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Improving the Response Time of Online Letter Management Application Users: an Application of Social Representation Theory of Shame

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Abstract—One of the most important and potential problems encountered in an official online letter management application is the recipients' late response. This action research aims to improve the recipients' response time and determine the central core of shyness according to response time categories: less than 24 hours (green zone); between 24 hours to 48 hours (orange zone); and more than 48 hours (red zone) in managing formal online letter management system at Jambi University. Using the social representation theory of shyness as the basis of action adopted from Moscovici theory [1], it is hypothesized that response time displaying will impact response time improvement. A survey questionnaire distributed to 129 respondents showed a significant improvement in the participants' response time, respectively, in cycles 1 and 2. The zone group increased percentage sed from 22.44% to 52.49 % in the first cycle, and it ultimately raised to 62.38% at the end of the second cycle. Such an increase might be due to the users' efforts to avoid the level of shyness, which were classified into: (1) slow to respond and (2) personal or work unit late response time – both marked in red. It is recommended that social shyness incorporated in improving response time in a formal online letter can be further implemented with other social and psychological parameters. The application will illustrate computer systems' interaction on social society to implement regulations both in institutions and in government.

Keywords— Online letter management; respond time; representation social theory; shame.

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I. INTRODUCTION

An electronic letter system is a series of electronic devices and procedures that serve to prepare, collect, process, analyze, store, display, announce, send and disseminate electronic information for correspondence and administrative activities. An online letter application is an application that replaces manual-based administrative processes with electronic-based processes by utilizing internet facilities.

Named Data Networking (NDN) paradigm, providing crowd-sourced real-time media contents. Such an architecture is composed of four different entities: an extensive group of heterogeneous devices that produce media contents to be shared, an equally large group of users interested in them, a distributed Event Management System that creators and handles the social community, and an NDN communication infrastructure can efficiently manage users requests and distribute multimedia contents [2]

There are several types of electronic letters in online letter applications. They include incoming mail, outgoing mail, and memos. One of the most popular types of mail managed in the online letter applications is incoming mail. This letter application is frequently accepted and operated by many work units' top leaders within an official institution. The mechanisms of a disposition or a final action each incoming letter are usually processed in a continuation. In addition, a memo feature can also be used to display direct order management, which is delivered from higher to lower official managers to perform a specific job, thing, or action. The management of letters, dispositions, and memos is often included in the scope of electronic document management (EDMS) [3]. EDMS refers to the use of computers that facilitate the creation, organization, storage, and circulation of documents electronically [4]. EDMS is a way of archiving correspondence from capture, storage, index, retrieval, and access. Electronic correspondence development aims to increase productivity, user response time, save costs,

increase document storage space efficiency, and reduce the risk of loss or damage to document files [5].

The Electronic Document Management System is an application system for managing Hardcopy documents, such as paper, microfilm which have been converted into digital and softcopy formats in the form of files of type, such as doc, ppt, xls., jpg, dwg, avi, mkv [6], which has been uploaded to the web-based DMS application. The uploaded documents can then be accessed, searched, displayed, or distributed by document users through this electronic document management system. By using an integrated search method that matches the type of document, users can easily display the intended document even though the document or archive is physically located in another place.

Electronic letter applications are made to speed up the letters' distribution process, including follow-up, dispositions, and memos, which are referred to in the letters. However, this service's speed depends on the recipients' response time to respond to the next processes. If the recipient immediately follows up the letter, the service will be fast. Conversely, if the letter recipient does not immediately respond to the letter addressed to him, the service time will be slow. The letter senders expect prompt replies from recipients, and some have even employed tricks to encourage quick responses [7]. Thus, the response time is a critical point for improving the quality of letter services. Response time is often related to service user satisfaction, where satisfaction will decrease as the response time increases [8].

The method commonly used to improve service in an institution is the Servqual method [9], [10], [11]. One recommendation for using this method in universities is for the manager to improve service quality and student satisfaction [12]–[14]. Both of these methods are good for improving the general service quality. Meanwhile, to improve service quality in letter management, it is necessary to improve service speed time.

For the response time to increase, an effective and consistent method is needed. One possible way to do this is by linking the letter management to shame. Intuitively, if a person feels embarrassed by the slow response time, he or she will increase the response time. The increase of speed in responding to a letter/position/memo is expected to happen due to the presence of Shame [15].

