Business Case Development for IT Projects - 19237600
Project Report

Swap

From Students, For Students

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Summary

Most students at the UT who wish to buy second-hand products resort to marketplaces online or on social media. These services unfortunately lack credibility and quality products at most times. This being the case, students are often scammed while buying such second hand products.

To address this issue, we propose *Swap*, a peer-to-peer multi-vendor marketplace. We envision this as a user-friendly system, that aims to reduce scams and promote a strong student community within the university. Buyers and sellers will be able to interact with each other through the platform and come to a consensus about the cost of the products that are up for sale.

We propose this business case as a subsidiary of the Students Union of the university. *Swap* will encourage the formation of a large network within the university by allowing cross-cultural communications and could also facilitate inter-departmental and intra-departmental knowledge sharing, on the long run. This service will be available to anyone with a UT ID. Sustainability is at the heart of our business as we promote the recycling of goods. In this case, we list out the various benefits, risks and costs that we have deliberated upon while deliberating this venture. Careful thought has been put into the case, by means of a decision tree analysis.

With this project document, we hope to make a demonstration about whether or not we see *Swap* as a viable business option.

Contents

1 Project Description

'*Swap*' is a web service that is 'From Students, For Students'. It is a peer-to-peer multi-vendor marketplace. It helps anyone with a UT account buy or sell used products seamlessly. Our business case would be like a new age barter system, especially on the campus.

The key features of this web service are Transparency, Security, Multilingualism, Accountability and Reviews. Most importantly, it is student-friendly. It also helps cultivate a strong student community. Anyone with a UT ID can use this service.

Sellers can upload their products and buyers can find interesting and essential products on the website. We believe that this would serve as an easy and hassle-free way for students to buy second-hand items and also helps build a healthy student community. Our key features focus primarily on lesser scams, trustworthy buyers and sellers and also the fact that buyers and sellers can easily visit each other, if needed. The main focus of our proposal is the security aspect - both for the transaction and the products that are bought/ sold. This, we feel, is unique to us because other marketplaces often sell stolen goods.

We charge a commission fee of 8% for each transaction. Based on our research on the commission fee for existing marketplaces, the commission rates are about 7-20% of each transaction. We have chosen a commission fee at the lower end of the spectrum. This is because, our potential buyers and sellers in our marketplace are closer to each other. Hence, the risk of them trying to circumvent the commission is higher.

The following aspects will help us retail customers and prevent them from omitting our commission fee. These are also the advantages that we offer over existing marketplaces:

- Convenience of browsing for a variety of a products
- Points based reward system where users get points for each purchase. These points can be en-cashed in future
- Search functionality by category (not present in other marketplaces)
- Focused on products that are needed by users on campus. Other marketplaces are usually flooded with all kinds of information (room rentals, ads for spaces etc.) Hence, second hand items are easily overlooked.

2 Project Scope

Who can access the '*Swap*' website? - As described earlier, anyone with a UT account can avail this service. They will have to log in to the website using their credentials and choose to upload content as a seller or browse content as a buyer.

Who are the stakeholders? - The key stakeholders are the students who generate and use the content on the '*Swap*' website and the Students Union of the University of Twente, whom we propose to be the owner of the project. This is because,

- The Students Union has a very good connect with the students
- They already have a profit interest (Union Shop and Bar)
- They have very good infrastructure
- The Students Union is open to supporting subsidiaries, (https://su.utwente.nl/en/union-services/associations/subsidies/)

What items do we offer? - Bikes, Electronics, Games, Furniture, Books and Stationery. *We plan to expand this based on success and the demand.*

