Software Requirement Specification Document for Project Name

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Table 1: Document version history

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GitHub: https://github.com/HelmyMagdy/Software-Engneering

Contents

Abstract

The target of the project is to upgrade Eama Group's (client) online presence to compete with other competitors in the same market and career as the company. The challenge we face is that our client (Eama group) hasn't been using any up-to-date application so we are going to start from the basics and build up from there. Our current plan to help the company reach its full potential is to create a web application to manage every minor detail the company faces for instance building up the storefront and fully manageable system to acquire new stock or the editing of old stock. We intend to use the agile development process to update our targets on the fly since we have ease of access to our clients.The proposed solution is a web application that will help in making the company easier to access on both business deals and getting orders or buying products from their store

1 Introduction

1.1 Purpose of this document

The purpose of this document is to build an online system to manage online storefronts and stock and employees to ease the user online shopping. Eama group is a hygienic distributing company concerned about providing the people with the best products with the best quality and the least prices to be affordable by all the societal levels. And as this is one of the most important fields, there is always a race between the companies in order to provide the best service along with the best products. So, after 2019, and after the outbreak of the covid-19 pandemic and the quarantine that made all the personnel as lazy as they can be, to order online. So, there had to be another solution for buying hygienic products such as toothbrushes, toothpaste, wipes, etc.

1.2 Scope of this document

The purpose of the online shopping system is to ease online shopping and to create a convenient and easy-to-use application for users, trying to buy hygienic products. The system is based on a relational database with its products, cost functions, also you can contact Eama group for new business propositions. We will have a database server supporting hundreds of products such as toothbrushes, toothpaste, wipes, etc.. Above all, we hope to provide a comfortable user experience along with the best pricing available.

1.3 Business Context

The problem with having a static web application is that you can't serve the people in a comfortable way. People will still have to go to a pharmacy to buy their most basic needs to have a healthy and hygienic lifestyle. So, Eama is looking forward to providing them with all that they need starting from a toothbrush and a toothpaste, passing by soaps, wipes, cotton buds, till reaching each and every one. So, as the online demand for online stores, and web applications that can remember your preferences, with a lot of discounts when you re-order them is what Eama and we are looking for. And this problem started at the covid-19 outbreak when people got stuck in their homes unable to buy anything in person, only from online stores. Unfortunately, the only current

solution is either to buy in person from a normal pharmacy which is tiring and not safe enough as the covid-19 is still present among us. Or the other solution is to buy from non-credible web applications and normal online stores that you don't know whether they are good for your health or might harm you even more than not using them. Therefore, our proposal for this project revolves around making a dynamic web application for Eama to be able to sell for individuals, families as well as their already-existing market of numerous pharmacies and supermarkets

2 Similar Systems

2.1 Academic

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The effectiveness of synchronous computer-mediated communication for solving hidden-profile problems: Further empirical evidence

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ABSTRACT

We experimentally compared the effectiveness of face-to-face (FTF) and synchronous computer-mediated communication when using a chat tool in solving hidden-profile business problems. In such problems, information critical to its solution is dispersed among team members and they must share it to solve the problem. Unlike prior research using hidden-profile tasks, our study used a real-world business-oriented task, established real rather than *ad hoc* teams, and imposed a time constraint on them. Hypotheses derived from media richness theory were found to be supported, with the results revealing that computer-mediated teams using the chat tool were less successful in exchanging and processing information than FTF teams and were thus less successful at solving the hidden-profile problem. The results also showed that, when operating under a time constraint, FTF was preferred over computer-mediated communication due to the relative immediacy of feedback and multiplicity of cues available in the FTF setting, as media richness theory predicted.

aware of which items of information are known only to them (uniquely held) and which items are known by others (commonly held), this step involves the exchange of both uniquely and commonly held information. Second, team members must process the information exchanged and recognize what information is uniquely held. In a hidden-profile task, this information should evoke additional information exchange. Thus, information exchange becomes an iterative process. Once members have exchanged all relevant uniquely held information, they can proceed to the third step: to solve the problem.

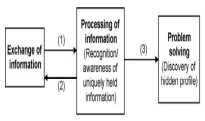
A team's ability to solve hidden-profile problems might be improved by using CMC, since it mitigates some of the process losses that occur in FTF team interaction. A key advantage is that the technology allows simultaneous parallel input of information by all members of the team. A second advantage of CMC is that all participants' comments may be automatically stored in a log, enabling participants to refer to them later. This is a form of collective memory that facilitates group decision-making [10]. It allows CMC participants to access exchanged information readily. However, it is possible that uniquely held information could be buried in the group memory: participants might become so engrossed in inputting their own comments that they do not devote adequate time to processing inputs of others. Also, the information later than GSS groups. However, the focus of the study was on information exchange (of shared and unshared information) rather than the ultimate solution to a hidden-profile problem. Furthermore, the study used *ad hoc* groups rather than established ones.

