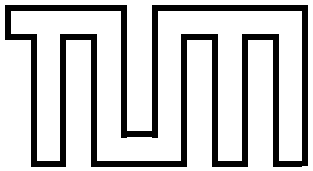


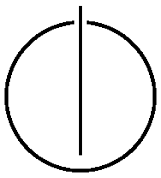
FAKULTÄT FÜR INFORMATIK

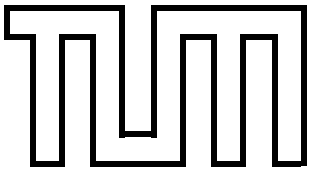
DER TECHNISCHEN UNIVERSITÄT MÜNCHEN

Master's Thesis in Informatik

Personalized Mass Email Communication

Baris Oztop





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Personalized Mass Email Communication

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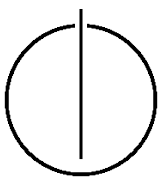

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Munich, July 14, 2013

(Baris Oztop)

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Abstract

Reaching out large-scale of people via Internet is a fast and cost efficient way comparing with postal mail or telephone. Therefore, email has been used not just for research, but also for marketing, customer support, and other data collection purposes. However, getting an acceptable response rates on the sent out emails requires additional efforts from the researchers' side. This thesis investigates a communication system, which contributes increasing the response rates while minimizing the burden on the researchers' side.

To achieve this, the system constructs a workflow supporting researchers to extract information, providing rule based automated decision making mechanism on respondents' emails, and personalize the content of the emails with the respondents' information which is extracted from the current state or earlier conversations. System also provides an option to enable contribution of other researchers to interact with the workflow under the permission of the initial researcher. Therefore, distribution of the work can ease individual's efforts on the mass email communication. This feature can be further extended on enabling crowd workers on distribution of the work.

This thesis demonstrates that providing a proper workflow and the possibility of an assistant contribution, a mass email communication can be achieved as if each email is individually tailored to each recipient, which contributes to high response rates. Therefore, while it keeps the efforts at minimum on the creation of emails, it maximizes the scale on the number of people communicated.

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List of Acronyms

CRM Customer Relationship Management

SaaS Software as a Service

UI User Interface

IMAP Internet Message Access Protocol

CC Carbon Copy

BCC Blind Carbon Copy

1 Introduction

Increased Internet usage turned email as a tool for communication replacing telephone and regular mail (Norman and Lutz, 2000; Madden and Rainie, 2003). There are many use cases showing that email plays a huge role as a communication tool. Some of them include marketing for engaging clients, customer support for offering assistance after sale, surveying people to get their opinion on a topic, and many other cases showing that email become essential part of our daily life.

However, when the amount of people you want to reach increases, the way how you compose the emails and extract the information change. Because, the personal effort will not be enough anymore to individually tailor the emails according to each recipients or reading out all the respondent's emails to extract the answers that you seek for. As a result, researchers tend to use online or software tools to send out generic emails to recipients with a non-adequate personalization, which is known as one of the important factor to increase response rates (Dillman, 1991; Schaefer and Dillman, 1998). Such emails are treated with low priority, which results low response rates at the end (Dillman et al., 2009, page 272).

There are several products in the market focusing on email communication and data collection. Customer Relationship Management (CRM) application keep track a company's communication with their clients. A Help desk application offers a platform to solve customers' problems or provide guidance regarding products. Email marketing applications help out sending commercial messages to group of people. Finally, survey applications aid to conduct online surveys to get people's opinions and behaviors. One of the common properties of all of these applications is their dependency on email communication. However, none of these mentioned tools offers a complete workflow to help out a re-

searcher to make an email communication possible with a great amount of people in a personalized manner and as easy as possible like communicating with an individual.

The goal of this thesis is to understand the possible workflow of a personalized mass email communication, and to show that it is possible to reach a great amount of people by keeping the communication personalized at the same time. A complete system, named Myriad, has been developed to demonstrate the practical aspects of the idea.

1.1 Email as a Data Collection Method

Nearly 600% growth rate on world-wide internet usage between 2000 to 2012 makes Europe's 63% and North America's 80% overall population internet usage proportion (Group, 2012). Email is ranked as the most popular online activity a long with search engine usage with 92% of online adult users (Purcell, 2011). Also, the connectivity and the flexibility have been increased with the introduction of smart phones and tablet devices (Madden and Jones, 2008). In addition to these facts, email has low cost and quick turnover compared to regular mail or telephone communication (Zikmund and Babin, 2006). Therefore, email as a part of communication is considered as a viable option for data collection as well (Zikmund and Babin, 2006).