In this study, the method used to improve response time is the social representation approach of Shame. Social representation is a concept that is understood, believed, and carried out by a group of people [16], [17]. This social context referring to shame will motivate individuals to cancel behavior that does not follow group norms. Besides, feelings of self-use and personal achievement are near related to Shame [18].

So far, not much research has been conducted to improve response times in online letter applications through Shame's social representation approach [19]. This study aims to see the impact of displaying the levels of personal response time which are associated with levels of Shame within Jambi University online letter correspondent service, involving heads and staff members either within a particular department work unit or inter-department work units displayed on the dashboard page of the application upon the response time speed. This research also identifies Shame's

central core in letter management, which is used to justify the recipient response time's improvement. One hundred twenty-nine respondents were involved in the study through an online survey questionnaire. They were requested to express their Shame in response to the color zone of their response time levels. Their shame levels were then analyzed to see the improvement of their response time to the letters.

A. Online Letter Application

Online letter applications are included in the tools within the scope of electronic document management systems. This application is used to manage incoming mail, outgoing mail, dispose, and memos in a government institution or other business institution [17], [18]. An online correspondence application may differ from one institution to another. This difference is determined by the culture of the correspondence formed since the institution's existence. The success of an application is greatly influenced by organizational culture [22][23].

As a case in this research, the University of Jambi has a letter application that has been operated to portrait the whole process of correspondence. The URL of the application is <https://surat.unja.ac.id>. This application has been used to send letters within work units or between work units. The application can also be used as a tool for online dispositions and memos from superiors to subordinates.

The letter system to ensure certainty and transparency, this application has several essential features, including.

- every user can find out where the position of the letter or disposition they have sent is,
- each sender of the letter knows precisely whether the letter sent has been read, disposed, or acted on as a final,
- application users know the number of incoming letters, the number of letters followed up, and the number of letters sent out.

Transparency is an essential key in information technology-based management.

B. Social Representation Theory

Defines social representation as an approach that describes how a concept or idea is understood, believed, and implemented by a social group [24][25]. In simple terms, social representation is how a concept is understood, believed, and carried out by a group of people[26]. Social representation theory believes that individuals and society influence and interact with each other in constructing meaning and reality in society. Thus, individuals are considered passive objects influenced by the group and actively participate in building the group's meaning and views.

Social representation is a collective phenomenon related to the community coordinated by individuals in their daily speech and actions. Social representation is the unity of thoughts and feelings expressed in actors' verbal and open behavior objects for social groups [26]. Social representation theory is a valuable tool in community-based health research [27].

In its development, several approaches are commonly used in examining social representations, namely genetic, dynamic, and structural [28]. According to Duarte [29],

social representation provides essential knowledge to understand ordinary people's position in various situations according to their respective perspectives. For this reason, culture, history, habits, linguistic practices, and emotions that are neglected in scientific knowledge in modern society, in fact in social representation, are considered as essential elements that shape the structure of society's thought [30].

C. Shame

Humans are taught to have Shame since childhood. Some forms of Shame are disrespectful and ashamed to act not according to the norms held by a community. The definition of the word Shame shows that Shame is closely related to ethics and morality [31]. Shame continues to develop according to age levels and social changes [32]. For example, Shame's meaning in the younger generation is related to self-doubt, events that give rise to negative judgments, a physical appearance that is not ideal, violations of morality's principles, and incompatibility with etiquette. [9].

Shame triggers a person to modify their behavior in order to adapt to the environment quickly. Shyness arises when group performance is higher than personal performance [29]. Shame is a determining factor of social behavior [33]. In several psychology studies, it was found that Shame arises when someone feels that they are unable to do something, feelings of helplessness, and failure [34].

II. MATERIAL AND METHOD

An action research strategy was used to increase the user's response time to the corresponding application process. Action research is suitable for introducing treatment changes to practice and observing the effects of these changes. By utilizing the spirit of action research, namely, to improve the process, this study adopted an iterative process consisting of 2 phases to improve response times. Before the first iteration is carried out, pre-cycle activities aim to prepare algorithms to calculate response times and prepare initial information about response times. The activities in each cycle have stages of diagnosis, planning, action, and evaluation. The diagnostic phase is how the recipient's correspondence/letter disposition is associated with Shame. Meanwhile, the planning phase is used to develop the response time presentation feature, which will then be displayed at a particular time period in the action phase.