Mennecke and Valacich [13] conducted an experiment varying both group history (i.e., established vs. *ad hoc* groups) and the level of computer support (i.e., CMC vs. FTF) for a hidden-profile task. Contrary to expectations, they found no significant difference in information sharing performance between the groups and that established groups discussed fewer of the unique items than *ad hoc* groups.

More recently, researchers have examined the relative effectiveness of alternative modes of team communication in hidden-profile tasks requiring domain knowledge in addition to the exchange of unique information. For instance, Murthy and Kerr [14] compared FTF to CMC using a bulletin-board tool, and also using a chat tool for a problem that required knowledge of accounting processes. In all three modes, teams were given as much time as they needed (no time constraint). The teams using the bulletin-board tool significantly outperformed teams using the chat tool or communicating FTF. There was, however, no performance difference between teams using FTF and chat tools.

2.2. Theory and hypotheses

Media Richness Theory [3] states that communication media differ substantially in the way they convey information; e.g., face-to-face communication is rich while CMC is leaner. Richer media help in resolving uncertainty (when there is not enough information to solve a problem) or equivocality (when there are multiple and possible conflicting interpretations of it) [7]. Thus, per media richness theory, CMC can be effective for low equivocality tasks but high equivocality tasks require information-rich communication.



(1) Facilitated by parallel communication
(2) Facilitated by immediate feedback, hindered by information overload
(3) Requires processing of uniquely held and commonly held information

1. Introduction

Computer-mediated communication (CMC) systems are now widely available for supporting teamwork in organizations. CMC tools have allowed professionals to form and work in "virtual teams" that are not bound by time and space [15]. There is ample empirical evidence that groups using them outperform face-to-face (FTF) meetings in brainstorming and similar tasks [20,21]. However, there is mixed evidence about their efficacy in group problem solving–tasks that require members to exchange information, process it, and solve the problem [1,11].

One type of group problem-solving task is the "hidden-profile" task, in which individual team members possess only part of the information needed to provide a superior decision, but they can pool and process all the needed information [18]. Such tasks require team members to process both commonly held information (i.e., information known by all members) and uniquely held information (i.e., information initially known by only one member). Teams of business professionals are often confronted with hidden-profile problems. In hidden-profile situations, it is essential that information be shared with other members of the team. Essentially, the team members must convey information to the others and then the team as a whole must process it to arrive at an optimal decision. This setting is analogous to many team-based settings where professionals perform some work individually and then meet to solve problems and make decisions.

One study of hidden-profile problem-solving performance compared teams meeting FTF with those using two forms of CMC–a bulletin-board based tool and a chat tool [14]. Computer-mediated teams using the bulletin board tool exhibited the best performance. There was no significant performance difference between the teams communicating FTF and those using the chat tool. The lack of a difference warranted further investigation because:

1. failure to find a significant difference did not imply that they were equally effective,
2. professional service teams are likely to meet synchronously when making a decision; therefore use of chat tools seemed more natural than bulletin boards,
3. it was not obvious why CMC via a chat tool was not better than FTF communication, since instant messaging has become so popular in organizations [2,4].

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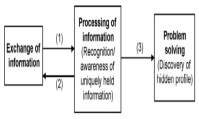
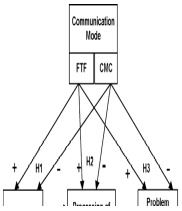


(1) Facilitated by parallel communication
(2) Facilitated by immediate feedback, hindered by information overload
(3) Requires processing of uniquely held and commonly held information

Fig. 1. Processes in solving hidden-profile tasks.

2.2. Theory and hypotheses

Media Richness Theory [3] states that communication media differ substantially in the way they convey information; e.g., face-to-face communication is rich while CMC is leaner. Richer media help in resolving uncertainty (when there is not enough information to solve a problem) or equivocality (when there are multiple and possible conflicting interpretations of it) [7]. Thus, per media richness theory, CMC can be effective for low equivocality tasks but high equivocality tasks require information-rich communication.