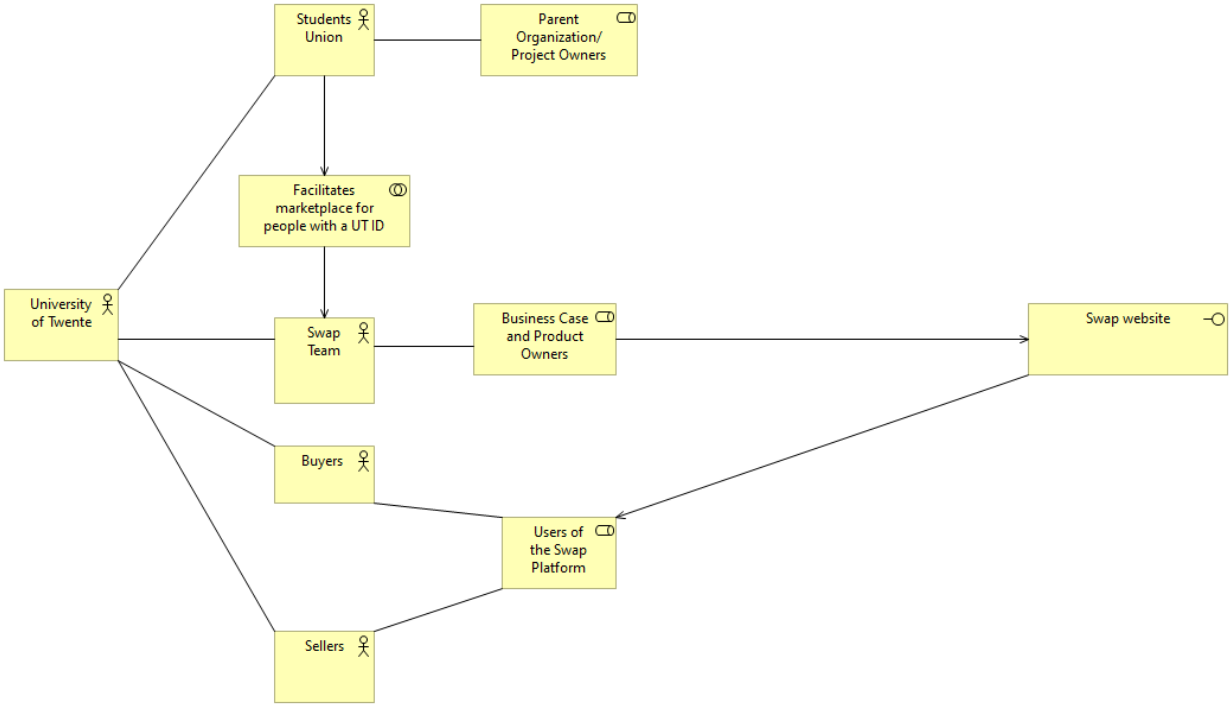

Figure 1: Organizational Viewpoint of *Swap*

How can users access *Swap*?- Users will be able to buy and/ or sell goods with the help of a website. The website will be linked to the UT IT system. This means that it will be hosted by the university and users can access the website with their UT accounts. We might also introduce a mobile app at a later stage.

What are the functionalities of our website? -

- Login and choose to buy or sell.
- If you choose to buy, you will be able to see existing products, place requests for products that you want, chat with sellers and place orders.
- If you choose to sell, you will be able to upload images of your product, chat with potential buyers.
- Users can pay through the website with the help of third-party services like PayPal or iDEAL.
- Prices can be negotiated with the help of the private chat functionality.
- Users who buy on *Swap* will be awarded points which can be used later to buy products once sufficient points are collected (points-based reward system).

The sellers will be able to upload a description of the item along with its specifications. There will be a provision to upload photographs and videos of the item as well. The website will also offer a private chat functionality that allows the buyer and seller to interact. This helps in the negotiation of the price of the item.

The buyer will be able to complete the transaction on the website. For this, we offer payment with the help of third-party payment vendors such as PayPal and iDEAL, that allows for automatic debit from the buyer's

account. This method also deducts the commission fee and sends the final amount to the seller. There is also an option for returning the item within 48 hours of receiving it.

Figure 1 represents the Organizational Viewpoint for *Swap*.