The displays are carried out in stages and stop at the response time that meets the service process standards. The evaluation phase is used to test the changes that occur by measuring the response time. If the ideal response time has not been reached, then it is back to diagnosis. An indicator of this action research's success is the achievement of online correspondence service standards, in which the recipient immediately processes the letter addressed within no more than 24 hours from the time of receiving the letter or disposition. Meanwhile, the number of letter responders whose response time is shorter than 24 hours must be more fantastic than 60% of the letter responders' total number. This percentage is very appropriate because not all actions can be completed quickly. At the technical level, people usually require longer response times than people whose jobs only provide dispositions.

Furthermore, a quantitative approach is carried out to obtain attributes in the form of a central core of Shame's social representations using the Hierarchized Evocation method [9], [35]. In this method, 150 participants were asked to write down their thoughts when they heard the word "shame in online correspondence". Participants then ranked the responses according to their degree of importance. A total of 129 respondents filled out a questionnaire and returned it to the researcher.

The four phases in this action research are illustrated as follows:

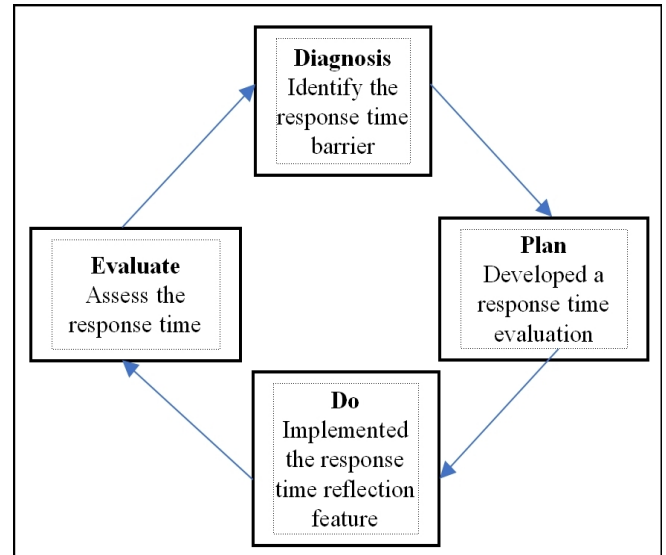


Fig. 1 Four steps of action research

The data obtained using the hierarchized evocation method can be analyzed by stages, (1) lexical analysis and categorization of the attributes that appear. At this stage, the attributes that are semantically the same will be categorized into the same category, and then the frequency is calculated, (2) statistical processing is by calculating the percentage of the occurrence frequency of the categorized attributes. The frequency percentage calculation result is accompanied by order of importance or ranking, which is used as a reference for determining the central core social representation of "shame in online correspondence". The responses that often appear and get the highest rank in importance are the central core of social representation, while the responses that rarely appear but get the highest rank in importance and the responses that often appear but get low rankings are not counted as the central core of Shame.

A. Pre-cycle

There are two pre-cycle activities: preparing the response time calculation algorithm and displaying the response time baseline before the action is carried out. Pseudocode calculates the average response time had input in letter arrival time, start date, and end date. Arrival time is the time during which the mail reaches the user's account. The pseudocode details are written in Fig. 2.

```

Function (arrival time, start date, end date)
{
    Read (first record);
    total time=0; count=0
    While (start date <=end date){
        Total time=total time +arrival time;
        count++;
        Read (next record)
    }
    End while
    Average=total time/count
}

```

Fig. 2 Pseudocode average response time

Meanwhile, the calculated response time baseline components include the number of actions, the average, the standard deviation, the number of responses, the number of responses with a response time smaller than or equal to 24 hours, the number of responses with a response time greater than or equal to 48 hours. The unit used for response time is seconds.