There are several reasons of data collection depending on the situation. However, purposes of data collection can be group under the following three categories (Sue and Ritter, 2011) (Babbie, 2012, pages 92–94):

1. To explore and get information about a topic
2. To describe the events and the situations
3. To explain things by questioning

To illustrate these purposes to see how we can use email to explore, describe, and explain things, let's suppose that we have an online learning platform offering various courses publicly:

Exploration Offering online courses is a relatively new trend; therefore we do not have a previous knowledge about the topic. To explore the popularity of the platform, we need

to ask questions about the platform's users: Why are they attending our online courses? Have they taken any online courses before? What are their income levels? Figuring out the answers of these questions will help us to improve the system or to decide its future. For example, the aggregated answers to the income level question will make us to decide whether to charge the users for their usage or offer it for free but find some sponsors to make it viable.

Description Our goal can be to describe characteristics of the online learning platform's users. The questions helping us to describe this can be: Where do they come from? What are their age ranges? Have they attended to a college? At the end, we might end up with a description of users profile like users, at the age of 16 – 22, who have never attended to a college, and coming from less developed countries. Knowing our users' portfolio according to this outcome can help us to attract organizations who have already had engagements to support those countries' young population. Hence, they can leverage our platform as a tool to reach those populations.

Explanation We figured out that our platform's users' age range is between 16 – 22 in our descriptive study. The reasons of why this ended up like that make our explanatory purpose. The questions like how often they are connected online or have they attended a college or a similar high level education institute might help us to find out the answer of why young people use our platform than older people. Collecting such statistics may help us to develop an explanation to a topic.

Since all of our registered users provided their email addresses as a primary and mandatory contact medium, we can use email to conduct our data collection whether the reason is to explore, describe or explain the user trends on our online learning platform.

1.2 Problem Sstatement

To date, email as a popular medium for communication has many use cases including to reach group of people to explore, describe, and explain things. However, when the group's size gets larger, it becomes difficult from the researchers' perspective to man-

age the state of the communication as in small groups. Therefore, researchers tend to write generic emails ignoring or using inadequate recipient specific information with the help of a software or online tool in the emails. This results low response rates since recipients become aware of being part of a large group, hence feeling less important and valued, as well as the chance to volunteer to reply the email get less. On the other hand, if researchers individually tailor those emails according to recipients, it will require much more additional efforts and as a result cost, hence reducing the advantages of using email as a communication medium.

Even though, there are many solutions in the market to support email communication, there is no individual product allowing researchers to reach larger groups with minimum effort and keeping the communication personalized at the same time.

The main goal of this thesis is that personalized communication with large groups is possible when a proper workflow is provided. To achieve this goal:

1. Examine the workflow of an email communication with large groups and possible exceptional cases on this flow
2. Investigate the effects of email content's personalization on the response rates
3. Describe how an adequate amount of personalized can be supplied
4. Comparison of existing products claiming to provide solutions on email communication and collection of respondents' information
5. Describe the design and implementation of an application satisfying the mentioned workflow to aid researchers including the initial prototype
6. Show how assistants can support the mentioned workflow
7. Real life use cases of the application and its users opinions about the application, and latest statistical information giving insight about how and in which way the application is used by its users.

This thesis also contributes on the following areas:

1. Email as a data collection method
2. Surveying with email

3. Defining a workflow on a mass email communication
4. Possible crowd sourced assistant usage
5. Personalization of email content

1.3 Outline

Outline goes here

2 Foundation and Related Work

This chapter presents the related work on the data collection domain. Even though, the technology is different for email surveys to collect data from well-established regular mail surveying methods, the nature of the communication is similar to self-administrated questionnaires (Schaefer and Dillman, 1998). Therefore, the chapter will also investigate the mail surveys in a way to emphases the points which are also related with email communication, and the earlier studies on response rate influences.

2.1 Surveys and Data Collection

A Survey is defined as a system for collecting information (Sue and Ritter, 2011, page 3). It helps to learn about people's opinions and behaviors (Dillman et al., 2009). The produced data during or at the completion of the survey belong to the data collection process. Therefore, data collection is a fundamental step to produce useful data to enable analyzes on researches (Groves et al., 2009, page 149). These researches include but not limited to many disciplines like sociology, statistics, psychology, marketing, economics, and heath sciences.

