**Colossus-Email**

**A**

**Dissertation Part-I**

**Report**

**Submitted to**

**Rajiv Gandhi Proudyogiki Vishwavidyalaya,Bhopal**

**Towards Partial Fulfillment for the Award of**

**Master of Technology**

**In**

**Computer Science & Engineering**



**Supervised By: Submitted by:**

**Deepak Patidar**

**0873CS20MT04**

**Department of Computer Science & Engineering**

**Shree Aurobindo Institute of Technology, Indore**

**Rajiv Gandhi Proudyogiki Vishwavidyalaya**

**DECLARATION**

I hereby declare that work which is being presented in the A Dissertation Report entitled, **“Colossus Email”** in partial fulfillment of the requirement for the award of Degree of Master of Technology **(Computer Science & Engineering)** degree by **Rajiv Gandhi Proudyogiki Vishwavidyalaya,**

**Bhopal (M.P.)** is an authentic record of my own work carried out under the guidance of <>

**Date: 05/02/2022**

**Deepak Patidar**

**0873CS20MT04**

**Acknowledgements**

I am thankful to the technical university Rajiv Gandhi Proudyogiki Vishwavidyalaya,

Bhopal for giving me opportunity to convert my theoretical knowledge into the practical skills

through this project.

Any work of this magnitude requires input, efforts and encouragement of people from all

sides. In compiling this project, I have been fortunate enough to get active and kind cooperation

from many people without which my endeavors wouldn’t have been a success. The project works

has been made successful by the cumbersome effort of the faculties.

I express my profound sense of gratitude to Principal, Shree Aurobindo Institute of technology Indore (M.P.) who was involved right from the inception of ideas to

the finalization of the work.

I would like to express my deep gratitude to my project guide **<>** under

whose valuable guidance, for encouraging me regularly and providing me each and every

facility. I was able to execute my project smoothly.

I especially thank to **Dr. Praveen Gupta** for their kind support and coordination to complete my

dissertation work. I am pleased to express my special thanks to my institution for their endless

support and help, especially other supporting me morally throughout my work. I also heartily

thanks to all other supporting staff of my institution.

Last but not the least; I am grateful to **My Parents**, and family members and colleagues,

for their continuous support and encouragement in success of this project.

Deepak Patidar

**Abstract**

After the breakout of the worldwide Resource online, there arises a severe need of marketing mechanisms, email marketing being the primary one. The basic aim of the project is to provide email marketing solution. We have used Python and Django Technology . The architecture used for the Email sending is based on multiple server and host client like gmail.because of its good performance accuracy and high speed. Alongside this, we have used basic concepts of background job scheduling and multiple bulk email from different host. Experimental results show that our system performs well on the test data with 100% and 99% precision and recall, respectively.

**Introduction**

The trend of email marketing is raising due to wide use of internet and mobile phones all over the world. Before that marketing only be possible in physical interaction. While other people are self-conscious about their business , they try to sell their products to the public directly and able to track their products feedback that every business can develop by knowing the reach of them.

Everyday millions off email sent by day to day life, we can manage our campaign and send bulk email every time.

