications like natural language processing, computer vision, and predictive analytics. By embedding AI into their core services, businesses can create unique value propositions that differentiate them from competitors. Duolingo's success exemplifies how AI can enhance user retention and attract new customers by offering innovative and enjoyable learning experiences, demonstrating the transformative potential of AI in the online education sector.

## METHODS

This research employs a qualitative method with a descriptive writing style, utilizing accidental sampling for data collection through literature review and observation of the designed interface. To implement the research topic, the author follows the steps outlined below.

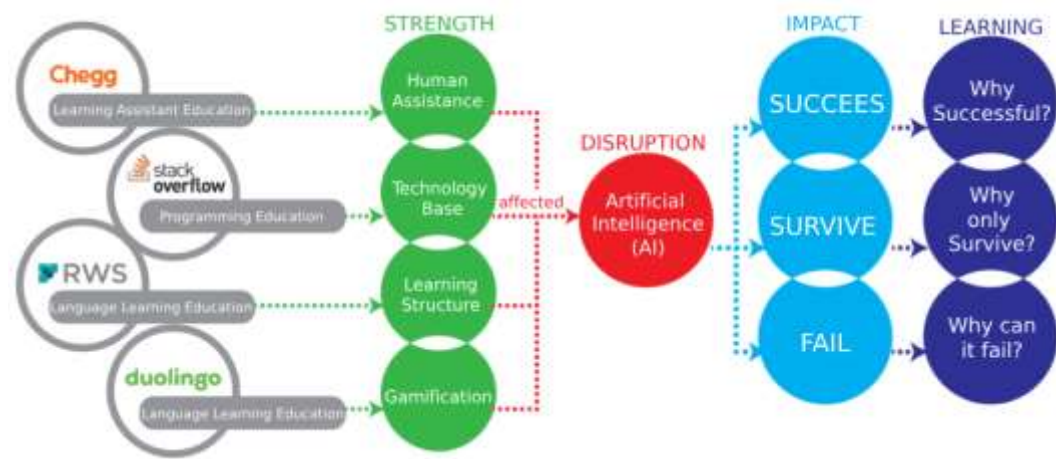


Figure 1. Research Methods (Source: Author Team's Work)

This study examines the impact of artificial intelligence (AI) disruption on four online retail education companies: Chegg, Stack Overflow, RWS, and Duolingo. The core strengths of these companies include human assistance, technological infrastructure, learning structures, and gamification. With the advent of AI disruption, the effects on these four online retail education providers can be categorized into three outcomes: success, survival, or failure. The final stage of this research invites an analysis of the key factors driving success, as well as the obstacles that hinder sustainability or lead to failure. It is hoped that this study will serve as an essential learning resource for navigating AI disruption, particularly for businesses in the online retail education sector.



Figure 2. Online Retail Service Business Platforms Face AI Challenges.  
(Source: Author Team Work)

## RESULTS AND DISCUSSION

Chegg, Stack Overflow, RWS, and Duolingo are four companies engaged in digital businesses with a primary focus on the education and professional services sectors (Williamson, 2021). In their heyday, these four companies enjoyed rapid growth and high popularity among their users. However, the rapid development of AI brought great challenges to Chegg, Stack

Overflow, and RWS, and Duolingo was able to capitalize on this opportunity. Unlike these three companies, Duolingo has successfully integrated AI into its service, introducing personalized learning features and creating lesson modules that are responsive to user needs, thus remaining relevant in the AI era.

### 1. Chegg's Ups and Downs

Chegg is an American education technology company

headquartered in Santa Clara, California (Chegg, 2025). The company provides homework help, digital and physical textbook rentals, textbooks, online tutoring, and other student services. In its heyday, Chegg managed to become one of the leading education technology companies in the

United States with a strong user base among students and college students. Chegg's success was underpinned by its innovative business model, particularly in providing affordable digital and physical textbook rental services, as well as an accessible online tutoring platform.