2.1.1 Email Surveys

Comparing many different characteristics of surveys and interviews, the concerns regarding speed and cost make the most powerful differences (Sproull, 1986; Schaefer and Dillman, 1998). Email surveys offer more rapid surveying than other methods including regular mail and telephone surveys. In addition to that, email surveys are inexpensive since it removes the postage, paper and printing, and interview costs (Schaefer and Dillman, 1998).

Sproull (1986) identified the characteristics of email with an organizational research, within a Fortune 500 office products and systems manufacturer, who were using email for 12 years in the organization and over 80 percent of all employees in the selected unit have email access at the time of the research. Selected candidates are separated into two groups. The data collection protocol within the organization asked each of the group's participants series of questions regarding their 3-day old email inbox. Both groups filled out the questionnaire and answer open-ended questions either electronically or in writing.

The result of the study indicated that the average duration of data collection time for email version was less than a week, which is half of the duration of the written version. While the response rate of email version was 73 percent, conventional written version's rate was 87. The percentage of missing data in the questionnaires was .2 percent in the written version, and 1.4 in the email version. There were no differences in mean answers in email version comparing written questionnaire.

In an another study from Sheehan and Hoy (2006), where they administered only an email survey to query individuals about their on-line behaviors and their attitudes and opinions regarding privacy. They have reached the shortest response time with 3.65 days comparing with earlier studies conducted until that time (See table 2.1).

Table 2.1: Summary of Survey Research Methods Using E-mail (Sheehan and Hoy, 2006)

Author	**Response Sample**	**Survey Topic**	**Sample Size**	**Usable Sample**	**Method**	**Response Rate**	**Time (days)**
Kiesler & Sproull (1986)	Employees of a Fortune 500	Corporate Communication	115	77	Mail	67%	10.8
			115	86	Email	75%	9.6
Parker (1992)	Employees of AT&T	Internal Communication	70	27	Mail	38%	NA
			70	48	Email	68%	NA
Schuldt & Totten (1994)	Marketing & MIS Professors (US)	Shareware Copying	200	113	Mail	56.5%	NA
			218	42	Email	19.3%	NA
Mehta & Sivadas (1995)	Usenet Users	Internet Communication	309	173	Mail	56.5%*	NA
			182	99	Email	54.3%*	NA
Tse, et al (1995)	University Population (HK)	Business Ethics	200	54	Mail	27%	9.79
			200	12	Email	6%	8.09
Bachman, Elfrink & Vazzana (1996)	Business School Deans	TQM	224	147	Mail	65.6%	11.18
			224	117	Email	52.5%	4.68
Sheehan & Hoy (1997)	University Population (Southeast US)	Privacy and New Technology	580	274	Email	47.2%	4.7

Continued on next page

Table 2.1 – continued from previous page

Author	Response Sample	Survey Topic	Sample Size	Usable Sample	Method	Response Rate	Time (days)
Smith (1997)	Web presence	Business Activities	150	11	Email survey	8%	NA
			150	42	Email solicit	11.3%	NA
Schillewaert, Langerak and Duhamel (1998)	Web users in Belgium	Attitudes toward the Web	430	125	Email	31%	NA
			62.5M	110	Ad in magazine	0%	NA
			4000	67	USENET Posting	2%	NA
			7500	51	Hyperlinks	0.68%	NA
Weible and Wallace (1998)	MIS Professors (US)	Internet Use	200	70	Mail	35.7%	12.9
			200	50	Fax	30.9%	8.8
			200	48	Email	29.8%	6.1
			200	52	Web form	32.7%	7.4
Schaefer and Dillman (1998)	University Faculty	Unknown	226	130	Mail	57.5%*	14.39
			226	131	Email	58.0%*	9.16
*Differences not significant							

In addition to speed of the email surveys, cost benefits have been indicated in Sheehan and Hoy's (2006) study also concluded that email is an extremely cost-efficient method for data collection, where the total cost estimated at $470 ($30 for printing out the responses, $440 for 22 hours computer time to download surveys for printing) while postal mail is estimated at $6,500 (printing, postage, survey, and reminder mailing).

In another study from Mavis and Brocato (1998), the email survey was nearly seven times cost efficient than postal survey. This includes labor hours, survey materials like booklets, mailing labels, envelopes, and postage costs. Total time spent into postal survey was 33 hours, but it only required 12 hours for the email survey. Final cost was $503.36 for postal survey, whose $305.36 was spent for postage part, and remaining $198 was spent for student labor cost. The only cost resultant from email survey was student labor cost, which was total $72.

