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ITRW 324

Project Proposal:

Blockchain

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**Part A**

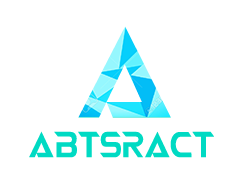
**Technical Report**

**Technical Report for RIP**

**(Registered Intellectual Property)**

For ITRW 324 Blockchain Project in Information Technology and Computer Sciences

Presented by



First Edition

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Abstract

This report provides a guideline for the audience – both non-technical and technical, for using the program and application of RIP (Registered Intellectual Property) for organisational, or personal usage. For this report, the main target market is aimed at non-technical readers. The purpose of this report is to provide the users with a descriptive discussion of the main elements of RIP and the potentials thereof. Some of the important elements of RIP consists of the use of blockchain technologies, which make the whole experience of the application much safer than other competing applications on the market. This guide concludes with an overall summary of the report.

Dedicated to non-technical readers (citizens, artists, armatures) with an ambition, and to technical readers (companies e.g. managers) who may sponsor, or assist the application in the future.

Acknowledgements

The authors (Abstract) would like to thank Pieter Rossouw for providing professional tips and assistance and to Zander Labuschagne for assisting and supervising the project at all times.

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1. Introduction

The majority of artists, whether it be in music, artworks, or filmography, at some point have encountered a copyright violation issue. Most of these issues consists of illegal distribution or the misuse of their work without the artist’s permission/consent. To combat this problem, Abstract aims to provide the users – in this case the artists - with a secure website and application with blockchchain technology. Blockchain in broad terms is referred to the decentralised digital ledger which is recorded in cryptocurrency and stored in a chronological order (Swan, 2015:02-03). In other words, it is a technology that reduces the need for third-parties to manage transactions between two of more users as multiple people across the globe will be managing that specific transaction (e.g. the distribution of music). A key element to blockchain is distribution and decentralisation – since there are no centralised company/individual managing the transaction, it is near impossible for someone to corrupt the network. RIP (Registered Intellectual Property) makes use of this blockchain technology which results in a secure and trustworthy application. The objective of this report is to portray the potentials and strongly recommend RIP towards the digital artists. This report contains the: background theory, literature review, procedures, results of RIP, and concludes with a strong positive impact of RIP.

1. Background Theory

Blockchain is a relevantly new concept to digital currently -it was been around for a mere decade. According to King and Nadal (2012:1-4), blockchain made its first appearance in 2008 when Satoshi Nakamoto implemented blockchain into Bitcoin. Bitcoin is decentralised electronic currency that uses peer-to-peer technology as well as cryptography that is used to make payments/ transactions for goods and services (Kroll, *et al*., 2013:1-2). Bitcoin is available in 18 different currencies and is used all around the world. The reason to why Bitcoin became popular in comparison with other cryptographically digital currencies is not only for the fact the Bitcoin has a far superior security, but also for their economic soundness. Bitcoin (or blockchain enabled Bitcoin), had its downfalls in the beginning of implementation and still today. There are many users that feel unsecure of the whole concept of blockchain. However, according to Ateniese *et al*. (2017:111-127), Bitcoin’s value (price) has risen to $4000 (when the report was compiled) and sees no trend of falling but doubling at a very rapid pace.

RIP implemented this blockchain technology and also can predict a positive worthiness. Unfortunately, as blockchain is such a new concept, Abstract had no prior knowledge or preparation of it, nor of any web/app development. However, Abstract has successfully learnt and implemented these technologies thereof.

As for the preparations from the users, only a PC or mobile phone (running on Android Platform of API level 21+) is needed. Whereby from the developers (Abstract), the preparations and applications used will be discussed below.

1. Literature Review

Before continuing reading with this report, it is important to note that this report has targeted to potential artists who would avoid being victims of copyright policies from other people. RIP is currently focusing on the younger generation population who are fonder of the internet and digital currencies, however, Abstract would like to encourage all ages to make use of RIP.

The SMART analysis has been made before the design procedure was planned. Specifically – Abstract planned to create a software that allows artists to sell their products online in a more secure manner as well as to allow the users to track their artworks that have been distributed illegally. Measurable – the project will be measured via meetings held frequently and with a use of a Gantt and burndown chart. Achievable – the challenges that the group may have encountered consists of trial periods expirations that may occur for external sourcing e.g. GitKraken or for the need in purchasing them. However, these issues can be resolved by using “student pro” versions or with the assistance from NWU. Relevant/ realistic – the goals for our project is to provide a user-friendly software that allows end users (digital artist) to expand their careers by distributing their artworks in a more secure and trustworthy application; these goals are possible to attain through the use of external sources such as Webstorm etc. Timely – the group was given roughly four months to create the project and the group also made use of Gantt charts for time management. With the SMART analysis stated, the design procedures can be discussed.

# Design Procedure

## Problem

From the End user’s (artists’) perspectives, copyright infringement has always been and will be problematic. According to the Copyright Act (98 of 1978) of South Africa, violations of the Copyright Act includes the unlawful use of: literacy or musical works, sound recordings, cinematographic films, artistic works, drawings, etc. Also, that these works can only be distributed in respectful manner whereby the copyright holder should be made known of any distributions, and traded fairly. Many artists have experienced a situation whereby an individual/ company used their work without their consent. Examples of theses situation can be when a company uses a piece of music for their official promotional videos or uses images from artists and sell merchandises out of them. Not only did the culprit steal the digital asset, they also steal possible income of the artists. It is important to keep in mind that most of these artists are either hobbyists, amateurs, or small businesses who rely on very bit of income. It is clear that these artists want a secure site that can not only manage their financial transactions safely, but also prevent the culprits from misusing their digital assets/ artworks.

