Perception and Use of E-mail: A Case Study in Universiti Utara Malaysia

Shafinah Farvin Packeer Mohamed[1], Ku Ruhana Ku-Mahamud[2], Razamin Ramli[3], & Kamarudin Abdullah[4]

[1]*Human-Centred Computing Research Lab, School of Computing, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia.*
[2]*Data Science Research Lab, School of Computing, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia.*
[3]*School of Quantitative Sciences, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia.*
[4]*UUMIT, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia*
shafinah@uum.edu.my

Abstract—**E-mail has grown out to become as one of the most successful and frequently used computer applications since it was invented. It can be used to communicate faster, easier, and at a lower cost with everyone all over the world. Besides providing flexibility and improving the quality of communication, researchers acknowledged that there are many problems faced by e-mail users, namely repeating e-mails, spam e-mails, huge size attachment files, and insufficient storage size. A case study was conducted to investigate on Universiti Utara Malaysia staff's perception and use of e-mail in order to improve the e-mail service provided to them. This paper discusses the findings from the study, which involves 958 staff. There were five phases involved in this study, which are instrument design, sampling, pilot study, data collection for real survey, and analysis. Self-administered questionnaires were used to gather the data, while descriptive statistical analysis was used for data analysis. The findings of the study reveal that UUM staff appreciate the e-mail service. However, they faced problems such as limited storage size and overwhelming number of e-mails. They believed that the UUM e-mail system is being abused as observed from the repeating advertisements and news sent to them. The output of this study can be used as a guideline by the UUM management in revising its e-mail policy so as to improve the quality of its e-mail service.**

Index Terms— **E-mail Service; Universiti Utara Malaysia; User Perception.**

I. INTRODUCTION

The birth of e-mails can be tracked back to the Compatible Time-Sharing System (CTSS) developed by Massachusetts Institute of Technology (MIT) in the 1960s [1]. CTSS is a system designed central logging platform that allows multiple users' access to documents (can store and share documents) from remote locations. Over the years, the popularity of the usage of e-mails grows exponentially due to its advantageous benefits such as extremely prompt reliable delivery compared with traditional mails, 24-hour services, remote usage, low charge rate, and the fact that one e-mail can be sent to multitude individuals at the same time and rate [2]. Its usage has been enhanced for document sharing, distributing and tracking tasks, storing information, delivering reminders, as well as scheduling and billing [3,4]. Consequently, e-mail usage is considered as a vital tool for communication both in formal and informal platforms. For instance, office staff communicate formally through e-mails, organizations carry out their advertisements through e-mails, and friends use e-mails to share social experiences and activities.

More than a decade ago, employees were found to be more alert with incoming e-mails as compared to telephone calls. They viewed the e-mail within six seconds of its arrival [5]. This scenario happened when the use of instant messaging and social network was not popular as per today. Today, the introduction of smartphones, tablets, portable computers, and other gadgets has caused users to be connected to the Internet [3]. Thus, the users can receive e-mails through their gadgets at any time. Hence, the response on e-mail notification is quicker than before [6]. On top of that, the Internet connection is continuously improving, and in 2016, the number of Internet users has increased to more than three billion [7]. Besides, e-mail marketing has drawn the attention of marketers since it serves as the cheapest method as compared to other methods [8]. Furthermore, since e-mails can be attached with files such as pictures, videos, and documents, thus, the process of promoting products has become more attractive [6]. These are among the reasons that influence the growth of e-mails.

Due to the huge benefits of e-mail usage, the Radicati research group report of 2017 stated that at the end of 2017, the total number of e-mails received and sent daily will be around 267 billion, and it is forecasted to reach 319.6 billion by 2021 [9]. Furthermore, the estimated number of e-mails sent and received per day is 205 billion [10]. Chui, Manyika, Bughin, Dobbs, Roxburgh, and Westergren [11] stated that 28% of a worker's workweek is spent for reading and responding to e-mails. These forecasts show the advantageous benefits of e-mail usage and its imperative importance. Although e-mail has utmost benefits, various researchers acknowledged that there are many problems faced by e-mail users. The users complained about the overwhelming number of e-mails received, which causes them to not be able to manage received e-mails effectively [12,13]. Because of this, they face the problem of organizing archival materials [14,15]. Furthermore, this causes them to forget several tasks that must be completed since the e-mails are mixed between important and unimportant ones [4]. This phenomenon is known as e-mail overload. Dabbish and Kraut [16] defined e-mail overload as a user's perception of being unable to handle, find, or process his/her e-mails effectively. Apart from that, the e-mail spam messages are being received and a notable growth can be seen [17]. There

are also studies that argue on the side effects of e-mail such as burn-outs and stress [13,18,19].

