

Contents

| | |
|--|-----------|
| 1. PROBLEM DOMAIN | 3 |
| 1.1 Background to the Problem | 3 |
| 1.2 Solution to the Problem | 3 |
| 2. SOLUTION DESCRIPTION..... | 4 |
| 2.1 System Features | 4 |
| 2.1.1 Functional Requirements | 4 |
| 2.1.2 Non-Functional Requirements | 5 |
| 2.2 UML Diagrams..... | 6 |
| 2.2.1 Use-Case Diagram: | 6 |
| 2.2.2 Class Diagram: | 7 |
| 2.2.3 Activity Diagram:..... | 8 |
| 3. Social Impact | 9 |
| 4. Development Plan with Project Schedule | 9 |
| 5. Marketing Plan..... | 11 |
| 6. Cost and Profit Analysis | 12 |
| 7. References | 15 |

1. PROBLEM DOMAIN

1.1 Background to the Problem

An e-commerce website allows individuals to purchase and sell physical items, and digital products online rather than at a physical store. A firm can use an e-commerce platform to handle orders, receive payments, manage logistics and delivery, and provide customer care [2]. The e-commerce environment has expanded dramatically, with big businesses such as Amazon, eBay, and Daraz dominating the sector. These platforms serve various product categories, making them one-stop shopping for different customer demands. However, certain features of these platforms, including personalization, consumer interaction, and user experience, can be enhanced. By developing a product-based e-commerce website that addresses these specific shortcomings, we can provide a superior shopping experience for consumers and outperform existing market leaders.

1.2 Solution to the Problem

The proposed solution is a product-based e-commerce website named "Happify," which, like Amazon and Daraz, offers an extensive range of items. The transaction between a merchant or retailer and an end customer on an e-commerce platform is B2C e-commerce, the most frequent e-commerce type [3], which will also be followed by our e-commerce platform that is feasible to Happify's business objective. Happify fills an essential market need and can attract a large client base through improving personalization, consumer interaction, and user experience.

Happify's distinctive features and benefits offer it an advantage over well-known e-commerce sites:

- Improved personalization: Happify's powerful algorithms deliver highly individualized product recommendations based on user preferences, browsing history, and other characteristics, providing a customized shopping experience that goes over and above the generic suggestions offered by other platforms.
- Happify will integrate with current social media platforms to promote user involvement, reviews, and recommendations, establishing a feeling of community and a more personal connection than well-known, impersonal e-commerce sites.
- Simplified user experience: Happify's user-friendly interface will include advanced search capabilities, intuitive navigation, and simple filters, allowing customers to locate the desired goods without being overwhelmed by the broad product range on general e-commerce platforms.
- Happify will develop a reward system that encourages customer loyalty and repeat purchases by providing unique offers, discounts, and benefits, differentiating it from other platforms and adding value to customers.

Objective:

To develop and launch the Happify e-commerce website, offering a user-friendly, personalized shopping experience that surpasses industry leaders through tailored recommendations, social media integration, and superior user engagement. By identifying competitors' shortcomings, Happify aims to deliver an exceptional buying experience while maintaining efficiency and reliability through meticulous planning, testing, and execution.