## Solution and Project Description

With the problems stated, it is clear that some platform of service is needed to assist these artists. Abstract has come up with an idea that solves these copyright issues and problems by creating an application. However, in order assist as many artist as possible at the same time, a networking technology is required; thus, Abstract decided on using the Internet. With the use of the Internet, not only will the artists easily access the application from all across the globe, but the artists can save up money as they do not need to pay professional third parties to manage their goods/services.

The idea of the application was to firstly to manage the music and other digital assets by making use of blockchain technology. The users can then access the application through a website (web service) or mobile application. Thus, Abstract visualised on an application called RIP (Registered Intellectual Property).

## Specification

### Hardware

Hardware specifications needed by the users consists of a personal computer (Mac is also accepted) which has connection to the internet. Internet speed should be above 1.5Mbps to prevent any buffering and frustrating experiences. It is also suggested that users use monitor screen resolutions of 15.6 inches for maximum comfort (however, other sizes do work too). As for the mobile application, a smart phone targeted on Android dedicated devices (which makes up the majority of mobile users) is advised. A screen resolution of 5 to 5.5 inches is recommended for the most comfortable view and experience.

### Software

Software specifications needed by the users consist of a personal computer that has a preinstalled web browser e.g. Google Chrome or Mozilla Firefox (avoid using Internet Explorer as it may cause the website to become slower). As for the mobile applications, users should have an Android OS with an API level of 21+ (5.0 and above: Lollipop, Marshmallow, Nougat, and Oreo). Thereafter users should install the RIP application onto their mobile phones.

## Optimisation

RIP strives to optimise the users’ efforts by reducing the stressful process to hire third-parties for management as well as copyright violation. Fortunately for the users, RIP is currently a freeware. Users do not have to pay to use the application (both web and mobile). However, it is important to keep in mind that the digital assets made available through RIP may be paid for - depending on the copyright holder. With a purpose to keep the cost of RIP down, Abstract had made use of other freeware available on the internet or have made use of trial versions in the development phase. There were some cases whereby the group had to purchase a licence or class fee, however, these costs has been kept to a minimum by the uses of discounts and student privileges. RIP is also an easy-access, easy-to-join, and simple application. Not only is the application user-friendly, it is also self-explanatory. RIP reduces time and money spent of artist by providing efficient transaction processes, music streaming and hosting, and more.

Datastructure

1. Feasibility Analysis

To analyse the feasibility of the project (how worthy is the project), six tests has been considered.

# Operational Feasibility

Operational Feasibility focuses on how well the RIP solves the problem of copyright violations. As discussed above, RIP has been designed to solve these copyright issues from the very beginning. Operational feasibility adds value and improves the quality of the system. It bridges any flaws in the system and makes the: performance, information, economics, security, efficiency, and services improvements towards the system. To further discuss operational feasibility, the PIECES framework will be used.

## Performance

* Simplifies transactions
* Simplifies processes of digital asset sales
* Improves overall experience of music streaming, and asset uploading.
* Increased opportunity to introduce product on a global scale.
* Simplifies the tracking process.
* Simplifies copyright policies for own works.

## Information

* Information regarding the copyright holder’s private data is kept confidential
* Data is stored on MySQL – an efficient database management system.
* Input from users is easy and uncomplicated.

## Economics

* Users (artist) do not have to pay third parties for external management
* Users do not have to pay to use RIP
* Artworks are sold via cryptocurrency making transactions safer.
* May attract potential customers – boosts sales.

## Control/ Security

* RIP uses blockchain-enabled high-level cryptocurrency.
* Easier for users to control who is the culprit behind “stolen art”.
* Personal information is kept confidential

## Efficiency

* User-friendliness
* Interactive system
* Accessible from multiple platforms/ devices

## Services

* Notifies user when error occurs.
* Customer service is effective.
* Faster services increases customer satisfaction.

# Cultural/ Political Feasibility

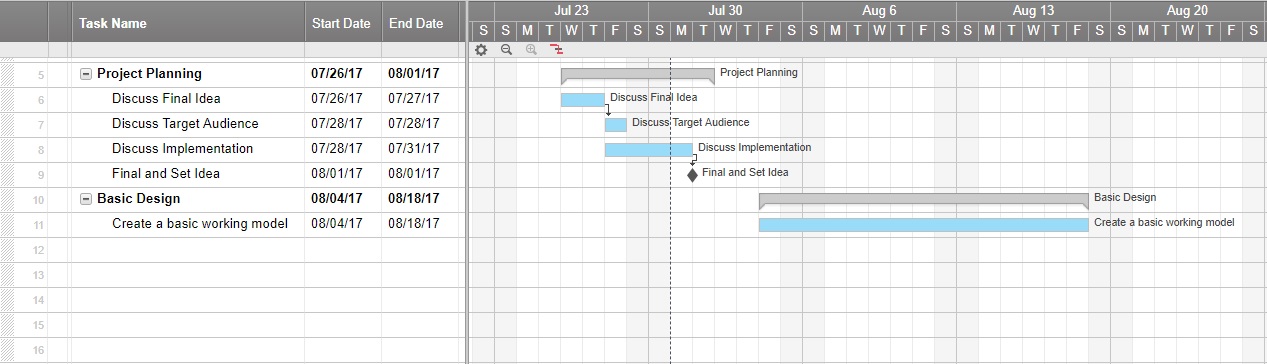
RIP aims to satisfy all organisational climates. RIP was dedicated to artists who have already been victims to copyright violations. It cannot be avoided to the fact that there may be user who may resist to the application as the concept of digital currency (blockchain) is relevantly new and some may still feel unsafe using this type of system. However, as RIP is a casual application, users are not requires to change their personal environments, and access it from their comfortable locations.