The same situation is also being faced by Universiti Utara Malaysia (UUM). UUM, which comprises 3,415 staff, receives complaints from its staff that they always receive too many e-mails and this causes them to overlook the important e-mails. Furthermore, some of the e-mails were not relevant and took up the space allocated for each individual. The overwhelming messages received cause them to have problems in managing those messages. More importantly, the staff feel bored reading the same e-mail that is sent over and over again. The staff are allocated with a particular e-mail inbox size according to their positions, for example, academicians with special posts are allocated with 4.0 GB, while academicians without special posts are allocated with 3.0 GB. On the other hand, the administrative staff are allocated with 1.5 GB. Nevertheless, they need to delete the e-mails every day, otherwise the inbox will quickly become full, which leads to e-mails unable to be received and sent again. This affects the tasks that need to be completed. The situation is worsening, causing the UUM management to take prevention actions. Therefore, a case study was conducted to investigate the staff's perception and usage of UUM e-mail in order to improve the e-mail service provided to them. This paper reports the outcome of the case study.

The next section provides an overview of related works, and is continued with the implementation of the study in Section III. Section IV presents the results and discussion, while Section V describes the conclusion and future work.

II. RELATED WORKS

Over the past twenty years, researches regarding the overwhelming nature of e-mails have been continuously conducted [3,16,20,21]. Among the studied issues are the size of safe e-mails, the number and types of e-mail in a safe, frequent e-mails received and sent, and the number of folders. Besides, the literature focuses on the perception of e-mails. For instance, Gersch, Massey, and Rose [22] concluded that the usage of an e-mail platform known as DANE will resolve distribution logistics' supply chain management. Furthermore, Mark et al. [23] investigated the perception of 40 workers on organizational e-mail usage influence on workplace productivity and stress. It was discovered that batching e-mail usage influenced productivity; however, it was not found to influence workplace stress. A similar finding was discovered by Al-Mazrouei, Dahalan, and Faiz [24], whereby the positive usage of e-mails in workplaces by staff will improve their job satisfaction.

Similarly, Al-Mahmud and Martens' [25] finding on the usage of e-mail patterns among older persons with aphasia (PWA) revealed that a majority of the PWA respondents agreed that the usage of e-mail is beneficial for their health intervention. However, this finding contradicted with Clouse and colleagues' [26] study, which investigated the perception of e-mail usage amongst 50 HIV-positive pregnant ladies. Though they are active users of e-mail for various purposes, however, they do not want e-mails to be used as an intervention medium. Moreover, Firestone [27] investigated the perception of 85 senior Naval US officers regarding their leadership style on their e-mail usage (using four e-mail usage measurements, namely time spent, e-mail processes, e-mails sent to senior and junior officers). It was discovered that their leadership style is not associated with their e-mail usage.

However, scholars like Derks and Bakker [28] and Kim et al. [29] argued that e-mail communication has a huge influence on leadership communication style and channel in the workplace. Likewise, the study of Granat and Stanoevska-Slabeva [30] on the usage of e-mail within a Swiss international company affirmed that e-mail is a vital tool to communicate and interact both formally and informally at the workplace, most especially with customers, co-workers, and supervisors.

Furthermore, Mazmanian et al. [31] investigated mobile e-mail users' perception and observed different norms, such as some users felt that the usage of e-mail is a monitoring medium, whereas there is worry about the use of e-mail as a social connection, which is termed disruptive behaviour within a workplace. This finding is related to Allen and Shoard's [32] study on UK senior police officers' perception on the usage of e-mails. It was discovered that e-mail usage is useful to police officers, which enables them to manage and plan their daily schedules properly and effectively. They also claimed that the use of e-mails at home and outside normal working hours was seen as part of a usual work routine, rather than as an extension of existing work practices. However, it was found that mobile e-mail usage did not reduce perceived information overload. Likewise, some officers have difficulties in shutting down their mobile phones during working hours. Thus, it was seen as an intrusion of technology, which makes users to experience a trade-off between formal flexibility and productivity for personal benefits.