3 Motivation and Principles

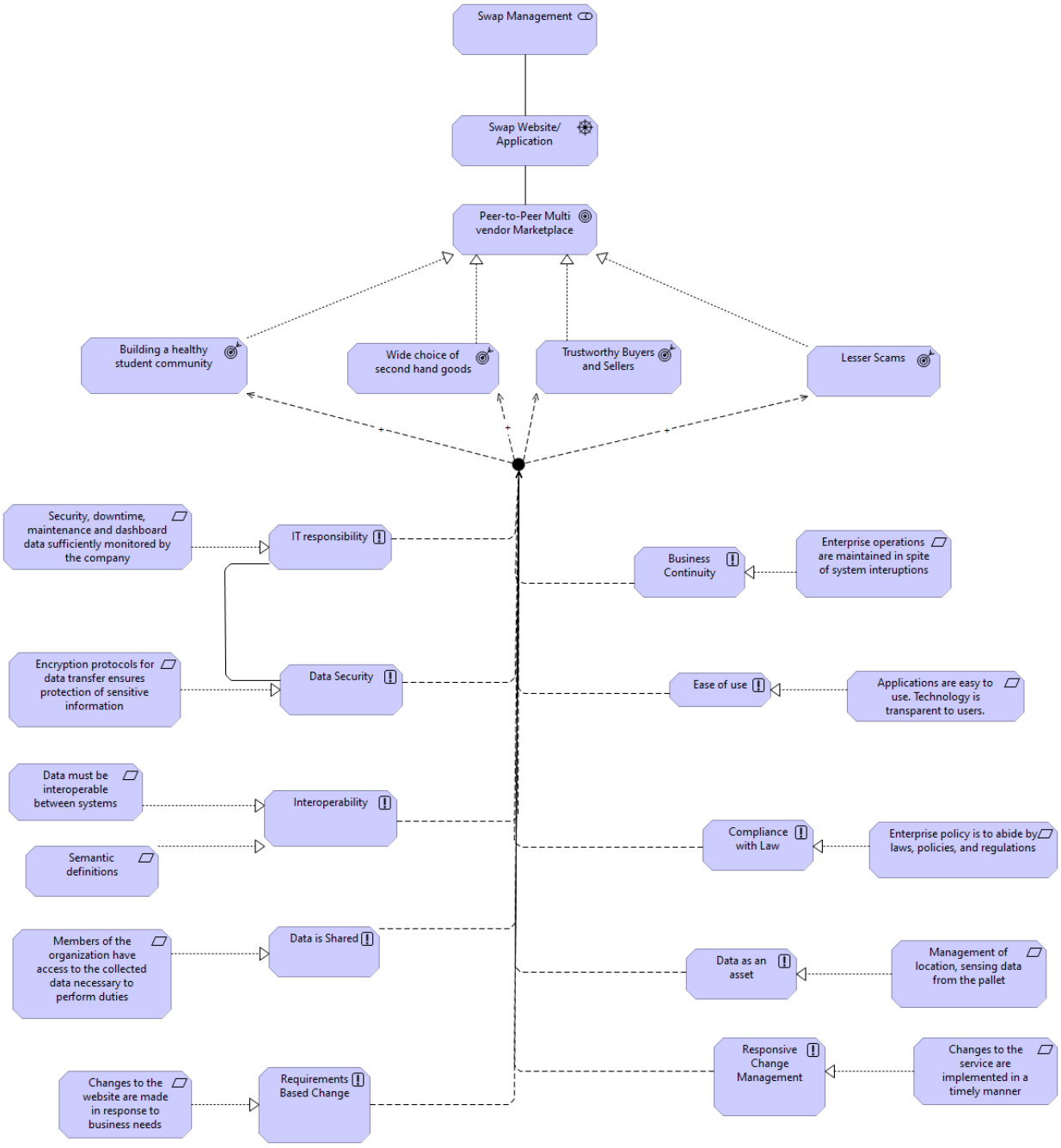

Figure 2: Motivational Viewpoint of *Swap*

We have formulated the Motivation Viewpoint for our business cased based on the TOGAF principles that are relevant to our context. Our business case aims to achieve a peer to peer multi-vendor marketplace by building a healthy student community and a platform to buy and sell a wide range of second-hand products. This will also provide leeway to lesser scams and trustworthy buyers and sellers in the market.

We have narrowed down on 10 TOGAF principles that we feel are relevant to our business context. They are IT Responsibility, Interoperability, Data Security, Data is Shared, Requirement-based Change, Business Continuity, Ease of Use, Compliance with Law, Data as an Asset, and Requirement Change Management. These principles are general rules that inform and support the way in which our organization sets about fulfilling its mission. They also serve as guidelines for the use and deployment of all IT resources and assets across the enterprise.

Figure 2 represents the Motivational Viewpoint for *Swap*.

4 Initial Benefits

This section covers the overall initial benefits of *Swap*. By introducing *Swap* at the University of Twente, we envision the following: Lesser Scams while buying or selling, a strong student community, additional revenue for the Students Union, sustainability, request based addition of products, quicker response times and returns (within 24 hours).

- **Lesser Scams** - Students who relocate for the purpose of study are always on the lookout for durable and pocket-friendly goods. When the scope of stakeholders is the student and staff of UT, the number of scams would be lesser than any online marketplace.
- **A strong student community** - An intra-university platform such as *Swap* enables cross-cultural and cross-departmental communications. Building a network beyond the scope of one's work would definitely be beneficial for everyone.
- **Additional revenue for the Students union** - Since this initiative is proposed as a subsidiary of the Students Union, the revenue realised will also benefit this committee. Using this, the Students Union might decide to offer many more facilities to the people at the UT.
- **Sustainability** - Goods will be recycled and this promotes lesser waste and encourages reuse of products.
- **Request based addition of products** - Online marketplaces usually have only a limited of products offered. But at *Swap*, a request based system is encouraged where students can
- **Quicker response time** - Usually, people on online marketplaces either take a very long time to respond or do not respond at all. We aim to reduce the frustration by resolving requests as soon as possible.
- **Returns (within 24 hours)** - Buyers who are unhappy with their purchase can return their product withing 24 hours of purchase (provided, the product is in the same condition as when they purchased it).

5 Key Performance Indicators

Our KPIs have been defined based on the balanced scorecard. These include - financial perspective, customer perspective and the internal process perspective.

5.1 Financial Perspective

- **Profit**
- **Budget Variance**

  The budget variance is the difference between what a our company estimated to spend budget versus what we actually spent.

  $$\text{Estimated Budget (per month)} - \text{Actual Expenditure (per month)}$$

- **Return on Investment**

  The benefit (or return) of an investment is divided by the cost of the investment.

  $$\frac{\text{Current Value of Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$$

- **Average order value**

  Average Sales Value per Transaction

5.2 Customer Perspective

- **Customer satisfaction** (5-star rating scale)

  An important aspect of this KPI is the *Net Promoter Score.* This metric tells us how likely a person is to recommend our product/ service to his/ her friends.