# Technical Feasibility

The project meets the technical feasibility positively as the proposed solution is highly practical in reality, and all necessary technologies required for the project is attainable through the internet and from alliance companies such as Amazon for Web Services. With regards to whether if Abstract possesses the necessary technical expertise, members have been taking online classes and have been researching about the project privately. Also, members have had assistance from supervisors.

# Schedule Feasibility

As mentioned above, Abstract has been given roughly four months and had a planning as the Gantt chart shows below in figure (num.).



It has been made aware that if Abstract were to miss the deadlines of the project, then members would take responsibility and accept the penalties thereof.

# Economic Feasibility

Economic feasibility measures the cost effectiveness of the project solution. This section will be discussed in detail under cost/benefit analysis in Part B of the report.

# Legal Feasibility

With regards to legal feasibility, RIP has been developed to assist and improve the matter. RIP has been created by all legal functionalities, and abides and respects the software laws. As RIP is a private application (owned by Abstract), RIP need no Union Contracts with other client companies, nor individuals. The main purpose of RIP is to protect the Copyright Act (98 of 1978), and prevent any further violations of the act.

1. Presentation of Procedure

# Hypothesis

RIP will reduce the number of victims (artists) on copyright violations and carry out securer transactions for payments of digital assets.

# Planning

To work collaboratively, Abstract made use of a git software called GitKraken. GitKraken allows several users to collaborate with each other on a same project at the same time. In a more common sense, one can push (upload) their work onto a branch (similar to a sub-folder) onto a network and also pull the contents (download newly added contents to that subfolder by another member). Abstract made use of six branches namely: develop, Feature (folder), mobile app, truffle, web service, website, and master. By doing so, member were capable of focusing on a specific feature, either to develop or test and by splitting the branches, overwriting other member’s work was avoided. For the process of testing the RIP application, Abstract kept performing mini-prototypes (testing parallel to coding). Other methods included tests made by other group members and tests from different devices. It was planned that different applications are to be used for different features. These features include, websites, web services, and mobile applications – with blockchain. This point will be further discussed later on in the report. Therefore, Abstract’s decision analysis concluded in creating a new computerised software.

One of the goal of the project was to keep the cost at minimum while keeping the efficiency at maximum. Preventing and counteracting unknown or possible errors were planned so that whoever encounters the error, must firstly report to the group messaging chat (Discord), and then either solve it themselves, ask for assistance and pair up, or ask the demi for assistance.

# Procedure

Before the procedure is discussed, the following applications has been made use of:

|  |  |
| --- | --- |
| Application Name | Field/ Purpose |
| Node.js | Web service – used for the generation/ creation of the webserver |
| Atom IDE | Web service – editing the codes of Node.js |
| Postman | Web service – testing the web service |
| Webstorm | Web site – used for website development |
| Google Chrome | Web site – testing of website |
| Android Studio | Mobile Application – development of app |
| MySQL | SQL – used for all databases |
| GitHub | Git – used for git technologies and store/share repos |
| GitKraken | Git – used for version control |
| Discord | Communication – served as the main communication medium |
| Slack | Communication – used for git updates and backup important messages |
| WhatsApp | Communication – used for personal/ comfortable messages or reminders |
| Truffle Framework | Ethereum – used for cryptocurrency payment engine and frameworks the blockchain used |
| Amazon Web Service | Cloud – used especially for mobile application’s cloud. Also hosts database and web service on an instance. |

The first step was to ensure that all the Abstract member were connected to the group chat on Discord. The reason why Abstract selected Discord was for the easy use of group calls and user-friendliness. All members all had to connect to GitHub and all other accounts for collaboration. Then the web server was hosted, allowing all other applications to connect to it. From here on, the members spilt tasks (features) into pairs and worked on it thereof by using the applications mentioned above in table 1.

CODES??

# Motivation

In simple terms, Abstract desired to provide a pleasing environment for artists from all places with a wide range of interests in digital entertainment. The members were motivated to create this project as the member were all fond of copyright violations and several member were also a hobbyist themselves. Abstract also had to complete this project within the given due-date.

1. Ways of Measuring Performance

# Personal Observation

Through simple observation, it was clear to keep track of the application’s functionality in practise. RIP provided a user-friendly, easy to use, and easily accessible platform for the users.

# Oral Reports

Complaints and compliments of RIP applications were given feedback in an oral communication method such as customer care service and was dealt swiftly by Abstract members.

# Written Reports

Written reports consisted of mainly commentary messages and ratings. Users provided Abstract with casual commentary. Overall performance and comments had a positive feedback.