**Literature Survey**

The birth of the Internet has opened ways for a massive amount of information to be collected and saved as digital form. Up till today, it is believed to be the fastest generated form of information, generally called digital information. All digital information is interpreted into ‘big data’. According to Arthur (2013), ‘big data’ is defined as the data collected by using both traditional and digital approaches from inside and outside of a company in order to serve the ongoing discovery and research of that company. The term ‘big data’ is rather new and only started being used in the 2000s. However, its growth rate should not be underestimated because 90% of the data in the world was created within only 2 years – 2016 and 2017. In 2017, the current output of data was 2.5 quintillion bytes a day, a massive number that is hard to figure out how many zeros follow up. (Hale 2017.) The world’s economy is developing and changing days to days in parallel with digital improvements. It was proved believed those changes have encouraged marketers develop new techniques within marketing approaches, making digital marketing increase hugely in demand (Hoekstra & Zwart 1993, 30). Government administrators in European developed economies made use of the big data to cut down on cost and was able to save $149 billion on operational costs, excluding reducing fraud and error activities and the collection of tax (Kumar 2017). Digital marketing practices could be divided into two sets of tools that could indepentdently work for different organizations. The first one includes digital marketing practices and tools that express a sense of commercial experience, namely email, search engines, affiliate marketing and other forms of online advertising. The second set is more relatable for the later generation as it includes social media, online gaming and virtual places. Additionally, digital marketing tools and digital 8 marketing channels should not be mixed together, given that mobile marketing is not considered a tool but still an effective channel for distributing email marketing and other display campaigns. (Reynolds 2010, 155-158.) According to Jamalzadeh, Behravan and Masoudi (2012), online marketing activities enables businesses and marketers to make use of the intensive internet boost when developing new marketing strategies and methodologies. The range of activities invloved in online marketing is wide and flexible, from banner advertising and sponsorship for content which are widely adopted around the web to other personal method such as emails and managing social media communities. Regardlessly, Gopal et al. (2005) commented, the fact that email marketing is a low-cost approach, immediate and could especially work for certain restrcited market sectors makes it one of the best performing service sector and an excellent tool for online marketing.

Ever since its first introduction, email and email marketing has been continuously praised as one of the most advanced and recognized communicating channel of the new century. Its role as both a tool and a channel of digital marketing have been recognized by several authors. According to Hoekstra and Zwart (1993), in the 1990s, when email marketing was not as popular as it is nowadays, the original form of it, as known as postal mail was considered as direct marketing. The aims of email marketing were not only to establish new relationships with customers, but also to maintain them to create customer loyalty to the brand. (ibid., 30.) According to Chittenden & Rettie (2003, 203-217), email marketing is recognized as the new and powerful way of digital marketing. It is great and convenient for attracting consumers by delivering advertising, promotional or commercial campaigns directly at targeted consumers’ mailbox in no time or effort (The Balance 2016). According to the Direct Mail Association’s DMA Fact Book 2012, there are about 54.2% of the total value of US Mail associated with direct mail advertising across all classes (Dalzell, 2013). 9 The Email Statistics Report 2018 – 2022 of The Radicati Group (2018) reported that in 2018, the number of email users of the entire world will top 3.8 billion, which mean more than half of the global population have at least one email account. In the same report, 281.1 billion mails are sent every day and is expected to increase 4.4% to 293.6 billion in 2019 (ibid., 2018). This indicates that emails are continuingly used by everyone for different purposes from business to personal, with numerous providers like Gmail, Hotmail, Outlook, etc. Companies analyze the data and see emails as an opportunity and motivation to invest in their marketing strategy to reach out to more customers, together with traditional approaches and other practices. According to Kendra (2017), e-mail marketing is 40 times more effective than social media marketing. Another research emphasized that e-mails were still the most efficient way of digital marketing compared to other social media mediums in term of acquiring customers (Aufreiter, Boudet & Weng 2014). Another article by Silva (2018) showed that, for every dollar company spends on email marketing, it will generate a profit worth of $35 to $45.

**Technologies Used**

**Python**

**Python** is Python is a widely-used, interpreted, object-oriented, and high-level programming language with dynamic semantics, used for general-purpose programming. It was created by Guido van Rossum, and first released on February 20, 1991.

While you may know the python as a large snake, the name of the Python programming language comes from an old BBC television comedy sketch series called **Monty Python’s Flying Circus**.

One of the amazing features of Python is the fact that it is actually one person’s work. Usually, new programming languages are developed and published by large companies employing lots of professionals, and due to copyright rules, it is very hard to name any of the people involved in the project. Python is an exception.

Of course, van Rossum did not develop and evolve all the Python components himself. The speed with which Python has spread around the world is a result of the continuous work of thousands (very often anonymous) programmers, testers, users (many of them aren’t IT specialists) and enthusiasts, but it must be said that the very first idea (the seed from which Python sprouted) came to one head – Guido’s.