In summary, the discussed studies have clearly depicted the vast usefulness and usage of e-mails in the workplace. However, it is seen that a majority of the studies focused on the perception of respondents within health and manufacturing companies, whereas little attention has been given to e-mail usage among academicians within the university environment. Nevertheless, there are two notable studies that investigated e-mail usage within the university environment, which are Shah, Mcgrath, and Keating [33] and Alkahtani et al. [12]. The study of Shah et al. made use of 402 non-academic staffs from four Malaysian public and private universities. They found that e-mail usage is higher in private universities as compared to public universities in Malaysia. Alkahtani and his colleagues, on the other hand, investigated the e-mail usage among Princess Nora University, Saudi Arabia. They used the outcome of the study to provide proper guidelines for the staff to ensure that they can communicate effectively through e-mails. This is important to overcome the issues they face currently. One of the important issues raised is the overwhelming e-mails. Thus, it is expected through the guidelines formed that the usage of e-mails can be improved. Likewise, this present study also investigated the use and perceptions of UUM staff on e-mails and it will serve as a guideline for the UUM management to revise its policy.

III. IMPLEMENTATION OF THE STUDY

A quantitative approach has been adopted in this study and data was collected using a survey. This approach was chosen since it is a useful approach and seeks to measure the

opinion of individuals [34]. There were five phases involved, as depicted in Figure 1.

Figure 1 The research methodology

A. Instrument Design

To carry out the survey, the self-administered instrument was developed since it has several advantages, such as cost-effective, easy to analyze the data, and has a higher level of confidentiality. Furthermore, respondents would have more time to think [35]. The content of the instrument was established by referring to the reference of previous related works such as Alkahtani et al. [12], Luo [36], and Kumar and Kumar [37]. There are altogether twenty one (21) questions, organized into three sections: 1) Section A: Demographic; 2) Section B: Use of UUM email; and 3) Section C: Perception on email services. Section A focused on the respondents' background, specifically their positions. Meanwhile Section B was regarding the frequency of e-mail usage, knowledge on the e-mail inbox and attachment size limitation, reasons for using the UUM e-mail in future, the use of UUM e-mail in communicating with students, and the possibility of being monitored through e-mail. On the other hand, Section C concentrated on the perception on the UUM e-mail. In the end, respondents were given an opportunity to offer suggestions on the e-mail service improvements.

B. Sampling

A simple random sampling technique was used to obtain the respondents for this survey. The respondents involved in this study are the UUM staff, which comprises academicians and non-academicians. As mentioned earlier, UUM staff's population is 3,415. Out of this population, at least 246 samples are required for this study, as stated by Krejcie and Morgan [38]. However, a total of 958 samples participated in this study, which is considered more than enough for the purpose of the study.

C. Pilot Study

Prior to the real survey, a pilot study was conducted to validate the instrument. The pilot study is very essential to examine the wellness and feasibility of the questionnaire [39]. 41 respondents were selected randomly among the UUM academicians and non-academicians. This number of respondents is considered adequate for a pilot study [35]. The respondents were provided with printed instruments. Based on their feedbacks, the questions were clear and understandable, thus, they managed to answer the questions easily. The results of the pilot study can be obtained from Shafinah Farvin, Ku Ruhana, Razamin, and Kamarudin [40].

D. Data Collection

For the real survey, the data was collected online. An online survey was used because it is beneficial since the turnaround time for results are shorter. Additionally, the response rate is higher since it is easily accessible [35]. The survey was developed using LimeSurvey and posted on the Internet for one month (November 2016). The URL of the survey was sent to the UUM staff through e-mails. There

were altogether 3,415 e-mails blasted to the potential respondents. A total of 1,041 responses were obtained; however, 83 responses were rejected because of incomplete or irrelevant answers. Thus, only 958 responses were usable.

E. Data Analysis

The data obtained from the survey was analyzed using descriptive analysis, whereby it focuses on describing the respondents' opinion or the frequency of certain events to occur [41]. The Statistical Package for Social Science software was used in this analysis activity.

IV. RESULTS AND DISCUSSION

The findings are elaborated according to demographic profile, e-mail usage, and ended with the perceptions on the e-mail service.