1. Results and Findings

# Prototype Testing

Discovery Prototyping was used to see the reactions of the users as well as the overall experience of RIP. It was also used to verify the requirements and improvements thereof. It was made clear that since this was a prototype, the system was incomplete and emphasized that the ultimate program may appear different and have more/less functionalities.

IMAGES / Screenshots

# Result

The prototype resulted in a successful achievement of the objectives and goals. There were some bugs and glitches in the prototype, however, the purpose of the prototype was to search for these issues and see the overall running of the application in a real scenario. These issues have been later dealt by and fixed. Users of the application seemed satisfied and had a pleasant experience. It was also found that

1. Conclusion

Many artists have encountered a copyright violation issue especially in the digital realm. To combat this issue, Abstract has created an application called RIP, that uses a blockchain implemented technology which allows users (artists) to make safe financial transactions and tracking of illegal digital asset distributions. The objective of this report was to portray the potentials and strongly recommend RIP towards these digital artists. This report discussed the: background theory, literature review, procedures, and results of RIP; which has all been met. It was also found that the hypothesis was correct and sound. RIP has a high-level potential and provides a vast number of opportunities for the artists. RECOMENDATIONS

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**Part B**

**Business Case**

**Business Case**

Project Name: RIP (Registered Intellectual Property)

Authors: Abstract (Group 9)

Sponsor: NWU - PUK

Presented by Abstract

First Edition

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Amendment History

Contains any changes made to this report.

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| P. Rossouw | Lecturer |

Glossary

The following terms appear throughout this document.

|  |  |
| --- | --- |
| Abbreviation/ term | Word |
| RIP | Registered Intellectual Property |
| GDP |  |

Table of Contents

Table of Figures

1. Executive Summary

The Executive Summary should provide a short, informative headline summary of the Business Case document to follow. It should typically be no longer than 1 page and contain:

A short narrative to identify the subject, scope, method of analysis and key results and findings;

A short list of the key objectives of the project

A summary of the financial metrics ( table below, provides a very basic and high-level example of summarizing outlay and ROI)) from the investigation, highlighting the most significant;

A brief summary of the conclusions as a result of the study

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year ….n** | **Total Cash Outlay** |
| **Investment Value (£) – Capital and Revenue** | **£x** | **£x** | **£x** | **£x** | **£x** |
| **Available / Committed Funding** | **£x** | **£x** | **£x** | **£x** | **£x** |
| **Return on Investment (ROI)** | **£x** | **£x** | **£x** | **£x** | **£x** |

The RIP Business Case has concluded with ----

1. Introduction

Business cases is an important tool for the management of capital funding. Abstract aims to convince the readers for the development and usage of the project of RIP. First of all, Abstract would like to make it clear that the contents of this report has been targeted towards potential sponsors and clients (digital artists), thus, the report will follow a structure for the non-technical readers. A largely common injustice that occurs deals with copyright violations. With the rapidly increasing use of the internet, many artists becomes a victim towards this issue without even realising it. A simple act of “sharing” a music file to a college is in fact a violation of the copyright act. RIP aims to combat copyright violation problems by making use of blockchain technology. The purpose of this business case is: obtaining financial approval to proceed with the application, comparing potential alternative solutions, provide an objective assessment, provide the benefits of the project, and provide a timescale along with all other factors needed for the project to operate. The report also contains the objectives, such as improving the copyright environment for the artist, as well as to provide the best possible solution. RIP is a private project carried out by Abstract which is not a part of another larger project, or another organisation. RIP has been planned thoroughly to meet the size/ recommendations needs for the users and given time constraints.

1. Overall Project Description

# Purpose and Objective

The purpose of RIP application can be summarized as follows:

* Provide a platform for independent artists
* Provide a more secure transaction procedure.
* To assist the Copyright Act (98 of 1978)
* To keep track of all authentic copies of digital data
* Eliminate unnecessary intermediaries
* Provide multiple service platforms for the users (web service, web site, and mobile)

The objective of this business case report consists of:

* To get the financial assistance approval to the development of RIP
* To get the final approval to publically run RIP
* To convince the readers that RIP can be run successfully
* To get potential stakeholders/ sponsors

# Approach

The approach for the development of RIP can be read in the technical report in detail. For the purpose of this report, a summarized version is stated. Abstract has made use of other applications to create the application of RIP. For the web service, Abstract has made use of Node.js, Atom IDE, Amazon Web Service, and Postman to create, edit, test, and host it. The web site has made use of Webstorm and Google chrome for the development and testing. Android Studio was used to create the mobile app as Android is the powerhouse of smart devices. Data on the database is kept confidential and was developed using MySQL. The Truffle framework was used to implement the ethereum frameworks along with the cryptocurrency payment. In this manner, all transactions have been dealt with cryptocurrency thus, made secure and safer than the normal digital currency. With the implementations of all these applications, it was possible to create a web service, web site, and mobile application for the users – free of costs.

# Identification of Alternative Solutions

In the process of planning RIP, there were several other alternative solutions which have been mined mapped. Examples include: running the full application of RIP on mobile devices, or to use BigChainDB for the database instead of MySQL, or not implementing blockchain technologies but to send emails to users. However, it has been found that there were security or other issues that could have been present; such as, the fact that the full application of RIP running on the mobile platform could cause confidential information loss since hacking a mobile phone through a network – especially hotspots - is much easier for hackers in comparison to the PC versions. As for BigChainDB, it has been found that BigChainDB has a very short trial period (and currently Abstract has no sponsors, payment can be of an issue), as well as implementing BigChainDB into RIP had a huge potential of slowing the application greatly. Over trial and error, it has been decided that the current system works best for both Abstract and RIP.