### **Python goals**

In 1999, Guido van Rossum defined his goals for Python:

* an **easy and intuitive** language just as **powerful** as those of the major competitors;
* **open source**, so anyone can contribute to its development;
* code that is as understandable as **plain English**;
* suitable **for everyday tasks**, allowing for short development times.

**Django:**

**Django** is a high-level Python web framework that enables rapid development of secure and maintainable websites. Built by experienced developers, Django takes care of much of the hassle of web development, so you can focus on writing your app without needing to reinvent the wheel. It is free and open source, has a thriving and active community, great documentation, and many options for free and paid-for support.

Django helps you write software that is:

**Complete**

Django follows the "Batteries included" philosophy and provides almost everything developers might want to do "out of the box". Because everything you need is part of the one "product", it all works seamlessly together, follows consistent design principles, and has extensive and [up-to-date documentation](https://docs.djangoproject.com/en/stable/).

**Versatile**

Django can be (and has been) used to build almost any type of website — from content management systems and wikis, through to social networks and news sites. It can work with any client-side framework, and can deliver content in almost any format (including HTML, RSS feeds, JSON, XML, etc). The site you are currently reading is built with Django!

Internally, while it provides choices for almost any functionality you might want (e.g. several popular databases, templating engines, etc.), it can also be extended to use other components if needed.

**Secure**

Django helps developers avoid many common security mistakes by providing a framework that has been engineered to "do the right things" to protect the website automatically. For example, Django provides a secure way to manage user accounts and passwords, avoiding common mistakes like putting session information in cookies where it is vulnerable (instead cookies just contain a key, and the actual data is stored in the database) or directly storing passwords rather than a password hash.

A password hash is a fixed-length value created by sending the password through a [cryptographic hash function](https://en.wikipedia.org/wiki/Cryptographic_hash_function). Django can check if an entered password is correct by running it through the hash function and comparing the output to the stored hash value. However due to the "one-way" nature of the function, even if a stored hash value is compromised it is hard for an attacker to work out the original password.

Django enables protection against many vulnerabilities by default, including SQL injection, cross-site scripting, cross-site request forgery and [clickjacking](https://developer.mozilla.org/en-US/docs/Glossary/Clickjacking) (see [Website security](https://developer.mozilla.org/en-US/docs/Learn/Server-side/First_steps/Website_security) for more details of such attacks).

**Scalable**

Django uses a component-based “[shared-nothing](https://en.wikipedia.org/wiki/Shared_nothing_architecture)” architecture (each part of the architecture is independent of the others, and can hence be replaced or changed if needed). Having a clear separation between the different parts means that it can scale for increased traffic by adding hardware at any level: caching servers, database servers, or application servers. Some of the busiest sites have successfully scaled Django to meet their demands (e.g. Instagram and Disqus, to name just two).

**Maintainable**

Django code is written using design principles and patterns that encourage the creation of maintainable and reusable code. In particular, it makes use of the Don't Repeat Yourself (DRY) principle so there is no unnecessary duplication, reducing the amount of code. Django also promotes the grouping of related functionality into reusable "applications" and, at a lower level, groups related code into modules (along the lines of the [Model View Controller (MVC)](https://developer.mozilla.org/en-US/docs/Glossary/MVC) pattern).

**Portable**

Django is written in Python, which runs on many platforms. That means that you are not tied to any particular server platform, and can run your applications on many flavours of Linux, Windows, and Mac OS X. Furthermore, Django is well-supported by many web hosting providers, who often provide specific infrastructure and documentation for hosting Django sites.

**Django Celery**

**Django Celery** django-celery provides Celery integration for Django; Using the Django ORM and cache backend for storing results, autodiscovery of task modules for applications listed in INSTALLED\_APPS, and more. Celery is a task queue/job queue based on distributed message passing. It is focused on real-time operation, but supports scheduling as well. The execution units, called tasks, are executed concurrently on a single or more worker servers. Tasks can execute asynchronously (in the background) or synchronously (wait until ready). Celery is already used in production to process millions of tasks a day. Celery is written in Python, but the protocol can be implemented in any language. It can also operate with other languages using webhooks..