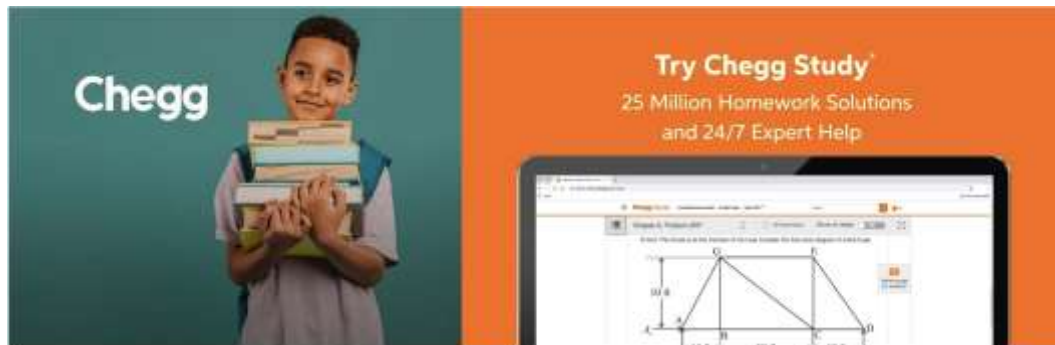


Figure 3. Chegg Service Ad. (Source: chegg.com)

In an increasingly expensive educational environment, Chegg offers an economical and practical solution for students to access learning materials without having to purchase new textbooks that are often unaffordable. In addition, Chegg is also expanding its services by offering homework help and other student services, further cementing its position as a complete digital education service provider. Its tutoring platform allows students to get real-time academic help, creating a more personalized and effective learning experience. These advantages make Chegg the first choice for many students in overcoming their academic challenges, especially in subjects that require deep understanding and specialized guidance.

However, the development of artificial intelligence (AI) brings great challenges for Chegg. The emergence of generative AI such as ChatGPT that is able to provide instant and more

in-depth answers to various academic questions makes Chegg's services feel less relevant (Waters, 2023). Instead of having to go through a tutoring process with a tutor on the Chegg platform, students can now get immediate answers and detailed explanations by simply typing questions into an AI-based chatbot (Stresemann & Millican, 2020).

This reduces the need for tutoring services offered by Chegg, especially for academic questions that are factual and structured. In addition, AI is also able to provide personalized learning resources, leading students to prefer using AI-based apps or platforms over Chegg's traditional services. The impact of this disruption can be seen in the decline in the number of customers and the weakening of the company's stock value, suggesting that simply offering online education services is not enough if it is not matched by innovation and adoption of AI in its core services.

## 2. Stack Overflow Technology Foundation

Stack Overflow is a question and answer website for computer programmers. It is the main site of the Stack Exchange Network. The site was created in 2008 by Jeff Atwood and Joel Spolsky. The site provides questions and answers about specific computer programming topics (Stack Overflow, 2025). In its heyday, Stack Overflow became the backbone for many software developers around the world. Many tech companies even recommend their employees to use Stack Overflow to find programming solutions (Moutidis & Williams, 2021).

Its efficient search system, combination of Q&A, and comprehensive technical documentation make Stack Overflow indispensable in the software development ecosystem (Igbudu & Ahmed, 2024). Its popularity is not only limited to individuals, but also extends to companies and educational institutions that utilize the platform to support learning and technology development. In the fast-paced world of technology, Stack Overflow is able to offer quick access to concrete solutions, helping to save time and increase the productivity of software developers (Giwangkoro & Nugroho, 2024).



Figure 4. Stack Overflow Service Ad. (Source: stackoverflow.com)

However, the rise of artificial intelligence (AI), especially generative AI such as ChatGPT, brings a big challenge to Stack Overflow (Kabir et al., 2024). Many programmers are starting to turn to AI chatbots because they are able to provide instant answers without having to go through a long question and answer process. By simply typing in a question, users could get detailed

explanations and even ready-to-use programming code, something that previously required interaction with the community on Stack Overflow. The decline in community engagement is evident, with many questions on Stack Overflow no longer getting responses as quickly as before.