2. SOLUTION DESCRIPTION

2.1 System Features

2.1.1 Functional Requirements

- **User Authentication and Authorization:**
 - Users should be able to register, log in, and manage their accounts.
 - Passwords must be encrypted and securely stored.
 - Role-based access control should be implemented to differentiate between customer, and administrator accounts.
- **Product Management:**
 - Admins should be able to create, edit, and delete product listings, including uploading images, setting prices, and managing inventory.
 - Products should be organized into categories and subcategories.
- **Search and Filtering:**
 - Users should be able to search for products by keyword or category.
 - Filtering options should be available, such as price range, color, size, and other product-specific attributes.
- **Shopping Cart and Checkout:**
 - Users should be able to include, remove, and modify items in their shopping carts.
 - The checkout process should include user-friendly steps, such as shipping address input, shipping method selection, and payment method input.
- **Payment Processing:**
 - Integration with secure and reliable payment gateways (e.g., Bkash, Nagad) should be established.
 - The website should be PCI DSS compliant to ensure secure handling of credit card information.
- **Order Management:**
 - Customers should receive email confirmations upon order placement.
 - Customers should have access to their order history and track the status of their orders.
 - Order statuses should be manageable and updateable by administrators. (e.g., processing, shipped, delivered).
- **Responsive Design:**
 - The e-commerce website should be optimized for both desktop and mobile devices, ensuring a seamless user experience across platforms.

- **SEO Optimization:**
 - The website should be designed with SEO best practices in mind, including proper use of meta tags, header tags, and URLs.
- **Administrative Dashboard:**
 - Administrators should have access to a dashboard to manage customers, products, orders, and other site-wide settings.

2.1.2 Non-Functional Requirements

- **Performance:**
 - Response Time: The website should load within 3 seconds on a standard broadband connection.
 - Throughput: The system should be able to handle a minimum of 10,000 concurrent users during peak hours.
- **Availability and Reliability:**
 - The e-commerce platform should have an uptime of 99.99% (approximately 52 minutes of downtime per year).
 - Implement redundant systems and failover mechanisms to ensure continuous operation in case of component failure.
- **Security:**
 - Data Protection: Implement encryption for sensitive data, both in transit and at rest.
 - Authentication and Authorization: Implement strong authentication and role-based access control.
 - Regular security audits and vulnerability assessments should be performed.
- **Usability:**
 - The website should be easy to navigate, with a clear and consistent design.
 - It should be accessible on various devices (desktop, mobile, tablet) and browsers.
- **Maintainability:**
 - Modular and clean code should be written to facilitate easy updates, bug fixes, and feature enhancements.