**Problem Statement**

Create and manage multiple mailing lists; Import lists from other providers (csv files or paste email addresses); Create reusable email templates; Customize sign up pages (subscribe, unsubscribe, thank you page, etc.); Default double opt-in for sign ups; Schedule email campaign to send on a specific date and time; Track email opens and clicks; Change link URL after email is sent; Reports with geolocation; Compatible with Mailgun, SendGrid, Mandrill, or any other SMTP email service.

**Research Objectives**

Rettie (2002) suggested that email marketing could be useful for customer acquisition and retention, which are considered foundational elements of customer equity. However, there were little researches on whether email marketing could play any role in increasing customer loyalty.

Aside from that, the increasing overload of emails and continuously changing consumer behavior is making marketers doubt whether the effective of email marketing is still great as it used to be. In 2016, there were 52 million Vietnamese people had access to the Internet, which was 54% of the population the time (Thach Hue 2016). The number of email users has been predicted to surpass 3.8 million in the beginning of 2019 (Heinz 2018). These facts make this market highly attractive for email marketers, however, there has been little research on email behavior of this geographic group.

In 2016, there were 52 million Vietnamese people had access to the Internet, which was 54% of the population the time (Thach Hue 2016). The number of email users has been predicted to surpass 3.8 million in the beginning of 2019 (Heinz 2018). These facts make this market highly attractive for email marketers, however, there has been little research on email behavior of this geographic group. Hence, the purpose of the research will be reached when it can come to a conclusion whether: Research Question 1 (RQ1): What are the email using behaviors of young Vietnamese email consumers? Research Question 2 (RQ2): Does email marketing positively contribute to customer loyalty? The literature review has revealed the relationships between the three contributing factors of customer equity, loyal intentions, customer equity and sales (Vogel et al., 2008). Following the previous researches by Kim & Ko (2011) on the effects of social media marketing on customer equity and customer loyalty, Cicek and Edogmus (2012) implied that if email marketing is proved to positively affects value equity, brand equity and relationship equity, it will also affects customer loyalty positively. Hence, the hypotheses for RQ2 are as follow: Hypothesis 1 (H1): email marketing has positive effects on value equity 22 Hypothesis 2 (H2): email marketing has positive effects on brand equity Hypothesis 3 (H3): email marketing has positive effects on relationship equity By proving the validity of the above hypotheses, RQ2 of “Does email marketing positively contribute to customer loyalty?” will come to a conclusion.

**Research Methodology**

When conducting a market research, there are typically two main types of research method – qualitative research and quantitative research. Each of these method delivers unique qualities that differ one from another. The choice of which method to apply depends very much on authors' intentions while carrying out a research. According to Guidelines for Qualitative Research (2011) as cited by McGivern (2013), qualitative research is a type of research involving observation, dialogue and evocation, with a flexible, unstructured approach that aims to provide highly valid, descriptive data for deeper understanding of a subject matter. Procter (2005) points out several limitations when using qualitative research, stating that: ‘Qualitative research does not pick out small differences quite as well as large-scale quantitative research … Another limitation is that qualitative studies do not provide samples that are representative of the target population of the research … Influential or dominant characters within a discussion group can also lead the group off on tangential discussions or bias the ‘group view’ … [and] the problem of the discussion leader’s competence.’ (ibid., 222) On the other hand, quantitative research is a research type which is based on positivism and neo-positivism methodologies (Adams et al. 2007,

25 - 26; Wang 2010, 2). They also pointed out that quantitative research is most likely to be strictly structured and designed prior to the real research. The name of this research type already suggests a sense of type of data collected, which will be statistics and hence, involves statistical analysis. (Adams et al. 2007, 25-26.). Quantitative research is proved to be more structured in approach, involves larger samples, can be easily replicated and produces statistical data that provide quantifiable insights into behavior, motivation and attitudes (Wilson 2013). The research on whether email positively contributes to loyalty intentions is conducted in quantitative method. This research method, however, has several limitations.