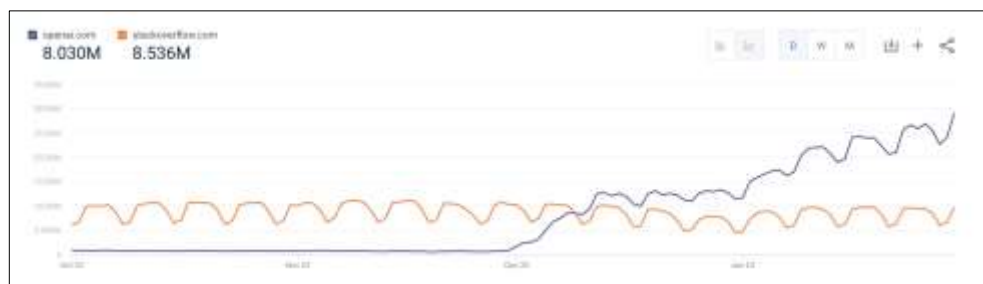


Figure 5. Stack Overflow (Orange) versus ChatGPT (Blue) in Google Trend Searching (Source: Esteve Castells on x.com)

AI is also able to learn question patterns and provide more personalized recommendations, diminishing Stack Overflow's appeal as the primary platform for finding technical answers (Garcia et al., 2023). As a result, Stack Overflow must continue to adapt quickly to stay relevant amidst competition from evolving AI technologies.

### 3. Learn Languages with RWS

RWS is a UK company that provides intellectual

property translation, archiving and search services, technical and commercial translation and localization, and develops and supports translation productivity and management software (RWS, 2025). In its heyday, RWS Group established itself as one of the world's leading translation and localization service providers. The company is widely recognized for its ability to provide high-quality technical and commercial translation services, especially in the legal, technology and intellectual property sectors.



Figure 6. Advertisement of RWS (Services. Source: rws.com)

RWS's strength lies in the combination of an extensive network of professional human translators and innovative productivity software, which enables the company to handle large projects with a high degree of accuracy and consistency. RWS is also known for its intellectual property search and filing services that assist global companies in protecting their intellectual assets in international markets. In addition, RWS has been able to build a solid reputation among multinational companies thanks to its quality-based approach and timeliness in every project it undertakes.

However, the disruption brought by artificial intelligence (AI) poses a serious challenge to RWS. The emergence of AI-based translation technologies, such as Google Translate and DeepL, has led many corporate clients to switch to faster and more economical AI solutions. AI technology is not only able to translate text instantly, but is also increasingly sophisticated in understanding the context and nuances of the language, something that was previously the main added value of RWS's manual translation services (Darmawan, Yoo, et al., 2024).

With the development of natural language processing (NLP), AI is also able to provide translations that are closer to professional quality, especially for general and non-technical texts (Guerberof-Arenas & Moorkens, 2023). In addition, AI software for translation also offers automation features that reduce the need for manual localization services, thus reducing the demand for traditional translation services provided by RWS. In the face of these challenges, RWSs need to consider AI adaptation and adoption strategies to remain relevant in an increasingly competitive industry.

#### 4. Play and Learn Languages with Duolingo

Duolingo is also a language learning platform (like RWS) but turns the process of learning a new language into a game (game-based learning or gamification). The Duolingo app brings that experience to mobile devices, allowing users to hone their language skills anytime, anywhere (Duolingo, 2025). Duolingo allows users to engage with small, quick modules built around specific skills. Duolingo, as an app-based language learning platform, reached its heyday with its innovative approach in combining learning and gamification.

Since its launch, Duolingo offers a fun and interactive language learning experience through

short modules that allow users to learn anywhere and anytime.