A. Demographic Background

The selected respondents consisted of academicians and non-academicians. Among the academicians, 40% are among the university lecturers, 4% visiting lecturers, and 4% of tutors. On the other hand, the non-academicians are from various posts; among others are administrative assistant officers (16%), administrative officers (6%), information technology officers (3%), and social research officers (2%). Figure 2 depicts the demographic profile of the respondents.
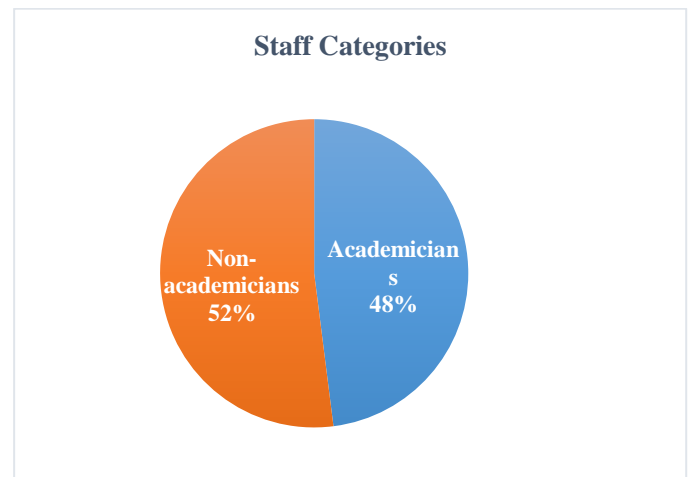

Figure 2 Staff Categories

B. E-mail Usage

The respondents were asked whether they have used the UUM e-mail for the past one year. A majority of them answered 'yes' (99%). Only 1% of the respondents mentioned that they are not using the UUM e-mail because they are comfortable to use other e-mails, plus, they are not familiar with it. The respondents who answered 'yes' were then asked on the frequency of e-mail usage. Table 1 illustrates the e-mail usage pattern of the staff. A majority of the staff use e-mail every day (96.7%). Half of them are non-academicians. However, there still exists a group of staff who only use e-mail once in a week among the academicians (0.4%) and non-academicians (0.1%). For the non-academicians, their job specification does not involve dealing with people through e-mail. For instance, the security guards are more engaged with field works.

However, for the academicians, that is not the case since e-mail is the main communication media used in the university. Thus, it is something that needs to be looked into. Most likely this might be due to the fact that the academicians do not prefer using the UUM e-mail. Nonetheless, this will cause the loss of information sent to them through e-mail.

Table 1
E-mail Usage Pattern

	Academicians	Non-academicians	Total
Every day	435 (46%)	479 (50.7%)	**914(96.7%)**
Once in 2-3 days	14 (1.5%)	12 (1.3%)	**26 (2.8%)**
Once in a week	4 (0.4%)	1 (0.1%)	**5 (0.5 %)**
Once in a month	0 (0 %)	0 (0%)	**0 (0%)**
Total	**453 (47.9%)**	**492 (52.1%)**	**945 (100%)**

Next, the respondents were asked whether they knew that the attachment size has limitations. Most of them are aware (79%), whilst 21% are not. Figure 3 shows the result.
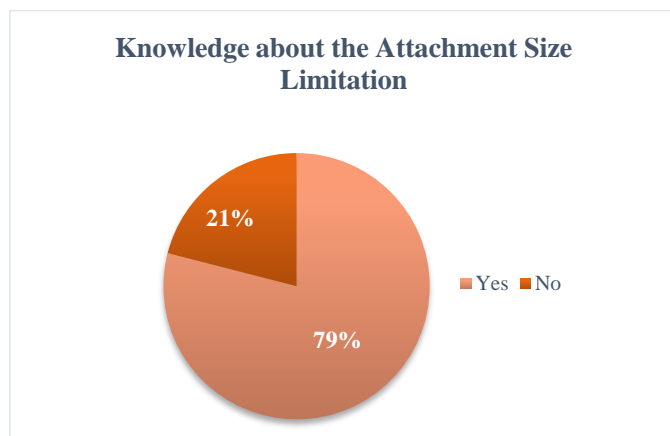
Figure 3 Knowledge about Attachment Size Limitation

Additionally, they were asked whether they used the UUM e-mail when they communicated with their students. More than half of the respondents used it (65%), while the rest did not (35%). This might be due to the utilization of other communication media such as WhatsApp, Facebook, or personal e-mails. Figure 4 portrays the result.
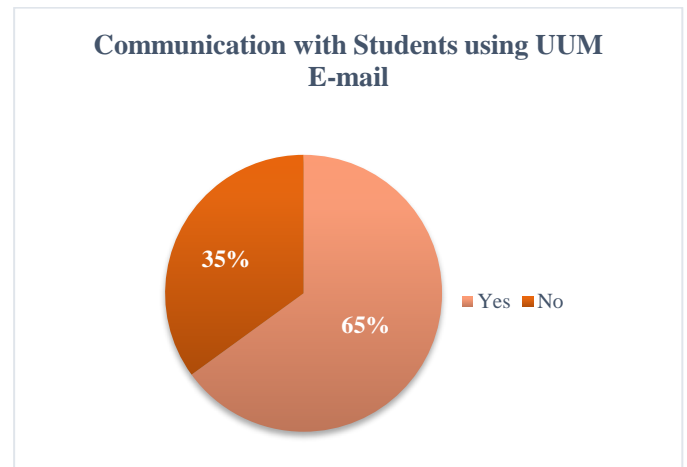
Figure 4 Communication with students using UUM e-mail