Moreover, Paolo (2000) reported that people made longer open-ended response comments in email version of the survey comparing with mail version. While the average number of words per comment was 58.33% in the mail version, and it was 75.40% in the email version of the survey. Bachmann (1999) had the same finding in 1995 and 1998, where open-ended questions were responded much likely by email recipients than the

mail recipients. In the latter study conducted in 1998, researches also found that email respondents were more likely to expand their answers, even it was not suggested by the survey, resulting more candid responses than mail surveys. Responses to open-ended questions is one of the important measure to determine the quality of the returned surveys.

Given these advantages and positive benefits of email surveys, next section will provide information about surveys errors applicable to all type of surveys.

2.1.2 Survey Errors

Sample surveys are quantitative estimation of the distribution of a characteristic in a population by obtaining this information from a small portion of the corresponding population (Dillman, 1991). To generalize results from a small portion, which is a sample, to a population, following sources of errors needs to be considered (Dillman, 2006, page 9; Dillman, 1991):

Sampling Error The more number of people surveyed, the large degree of precision can be achieved. Therefore, the limitations on the number of people surveyed are considered under the sampling error. For example, while public opinion of 100 people results $\pm\$10\%$ of the true percent, 2,200 people results higher confidence with the percent of $\pm\$2\%$ (Dillman, 2006, page 9). The surveys relying on predefined list of recipients considered that the list is randomly generated or with a systematic sampling. Hence, it has got little research to reduce sampling errors comparing with face-to-face interviews in which multistage cluster designs[1] are used due to cost and time limitations (Groves et al., 2009, page 106; Dillman, 1991).

[1] Cluster sampling selects preexisting groups of population elements instead of a single element of the population (Groves et al., 2009, page 106). Departments of a university or households in a block represents clusters of people. When the allocation of those sampling resources are stratified and based on multiple stages, frequently three stages, it is called multistage cluster sampling. First step selects the sample of counties, followed by the blocks within those counties, and finally the dwellings from the chosen blocks (Scott and Smith, 1969).

Coverage Error When the list of surveyed people does not include all the elements of the population, coverage error happens (Dillman, 2006, page 9). Coverage error is considered one of the biggest issue of surveys since while surveying general public (Dillman, 1991).

Measurement Error When a respondent's answer is hard to evaluate or cannot be compared with other respondent's answers or there are inconsistencies between the observable variables like opinions, behaviors, or attributes and the survey responses, measurement error happens (Dillman, 2006, page 9; Dillman, 1991). The possible reasons might depend on poor wording or order of the questions or the characteristics of the surveyed person such as incapability to provide correct answers or motivational factors (Dillman, 1991).

Nonresponse Error When there are large amount of people who do not response, and their characteristics are different from the ones who responded, then it results nonresponse error (Dillman, 2006, page 9). Low response has been considered a major problem, and many researches have focused on improving the response rates (Dillman, 1991).

2.2 Response Rate Influences

As mentioned in the previous section, one of the survey errors is the nonresponse error. Researchers have concerns regarding response rates, since responses coming from survey participants may be substantially different from those of nonrespondents, which will result in a biased estimate of representation of the population (Bogen, 1996).

Low response rate was even considered shortfall of the email methodology despite to its advantages (Bachmann, 1999). In table 2.1, there are nine studies where both postal mail and email are compared side by side. Out of those nine studies, four of them show high response rate on postal mail, three of them got higher response on email. and two studies did not show any significant differences. Parker's (1992) study of AT&T employees was the only study which got an acceptably high response rate by email. Schaefer and Dillman (1998) attributed this fact to the novelty of email and sent emails were carefully

examined instead of considered company junk email. Mavis and Brocato (1998) stated that studies cited by others in support of email surveys, also shown in table 2.1, did not compare email data collection with more traditional methods, and their study design and analyses varied greatly. Sheehan and Hoy (2006) also takes the attention to many of these studies' small and homogeneous population, therefore it may not represent larger population groups' response tendencies.

Therefore, researchers investigated on how to increase response rates at email communication. Schaefer and Dillman (1998) conclude that even though, the technology for email is quite different from well established postal mail surveying methods, the communication is considered similar to self-administrated questionnaires delivered by post. Hence, the techniques used to increase response rates on postal mail can be applied to develop a email methodology. Following techniques are the ones where researchers focused on their effects on response rates.