# Current Market Situation

Currently, there are many applications similar to RIP. However, ironically, these applications are the reason for the vast illegal distribution of music and other digital assets. Many of these sites and mobile applications’ sole purpose is for the easy distribution and sharing of file – furthermore, these applications depends on the distributor for payments. Sites such as: 4Shared, Dropbox, MEGA, MediaFire, SugarSync, and ZumoDrive are only a few fraction of these sites available on the internet today. Many uploaders distribute these digital assets for free or use an external payment facility such as PayPal for secure payments. Unfortunately, not many original artists gets any income out of these distributions, nor is it easy for them to identify who the culprit is. With the use of RIP, artists can combat these issues.

# Project Stakeholders/users

Currently, this project is not part of any larger organisation, nor any larger projects, thus there are no stakeholders at the moment. However, as stated in the objective of the report, Abstract aims to get stakeholders and sponsors for the project to assist in the costs of using third-party applications, or licence fees for the application.

Potential users for RIP consists of independent (who does not have a professional salesman) artist consisting of hobbyists, amateurs, or non-professional individuals or groups. This group of people has been targeted as RIP can provide them with a vast opportunity to experience the professional realm without having to pay a fortune. RIP also provides an opportunity for the entertainment industry to scout/ cast these potential artists out there as it will be easy to track who the real owner/ creator is.

1. Market Analysis

Estimated Project start date: 17 July 2017 (handheld)

Estimated Project end date: 16 October 2017 (handheld)

# Current state of RIP

The first release of the online web site and mobile app occurred around 7 September 2017 for an alpha testing. From then on more functionality has been added, which allowed Abstract to make checklists of to-do’s and manage time more effectively. The latest sates of the application improves the timeliness, completeness and reporting capabilities from the first test. The opportunity for improvement still exists e.g. to improve marketing and save operational costs.

# Definition of Industry

RIP falls under the file hosting service industry, also known as one-click/ cyberlocker industry (Stantchev *et al.,* 2014:612-619). File hosting industry is an online industry that runs on the internet band stores the data at the back end of the internet. Users can retrieve this data through FTP and HTTPs. Data includes music, image, video, tutorials, etc. RIP likewise, stores data on the internet and allows users to retrieve it. The file hosting industry plays a big role in the information technology industry, and can be said to be one of the greatest innovations for the computer science world.

# Target Market and Statistics

According to a research result complied by Go-Gulf (2011), 91.5% of digital files are made available through cyberlocker (file hosting service) sites, and only 1% of these files are non-copyrighted. These statistics shows that 99% of the artist are subjected to copyright violations. The following data has been adapted from Go-Gulf and summarised to indicate percentage and type of digital assets that are pirated from the internet (see figure 2). There are approximately 146 million people pirating digital files daily which round to 53 billion users who is illegally downloading/distributing files a year. Unfortunately, this results in a $12.5 billion (approximately 2 billion ZAR) lost in only the music industry – meaning that music artists are losing a possible income of $12.5 billion each year.

RIP targets all artists especially the non-professionals, or minor artists who are dependent on every income they need. RIP also aims to assists these artist in protecting their works. It can be predicted that these artists will be populated with the younger generations who are prone to online payments, or the internet itself. Another focus group would be the middle class (those who earn R5 600 and R40 000 per month (Writer, 2016)) in South Africa. The middle class employees take the majority of the population and would probably afford the internet – which RIP is needed to run, and would thus be the stronger target market. Another reason to focus on the middle class and younger generation is for the fact that these people desire and commonly listens to music of all genre.

Figure 2

# Competition and Market Needs

There are numerous number of competitors to RIP. Popular sites include: 4Shared, Uploaded, MEGA.nz, MediaFire, Volafile, and many more. Most of these website also come in mobile applications and store files on a cloud server. They are often free to use, however, users have to pay to use a premium version which users can sync to a Google of Facebook account. Majority of the files are freely available, and users are sometimes restricted to a download limit a day. The file sharing market does indeed want users to buy the premium packages to make an income, however, RIP is a totally freeware thus does not require a subscription cost. This market also has a strong need and demands for a safer and stronger law-enforced environment.

# Regulations

Due to the fact that 70% of the people using file hosting websites do not feel any guilt in violating copyright laws (Go-Gulf, 2011). Using RIP makes it the perfect solution as not only will the users follow the legal, but also to learn about the copyrights that have been violated so far. RIP is one of the very few applications that strongly enforces the entertainment industry’s copyright act (98 of 1978) for South Africa. Thus, it can be determined for sure that political and economic support is given towards RIP. RIP can also boost the economy flow as many digital assets are excluded from a countries GDP simply for the fact that it cannot be tracked. With the use of RIP tracking becomes easy, artists can earn more income, and ultimately create job creation.

# Risks and sensitivity analysis

The purpose of the risk and sensitivity analysis has been operated to reduce taking solutions and selections that would lead to a negative result.

Sensitivity analysis is a modelling technique that supports modellers in their decision making. Sensitivity analysis draws a financial model, revolving around a target variable and how other variables can influence the target variable (Pannell 1997). To perform a complete sensitivity analysis, variables are monitored and relationships between variables are established to identify the best possible solution.