When faced with hidden-profile-type problems requiring discussion and deliberation, teams are faced with a choice of communication mode–either FTF or some form of CMC. To solve a hidden-profile task, team members must both exchange and successfully process uniquely held information. The first two hypotheses deal with the processes involved in solving hidden-profile problems. Following media richness theory, teams using a leaner communication medium such as a CMC chat tool should be less successful at solving hidden-profile problems than teams using FTF communication. Accordingly, we posited:

Thus our study was intended to extend CMC research by investigating the performance of FTF teams with those using a chat tool when they operated under a time constraint. Employing media richness theory, we further hypothesize that the leaner medium of CMC would cause teams to exchange and process less of the uniquely held information necessary for solving hidden-profile problems, resulting in CMC teams being less successful.

2. Background, theory, and hypotheses

There is evidence that performance of a team is superior to that of an individual: members provide different viewpoints, pool information and check for errors. This is particularly important in the discovery of hidden profiles in team decision-making tasks.

Prior studies using hidden-profile tasks have found that teams interacting FTF often fail to process all of the uniquely held information, leading to sub-optimal decisions. However, such groups may be less prone to overlook uniquely held information if they believe that their task has a correct answer or when members are told who has additional relevant information [16]. However, it has also been observed that simply forewarning members of the existence of uniquely held information does not lead to greater success [19].

2.1. Effects of CMC on hidden-profile tasks

There are three major information-related steps involved in solving hidden-profile tasks, as shown in Fig. 1.

First, all relevant uniquely held information must be exchanged, i.e., each team member must share uniquely held information with the other team members. Since team members initially are not

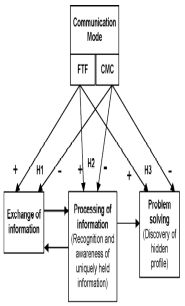


Fig. 2. The resulting research model for our study.

Four factors influence media richness: its ability to transmit multiple cues (e.g., voice and facial gestures), immediacy of feedback, language variety, and the personal focus. FTF communication provides immediate feedback and many cues but CMC is better suited when rich communication may actually hinder participants by their being distracted by cues extraneous to the task.

We had decided that our experimental task would require domain knowledge (of accounting procedures) and involve discovering a hidden profile under a time constraint. We believed group memory can quickly become large and difficult to process by its potential users. Process losses such as these might well counteract the effects of process gains.

Several previous studies have examined the effects of CMC solving hidden-profile tasks. Dennis [5] investigated groups working on a task in which each participant received different but not conflicting information. The participants had to combine the information to identify the best solution. He found that groups interacting FTF exchanged only a small portion of the available information and thus made a poor decision. Groups using CMC exchanged about 50% more information, providing sufficient material to enable all groups to identify a good decision. However, only one CMC group chose the best. Dennis suggested that anonymity and delayed feedback in CMC reduced the credibility of new information.

Another study [6] examined information exchange and decision-making processes in small groups interacting verbally or with a CMC system. Using a group size of six, the study had groups attempt to solve a hidden-profile task in which group members had information that needed to be shared. Both computer-mediated and FTF groups exchanged only a small portion of the available information and made poor decisions. Even when information was shared, CMC groups were less likely to use the shared information.

Another study compared GSS and FTF groups in their exchange of information in a requirements elicitation task [17]. GSS groups used a brainstorming tool (synchronous chat) within *GroupSystems*. Although both groups exchanged a large percentage of the shared information, the GSS groups were more effective in exchanging unshared information. It was observed that FTF groups discussed shared information sooner and unshared

When faced with hidden-profile-type problems requiring discussion and deliberation, teams are faced with a choice of communication mode–either FTF or some form of CMC. To solve a hidden-profile task, team members must both exchange and successfully process uniquely held information. The first two hypotheses deal with the processes involved in solving hidden-profile problems. Following media richness theory, teams using a leaner communication medium such as a CMC chat tool should be less successful at solving hidden-profile problems than teams using FTF communication. Accordingly, we posited:

H3. Teams using a CMC chat tool will be less successful at solving hidden-profile problems than FTF interacting teams.

H3a. Team problem-solving success will be positively associated with the exchange of unique information.

H3b. Team problem-solving success will be positively associated with information-processing performance.

3. Method

3.1. Participants

An experiment was performed using 128 students taking a masters degree. They were enrolled in a corporate auditing course and had been formed into teams of four at the start of the semester. Students were assigned so that all teams were as similar as possible along four dimensions: (1) aptitude (measured by students' overall grade point average), (2) employment history, (3) membership in student organizations, and (4) gender (no all-male or all-female teams).

that such a task was highly equivocal and should benefit from immediacy of feedback and multiplicity of cues available in a rich communication medium. Moreover, because the teams were established ones and needed to recall and discuss accounting procedures, a rich communication medium should be best.