2.2 UML Diagrams

2.2.1 Use-Case Diagram:



Figure 1

2.2.2 Class Diagram:

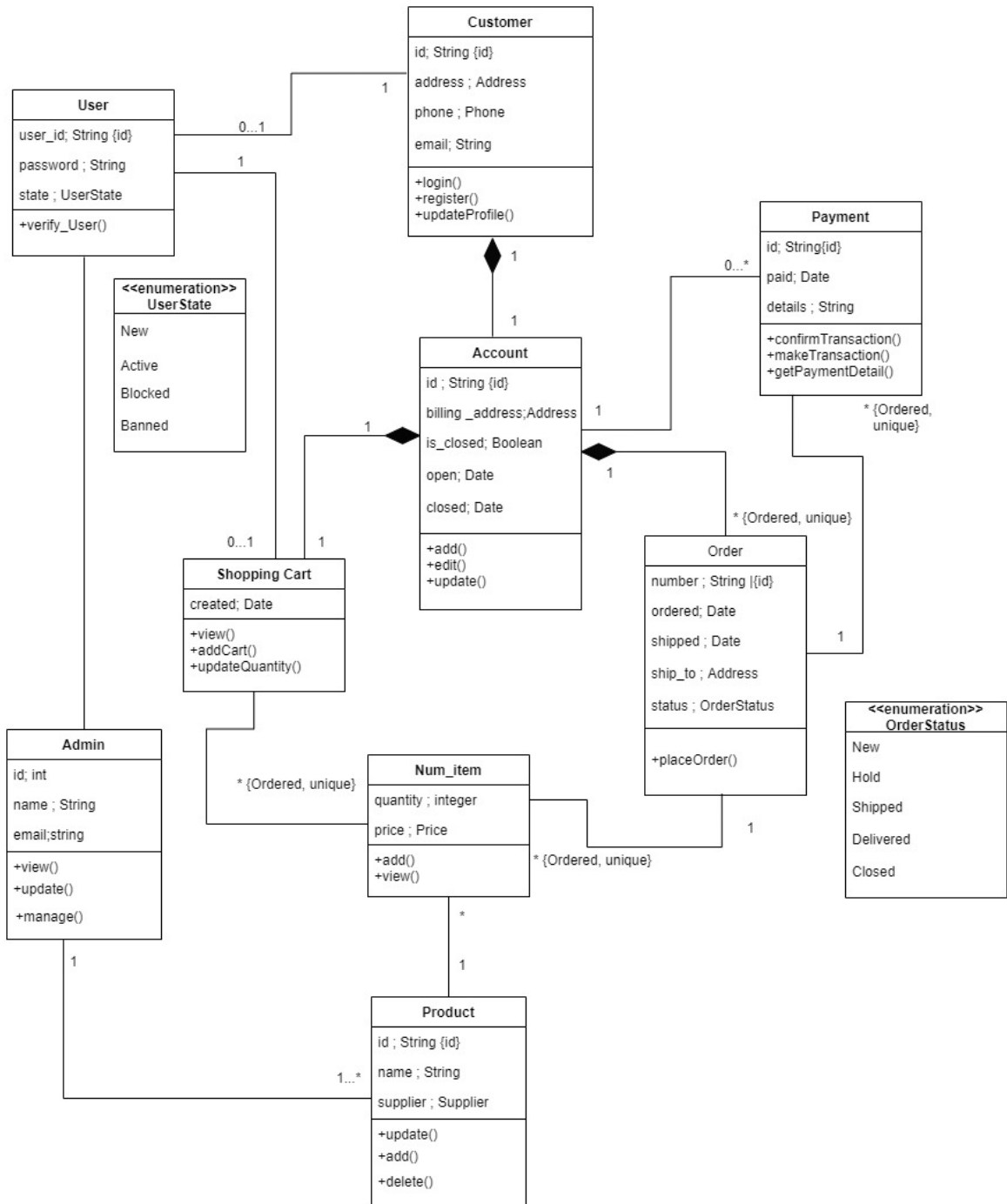


Figure 2

2.2.3 Activity Diagram:

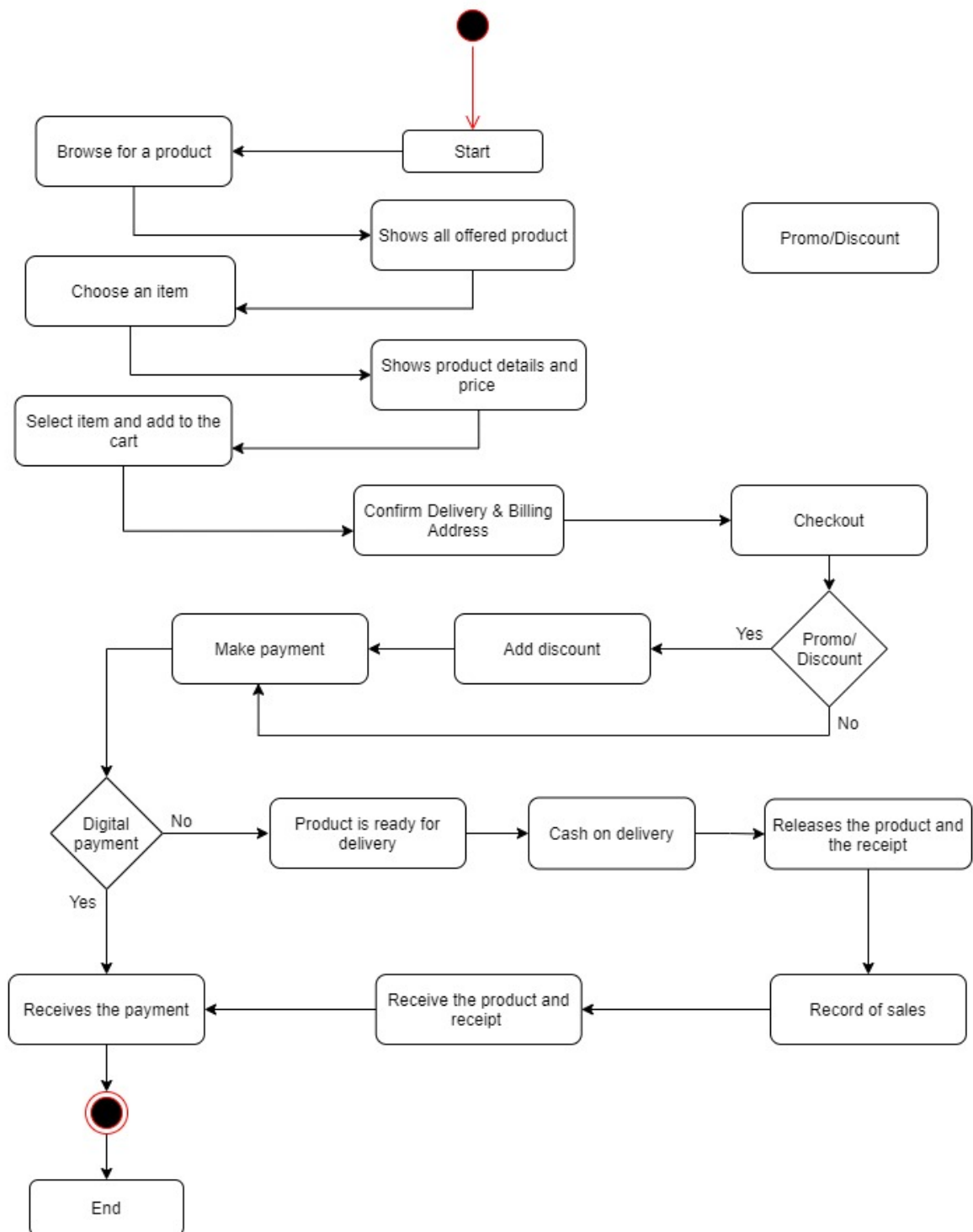


Figure 3

3. Social Impact

The “Happify” e-commerce website can have notable influences on the society. The significant influence of e-commerce on the economy, in general, will be on productivity and inflation. Increased competition, cost savings, and changes in seller pricing behavior may all contribute to the continued expansion of e-commerce, which reduces inflation [5]. It streamlines the buying process, making things more accessible to customers from every aspect of life. The online store promotes diversity and economic progress by enabling a broad selection of products. Furthermore, by advocating for eco-friendly products and responsible shipping practices, our e-commerce website may encourage sustainable consumer behavior. The e-commerce website can also help build a more connected, inclusive, and environmentally conscious society while promoting economic growth.

4. Development Plan with Project Schedule

The e-commerce website's development plan was established using the classic Waterfall method. Planning, Requirement Analysis, Design, Development, Testing, Deployment, and Maintenance are the seven major phases of the project timeline.

List of tasks (Work Breakdown Structure) in each of the seven phases:

1. Planning: [40 hours]

- I. Draft project brief
- II. Schedule kickoff meeting
- III. Project timeline estimation
- IV. Share timeline with teammates
- V. WBS Preparation
- VI. Review and acceptance

2. Requirement Analysis: [42 hours]

- I. Requirement gathering
- II. Requirement elicitation
- III. Requirement analysis
- IV. Requirement filtering
- V. UML diagrams
- VI. System architecture design
- VII. SRS documentation
- VIII. Review document

3. Design: [38 hours]

- I. Database design
- II. UI design

- III. UX design
- IV. Network and security design
- V. Design documentation
- VI. Design review and approval

4. Development: [400 hours]

- I. Development planning
- II. Web development
- III. Admin panel development
- IV. Third-party integration
- V. Version control and code review
- VI. Development documentation