Regarding our application RIP, we will discuss the values and factors that can cause change and errors in our environment. The target variable for RIP will be profit which includes price of content, amount of sales and revenue percentage. The profit margin we will be calculating is before any external factors (even liabilities) are applied which can be represented with the following equation.

Further we will discuss the factors (external variables) that can influence the target variable “profit”.

**Popularity,** is a major influence on profit as, artists that are not renown it can effectively turn the profit earned from a specific artist to naught, as their “amount of sales” will be more or less equivalent to 0, as user are not interested their content or their content will be obscured by the content of the popular artists.

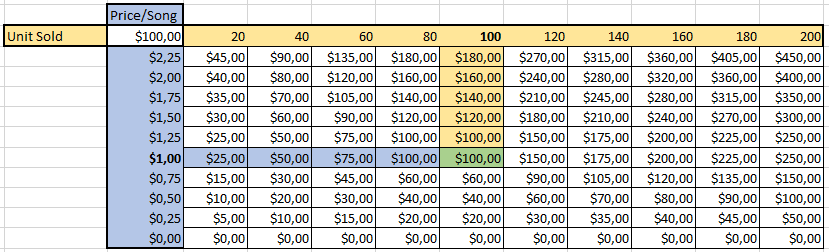
Popularity is an aberrant variable as it relies on the interest and the approval of social groups. Popularity can thus change the amount of sales by -100% to +100% if not more as in 2006 iTunes sold 2 billion songs (Jobs 2007 page 2) which would result in an unfathomable growth rate.

**Monetary Worth,** is the factor, where artists place a value on their product, i.e. they feel that the average amount that song is sold for on RIP should be more (or less). Another scenario is where an artist or company demands a larger share in revenue decreasing profit for Abstract.

Much like popularity, monetary worth can also fluctuate but this variable is under the control of RIP as an artist may place a value on their product, however RIP places the final value and without accepting our contract, which states revenue percentage and boundaries for monetary worth they cannot make use of RIP’s services.

**Competition,** in future endeavours, competition can turn into a major factor as they can influence the value that RIP should place on products or it competition can take customers interested in our service away from us, which effectively reduces our profit by reducing “price of content” and” amount of sales”.

Competition is an external factor that every organization faces, however we are a new product and not many similar products co-exist with RIP, so as of now the threat of competition does not exist. But if the challenge does arise, depending on the state of RIP (social and technological) the competition can have minimal or lingering effects on RIP’s profit margin.



An example of structural sensitivity analysis that displays the basic concept of the formula, however the external factors can fluctuate and change the target variable profit.

# Return on Investment

ROI according to Bentley (page 425) is a technique that compares the lifetime profitability of alternative solutions. It can be calculated by using the calculation presented below.

The estimated cost of the investment can refer to two possibilities, assets provided by investors or the additional assets that Abstract uses to benefit RIP. The estimated benefits that are gained from an investment refers to the assets generated by an investment made by Abstract or investors.

Within this segment we will discuss the possible investors, under what procedures should be followed to get investments and how investing in RIP should be done.

Target investors of RIP are artists and on a larger and smaller scale label companies, we will discuss why larger companies are not the target investors for RIP at its current stage, further on in this segment. Artists are the target because they embody the nature of RIP, their content serves as the product sold by RIP, thus attracting artists even if they are small time artists. Content provided by artists can be converted into money as their content is assigned a value and RIP receives a share of the sales of each item, thus returning value to the artist and to RIP.

Regarding content and the investments made the average price of a song on iTunes is $1, 29, small time artists that work from their homes or create content part time, show a massive ROI because the cost of their work was essentially nothing (excluding labour costs, which the price is assigned for) this if we use the above-mentioned formula, if a song is sold for $1, 00 and the artist initially valued the song at $0,70

*If an artist invests a song into RIP.*

*If a large company invests a surge of money into RIP.*

*(Assuming RIP sold 100 items for $1,00 and the company invests $1000,00)*

Regarding the nature of RIP, because Block-Chain is such a new technology and the type of software of RIP estimating how much it will grow is nearly impossible as there is no documentation and no current investors. Thus, large investments made by companies would be very counter intuitive. According to Wiederhold (page 5) the value intellectual property is “The value of the Intellectual Property is the income it generates over time”. Furthermore, Wiederhold states continuing improvement will result in growth of value.

Because of the initial value (which is difficult to estimate for RIP because of lack of information), RIP must grow through continuous improvement. When its value reaches a peak where large investments, yield an attractive ROI, can RIP grow exponentially because it can take large investments.

# Threats from Emerging Technologies

According to Crouch (2016), blockchain, artificial intelligence (AI), and predictive analysis are considered to be emerging technologies at risk or threatening. These technologies may cause socioeconomic and cultural impacts to the society and to the political environment. It is true that these technologies can create new job opportunities, however, it is also true that these technologies can cause job losses as they require a high-level of knowledge and skill sets. Other threats also include situations where data can be stolen especially when applications such as RIP are connected to a network. One of the more popular technology emerging to the current society is IoT or the Internet of Things; many analysis state that the IoT is a great innovation, yet it is also a great platform for hackers, thus Abstract suggests that RIP should be strictly used from the computer or from mobile devices. A simpler and less chaotic threat is spam mails. Spam mails itself can be harmless, but they can be annoying to the users especially when a hacker or malware somehow obtains a user’s contact details and sends potentially dangerous mail contents or consistently annoys them. Smith and Peot (1993:500-506) states that the current development of AI is not as advanced as people assume, thus it can be predicted that AI will not hinder the RIP applications, and that AI can in actual fact boost the security. With the threats from emerging technologies discussed, it is once again emphasized that RIP uses blockchain technologies, thus is strongly secure. Other possible threats towards RIP does not pose a large risk to RIP as RIP is a high-level application, and in the technological environment, all threats can be combated – of which RIP plans to combat any problems faced.