5.3 Internal Process Perspective

- **Awareness level** (percentage of students who log into the system)

  $$\frac{\text{Individual Visitors Per Month}}{\text{Total Number of UT Accounts}} \times 100\%$$

- **Conversion rate** (percentage of visitors that actually buy/sell something)

  $$\frac{\text{Successful Transactions}}{\text{Number of Page Visits}} \times 100\%$$

  This will be calculated based on categories of items, buyers/ sellers etc. (drill-down). This can also be used to assess the *Bounce Rate*.

  Bounce Rate - It represents the percentage of visitors who enter the site and then leave ('bounce') rather than continuing to view other pages within the same site.

- **Seller-Buyer ratio**

  $$\frac{\text{Total Number of Listed Products}}{\text{Total Number of Products Bought}}$$

- **Web traffic generated by specific promotional activities**

  Click-through rates from referral links

- **Average time per session**

  Calculated based on on the number of individual pages visited per session. This also helps us assess the *Bounce Rate*.

- **Hit-Miss ratio of search queries**

$$\frac{\text{Number of Times Users Click On Search Results}}{\text{Total Number of Queries}}$$

- **Number of people leaving after using our chat functionality**

5.4 Innovation and Learning Perspective

- Number of employee development training programs

Note: we plan to assess these KPIs by asking one question to each user after each transaction. Apart from our system analytics, this will help us understand the user needs and feedback better. We will restrict the number of questions to one per transaction so that users are not annoyed by them.

6 Benefit Analysis

This section describes the potential benefits that we see for our business case. We have categorised the benefits as Financial, Measurable, Quantifiable and Observable in the following table.

	Doing new things	Doing things better	Stop doing things
Financial	**Benefit**: Income for Student Union **Measure**: 8% each transaction (measured in EUR) **Benefit Owner**: *Swap* Finance Manager **Benefit**: The setup uses the existing infrastructure and hence, our setup will not require too much capital. **Measure**: Cost for developing website (infrastructure belongs to the Students Union) (measured in EUR) **Benefit Owner**: *Swap* Design Manager	**Benefit**: The costs incurred in recruiting employees (students) will be lower as compared to hiring professionals (externals). **Measure**: Amount saved per average number of work hours = (standard wage (market) − standard wage (SU)) × number of employees (measured in EUR) **Benefit Owner**: Student Union Recruitment Manager	
Quantifiable	**Benefit**: We offer employment opportunities for students looking for part-time jobs. **Measure**: Website design: 2 employees (temporary) System integration & maintenance: 2 employees (permanent) **Benefit Owner**: Student candidates (applicants)	**Benefit**: Increased customer/ seller retention due to satisfaction (for/ by students) when compared with FB marketplace **Measure**: Repeat customers and sellers **Benefit Owner**: Operations Manager **Benefit**: Customers not switching to other products or services **Measure**: Repeat customers and sellers **Benefit Owner**: Operations Manager	
Measurable	**Benefit**: High accessibility - ready-made potential consumer and seller base **Measure**: Number of people with a UT ID **Benefit Owner**: Operations Manager	**Benefit**: Additional promotion of SU products **Measure**: Number of items sold from the Union Shop **Benefit Owner**: Student Union Shop Sales Manager	

	Doing new things	Doing things better	Stop doing things
Observable		**Benefit**: Better student community (directly connects sellers and buyers) **Measure**: Number of interactions **Benefit Owner**: Students **Benefit**: Improved visibility of Student Union **Measure**: Number of members joining the students union, number of items sold, feedback from students **Benefit Owner**: President of Student's Union **Benefit**: Reduced number of scams through FB marketplace (directly connects sellers and buyers) **Measure**: Customer and seller feedback **Benefit Owner**: *Swap* Sales Manager	

7 Cost Estimations

This section describes the cost estimation over the different phases of the development of the *Swap* initiative. The phases include Design, Development and Implementation, Operation, Support and Maintenance. Some of these costs - Design and Development - are *one-time costs*, whereas Operation, Support and Maintenance entail *recurring costs*.

For developing the marketplace, we have decided to choose ***Arcadier***, which is a a well known provider in the SaaS industry, for online marketplaces. The features of Arcadier have been listed below.

- Search
- Social Login
- Multilingual
- Admin Portal
- Analytics
- Negotiation
- SEO
- Ratings & Reviews
- Start Selling
- Private Marketplace
- Payments
- Custom-codes
- Seller Portal
- Chat
- Mobile-responsive Design
- Custom Domain
- API Access
- Custom Homepage

One-Time Costs

1. We plan to hire a freelancer for the web-design and the development and plan to pay the developer once the design is complete. We arrived at this cost based on industry standards. Also, the freelancer would be required to integrate the Arcadier marketplace. -**2000 €.**
2. Testing - 1 student = (14 € per hour, 8 hrs per week - in total) - 14*8*4 = **448 € per month**
3. Incorporating a Dutch BV (LLC) - **500 €**
4. Legal Advisor - According to market research, a legal advisor earns **44 €** per hour. We will require their support in drafting the legal documents for the business model. Other than that, we will pay them on a demand basis. For the initial policy drafts, the payment estimates to **500 €**, assuming that they work with us for 10 hours.