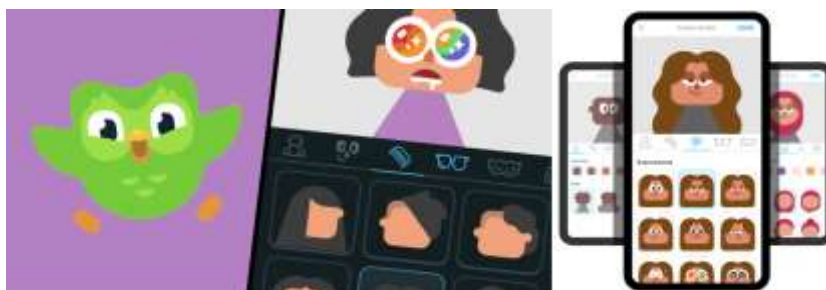


Figure 7. Gamification of Avatars for Duolingo Users. (Source: duolingo.com)

Duolingo's success is also supported by its freemium business model, where users can access most content for free while being offered additional features through premium subscriptions. The use of game elements, such as points, levels, and daily challenges, not only increases user retention but also encourages consistent learning. In addition, Duolingo is actively expanding the range of languages offered, from popular languages to lesser learned languages, expanding its market share and making it the world's leading language learning platform.

One of the main reasons for Duolingo's sustainability and growth amidst AI disruption is their ability to adopt AI technology into their platform (Ouyang et al., 2024). Duolingo uses AI to create a personalized learning experience, where AI algorithms are able to adjust the difficulty of lessons based on each user's performance and learning speed. AI is also used in the interactive conversation feature, where users can practice speaking with an AI chatbot designed to simulate real conversations.

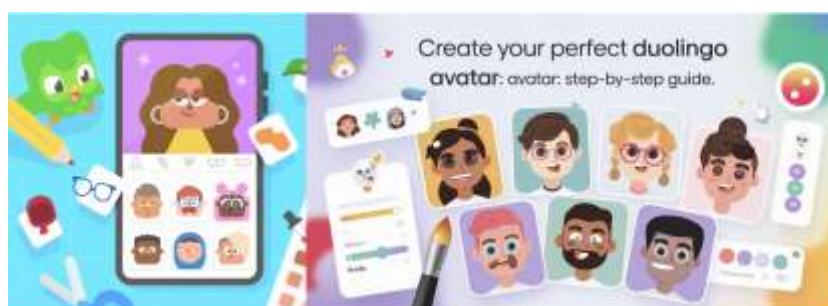


Figure 8. Avatar Personalization for Duolingo Users. (Source: duolingo.com)

AI-based speech recognition technology helps in providing immediate feedback on the user's pronunciation, thus improving the quality of language learning significantly (Ikawati et al., 2022). In contrast to other educational platforms that are being eroded by AI, Duolingo has successfully

positioned AI as a major force to enrich its user experience, ensuring that the platform not only survives but also thrives in the global market.

## 5. Learning from Duolingo (Using Chatbot)

Learning from Duolingo's success, companies in the

online retail education services sector need to understand that AI adoption is not just a trend, but an essential business strategy for sustainability and growth. Duolingo has proven that integrating AI deeply into business operations can create a more engaging and effective user experience (Darmawan, Utomo, et al., 2024). By using AI to create personalized and interactive learning, Duolingo has

increased user retention and expanded its market share. The platform not only utilizes AI for automation, but also uses it as a tool to improve service quality, such as voice recognition features to train pronunciation and AI chatbots for conversational practice. These successes show that AI can be a strong competitive advantage if used with a creative and purposeful approach.