The market analysis was conducted for the project of RIP to find and understand the environment RIP will be entering to. Current states, industry definition, target market and statistics, competition and market needs, regulations, risk and sensitivity, return on investment, and the threats from emerging technologies has been scrutinised for the purpose of:

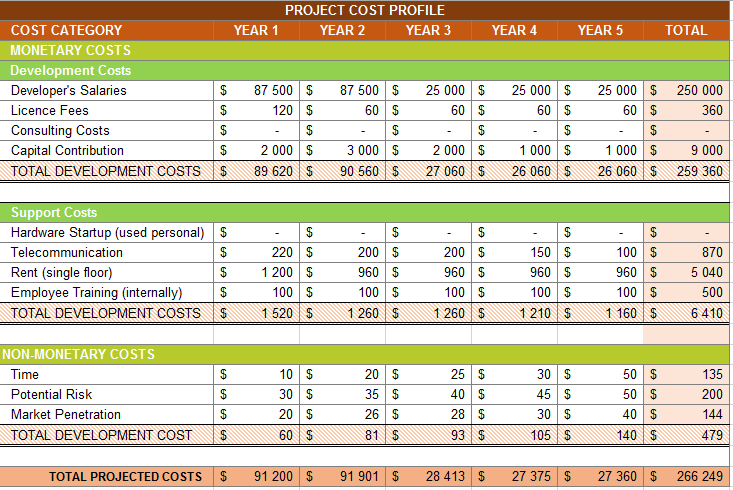
* Understand existing customers
* Identifying potential customers
* To develop effective strategies
* Identify new business opportunities
* To examine and solve the business problem.

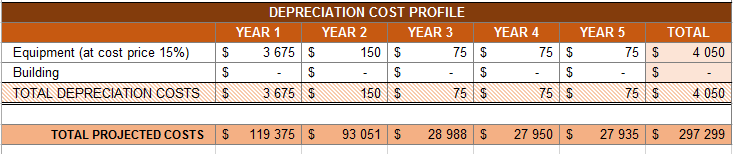
1. Cost/ Benefit Analysis

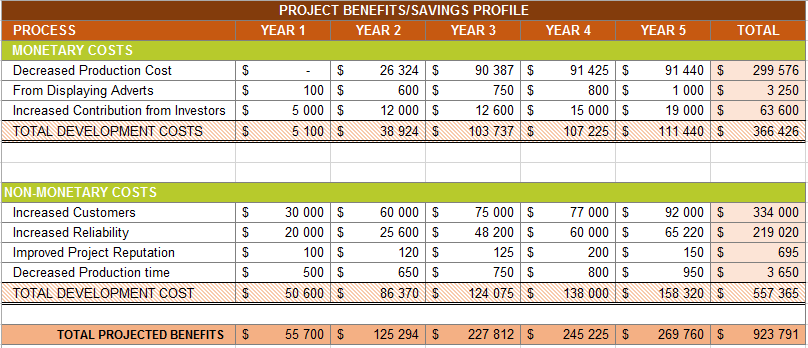
# Quantified Analysis

The cost benefit analysis (CBA) is a tool used to weigh the projects pros and cons of solutions as well as to determine the economic benefits thereof in order to make financial decisions. The CBA of RIP can be used to: evaluate the feasibility of the project, justify the technological equipment invested, determine the most effective method of keep the cost low as possible, quantify hidden costs, and to ensure accountability of the project of RIP.

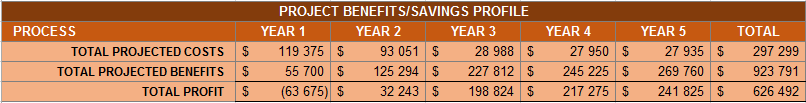
The following table figure displays the potential costs and expense for the application of RIP for the next 5 years.







With the total costs and benefits calculated, the total profit of the project can be calculated as follows:



During the first year, the project may seem to be at a loss, however, it is important to remember that the first year has extra expenses of start-up costs, thus, even though the project may begin with a negative profit, it is strongly suggested that the project has potentials to yield profits incrementing towards the future.

# Unquantified analysis

Unquantified analysis is analysis conducted to calculate the rate at which a company or project will fail to quantify their benefits (Masur & Posner, 2016:87). In this section of the report, the reasons to why RIP might fail along with the weighted calculations will be discussed. A few potential factors that might yield to a loss in the project consists of: poor productivity rate, poor quality of project, overpayments to developers, theft, and not taking the opportunities for an income.

If RIP has the probability (from previous data) of:

* 75% Positive environment
* 15% Neutral environment
* 15% Negative environment

And a prediction-probability of:

* 50% Costs and benefits will be fully quantified
* 35% Costs and benefits will be partially quantified
* 10% Costs and benefits will be unquantified from

Using the Bayesian formula indicated below, the unquantified costs and benefits probability can be calculated.