2.2.1 Length

For many people the time required to spend on survey is considered the biggest cost (Dillman et al., 2009, page 26). The study from Heberlein and Baumgartner (1978) also states that the length of the survey has a negative effect on mail survey response rates, where they stated that each additional question reduces responses by .05%. On the other hand, Bradburn (1978) suggests that the length of the survey is correlated with its importance, therefore it will increase the efforts both on researchers and respondents side resulting a higher response rate. Bogen (1996), in his literature review, concluded that the relationship between interview length and nonresponse is week and inconsistent.

2.2.2 Multiple Contacts

Researchers found that the number of attempts to contact people increases the response rates (Heberlein and Baumgartner, 1978; Schaefer and Dillman, 1998). The scenarios for multiple contact include pre-notification contact, which is a brief notice for the main request, and follow-up contacts aiming to the people who did not respondent at the initial contact. Heberlein and Baumgertner (1978) showed that follow-up mailing has a mean

return rate of 19.9% at the initial contact, and continued with 11.9% and 10.0% for the second and third contacts, respectively (Heberlein and Baumgartner, 1978). Schaefer and Dillman (1998) also stated the same conclusion for the multiple contacts for email in their literature research. According to this, the average response rate for email surveys with a single contact was 28.5% while 41% and 57% for two and more than two contacts, respectively (Schaefer and Dillman, 1998).

2.2.3 Personalization

Personalization has been addressed as an important factor to increase response rates by many researchers (Dillman, 1991; Schaefer and Dillman, 1998). It builds a connection between the respondent and researcher by making the respondent feel important, and drawing the respondent from out of the group (Dillman et al., 2009, page 272). Dillman and Frey (1974) conducted a study to see the effects of personalization, where they reached half of an university alumni sample via personalized cover letters, while the other half got unpersonalized letters. The personalization treatment included personal salutations and real signatures on the mails. They achieved nearly 9% greater response rates for the personalized group. It is also stated that this type of personalization techniques can be also applied to emails (Schaefer and Dillman, 1998). In the next section, we will continue with the applications of personalization in emails, and give the results of some studies.

2.3 Personalization of Emails

Studies on mail surveys showed that personalization increases the response rates (Dillman, 1991; Schaefer and Dillman, 1998). Personalization is also important for email communication since it also builds a connection between the respondent and researcher as in the mail surveys studies, and make them feel more important and valued (Dillman et al., 2009, page 272). With this argument, Dillman et al. (2009), emphasized the social exchange theory[2] of the personalization of the email.

[2]Social exchange theory was considered as a frame of reference to other theories rather than a theory by itself. It implies a two-sided, mutually contingent and rewarding transactions or exchanges (Emerson, 1976).

On the other hand, Barron and Yechiam (2002) stressed on the sociopsychological phenomenon, the diffusion of responsibility, which is also an outcome of volunteer's dilemma. In the volunteer's dilemma one player is needed to volunteer in order to reach the outcome preferred by all the others in the game. However, each person might be inclined to hoping that somebody else will be volunteer, resulting a higher utility of not volunteering than volunteering. According to this, the more people in the group size, the less probability of volunteering will result, which produce the diffusion of responsibility effect. In order to experiment the effect of diffusion of responsibility in the context of email requests, they sent emails asking for help either to single addresses or to a list of five addresses. In the email body (see Appendix A), a fictitious graduate student asked a question to know if the university has a biology faculty, whose answer was well known to anyone familiar with the institute. The result of the study showed that the proportion of replies where they use single email address in the "To" field got 20% higher response than the replies where they used groups of email addresses. In addition, the study qualified the given responses according to its helpful level, and the proportion of "very helpful" replies in the single email address condition was 187% higher than the groups of email addresses condition.

In another study by Heerwegh (2005), personalization was applied to the salutations in the emails. The randomly drawn 2,540 samples from the student database of Katholieke Universiteit Leuven, Belgium were separated into equally sized two groups. In the non-personalized group, the salutation of "Dear student" was used, while in the personalized group "Dear [First name] [Last name]" was used. The email content was an invitation to a web survey which was about adolescent attitudes towards marriage and divorce. The result of the study showed that the personalization applied group got 6.9% higher login rate to the survey than the unpersonalized group. Therefore, they concluded that increased response rates were in line with social exchange theory and with the diffusion of responsibility theory.