Goertzen (2017) criticizes quantitative research as it 24 does not provide the logic behind participant’s responses, its inability to reach specific demographic groups and how time-consuming the studies might be to collect the data. When it comes to data collection, there are multiple methods that can be used to complete the task, which are generally called surveys. Commonly, the two most popular types of surveys are interviews and questionnaires, which belong to qualitative research and quantitative research respectively. (Kelly et al. 2003, 261 - 262.).

Survey research is a method used to collect primary data, so the data is relatively ‘fresh’ and ‘up-to-date' of what is going on in the real world (Kelly et al. 2003, 261 - 266). It is also argued that survey is capable of generating a large amount of data within short time-frame and at low cost (ibid, 263). For the mentioned advantages of survey research method, it is chosen as a mean of data collection. The survey will be created using an online tool, making it an E-survey. Even though E-survey encounter a number of factors that can cause poor results (Adams 2007, 128 - 140), when being compared to other mediums of data collection such as telephone interview and postal questionnaires, E-survey offers respondents a more interactive and user-friendly surface to work on (Dillman, Smyth & Christian 2014, 140). However, besides the convenience being stated, researchers should be aware of survey method drawbacks as well. The most likely to encounter drawbacks is the insecurity of response rate when it is very hard to control respondents' willingness to participate in a survey (Kelly et al. 2003, 263; Adams et al. 2007, 140). The research purpose is to study the email behavior of the Vietnamese demographic and whether email marketing has effects on their loyalty intentions. Hence, the sampling was reduced to Vietnamese email users ranging from age 18 to 30 due to the fact that this demographic group is easier to reach for completing the survey and typically has more access to digital advances and are more online active. In fact, a survey (2012) reported that 95% of Vietnamese internet users ages from 15 to 24 years old (95% số người dùng internet ở tuổi từ 15 – 24! [95% of internet users ages from 15 - 24 years old] 2012). Apart from that criteria, respondents are supposed to be currently living in Vietnam so that they truly experience the Vietnamese digital marketing,

observe the changes throughout every day and react to those marketing activities. Vietnamese who live 25 abroad may still receive promotional emails from corporate senders from Vietnam but they will not react in the same way as if they were living in Vietnam, which affects the result from the survey. Last but not any least, all the respondents must have an active email account for the sake of the research as email marketing. It can be inducted from the two sources of info that it is safe to say a relatively large portion of Vietnamese people have at least one email account each. For the sampling process, non-probability sampling technique was adopted, with the population of interest being random people who come across the online survey. The respondents are selected by their convenient accessibility to the researcher on the ground of convenience sampling method. Non-probability sampling technique refers to a set of sampling methods with the samples selecting procedure conducted subjectively, with smaller sample size and is faster and easier to conduct than probability sampling technique; however, exposed to risks of not knowing the representative level of the population drawn, incomputable sampling error and may leave the results more indicative than definitive. (Wilson, 2012.). This, along with the nature of convenience sampling, might produce biased results that turn to be invalid or unusable. Despite all the risks while using non-probability and convenience sampling methods, they bring along the best cost effectiveness and time efficiency, which encouraged the researchers to go with them.

Before starting the data collection process, a survey should be designed in advance, in either open-ended form or closed-ended one. For the purpose of ease at categorizing and processing answers, a closed-ended questionnaire is the best choice. According to Adams et al., closed-ended questions also enable researchers to compare and contrast answers in depth (2007, 132). However, while using this type of data collection method, researchers should be also aware of the possibility where respondents hesitate to answer or unwilling to participate actively. In fact, there are respondents who fill in the survey with no intention to complete it with true to one's self, which distracts researchers. (Adams et al. 2007, 132.) Data collection process is planned to be done within 7 days, including the pilot testing phase and the actual survey. The actual survey will take place in 2 days when the first official questionnaire survey is published. Google Docs is used as a tool to create a questionnaire online for its user friendliness and convenience. A set of 18 questions 26 is designed and is expected to take about 5 to 7 minutes for each response. The questionnaire comprises of all closed-ended questions, varies from multiple choices to scaling answers. All 18 questions are marked compulsory to maximize the generation of answers. The questions are designed with the three hypotheses in mind, in other words, are expected to give answer to one of those hypotheses. The research subjects are email users aged from 18 to 30 who are currently living in Vietnam.