5. Testing: [40 hours]

- I. Test planning
- II. Test case development
- III. Test environment setup
- IV. Test execution
- V. Bug reporting and tracking = Ongoing
- VI. Regression testing
- VII. User acceptance testing (UAT)
- VIII. Test closure

6. Deployment: [40 hours]

- I. Deployment planning
- II. Environment preparation
- III. Release package
- IV. Deployment – staging server
- V. Deployment execution
- VI. Go live

7. Maintenance: [Ongoing]

- I. Assign service operation team
- II. Monitoring and performance management
- III. Bug fixing and troubleshooting
- IV. Security updates
- V. Content updates
- VI. System and software updates
- VII. User support

The total time it will take for the project to be completed is approximately 16 working weeks or 4 Man-Months, from April 2, 2023, to July 25, 2023.

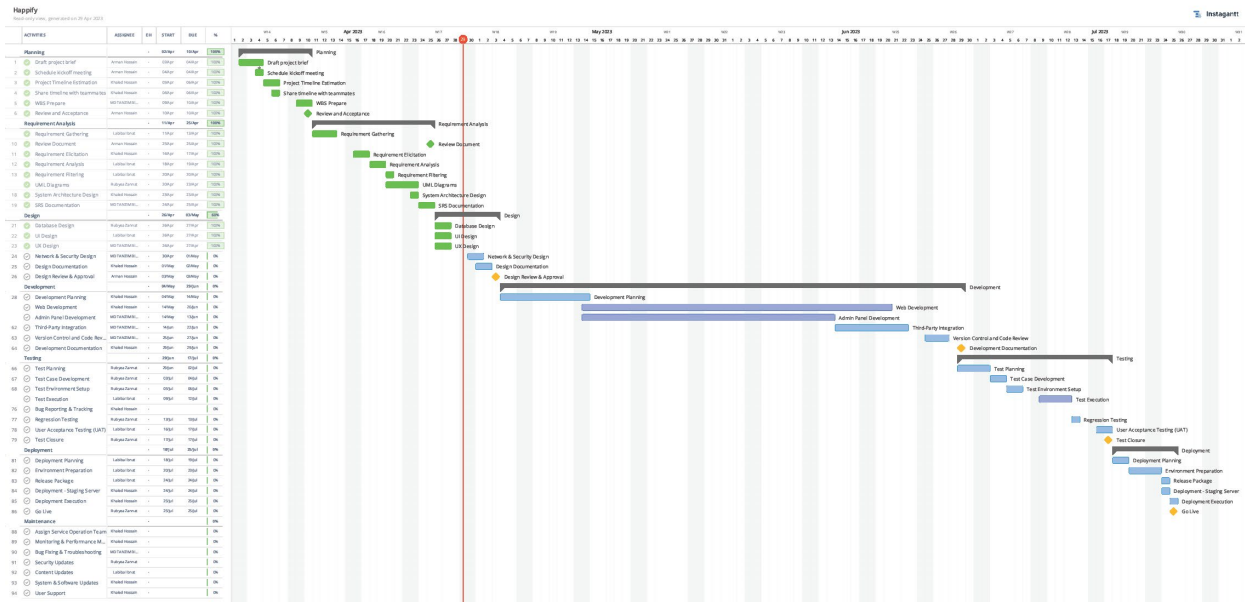


Figure 4: Gantt Chart

5. Marketing Plan

- **Short-term Plan (1 to 6 months):**
 - **Launch Promotion:** Offer a limited-time discount or promotional offer to entice new customers to make their first purchase on Happify. This can create a sense of urgency and help generate initial buzz.
 - **Social Media Advertising:** Leverage popular social media platforms like Facebook, Instagram, and Twitter to run targeted ads and sponsored posts that reach potential customers in the target demographic.
 - **Influencer Marketing:** Partner with influencers in the specific niche to promote the e-commerce site through sponsored posts, stories, and product reviews. This can help create trust and credibility among their followers.
- **Long-term Plan (6 months to 2 years):**
 - **Search Engine Optimization (SEO):** Implement a comprehensive SEO strategy to improve organic search rankings and drive long-term, sustainable traffic to the site. This includes optimizing the site's structure, content, and meta data to align with relevant keywords.
 - **Content Marketing:** Create and share valuable, informative content such as blog articles, videos, and infographics that showcase the products. This can help you establish authority in the specific niche and attract new customers.