In addition to personalization of salutations on the emails, Joinson and Reips (2007) stated the power of its combination with the power or status of the sender. In the study, a group of discussion panel students of Open University UK were sent an email invi-

tation to complete a survey. Panel members were assigned to one of the conditions where salutation was modified in "Dear student", "Dear John Doe", and "Dear John". The sender power was manipulated on the first and last lines of the emails by assigning a neutral power saying that "From <name> (Strategy, Planning, and Partnerships), The Open University" and a high power "From Professor <name>, Pro-vice chancellor (Strategy, Planning, and Partnerships), The Open University". The results showed that the highest response rate was achieved when a personalized invitation came from a high power source and lowest when an impersonal one came from a neutral power source (See table 2.2). The possible reason for this was stated as personalized salutations increase people's sense of identifiability, and its combination with a high power audience increase socially desirable, strategic behavior.

Table 2.2: Power, salutation and response rates (raw and %) (Joinson and Reips, 2007)

	Dear Student	**Dear John Doe**	**Dear John**
Neutral power	143 (40.1)	158 (44.4)	166 (46.6)
High power	150 (42.1)	154 (43.3)	190 (53.4)

As aforementioned studies showed that different forms of personalization increase the response rates in email communication. However, it has become very easy to add personalized information into email thanks to the softwares. Dillman et al. (2009, page 237-238) stated that over-personalization using software tools might easily result impersonal messages, and gave an example: "Dear Don Dillman, I am writing to inform you and your wife Joye that the XYZ Company has created a new dog food that we are sure your Boston Terrier, Crickett, will find to be very tasty. We would like to send a free sample to your home in Pullman, Washington." In this message, there is overwhelmed personalization with the usage of person's wife, their dog's type and name, and their home address. Moreover, experienced email users can identify if a message is written by a person or computer generated by looking appearance of one's name in certain locations, and similar patterns for other information (Dillman et al., 2009, page 272). Therefore, it becomes difficult to have a correct amount and tone of personalization. The more daily interaction with digital devices will make the true authentic personalization more rare, hence achieving it will make it more important and effective (Dillman et al., 2009, page 238).

2.4 Conculusion

–> At the end of the chapter 2, a brief summary/conclusion could be helpful. Thereby, you could also put the related work in perspective to your problem statement, i.e. explaining where the existing work falls short or can be improved (by your solution).

3 Evaluation of Existing Applications

After building the foundation on related work on personalized mass email communication, this section will evaluate existing systems available in the market.

3.1 Application Categories and Their Relation with The Thesis

There are three different application categories that are related with this thesis, and focusing on email communication directly or indirectly. Followings section will give a brief description of those are these product types, and their relation with this thesis:

3.1.1 Customer Relationship Management (CRM)

A CRM application helps to manage customer relationships effectively, which is a topic studied both by academia and industry in recent years. Such applications play an important role in the marketing where organizations use more customer oriented instead of product or brand oriented marketing strategies. Therefore, each customer's economic value is different to the company, and organizations' customer relation strategies require to adapt their customer offerings and communication strategy personalized according to individual customer (**?**).

One of the reason why this thesis considers CRM applications to evaluate is its communication aspects of a company with their clients. Another reason is, as it is mentioned at section 2.3, the adequate amount of personalization in emails is crucial on response rates, and people's increased daily interactions with digital world make the true authentic personalization more rare. To achieve such a level of personalization requires getting know each recipient very well by considering not only the recent conversation, but also earlier conversations, and all the information that might be extracted from those conversations helping to build a relation with respondents. Since a CRM system aims to keep

track of each customer history regarding a product or a brand, such a data store could be leveraged to add adequate amount of personalized information to a email conversation.

3.1.2 Help Desk

Another application that focuses on a company and its relation with their clients is help desk applications. It's main purpose to provide information and support related to a company's products and services to their customers. As a part of knowledge acquisition, help desks supports both sides of the communication in a way that while customers or end users find the knowledge they need, and the people who provide help by making the knowledge available and reusable (**?**).