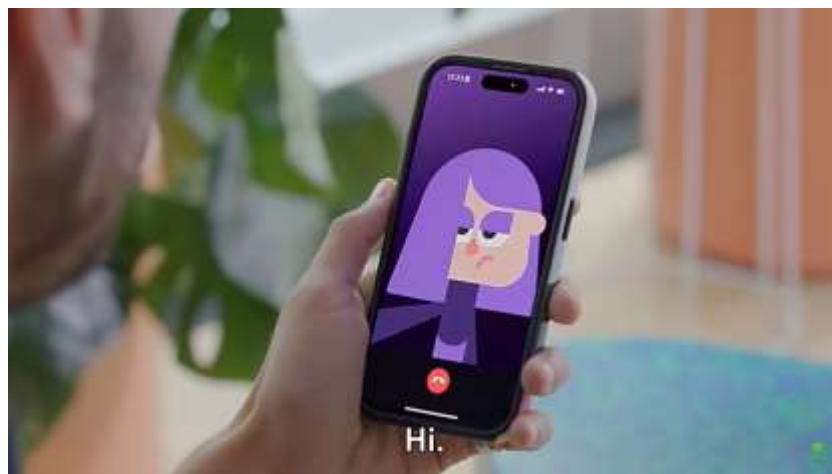


Figure 9. Duolingo AI Chatbot Interaction. (Source: duolingo.com)

Companies like Chegg, Stack Overflow, and RWS can learn valuable lessons from Duolingo's proactive approach to addressing AI disruption. Rather than viewing AI as a threat, businesses need to explore ways to leverage it as a tool to enhance value for users. The use of AI for process automation and service personalization, as demonstrated by Duolingo, can help companies remain competitive in an increasingly challenging market. Adopting AI also opens opportunities to create new, more adaptive business models that are consumer-centric. By embracing innovative strategies like those of Duolingo, online retail education providers can not only maintain their market share but also expand their business and create sustainable long-term value.

## MANAGERIAL IMPLICATION

The analysis of Chegg, Stack Overflow, RWS, and Duolingo provides critical insights for managerial decision-making in the online education and technology sectors. These implications are particularly relevant for companies facing disruption from artificial intelligence (AI) and evolving consumer preferences. Companies like Chegg, Stack Overflow, and RWS must view AI not as a threat but as an opportunity to enhance their services. Duolingo's success demonstrates how AI can be integrated into core operations to create personalized, interactive, and engaging user experiences. For instance, AI can automate repetitive tasks, provide real-time feedback, and tailor content to individual user needs. Managers should invest in AI-driven tools such as chatbots, voice recognition, and adaptive learning algorithms to improve service quality and user retention.

Practical decisions include allocating budget for AI research and development (R&D) to create innovative features, partnering with AI technology providers or developing in-house AI capabilities, and training employees to work alongside AI systems effectively.

The decline in relevance of traditional services offered by Chegg (tutoring), Stack Overflow (Q&A forums), and RWS (manual translation) highlights the need for businesses to adapt to AI-driven solutions. Managers must recognize that AI can provide faster, cheaper, and more scalable alternatives to manual processes. For example, AI-powered chatbots can replace human tutors for factual queries, and AI translation tools can handle general text localization with high accuracy. Practical decisions include transitioning from manual services to AI-augmented solutions where feasible, investing in AI tools that complement existing services (e.g., AI-assisted tutoring or translation), and phasing out outdated services that are no longer competitive in the AI era.

Duolingo's gamification strategy has proven highly effective in retaining users and making learning enjoyable. Managers in the education technology sector should consider incorporating game-like elements such as points, levels, and challenges into their platforms. This approach not only increases user engagement but also encourages consistent usage, which is critical for long-term success. Practical decisions include developing gamified features to make learning or problem-solving more interactive, allocating resources to design and test gamification strategies, and monitoring user engagement metrics to refine gamification elements.

Duolingo's freemium model, which offers free access to core features while monetizing premium services, has been instrumental in its growth. Managers should consider adopting similar pricing strategies to attract a large user base and generate revenue through upselling premium features. This model is particularly effective in competitive markets where users are hesitant to pay upfront for services. Practical decisions include designing a freemium pricing structure that balances free and premium offerings, identifying premium features that provide significant value to users (e.g., advanced analytics, ad-free experiences), and using data analytics to identify free users who are likely to convert to paid subscriptions.