- **Retargeting Campaigns:** Use retargeting campaigns to re-engage potential customers who have visited the website but did not make a purchase. This can help increase conversion rates and encourage repeat purchases.
- **Customer Loyalty Program:** Develop a customer loyalty program that rewards repeat customers with exclusive discounts, early access to new products, and other incentives. This can help foster long-term relationships and increase customer lifetime value.
- **Continuous Plan:**
 - **Social Media Engagement:** Maintain an active presence on social media platforms by consistently posting relevant content, engaging with followers, and responding to customer inquiries. This can help build a strong community around the brand and foster positive word-of-mouth.
 - **Data Analysis and Optimization:** Regularly analyze user behavior data, site metrics, and marketing campaign performance to identify areas for improvement and optimization. Adjust the marketing strategies accordingly to maximize ROI.
 - **Partnerships and Collaborations:** Continuously explore opportunities for partnerships and collaborations with complementary businesses or influencers that can expose your brand to new audiences.
 - **Customer Feedback:** Collect and analyze customer feedback through surveys, reviews, and social media interactions to understand their needs and preferences. Use this information to refine the product offerings, marketing strategies, and overall customer experience.

6. Cost and Profit Analysis

Cost Analysis:

The figures below provide a thorough breakdown of the expenses associated with development and marketing.

| PROJECT RESOURCE ENGAGEMENT (GENERIC) | | Dev HOUR : | | 440 | PROJECT RATE | |
|---------------------------------------|------------------------|------------|---------|-----------|--------------|------------|
| SL | POSITION | QTY | RATE/HR | % of WORK | TOTAL HOUR | TOTAL RATE |
| 1 | PROJECT MANAGER | 1 | 1000 | 9% | 40 | 40000 |
| 2 | BUSINESS ANALYST | 1 | 1000 | 8% | 35 | 35000 |
| 3 | TECHNICAL LEAD | 1 | 1000 | 7% | 31 | 31000 |
| 4 | DATABASE ADMINISTRATOR | 1 | 800 | 3% | 13 | 10400 |
| 5 | WEB DEVELOPER | 1 | 800 | 91% | 400 | 320000 |
| 8 | UI/UX DEVELOPER | 1 | 600 | 4% | 18 | 10800 |
| 9 | QA ENGINEER | 1 | 600 | 9% | 40 | 24000 |
| 10 | NETWORK ENGINEER | 1 | 600 | 2% | 7 | 4200 |
| 11 | TECHNICAL WRITER | 1 | 400 | 0% | 0 | 0 |
| 12 | TRAINER | 1 | 500 | 2% | 8 | 4000 |
| SUB TOTAL: | | | | | 592 | 479400 |
| OTHERS | | | | | | |
| 13 | D&C FOR PROPOSAL | 1 | 500 | 1% | 4 | 2000 |
| 14 | LEGAL AFFAIRS | 0 | 500 | 0% | 0 | 0 |
| 15 | Administrative | 1 | 1000 | 1% | 4 | 4000 |
| SUB TOTAL: | | | | | 8 | 6000 |
| GRAND TOTAL: | | | 715 | 135.9% | 600 | 485400 |