Recurring Costs

1. We will pick the *"Growth Package"* of Arcadier, which will cost around **138 € per month**. Please refer to Arcadier's pricing catalog. `https://www.arcadier.com/packages.html`
2. Maintenance and operations (1 student) - (14 € per hour (4 to 5 working hours hours per week) = 14*5*1*4 =**280 € per month**
3. Marketing and Support (1 student) (14 € per hour, 5 working hours per week - in total) - 14*5*1*4 = **280 € per month**

Note: We plan to hire students, willing to work part-time. Wages for students working part-time have been decided based on the standard rates that students receive while serving part-time jobs such as Teaching Assistants at the UT.

Hidden Costs

1. Attendance Management - for clocking in hours of student employees - *Clockify* - 6€ per employee = 6*3 = **18€ Per month**
2. Bonus for employees for motivation (employee motivation) - **100€ per month** (for all the employees)

The above costs have been tabulated below. The total one-time costs amount to **3448€** and the monthly costs amount to **816€**.

Type of Costs	**Cost Description**	**Acquisition & Implementation (One-Time)**	**Operation (Recurring)**
Software Costs	Arcadier (SaaS for online marketplace)		138€
	Clockify		18€
Personnel Costs	Testing & Maintenance	448€	280€
	Freelancer for webdesign and development	2000€	
	Marketing & Support		280€
	Legal Advisor	500€	
Other Costs	Dutch BV	500€	
	Employee Motivation		50€
Total		3448€	766€

8 Risk Analysis

Performing risk analysis includes considering the possibility of the occurrence of all events that could affect the business venture. More often than not, it helps to have a pessimistic mindset while listing out all the risks. This helps the team to comprehensively cover all the risks, including the most insignificant ones.

An important part of risk analysis is identifying the potential for harm from these events (impact), as well as the likelihood that they will occur (probability). Any risk is made up of these two parts: the probability of something going wrong, and its impact.

This activity (Risk Analysis) helps the team define preventive measures to reduce the impact of these risks and identify countermeasures to successfully deal with these constraints when they develop to avert possible negative effects on the competitiveness of the company.

This section covers the risks that we have estimated for this venture. Apart from the risks, we have also provided the probability of occurrence and the relevant impact of each risk. The table also covers the mitigation and the contingency plan for some of the risks. We have also mentioned the owners for each of the mentioned risks. Please refer to the table below for further details.

ID	Risk Description	Risk Category	Likelihood of risk	Impact if occurs	Severity rating	Risk Owner	Risk Response	Mitigating Action	Contingency Plan
1	The estimated budget is not sufficient to fund the development of the website	Budget Risk	Low	High	Medium	Financial manager	Mitigate	Planning and budgeting	
2	Cross-platform compatibility - apps/ third party apps fail to integrate seamlessly	Technical Environ-ment Risk	Low	Medium	Low	Lead developer	Mitigate	Periodic reviews of (market position and performance of) third party software	
3	Website abused for illegal activities	Business Risk	Low	Low	Low	Project Lead	Mitigate, Contingency Plan	Upload-filter (blacklisting terms referencing illegal items)	
4	“GDPR compliance - personal data linked to accounts (contact details, addresses)”	Program-matic Risk	Medium	Medium	Medium	Legal advisor	Transfer		
5	Intellectual property risk - website images, logos, product descriptions etc.	Program-matic Risk	Low	Low	Low	Legal Advisor	Transfer		
6	General regulatory risk (privacy policies, eCommerce considerations, email advertising,)	Program-matic Risk	Medium	High	High	Legal Advisor	Transfer		
7	The maintenance expenses exceed the income, the business is not sustainable.	Financial Risk	Medium	High	High	Financial manager	Mitigate	Planning and budgeting	
8	Security related risks concerning student data and payment details	Information Security Risk	Medium	High	High	Lead developer	Mitigate	Have good encryption and security protocols	
9	Bugs in the website/ app or website downtime	Technology Risk	Medium	High	High	Tester	Mitigate, Contingency Plan	Hiring a dedicated tester	Uptime monitoring service