Furthermore, the respondents were asked if they knew that the e-mail inbox size has limitations. Most of them knew about it (87%), while only 13% did not know. This reflects that the staff are aware about it since they get e-mail notifications when their inboxes are almost full. Figure 5 depicts the result.
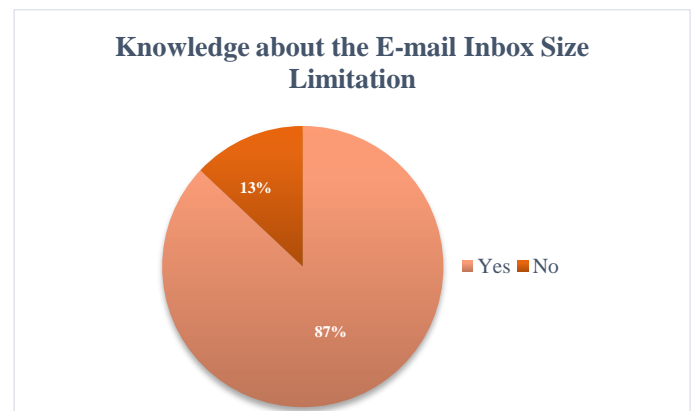
Figure 5 Knowledge about E-mail Inbox Size Limitation

The respondents were then asked whether they planned to use the UUM e-mail in the future. A Majority of them answered 'yes' (96.14%), while only 3.86% answered 'no'. To understand better, the respondents were asked why they planned to use the UUM e-mail in future, and why not. They were allowed to write their own opinions. The reasons are categorized as portrayed in Table 2. In a nutshell, the respondents utilize the UUM e-mail since it gives various benefits for their working environment. Among the benefits found are that it can be used for the purpose of work, can be easily accessed, and acts as an official e-mail to communicate with colleagues from UUM itself or outside UUM, as well as with students.

However, 40.5% respondents stated that they preferred other e-mail platforms like Yahoo and Gmail, since they are easier to login, provide more space, and easier to download and send attachments. Furthermore, they stated that the UUM e-mail has updating problems and the connection is sometimes not stable when accessed outside of the campus. On top of that, the respondents mentioned that the UUM e-mail contains a lot of repetitive e-mails, which cause their inbox to quickly become full. Therefore, they need to delete

the e-mails frequently to avoid disruptions in their daily work.

Table 2
Reasons for using UUM E-mail in Future

Reasons	Frequencies	Percentages
For the purpose of work (To communicate with other staff and colleagues/ easy to use one e-mail for work purposes)	276	29.97
Sources of current and past information (UUM activities, seminar, conference, job vacancies, etc.)	171	18.57
Official e-mail (To look important when dealing with other agencies and students)	190	20.63
Easy accessibility (User-friendly, efficient, updated features, easy directory search, link with UUM portal)	190	20.63
For academic matters (Research/journals/academic network/academic engagements with other university)	4	0.43
Must use the facilities provided by the university for the staff	14	1.52
Secure and private	9	0.98
Medium of communication (students, staff, other universities, other organizations, etc.)	27	2.93
Used to this e-mail/ the only e-mail I used	21	2.28
Irrelevant answer/ Not answering the question	19	2.06
Total	**921**	**100**

The respondents were also asked whether they thought that their e-mails were being monitored. 80% of the respondents believed that their e-mails were being monitored, while 20% thought otherwise. This might be due to the fact that in today's technology, they believed that all information is accessible by the top management. Moreover, the employer has the rights to monitor employees' workplace activities. Figure 6 exhibits the result.

C. *Perceptions on E-mail Service*

The respondents were then asked about their perceptions on the e-mail service provided to them. The results are portrayed in Table 3. As a whole, the respondents have good perceptions on the UUM e-mail, whereby it is found as an effective communication method. 87.8% of the respondents agreed on this. Similarly, 90.6% of them agreed that through the use of e-mail, the number of meetings and phone conversations can be reduced. Moreover, 85% of them felt that they can communicate effectively by using e-mail. Likewise, the outcome of a study conducted by Birchall dan Giambona (2008) [42] found that e-mail usage helps in the workplace, especially for managing the work. Moreover, Granat and Stanoevska-Slabeva [30] also found that e-mail

is a vital tool to communicate and interact both formally and informally at the workplace. As a consequence, the use of e-mail can increase job satisfaction, as found by Al-Mazrouei and his colleagues [24].