Figure 5: Development Cost

| Marketing Plan | Estimated Cost (BDT) |
|--------------------------------------|----------------------|
| Short-term Plan | |
| Launch Promotion | 10,000 |
| Social Media Advertising | 20,000 |
| Influencer Marketing | 30,000 |
| Sub-Total | 60,000 |
| Long-term Plan | |
| Search Engine Optimization | 20,000 |
| Content Marketing | 50,000 |
| Retargeting Campaigns | 15,000 |
| Customer Loyalty Program | 35,000 |
| Sub-Total | 120,000 |
| Total One-Time Marketing Cost | 180,000 |
| Continuous Plan | |
| Social Media Engagement | 20,000 |
| Data Analysis & Optimization | 25,000 |
| Partnerships & Collaborations | 40,000 |
| Customer Feedback | 15,000 |
| Total | 100,000 |

Figure 6: Marketing Costs

Profit Analysis:

Annual Maintenance Contract

In order to ensure a seamless operation in the platform, it is important for Happify to conduct the maintenance services, and as the system will be developed by the same party, better support should be provided. The Annual Maintenance Contract is divided into two parts. The Core AMC part is 30% of the total product pricing. And Rest of 5% is for licensing which is depending on the requirement volume.

| FINANCIAL COSTS | % | Cost (BDT) |
|--|------|------------------|
| Project One Time Cost (Dev) | 100% | 485,400/- |
| Marketing Plan | 100% | 180,000/- |
| AMC | 30% | 199,620/- |
| Licensing | 5% | 30,000/- |
| TOTAL FIXED ONE TIME COST | | 665,400/- |
| TOTAL ANNUAL RECURRING COST (AMC) | | 229,620/- |

The following amount will be considered as AMC. **229,620/-BDT** excluding VAT, **which is to be paid yearly by Client** after the deployment of the project. The AMC tenure will start from Go Live date of the website deployment.

This amount is for the first year of deployment of the mentioned version. The amount will be reviewed yearly and any further enhancement versions for the platform will have an impact while reviewing the amount.

Note: This AMC is excluding “Server Cost”, “Domain Cost” & “SMS Gateway Integration Cost”.

Assumption: Annually 1,000,000/- BDT worth of products to be sold where 5,000/- per unit sales. Based on the assumption the profit ratio and break-even points are calculated.

- Total Variable Expenses = Direct Material Cost + Direct Labor Cost + Service & Licensing Cost [6]
= 200,000 + 320,000 + 30,000 = 550,000 BDT
- Gross Profit = Sales Revenue – Total Variable Expenses
= 1,000,000 – 550,000 = 450,000 BDT
- Profit Ratio = Gross Profit ÷ Sales Revenue
= 450,000 ÷ 1,000,000 ≈ 0.45

Now, calculating the break-even point in terms of unit sales:

- Break-Even Points = Fixed Costs ÷ (Sales Price per Unit – Variable Costs per Unit)
[7]

Firstly, the variable costs per unit is calculated:

- Total Variable Expenses = 550,000 BDT
Total Sales = 1,000,000 BDT ÷ 5,000 BDT per unit = 200 units
- Variable Costs per Unit = Total Variable Expenses ÷ Total Sales
= 550,000 ÷ 200 = 2,750 BDT per unit
- Therefore, Break-Even Point = 665,400 ÷ (5,000 – 2,750) ≈ 240 units

The e-commerce website would need to sell approx. 240 units to reach the break-even point and start generating profit.