If the three environment has a probability of equally likely (33.33%), the results as follows:

* Given that a it is a neutral environment, the probability equals to:
  + Partially quantified costs and benefits = 12.6%
  + Unquantified costs and benefits = 3.6%
* Given that a it is a negative environment (which has the same probability as the neutral environment), the probability also equals to:
  + Partially quantified costs and benefits = 12.6%
  + Unquantified costs and benefits = 3.6%

Note that the positive environment values with the fully quantified variables are not indicated as it is not part of the unquantified analysis. Through the various calculations, it is clear that at most, the project of RIP will fail at 12.6% which then sums up to the fact that RIP has a success rate of 87,4% at min. Therefore, even though RIP has a potential to fail and yield a loss to the company, it can be suggested that the project and application of RIP can be carried out successfully.

1. Assessment of Benefits

The benefits to be gained from the investment compared to the alternative of ‘doing nothing’ should be summarised. Benefits should be identified and quantified, as far as possible, in financial terms: as appropriate, this to include projected cost reduction against investments, impact if no investment,, reduction in risk, improvements in quality, reliability, accuracy and other tangible, non-tangible and consequential benefit i.e. ‘what are the real benefits from making the investment?’

Impacts/ effects

A full assessment / explanation of the benefits should be included as an Annex if appropriate.

WHAT IS BENEFICIAL BY USING RIP -support by financial figures (above)

Success critea/benefits –what will change to a result of interview

RIP already possess various benefits in comparison to doing nothing to solve the problem.

1. Option Appraisal – Recommended Option

When formulating an investment proposal the options available, including the ‘do nothing’ option, should be considered and compared. Based on the outcome of the comparison of the options i.e. the option appraisal, a recommendation should be made for one option.

The full option appraisal should include a cost/benefit/risk comparison between the options available to address the business problem / opportunity. Options to include ‘do nothing’, business and technical options, timing options and, if at all relevant, consideration of 3rd party involvement – contractors, joint ventures partnerships, PFI and funding options. When considering options, relevant strategies, standards and legal requirements should be taken into account.

*Depending on the situation the option appraisal may be simply qualitative or a detailed analysis. It may be done in two stages i.e. a broad sift of a wide range of options followed by a detailed examination of say, 3 of them.*

1. Key Assumptions and Dependencies

Key assumptions, which, if they turn out to be wrong, may affect the projection for and the eventual success of the investment, should be identified.

Key dependencies, which if not in place may affect the outcome, should also be clearly identified.

Comments about likely inflation rates in the cost and benefit estimates should be included in this section as well.

1. Implementation Considerations

The key business risks associated with the recommended option should be summarised, particularly those which may impact on the financial projections (costs and/or benefits). The summary should include an indication of the probability and likely impact of the risks and the measures being proposed to manage the risk(s) and / or to reduce their impact e.g. business case review prior to major cash expenditure. **P**olitical, **O**perational **E**conomic / Financial and **T**echnical (POET) risks should be taken into account as they could all contribute to the overall business risk.

The financial projections presented in support of the recommended option should reflect the expected, or most likely, outcome of events. In presenting an analysis of the business risks, the Sponsor should identify the major sensitivities to which the investment could be exposed, typically the impact of cost overruns, time slippage which may result in higher costs and missed opportunities; failure to achieve the development/investment period.

Opportunities

1. Resource Requirements And Cost

The resource requirements and costs associated with the recommended option should be summarised i.e. external costs for equipment, external service costs e.g. for consultancy and internal staff costs. The summary is to include investment and running costs.

Resource needs

What supports are needed

|  |  |  |  |
| --- | --- | --- | --- |
| **Resource requirements and costs:** | Man years | Capital  £ | Running costs per annum (range) |
| External (bought in equipment)  External services  Internal costs |  |  |  |
| **Total** |  |  |  |

1. Funding source/ Timing/ Certainty

The source and timing of the funding for the investment, be it required, known or suggested, should be identified and an indication given of the certainty or otherwise of the funding being available when required.

1. Timescale

The proposed start and end dates should be given together with a list of significant (particularly financially significant) milestones (events with dates). Where relevant, the milestones to include dates on which the investment should be reviewed.

|  |  |  |
| --- | --- | --- |
| **Main milestones and dates:** | **Proposed start:** | **Proposed end:** |
| Tba | date | date |

1. Comments/ Issues

This section to be used if needed to draw attention to additional points or issues, which should be taken into account when considering the business case.

1. Conclusions and Recommendations

Bring the document to a close by concluding the findings and making recommendations.

1. Bibliography

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Smith, D.E. and Peot, M.A., 1993, July. Postponing threats in partial-order planning. In *Proceedings of the eleventh national conference on Artificial intelligence* (pp. 500-506). AAAI Press.

<http://www.immagic.com/eLibrary/SOURCE/APPLE_US/A070206J.doc> link to the statement made by Steve Jobs in 2007, he talks about iTunes and its success basically

<http://dpannell.fnas.uwa.edu.au/dpap971f.htm> - David J. Pannell (this seems legit enough and it is the most well summed up of all the sources) the actual book is referenced at the bottom of the link

Masur, J.S. and Posner, E.A., 2016. Unquantified Benefits and the Problem of Regulation under Certainty. *Cornell L. Rev.*, *102*, p.87.