B. First Cycle

The problem that will be resolved is the high response time of the letter. Based on data processing, all correspondence application users' response time obtained an average of 575566 seconds with a standard deviation of 885074 seconds. The actions given in cycle 1 are:

1) *Create a feature to display the response time with the information presented as follows:*

- If the average response time is equal to 24 hours then the message “response time good” appears in the green box,
- If the average response time is between 24 and 48 hours, the message “moderate response time” appears in an orange box,
- If the average time is greater than 48 hours, then the message “Slow response time” appears in the red box.

2) *Disseminate features to all officials and staff via letters and other social media:* After the socialization was carried out, the letter application with the new feature was implemented within one month. This study's subjects were all lecturers with additional assignments, structural officials, and academic staff at Jambi University in 2020. At the end of cycle one, the researcher re-measured the response time. Based on data processing results, the number of responders in the green zone has increased but has not been optimal.

C. Second Cycle

The second cycle is carried out to increase the number of responders to those in the green zone. The plan that will be implemented in the second cycle is to inform the response time zone on the employee dashboard. The displayed information includes personal response time zones, response zones for each employee in a work unit, and response time zones for the work unit. Fig. 2 is an example of a user's response time in the green zone, while Fig. 3 is an example

of a work unit's response time and a list of mail action time zones in one work unit.

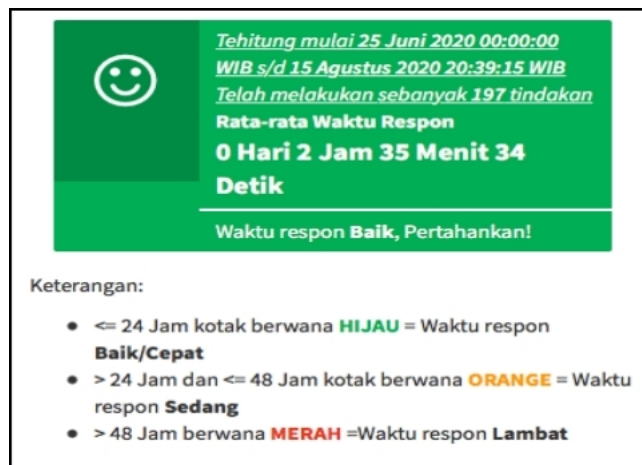


Fig. 3 Personal response time

Displaying each colleague's response time zone in a work unit is based on the action hypothesis that people feel embarrassed to be in the red zone and feel ashamed if others know them. Because of this Shame, each individual will try to make the green zone's response time. This treatment is carried out for one month, after which an evaluation is carried out to re-measure the response time of the recipient of the letter. At the end of the second action cycle, an open survey was conducted. Requests to respondents in this survey are as follows: "Write down several things that come to mind when you hear the word" SHAME "in the letter management. If there is more than one written answer, give the serial number based on the degree of priority".

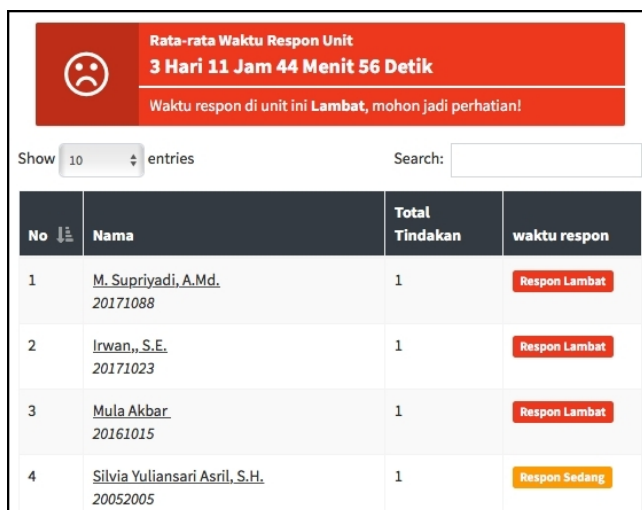


Fig. 4 Work unit response time

III. RESULT AND DISCUSSION

The main finding from displaying the response times of personal, work unit peers, and work units is an increase in the number of responders in the green zone category and a decreased number of responders in the red zone category. As a summary, the response times for each cycle are shown in Table I.