Additionally, about one third of the respondents (63.4%) do not expect any privacy intrusion when using the UUM e-mail. However, the respondents believed that the UUM e-mail can be improved in future for better service. For instance, in terms of the e-mail storage size, more than half of the respondents stated that it is insufficient. Furthermore, about three quarters of the respondents felt that certain e-mails are sent to them repeatedly. This will cause the inbox to be filled up in a short time. A similar finding was found in a previous study, where the respondents received repeating and overwhelming e-mails [12]. Consequently, more than half of them foresaw that the UUM e-mail is being abused through advertisements and news sent to them. Hence, a great percentage of the respondents believed that UUM should implement a more stringent e-mail policy to prevent abuses (87.3%). This result is comparable with Alkahtani et al. [12], whereby there is a need to revise the existing policy. When asked whether they need trainings on how to use e-mail, more than half of them stated that they needed training (52.8%). This might be because the e-mail application has been upgraded recently, thus, the staff might not be familiar with the ins and outs of the e-mail system.
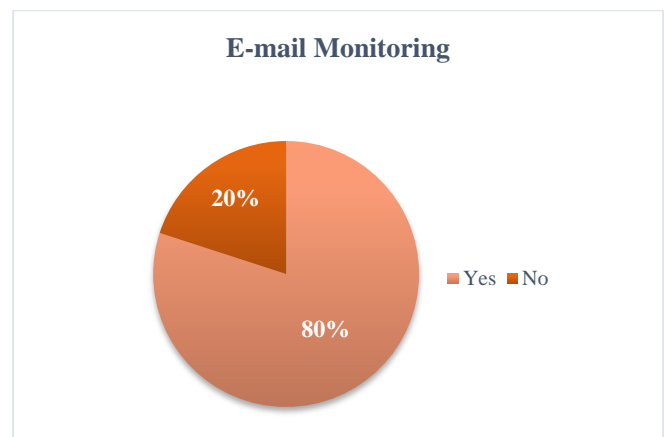

Figure 6 E-mails being monitored by UUM

Table 3
UUM Staff's Perception on UUM E-mail

Statements	Strongly Disagree	Disagree	Agree	Strongly Agree
Sufficient e-mail storage size is provided	251 (26.2%)	314 (32.8%)	346 (36.1%)	47 (4.9%)
Too many repeating e-mails in inbox	34 (3.6%)	150 (15.7%)	407 (42.5%)	367 (38.3%)
Abuse on UUM e-mail in terms of advertisement and news	42 (4.4%)	224 (23.4%)	393 (41%)	299 (31.2%)
E-mail as an effective way to communicate in workplace	32 (3.3%)	58 (6.1%)	432 (45.1%)	436 (45.5%)
Expectation on privacy intrusion when using e-mail	71 (7.4%)	280 (29.2%)	469 (49%)	138 (14.4%)
The needs of more stringent e-mail policy	19 (1.9%)	103 (10.8%)	475 (49.6%)	361 (37.7%)
The number of meetings and phone conversations can be reduced through e-mail	34 (3.6%)	128 (13.4%)	493 (51.5%)	303 (31.6%)
The ability to communicate effectively through e-mail	18 (1.9%)	126 (13.2%)	563 (58.8%)	251 (26.2%)
The needs of training on how to use e-mail	122 (12.7%)	330 (34.5%)	429 (44.8%)	77 (8%)

Furthermore, the respondents gave suggestions on improvements such as to increase the e-mail storage capacity, block spam e-mails and advertisements, ensure that e-mails are sent to the targeted receivers only, and increase the file attachment size. Besides, there were among the respondents who commented that they are satisfied with the e-mail service provided to them. The comments are listed in Table 4.

These results give insight to the UUM management on the improvements that can be made on the e-mail service by revising the UUM e-mail policy. Among them are to increase the e-mail storage capacity and attachment file size as well as create new rules for sending e-mails. For instance, a particular e-mail should be sent only to the related staff without sending it to everyone in the university. This might reduce the problem of repeating e-mails and insufficient storage. They also hoped that the UUM management does not monitor their content of e-mails.