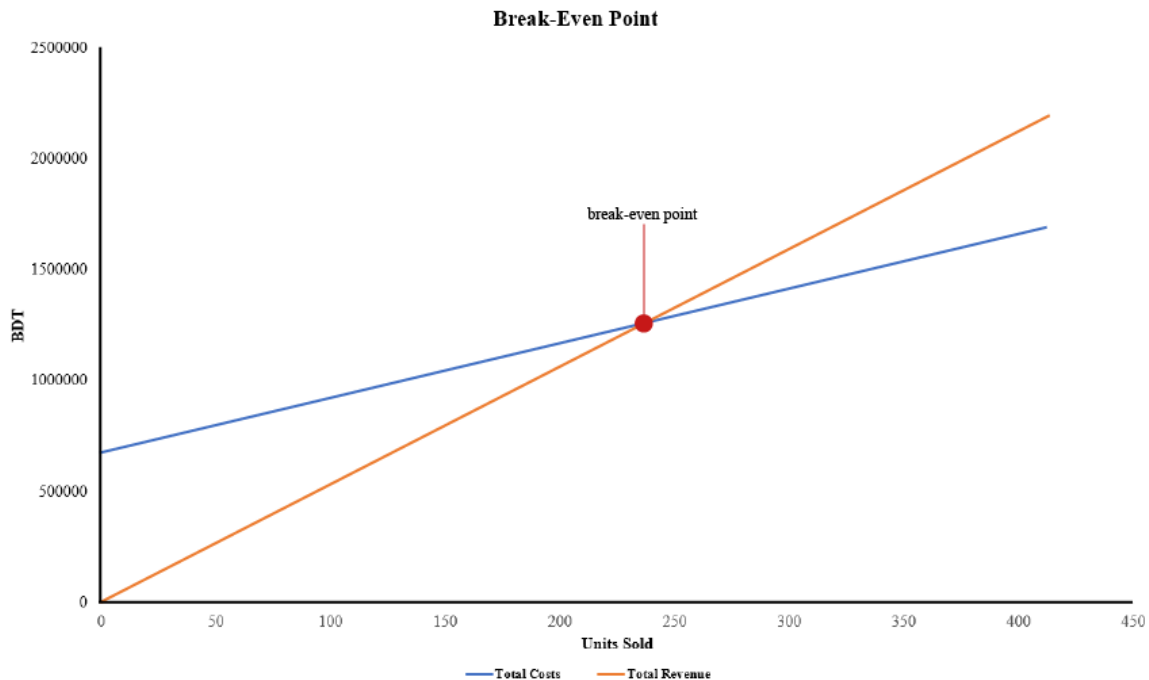


Figure 7: Break-Even Point Graph

7. References

- [1] P. Packt, "The E-Commerce Problem Statement," in *Big Data and Business Intelligence*. Available:
<https://subscription.packtpub.com/book/big+data+and+business+intelligence/9781783981847/1/ch01lv11sec12/the-e-commerce-problem-statement> [Accessed: 16 Apr. 2023]
- [2] Mailchimp, "E-commerce Website," *Marketing Glossary*, 2021. [Online]. Available:
<https://mailchimp.com/marketing-glossary/ecommerce-website/#:~:text=An%20e->

[commerce%20website%20is,logistics%2C%20and%20provide%20customer%20service](#)
[Accessed: 23 Apr. 2023].

[3] Fabric, "Types of E-commerce," *Fabric Blog*, 2021. [Online]. Available: <https://fabric.inc/blog/types-of-ecommerce/#:~:text=read%20customer%20reviews,-.B2C%20E-Commerce,type%20of%20e-commerce%20today>. [Accessed: 23 Apr. 2023].

[4] NASSCOM Community, "E-commerce Website: Functional and Non-Functional Requirements," *NASSCOM*, 2021. [Online]. Available: <https://community.nasscom.in/communities/mobile-web-development/e-commerce-website-functional-and-non-functional-requirements>. [Accessed: 29 Apr. 2023].

[5] AcoWebs, "The Impact of E-Commerce on Society: Positive and Negative Effects," *AcoWebs*, [Online]. Available: <https://acowebs.com/impact-ecommerce-society/#:~:text=The%20main%20way%20in%20which,changes%20in%20sellers%27%20pricing%20behavior>. [Accessed: 29 Apr. 2023].

[6] "Variable Cost Per Unit," *WallstreetMojo*, [Online]. Available: <https://www.wallstreetmojo.com/variable-cost-per-unit/>. [Accessed: 30 Apr. 2023].

[7] "Break-Even Point," *ReadyRatios*, [Online]. Available: https://www.readyratios.com/reference/analysis/break_even_point.html. [Accessed: 30 Apr. 2023].