Reusing the existing knowledge requires to structure the captured knowledge. This is where it makes the relation with this thesis. Because, a help desk application provides a workflow where both parties develop a communication where person who needs assistance describes his/her problem while people who provide help identify the problem by looking earlier cases or asking questions to clarify the initial question. This also requires the cooperation of assistants while providing help to a problem at which one person might have previous experience to guide other assistants. As a result, a help desk application is similar to a mass email communication where a researcher initiate an open ended questionnaire, extracting information from the coming replies, and organize them according to the answers that researcher seeks for. In addition, respondents might also come up with some questions to clarify things, where existing answers can easily be reused. Having such a email conversation with large groups require great amount of effort from a researcher's side, where he might assign tasks to distribute the efforts to other researchers to deal with the large size of the group.

3.1.3 Email Marketing

Organizations and marketers use email marketing for several reasons. Some of those purposes are brand and customer loyalty building, acquiring or converting customers, advertising the brand or the product, solicit sales or donation, communicating for promotional offers and even educational purposes. At the end, these approaches can be

group under following categories **?**:

- **Educational Communication:** An educational message is given in the form of newsletter, avoiding sale push, but it might still consists some content indirectly by encouraging recipients. For example, free monthly newsletter which contains tips about digital photography, and photography accessories used in the tips might be linked to an online shopping website.
- **News and Updates:** To notify the customers about important updates or changes to a business. For instance, release of a new product, changes on contact details or major changes on a company's website
- **Direct Sales Messages:** Emails sent by others consists marketing ads, and clear message on offers.
- **Housekeeping:** Emails such as subscription confirmation messages or welcome emails. These messages are often system generated automated messages. However, they can be used to promote a message as well like offering a discount code a long with the registration confirmation email.

Since these categories consists communication with large group of people, this thesis also evaluates existing tools in the market for email marketing including its technical aspects.

3.2 Methodology

The analysis examined two products from the categories of CRM, help desk, and email marketing. Selection of the products depends on the several product comparison websites including Toptenreviews.com[1], Softwareshortlist.com[2], as well as from the suggestions of Stanford HCI group members[3]. In addition to those websites and suggestions, their demo or trial version availability were also considered, since some of the products required fee before using them. After the products were shortlisted, the last filtering was done by getting their web traffic rankings from Compete.com[4], Alexa[5], and Google

[1] http://{email-marketing-software-review, crm-software-review}.toptenreviews.com/

[2] http://www.softwareshortlist.com/crm/solutions/

[3] http://hci.stanford.edu/people/

[4] https://www.compete.com/

[5] http://www.alexa.com/

Trends[6]. Finally, trial accounts were created on those application, and a scenario is simulated to get the full insight from them.

3.3 Results

Evaluation of the products will be done according to their category. A brief description of the products will be presented. This description will mainly focus on the features which are related to support email communication as explained in section 3.1. After that each category will be concluded with a comparison matrix of the selected products.

3.3.1 CRM Applications

Table 3.1: Comparison Matrix for CRM Applications

	SugarCRM	**Highrise**
Neutral power	143 (40.1)	158 (44.4)
High power	150 (42.1)	154 (43.3)

SugarCRM SugerCRM comes in three different deployment versions. These are on-premise, Software as a Service (SaaS), and the free community edition. It has a clean User Interface (UI) with a single navigation menu. Its calendar view can be synchronized with Outlook's calendar or any platform which supports iCalendar[7]. It provides email management right in the application, and integrates with several platform like Outlook and Gmail or an Internet Message Access Protocol (IMAP) based email server. Users can archive emails in the SugarCRM by adding a unique email address into TO, Carbon Copy (CC), or Blind Carbon Copy (BCC) fields. This address can also be used to link email recipients information including email attachments with SugarCRM by simply forwarding the emails, therefore it removes the additional effort to import them into SugarCRM and reduces dependency on a platform. SugarCRM also comes with build in email client. Even though, its inbox view only provide basic functionalities, its email

[6] http://www.google.com/trends/

[7] iCalendar is the calendar data exchange stanard (RFC 5545) having file extension of .ics, and it allows sending meeting requests or tasks via email.

creation view goes a little further to support email marketing by providing custom variables that can be embed into an email's content, and can be replaced with actual values available in SugarCRM (See figure 3.1).