Duolingo's use of AI for personalized learning and real-time feedback has set it apart from competitors. Managers should explore how AI can be used to differentiate their offerings in the market. For example, Chegg could use AI to provide more personalized tutoring, Stack Overflow could integrate AI to offer instant code solutions, and RWS could use AI to enhance translation accuracy and speed. Practical decisions include identifying unique ways to integrate AI into existing services, conducting market research to understand how competitors are using AI, and developing a clear value proposition that highlights AI-driven advantages.

The success of Duolingo and the challenges faced by Chegg and Stack Overflow underscore the importance of designing services that are user-friendly, accessible, and responsive to user needs. Managers should focus on creating platforms that

are easy to use, mobile-friendly, and capable of delivering immediate value to users. Practical decisions include investing in user experience (UX) design to improve platform usability, ensuring services are accessible across devices (mobile, desktop, etc.), and gathering user feedback regularly to refine and improve services.

The rapid rise of AI technologies like ChatGPT and DeepL has disrupted traditional business models. Managers must stay informed about emerging trends and be prepared to pivot quickly. For example, Stack Overflow's decline in engagement due to AI chatbots highlights the need for continuous innovation and adaptation. Practical decisions include establishing a dedicated team to monitor industry trends and technological advancements, developing contingency plans to address potential disruptions, and fostering a culture of innovation and agility within the organization.

As AI disrupts traditional services, companies must reinforce their brand positioning to remain relevant. Duolingo's strong brand identity as a fun and effective language learning platform has helped it thrive despite competition. Managers should invest in marketing campaigns that highlight their unique value propositions and differentiate them from AI-driven alternatives. Practical decisions include allocating budget for targeted marketing campaigns, emphasizing unique selling points (e.g., gamification, personalized learning), and using social media and influencer partnerships to reach a wider audience.

## CONCLUSION

The disruption caused by artificial intelligence (AI) in the digital business landscape, particularly in the online retail education sector, has created significant challenges as well as opportunities for companies. The case studies of Chegg, Stack Overflow, and RWS illustrate how AI can pose a serious threat to businesses that fail to adapt. These three companies have experienced declining performance and market relevance due to their defensive approach toward AI adoption. Chegg, which initially excelled as a platform for homework help and online tutoring, now faces intense competition from AI tools that can provide students with instant answers and explanations. Similarly, Stack Overflow, once a go-to resource for programming communities, is increasingly being overshadowed by AI solutions like ChatGPT, which can quickly and contextually answer programming questions. Meanwhile, RWS, which previously relied on a network of professional translators, is struggling to compete with AI-powered automated translation services that are faster and more cost-effective. These cases underscore that mere adaptation to AI is insufficient; companies must strategically and proactively adopt AI to remain relevant in an ever-evolving digital business landscape.

On the other hand, Duolingo serves as a successful example of how the right adoption of AI can drive business growth amidst technological disruption. By leveraging AI to create personalized and interactive language learning experiences, Duolingo has not only maintained but also enhanced its competitiveness. The use of AI algorithms to adjust lesson difficulty, AI chatbots for conversational practice, and voice recognition technology to

improve pronunciation has transformed Duolingo from a simple online education platform into an adaptive and engaging learning ecosystem. This success demonstrates that companies in the online retail education sector must not only follow AI trends but also integrate AI as a core component of their business models.

In an era dominated by intelligent technologies, business sustainability depends not only on the

ability to adapt but also on the readiness to transform through innovative and visionary AI adoption. Companies must embrace AI as a strategic tool to enhance user experiences, streamline operations, and create new value propositions. By doing so, they can not only survive but also thrive in the face of AI-driven disruption, ensuring long-term growth and relevance in the digital age.

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