After more than three months of using the online letter application with the following stages: without displaying the response time (A), displaying the self-response time (B), and displaying the response time of self and work unit colleagues (C), an increase in the number of responders in the green zone category with a percentage per stage of 22.44% (A), 52.49% (B), and 62.38% (C). Meanwhile, the number of respondents in the red zone category (decreased by 57.36% (A), 31.23% (B), and 26.21% (C)). A very significant increase in the green zone and a very significant decrease in the red zone. The changes of response time by cycles can be seen in Fig. 5.

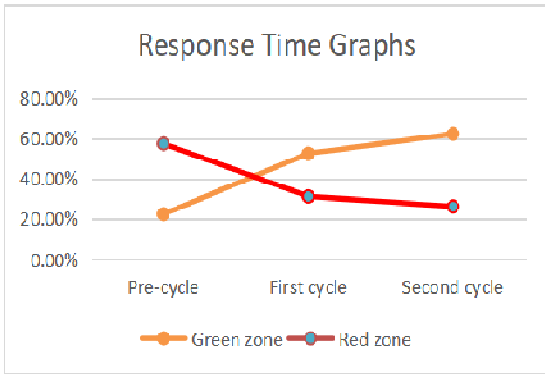


Fig. 5 Change in response time

Meanwhile, Shame's central core in managing letter applications is obtained through an open survey of letter recipients. The results of processing the answers to the questionnaire are shown in Table II. This table shows that Shame has the highest percentage and the highest-ranking if the letter's recipient is slow to open the online letter application and provide follow-up. Besides, respondents feel embarrassed when their individual and work unit response times are in the red zone. Meanwhile, 3.1% of respondents said they were embarrassed if they sent a letter wrong.

TABLE I
RESPONSE TIME PER CYCLE (IN SECONDS)

Cycle	Total action	mean	Deviation standard	Total response
Pre-cycle (A)	4390	575566	885074	254
First cycle (B)	6284	172605	218493	301
Second cycle (C)	16196	188691	350060	412

TABLE III
RESPONSE TIME PER CYCLE IN GREEN AND RED ZONE (IN SECONDS)

Cycle	Total in green zone	Total in red zone
Pre-cycle (A)	57 22.44%	148 57.36%
First cycle (B)	158 52.49%	94 31.23%
Second cycle (C)	257 62.38%	108 26.21%

Table III shows the highest-ranking indicator of Shame when in the red zone. This indicator is used to measure the slow response rate to user embarrassment. For example,

embarrassed to appear in the red zone, embarrassed if the response time is long, and embarrassed when responding or sending letters to the wrong destination. The number of percentages on each indicator will show the number of users involved in errors in responding.

On response time it is long and embarrassing when responding or sending letters to the wrong destination. The number of percentages on each indicator will show the number of users who are involved in errors in responding. As for low rankings, there are two indicators to measure user response as a warning. There is an embarrassment if I am reminded to respond and embarrassed if my response time is in the orange zone. This indicator is used to warn the user before an error occurs, especially in responding very slowly.

TABLE IIIII
CENTRAL CORE SHAME ON MANAGING LETTER APPLICATIONS

	High rank (<1.8)	Low rank (>=1.8)
High frequency (>3%)	1 Shame if I don't check the letter application every day and follow up lately 32.56%; 1.36	1 Shame if I was reminded to respond 4.65%; 2.8
	2 Shame if the response time is in the red zone 17.8%; 1.5	2 Shame if my response time is in the orange zone 3.88%; 1.8
	3 Shame if the work unit's response time is in the red zone 12.4%; 1.64	
	4 Shame if I send a letter to not the right person 7.75%; 1.53	

The results showed an increase in the green zone from 22.44% to 62.38%, and there was a decrease in response time in the red zone from 57.36% to 26.21%. An increase in the number of responses in the green zone and decreased responses in the red zone after implementing this application for three months happened due to the treatment differences every month. The final result showed that the number of respondents in the green zone was already more than 60%.

The use of the response time zone display method can increase the response time. This increase certainly improved the satisfaction of letter service recipients. Thus, this method is a way to improve service quality and satisfaction in higher education and the Servqual method that has been introduced previously.

Meanwhile, the central cores of Shame in the field of letter management fell into a few categories, such as the Shame of not checking the letter in the application; the Shame if the personal response time is in the red zone; and the Shame if the work unit response time is in the red zone.