TABLE 4
Comments from the Respondents

Comments/ Suggestion	Frequencies	Percentages
Increase e-mail storage capacity	123	12.06
Block spam e-mails and advertisement like loan etc.	85	8.33
Satisfied	56	5.49
Too many repetitive e-mails	52	5.1
New version is not good as compared to the old version; Problems regarding lost e-mails and hard to find contacts.	47	4.61
Select and choose to send relevant e-mails to the targeted receivers only.	39	3.82
Increase file attachment size	31	3.04
Add more application so that the e-mail will be more user-friendly with colourful backgrounds for interesting view	22	2.16
Provide training or class to enhance the utilization of UUM e-mail	22	2.16
Do not monitor the e-mail contents to secure privacy	5	0.49
Provide information first before upgrading the e-mail	2	0.2
Others (Language selection should be uniform to avoid confusion among international students and staffs/ Uniform template for all e-mails/ No need to send same celebration wishes/ Create a strict policy to those who misuse e-mail for personal use)	45	4.41

V. CONCLUSION

The findings of the study reveal that UUM staff have good perceptions on the UUM e-mail. However, there exist problems faced by them, namely insufficient storage size, overwhelming e-mails, and repeating advertisements and news. Thus, further improvements need to be done by the UUM management to enhance the e-mail service's quality. The output of this study can be used as a guideline to the UUM management for further improvements.