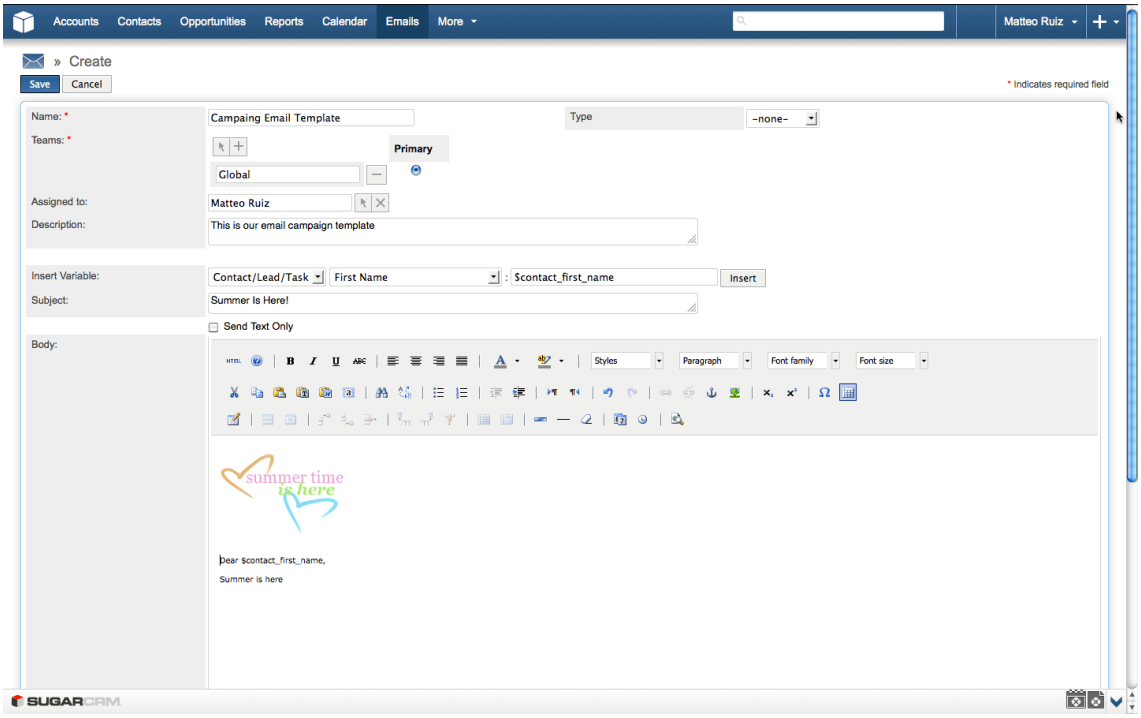

Figure 3.1: SugarCRM Create Email View with Embeded Variables (**?**).

Highrise

3.3.2 Help Desk Applications

Zendesk Cloud-based customer service software Zendesk [8] provides a nice and clean UI. Zendesk has more than 30,000 businesses from a wide variety of industries. Zendesk offers one-on-one support via many different communication channel including website, email, phone, and social platforms like Facebook and Twitter. Hence, support request coming from those platforms can be turned in to a support ticket. Those support tickets can be group under categories, and more further classification can be done via tags for each ticket. Those feature also help to find related archived resolved tickets, so they can be reused for new tickets. Thanks to the automated process coming with macros a combination of actions can be done with one click like setting status, priority, type of a

[8] http://www.zendesk.com

ticket, and assign it to another person with a predefined comment for the ticket. A ticket can be merged with another one, or copied to the forum to make it available to public, which helps to create a knowledge base. Customer ticket history and basic personal information are kept in the system. However, it does not support to add additional fields to customers' profiles. In addition to desktop version of Zendesk, it support mobile devices as well. Therefore, support team has no dependency on a device. Lastly, provided analytics view by reports give an overview of customer satisfaction and performance of the support team (**??**).

Kayako Kayako's[9] complete solution for customer support is named as Kayako Fusion. It comes as software and SaaS. Comparing with Zendesk, its UI seems more complicated. Kayako has been had more than 30,000 clients since ten years. Kayako does not have social platforms integration like Zendesk, therefore support tickets are generated over website, email, and phone. Tickets can have custom types, statuses, priorities, and tags. Similar to Zendesk, it also supports macros to assign tickets into a department, owner, type, priority, and provide canned responses for tickets with a click. Kayako also keeps basic customer information if they are registered to the system. Registered customers can also support to build a knowledge base in a forum-like environment by contributing others questions a long with support team. Kayako does not have any native app for mobile platforms like Zendesk. Finally, it has a analytics view to keep track of tickets report measuring customer satisfaction and support team performance (**??**).

3.3.3 Email Marketing Applications

MailChimp

Constant Contact

[9] http://www.kayako.com/

A Detailed Descriptions

Here come the details that are not supposed to be in the regular text.

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