The survey will be spread out on the authors' Facebook pages, with public setting so that everyone who has the link can click on it and will be taken directly to the survey. The reason behind the choice of communication medium is the massive number of Facebook users in Vietnam with 64 million users, ranked at the 7th country with the most Facebook users and they spend 2 hours each day on average to go online and use social media (Phuong 2017). The respondents are asked to help spreading the survey to even more people on their friend list. Because the authors are in the studied age range, it is very unlikely that anyone who is out of the group will attend the survey. In order to keep a record, the first question is to about respondents’ ages and is entered manually. The link is made accessible for 2 days February 20 and February 21, 2018. The research expects around 80 to 100 responses collected during that 2 days.

After all data is collected and analyzed, it will be taken to a cognitive process called reasoning, so that inferences can be drawn from the data set. Because in the beginning of the research, hypotheses were made, deductive reasoning will be used in order to test the validity of them. According to Vinod Goel and Raymond Dolan, while inductive arguments are never valid, deductive arguments are reliable in terms of testing the relationship between the collected data and the hypotheses (2004, B110). It was proven by Vogel et al. (ibid.) that relationship equity, brand equity and value equity have effects on loyalty intentions, so by providing the proof and evidence from the deductive reasoning process and compare it to the model, it is possible to conclude whether or not email marketing can affect loyalty intentions through the three hypotheses.

**Expected Outcome of the study**

Regarding RQ1, the research results show that the email using behavior of the young Vietnamese demographic, aging form 18 – 30 are highly divided, from enthusiastic to indifferent using behavior. Most people receive emails at a very low volume, however have very little interest or positive attitude toward a total amount of email as little as less than 10 emails per week. As predicted, subject lines and the identity of senders play a major role in grasping the attention and engagement of the email receiver as they are subjectively the first features of the email come into contact with the receiver. In fact, almost 50% of respondents claim that they would not open an email if it was sent from an unknown entity.

However, it does not mean that known sender will get through, as research result show that the likeliness to open an email between an unknown and known sender is very much the same. The only difference is that for unknown senders, the negativity towards them is relatively higher. Overall, respondents experience with emails in general are mixed to positive. In RQ2, the research outcomes are mixed. Research results show that respondents do not consider emails helpful in identifying the values of the products/ services, however could serve as a useful informative source. It is not clear whether emails could contribute positively to value equity (H1), due to the fact that respondents could use the information provided in the emails but not using those information to come up with any solid judgment or decision.

On the other hand, most respondents thinks that emails make them more aware of the brand and what it does, which proves that H2 is correct. However, efforts to establish relationships and consequently enhance relationship equity. Research results show that most respondents are not highly interested in using their emails for ‘exclusive offers’ anyhow, and their experience with post-purchase emails are showed to be mixed to negative. Hence, it is not possible to conclude whether emails could positively enhance relationship equity. This could mean that email marketing is particularly useful for increasing brand awareness, despite it is a negative or positive impression. Emails stand alone could not trigger customer loyalty or loyalty intentions amongst receivers, however when combined with other online marketing practices, the results might appear different.

#### **Benefits of Email Marketing**

Email marketing is a fully grown and well-used tactic for business promotion via emails. It is cost-effective, easily executed and gives a good impact on your campaigns. Email marketing does not replace your other marketing activities but compliments them extremely well. A well run and good email marketing campaign can grow your customer pool and add to customer’s loyalty. Hearing from your brand repeatedly, with good content reminds readers of your business’ value, especially if they take your advice and find it works for them. Although email marketing comes with lower risks and higher profitability, however, this can only be achieved through proper planning and execution tuning into higher success rates for your business.

**Reference**

1.https://landing.sendinblue.com/

2.<https://mailmarketer.in/>

3.<https://sendclean.com/>

4.https://mailchimp.com/