ID	Risk Description	Risk Category	Likelihood of risk	Impact if occurs	Severity rating	Risk Owner	Risk Response	Mitigating Action	Contingency Plan
10	"Unable to provide the variety of promised goods - this is assessed based on supply and demand"	Resource Risk	Medium	Low	Low	Project Lead	Mitigate	'Request' feature: supply/demand more transparent, will encourage potential sellers	
11	Arcadier does not support functionality required for expansion	Technical and Architectural/ Infrastructural Risk	Medium	High	High	Project Lead	Mitigate, Contingency Plan	Periodic reviews of (market position and performance of) third party software	Identify a back-up service provider that is compatible with our system, in case the software no longer supports our venture
12	"Third party software no longer supports the project - it becomes obsolete"	Technical and Architectural/ Infrastructural Risk	Medium	High	High	Project Lead	Mitigate, Contingency Plan	Periodic reviews of (market position and performance of) third party software	Identify back-up application providers that are compatible with our system, in case the software no longer supports our venture
13	People circumvent our system and communicate among themselves to avoid the commission fee	Quality and Process Risk	High	High	High	Project Lead	Contingency Plan		Restrict chat functionality
14	"The university does not allow access to the UT database"	Quality and Process Risk	Low	Medium	Low	Project Lead	Mitigate, Contingency Plan	Provide security plan to UT IT	Provide login feature
15	"Improper definition of teams and hence roles and responsibilities (right now, this is a small venture. But what happens when we expand?)"	Project Planning	Low	Low	Low	Project Lead	Mitigate	Assign clear roles and responsibilities	

9 Real Options Values

In this section, we aim to explain our decisions surrounding the financial calculations of our business case, in particular those that are used in the decision tree and the consequent calculation of the real option value of conducting market research. We recognize that the probability of each of the market conditions as used in the decision tree is purely based on intuition and not grounded in any external data, since we believe no external source could accurately predict the specific market conditions surrounding the student community at the University of Twente. To counteract this uncertainty to a minimal extent, we opted at what we believe to be conservative estimates.

The probabilities without additional information, that means without having conducted market research were estimated as follows:

- Favorable market conditions: 20%
- Moderate market conditions: 30%
- Unfavorable market conditions: 50%

In Bayesian statistics, which were used in a later step to calculate the probabilities after having conducted market research, the probabilities are known as 'priors'. In the next step, we estimated the probabilities of the market research having a specific result given a certain market condition, called 'likelihood' in Bayesian terms:

- **Favorable market conditions (in reality)**

  Market research result is favorable: 70%
  Market research result is moderate: 20%
  Market research result is unfavorable: 10%

- **Moderate market conditions (in reality)**

  Market research result is favorable: 20%
  Market research result is moderate: 50%
  Market research result is unfavorable: 30%

- **Unfavorable market conditions (in reality)**

  Market research result is favorable: 10%
  Market research result is moderate: 20%
  Market research result is unfavorable: 70%

While we assumed equal likelihood for the market research to identify favorable and unfavorable market conditions, we assumed a higher likelihood of an unfavorable result in case the market conditions are moderate in reality. The reason for this is the aforementioned conservativeness in our approach. In reality, the result of market research is not a trichotomy as implied by the simplifying assumptions in our calculations, but a gradient. By giving the result of the market research a higher likelihood of being unfavorable when the market conditions are moderate, we imply that higher caution towards the perceived meaningfulness of the market research would be exercised when the outcome is in the scope of what would be considered a moderate result. Additionally, we believe it to be an accurate representation of reality to assume that market research is less capable of identifying a moderate market size in contrast to any of the extremes, hence the reduction in likelihood from 70% for (un)favorable market conditions to 50% for moderate ones.

From the priors and likelihoods we calculated the so-called 'marginals', which indicate how likely each possible result of the market research is if the actual market condition is unknown and given our previous assumptions:

- Market research result is favorable: 25%
- Market research result is moderate: 29%
- Market research result is unfavorable: 46%

In the last step, we calculated the 'posteriors'. They give the probability of a specific market condition given a certain result of the market research (values are rounded to full percentages):

- **Market research result is favorable**

  Market conditions are favorable (in reality): 56%
  Market conditions are moderate (in reality): 24%
  Market conditions are unfavorable (in reality): 20%

- **Market research result is moderate**

  Market conditions are favorable (in reality): 14%
  Market conditions are moderate (in reality): 52%
  Market conditions are unfavorable (in reality): 34%

- **Market research result is unfavorable**

  Market conditions are favorable (in reality): 4%
  Market conditions are moderate (in reality): 20%
  Market conditions are unfavorable (in reality): 76%

In the following, we will discuss our approach to estimating at the financial values used in the decision tree calculations. More specifically, we will explain the make-up of the market size values for favorable, moderate and unfavorable market conditions.