REFERENCES

[1] T. V. Vleck, "The history of electronic mail", Retrieved from http://www.multicians.org/thvv/mail-history.html. (2001).
[2] G. Tang, J. Pei, & W. S. Luk, "Email mining: tasks, common techniques, and tools". Knowledge and Information Systems, 41(1), 1-31. (2014).
[3] C. Grevet, D. Choi, D. Kumar, and E. Gilbert. "Overload is overloaded: email in the age of Gmail," in Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (2014), pp.793-802.
[4] S. Whittaker. "Supporting collaborative task management in e-mail," in Human Computer Interaction, 20(1-2), 49-88 (2005).
[5] T. Jackson, R. Dawson, and D. Wilson, "The Cost of Email Interruption," Journal of Systems & Information Technology, vol. 5, no. 1, 2001, pp. 81-92.
[6] Y. R. Bujang, & H. Hussin. Should we be concerned with spam emails? A look at its impacts and implications. In Information and Communication Technology for the Muslim World (ICT4M), 2013 5th International Conference on (pp. 1-6). IEEE. (2013).
[7] InternetLiveStats (2017). Retreived from http://www.internetlivestats.com/internet-users/#sources
[8] M. Raad, N.M. Yeassen, G.M. Alam, B.B. Zaidan, and A.A. Zaidan, "Impact of spam advertisement through email: A study to assess the influence of the anti-spam on the email marketing.," African Journal of Business Management, vol. 4, no. 11, 2010, pp. 2362-2367.
[9] The Radicati Group (February 2017). Email Statistics Report, 2017-2021. Retrieved on March 2, 2017 from http://www.radicati.com/wp/wp-content/uploads/2017/01/Email-Statistics-Report-2017-2021-Executive-Summary.pdf
[10] The Radicati Group. http://www.radicati.com/wp/wp-content/uploads/2015/02/Email-Statistics-Report-2015-2019-Executive-Summary.pdf. (2015).
[11] M. Chui, J. Manyika, J. Bughin, R. Dobbs, C. Roxburgh, and M. Westergren. "The social economy: Unlocking value and productivity through social technologies McKinsey Global Institute". Retrieved from http://www.mckinsey.com/industries/high-tech/our-insights/the-social-economy. (2012).
[12] H. Alkahtani, R. Dawson, and R. Lock. "Communication and effective email usage in Saudi Arabia," in BCS Software Quality Management Conference. Retrieved from https://dspace.lboro.ac.uk/dspace-jspui/handle/2134/18274. (2015).
[13] K. Reinke, and T. Chamorro-Premuzic, "When email use gets out of control: Understanding the relationship between personality and email overload and their impact on burnout and work engagement," Computers in Human Behavior, 36, 502-509 (2014).
[14] S. Whittaker, T. Matthews, J. Cerruti, H. Badenes, and J. Tang. "Am I wasting my time organizing email?: a study of email refinding," in SIGCHI Conference on Human Factors in Computing Systems (2011), pp. 3449-3458.
[15] R. Boardman and M. A. Sasse, "Stuff goes into the computer and doesn't come out: a cross-tool study of personal information management," in Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (2004), pp. 583-590.
[16] L. A. Dabbish, & R. E. Kraut. Email overload at work: an analysis of factors associated with email strain. In Proceedings of the 2006 20th anniversary conference on Computer supported cooperative work (pp. 431-440). ACM, (2006)
[17] S. K. Tuteja, "A survey on classification algorithms for email spam filtering," International Journal of Engineering Science, 6(5), 5937-5940 (2016).
[18] S. R. Barley, D. E Meyerson, & S. Grodal, (2011). E-mail as a source and symbol of stress. Organization Science, 22(4), 887-906.
[19] G. Mark, S. Voida, & A. Cardello. A pace not dictated by electrons: an empirical study of work without email. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 555-564). ACM. (2012)
[20] B. Hogan, & D. Fisher. A scale for measuring email overload. Microsoft Research, 7(9). (2006)
[21] S. Whittaker, & C. Sidner. Email overload: exploring personal information management of email. In Proceedings of the SIGCHI conference on Human factors in computing systems (pp. 276-283). ACM. (1996)
[22] J. Gersch, D. Massey, & S. Rose. DANE Trusted Email for Supply Chain Management. In Proceedings of the 50th Hawaii International Conference on System Sciences. (2017)
[23] G. Mark, S. T. Iqbal, M. Czerwinski, P. Johns, A. Sano, & Y. Lutchyn, . Email duration, batching and self-interruption: Patterns of email use on productivity and stress. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (pp. 1717-1728). ACM. (2016)
[24] S. A. S. Al-Mazrouei, N. Dahalan, & M. H. Faiz. The Impact of Email Usage on Job Satisfaction. Researchers World, 6(3), 32. (2015).
[25] A. Al Mahmud, & J. B. Martens. Social networking through email: studying email usage patterns of persons with aphasia. Aphasiology, 30(2-3), 186-210. (2016).
[26] K. Clouse, S. R. Schwartz, A. R. Van, J. Bassett, S. H. Vermund, & A. E. Pettifor. High mobile phone ownership, but low Internet and email usage among pregnant, HIV-infected women attending antenatal care in Johannesburg. Journal of telemedicine and telecare, 1357633X14566569. (2015).
[27] S. Firestone. The Relationship Between Leadership Style and Email Usage Among Naval Leaders. NORTHCENTRAL UNIVERSITY. (2014).
[28] D. Derks, & A. B. Bakker. The impact of e-mail communication on organizational life. Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 4(1). (2015).
[29] H. Kim, G. J. Kim, H. W. Park, & R. E. Rice. Configurations of relationships in different media: FtF, email, instant messenger, mobile phone, and SMS. Journal of Computer-Mediated Communication, 12(4), 1183-1207. (2007).
[30] J. Granat, & K. Stanoevska-Slabeva. Impact of Mobile E-Mail in Corporate Environment. In ECIS (pp. 322-333). (2007).
[31] M. A. Mazmanian, W. J. Orlikowski, & J. Yates. Crackberries: The social implications of ubiquitous wireless e-mail devices. In Designing ubiquitous information environments: Socio-technical issues and challenges (pp. 337-343). Springer US. (2005).
[32] D. K. Allen, & M. Shoard. Spreading the load: Mobile information and communications technologies and their effect on information overload. Information Research: An International Electronic Journal, 10(2), n2. (2005).
[33] A B. M. Shah,M. Mcgrath, & M. Keating. Email Usage Among Youth Staff in Malaysian Public and Private Universities. Malaysian Journal of Youth Studies, 13, 117-140. (2015).
[34] U. Sekaran, and R. Bougie. Research methods for business (John Wiley & Sons, New York, 2010).
[35] D. R. Cooper, & P. S. Schindler. Business research methods (McGraw-Hill/Irwin, New York, 2011).
[36] L. Luo. "Text a librarian: a look from the user perspective," Reference Services Review, 42(1), 34 – 51 (2014).
[37] S. B. T. Kumar, and G. T. Kumar. "Perception and usage of e-resources and the Internet by Indian academics," The Electronic Library, 28 (1), 137 – 156 (2010).
[38] R. V. Krejcie, & D. W. Morgan . Determining sample size for research activities. Educational and Psychological Measurement. (1970).
[39] E. Teijlingen, & V. Hundley. The importance of pilot studies, Social research update, 2001.
[40] Shafinah Farvin Packeer Mohamed, Ku-Ruhana Ku Mahamud, Razamin Ramli, Kamarudin Abdullah. (2017) proceedings ICAST
[41] A. N. Oppenheim. Questionnaire design, interviewing and attitude measurement. London: Pinter Publishers. (1992).
[42] D. W. Birchall, & G. Giambona. The impact of ICT on the work patterns of managers and their Organisations. EuroMed Journal of Business, 3(3), 244 – 262. doi:10.1108/14502190810906428. (2008).

.