Following the social representation theory, Shame triggers a person to modify their behavior to adapt to the environment quickly. This social context, which refers to Shame, will motivate individuals to cancel behavior that does not follow group norms [36]. Thus, it can be explained that the increase in the green zone is caused by the number of people feeling embarrassed if they are late in following up the letter or the response time level turns to the red zone. Thus, Shame forces people to check a letter every day and follow up immediately.

They were feeling shy means feeling seen by others. Shame is present when the immediate environment evaluates someone, and in that assessment, someone feels that they do not display self-standards and ideal values in their environment. Shyness focuses on the presence of social comparisons and recognition of one's social environment [37]. Thus, it makes sense that people improve the response time when their name appears in the public space as responders in the red zone category.

TABLE IVV
CENTRAL CORE OF SHAME AND ITS IMPLICATIONS

Central core of Shame	Implications
Shame not to check the online letter application every day and late to follow up	1. Displays the frequency of logins into the letter application per day. Alerts will be given in red if the user has logged in once, orange for two times, and green for three times.
Shame that the response time is in the red zone	2. Displays the personal response time on the recipient's account. 3. Displays the response time of each person in a work unit with the slowest to the fastest response time order. 4. Displays the 10 letter responders with the fastest response times, who are in the green zone and have processed at least 50 letters.
Shame if the work unit's response time is in the red zone	5. Displays the work unit response time zone.
Shame if letter is not sent to the right person	6. The letter is returned with a red warning

Table IV describes the problem centers and the actions taken by the system. For example, displays of embarrassment, rarely checking online mail applications every day, and being late following upon them. Shown with red, orange, and green symbols to indicate the frequency with which users have opened the system. The reprimand action from the system is outstanding and polite without having to give strict instructions. The colors on the display symbols will influence the user to change their shy attitude without feeling pressured or overwhelmed.

A further implication is that it can change user behavior by displaying the recipient's account's response time. This action has an indirect effect on the user to be given the responsibility while carrying out his job. The response to the delay in follow-up will be seen from the leadership and colleagues in one unit so that the effect of this social warning can reduce the burden on institutional leaders in running the government.

The system also displays the speed and slowness of each person in responding to their work. The size of the difference in response from fast and slow will also affect a person's performance, motivating him to respond quickly. As a penalty when the display responds slowly and is marked with a red zone, it takes ten letters to respond quickly so that the user's display will change to a green zone. If someone responds quickly but there is an error in the destination, then it will enter the red zone. This aims to keep the quality of mail delivery to the right destination.

In social behavior and social environment theory [38], [32], a person's shame towards their environment is the most significant impact on someone in their life. Shame is a positive and negative attitude towards someone. However, if

the Shame is to change someone's behavior towards society, it will be a social punishment for him. Shame is very effective if the shame warning improves and enhances one's performance in institutions and government.

On the other hand, social representation theory [39] successfully increased response times and follow-up percentage to green zone letters. About the embarrassment of the response time problem to follow up the letter is showed from the results of the study that the display response time is categorized as less than 24 hours (green zone), between 24 hours to 48 hours (orange zone), and more than 48 hours (red zone) for individuals, work units, and colleagues.

Electronic document management system (EDMS) [40] implementation refers to the use of computer storage, and electronic circulation of documents integrated with shame instructions can facilitate proper and measured correspondence management in institutions. EDMS innovation with Shame is a breakthrough innovation to obey everyone in the organization or government to carry out their respective duties.

IV. CONCLUSION

This research draws close social representation theory about Shame to the problems of response time to letter follow-up. The results of the study prove that the display of response times is categorized as less than 24 hours (green zone), between 24 hours and 48 hours (orange zone), and more than 48 hours (red zone) for individuals, work units, and colleagues. Successful in increasing response times and percentage of green zone letter follow-up. This change happens because people feel embarrassed if they are too late to open the letter application and have a red zone for personal response time or work units. Shyness is a central core of Shame in managing an online letter. With the disclosure of Shame in managing letters, the managing letter application has been improved with the addition of features and tools related to shame implications. This improvement is needed to anticipate people from negligent in responding to the correspondence in a prime manner. In the future, it is necessary to examine the optimal response time for the green zone while taking into account the quality of follow-up.

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