Since *Swap* is set to be a direct competitor of the Facebook group 'University of Twente - Marketplace', we based our estimates on an exploratory investigation into data from listings in this group. The considered time frame was 14 days; we did not want to go too far back, as listings that are resolved (i.e. for items already sold) are not shown anymore. This in and of itself is an obvious limitation to our approach, but it would only lead to undervaluing the market size and as such is in line with our aspirations of favoring conservative estimates. Additionally, only items with an asking price of 10 € or more were considered, as too many low-impact listings would have cluttered the calculations otherwise. One dilemma we faced was with regards to items with an exceptionally high asking price: While we believe these items to be natural contenders for being sold on *Swap* in contrast to Facebook due to the added layer of security, we believe a static commission fee would deter many sellers. One idea we had to counteract this effect was the introduction of a dynamic commission fee that gradually decreases to a minimum (e.g. half of the original) for expensive items. The exact implementation of such a system is intricate and would have to be considered more in-depth if the business case should come to pass. In order to simulate the effects of such a dynamic commission, we halved the value of all items with an asking price of over 250€ in our investigation.

The results of our investigation are as follows:

- 125 listings with 254 listed items in total over the 14-day period (FB allows for multiple items per listing)
- Average item value is 83 €

We believe the average item value to be skewed upwards due to few very expensive listings (smartphones, laptops) and our exclusion of items valued 10 € or lower, so we decided to use a more realistic 50 € average per listing for our calculation.

Since *Swap* does not allow for more than one item per listing, we extrapolated the 254 listed items to 500 listings per month; this is the number of transactions that we used for moderate market conditions and corresponds to a conversion rate of roughly 4% (under the assumptions that the average user sells one article per month and that the university has roughly 12000 students and employees).

Favorable and unfavorable market conditions were calculated by multiplying this number by 1.5 and by 0.5 respectively, so the estimated number of monthly transactions for each of the market conditions is as follows:

- Market conditions moderate: 500 transactions per month
- Market conditions unfavorable: 500 * 0.5 = 250 transactions per month
- Market conditions favorable: 500 * 1.5 = 750 transactions per month

The decision tree was constructed with a time frame of twelve months in mind. In our view, this is a reasonable amount of time after which an investment would presumably have to pay off for the Student Union. If profitability can be achieved within one year, the investment is expected to remain profitable for the medium-term future, as the initial investments are paid off.

Assuming a 12-month time frame, the aforementioned number of transactions per month, and a 5% commission rate, the market size for the first year of operations for each of the scenarios was calculated as follows:

- Market favorable: 12 * 750 * 50 € * 0.05 = 22.500 €
- Market moderate: 12 * 500 * 50 € * 0.05 = 15.000 €
- Market unfavorable: 12 * 250 * 50 € * 0.05 = 7.500 €

The *development and maintenance costs for the 12-month period* are based on the cost estimations in the respective section of the report and are calculated as : **3448 € [one-time] + 778 € [monthly] * 12 [months] = 12784 €**

The *costs for market research* in the form of a survey on the campus were estimated to be 500 €.

As can be seen in the decision tree, our advice to the Student Union would be to conduct market research before deciding whether to invest in the project or whether to drop it. If the market research has a positive result, the project should be accepted, if it has a negative result, the project should be dropped. If the result is moderate, the advised course of action is less clear: Since the projected profit barely outweighs the costs after a 12-month period, the decision cannot be based entirely on numerical factors. The Student Union should in this case ask themselves at which point in time they require a positive return on their investment and whether or not they are willing to take the risk that the market conditions may not be favorable, which we estimated at 34%. Since the profitability of the project is expected to increase after the initial investments are paid off, we would advise them to invest in the project unless they require faster returns on investment or have high risk aversion.

The *estimated real option value* of conducting market research over blindly investing in the project after a 12-month period is calculated as: **(expected value with market research - cost of market research) - (expected value without market research)** = (1436.64 € - 500 €) - (12750 € - 12784 €) = 936.64 € - (-34 €) = **646.64 €**

Figure 3 represents the Decision Tree Analysis for *Swap*.

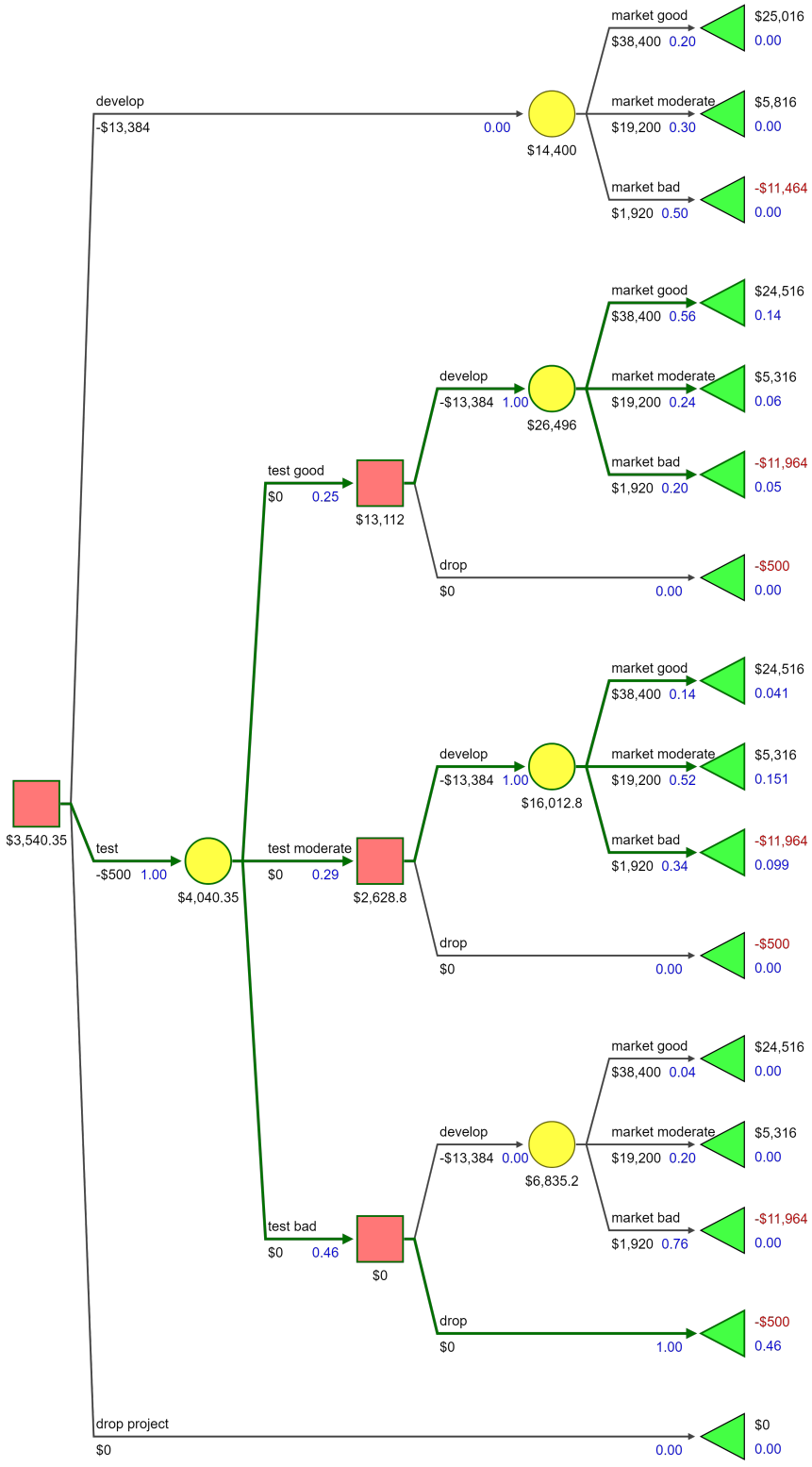

Figure 3: Decision Tree Analysis

10 Scenarios

- Disintermediation wherein users bypass a hub and connect directly can be a big problem for any business use case. This way, people will circumvent the commission by taking the transaction off-website. The solution we have proposed for this scenario includes an analysis that can be conducted to determine the number of people who use the chat functionality but don't purchase through the website. In the event that this happens, we close the chat functionality or only have a prompt based chat. This way any form of personal contact information being exchanged via the chat functionality can be prevented.
- Expansion of *Swap* outside of the University of Twente can be challenging. We have proposed a solution that helps expand our services by procuring contacts, hiring more employees depending on the stakeholder base and the profits gained. Another viable solution is establishing a sister organization in partnership with other universities or organizations unions.
- In the event that the Student Union does not support the venture, we will look for other investors who can support our business case financially. One possible solution could be to get in touch with *Incubase* that nurture startups and facilitate and support students with their business ideas.

11 Sustainability and Corporate Social Responsibility

As mentioned, *Swap* is proposed a subsidiary venture of the Students Union. As a small, yet visionary group, we would like to do our bit for society with the following activities:

- Sustainability is the heart of our e-commerce company, which facilitates the re-use of commodities.
- As part of the CSR activities, *Swap* plans to donate 10% of the profits towards social causes.
- As part of our employee well-being initiatives , we plan to conduct health and wellness programs to improve our employees' physical and mental health to ensure a productive workforce.
- To ensure that we have a motivated team, we plan to organize social events and team retreats.
- We feel that we should share the knowledge that we have gained by organizing skill-based worked workshops at schools and other educational institutions.

12 Appraisal and Conclusion

Swap is an initiative with great potential but also has high risks involved. As mentioned earlier, we see this as an opportunity to build a good student community and add a revenue stream to the Students Union. However, some of the potential risks that we need to address are competition from the existing marketplaces on social media. We will attempt to provide a good variety of goods and we will also promote our service to the student body.

Another risk that could serve as a significant threat to us is that scenario where our users circumvent our platform and take the deal offline. There could also be a case where inappropriate or unauthorised goods on our platform. The mitigation strategy we have towards these risks is vigilance.

Based on the calculations in the decision tree we advise the Student Union to conduct market research to decide whether or not they should continue the venture. If the market research shows favourable or even moderately favourable conditions, the owners can proceed with the initiative. In case of an unfavourable outcome, the project should be dropped.