However, it was also possible that CMC teams using a chat tool may be more able to exchange information efficiently than FTF teams due to the parallel communication possible under conditions of low task equivocality [9], though CMC teams were likely to be less able than FTF teams to distinguish between uniquely held and commonly held information. Consequently, given the commingling of uniquely held and commonly held information in hidden-profile situations, CMC teams were expected to be *less effective* at identifying, exchanging, and processing the uniquely held information crucial to solving the problems (Fig. 2). Accordingly, we hypothesized that for our task involving exchange of uniquely held information in interacting teams *operating under a time constraint*:

H1. Teams using a CMC tool will be less effective at exchanging uniquely held information relative to teams interacting FTF.

The immediacy of feedback inherent in FTF communication should allow such teams to quickly identify and process uniquely held information, especially when operating under a time constraint. One method of discerning the relative effectiveness of information processing by team members is to examine their recollection of information, since information effectively processed is more salient and more easily recalled [8]. Prior studies have deemed the recall of information to be an appropriate proxy for effectiveness of information processing [12]. This lead to our second hypothesis:

H2. Individuals in teams using a CMC tool will exhibit lower information processing proficiency as evidenced by recall of information (*U* = 515.5, $p < 0.01$). These results were also consistent with Hypothesis 1 and supported the results based on the analysis of uniquely held items only.

4.2. *Effect of communication mode on information processing*

Hypothesis 2 addressed team members' recall of information following discussion of the case, comparing recall performance between those using a CMC chat tool and interacting FTF. ANCOVA was used to test the hypothesis, where the number of items correctly recalled in the post-test was the dependent variable, communication mode was the independent variable, and to control for differences in participants' overall recall abilities, pre-discussion recall performance was included as a covariate. Descriptive statistics for the information recall dependent variables are shown in Table 3, arranged according to the teams' communication mode.

As shown, participants who discussed the case FTF were better able to recall, immediately after completing the case, information that was not in their possession prior to the discussion, learned from their teammates (unique information), than were participants in the CMC condition. ANCOVA results indicated this difference was statistically significant ($F = 46.3$, df = 1, $p < 0.01$). There was no significant difference in recall of common information possessed by all participants across communication mode ($F = 0.28$, df = 1, $p = 0.60$). These results provided partial support for Hypothesis 2.

4.3. *Team problem-solving performance*

It supports same time/same place, same time/different place, and different time/different place discussions. All participants had prior experience using the system with their teammates and had received a written summary about using the software; also assistance was available for anyone needing help. One member in each CMC team was also designated as the team's scribe. Written instructions were provided to the scribe indicating how the team's solutions were to be submitted in the *WebBoard* system. Participants were reminded that all of their typed comments would be recorded and saved electronically.

Each team member in the CMC condition was assigned to a computer terminal in a large computer lab, with other team members dispersed throughout the room. In effect, the setting simulated a "same time/different place" setting, since verbal interaction was not allowed. The *WebBoard* system allowed team members to offer their comments simultaneously. The *WebBoard* program split each user's computer screen so that the user could read the comment he or she was typing as well as see other team members' comments. The *WebBoard* session log captured each team member's typed comments, as well as each team's scribe's solutions to the case.

All teams were told they would have 30 min to work together to complete the task. A time constraint was imposed to allow us to investigate the impact of time pressure on CMC teams compared to FTF teams in successfully sharing the unique and common information and solving the hidden-profile problem. The amount of time given to participants – 30 min – was based on pilot testing of the task; CMC teams had taken approximately 39 min on average in completing it.

3.5. *Post-discussion test*

Hypothesis 3 addressed the degree of success in solving hidden-profile-type problems, comparing teams using a CMC and interacting FTF. Problem-solving success was determined by finding, for each team, which of the following "hidden" facts were discovered: (1) $150,000 was owed by the client to the supplier, (2) the check was made payable to the wrong company, and (3) the check was mailed to the wrong state. Problem-solving success was measured as the number of these that each team was able to discover (a scale from zero to three). Teams' answer sheets were analyzed by two coders working independently. Analysis of interrater reliability revealed a very high level of agreement between coders (a correlation of 0.949).

Descriptive statistics for the problem-solving success dependent variable are shown in Panel A of Table 4 arranged according to teams' communication mode. A Mann–Whitney *U*-test was used with teams' communication mode as the independent variable and the number of hidden facts discovered as the dependent variable. Results of the *U*-test are presented in Panel B.

FTF teams showed greater problem-solving success rates than CMC teams, with 71% of the FTF teams discovering all three hidden facts while only 33% of the CMC teams discovered all three. A Mann–Whitney *U*-test showed that the difference in FTF and CMC teams' distributions of success scores was significant ($U = 65.0$, $p < 0.01$). These results supported Hypothesis 3, which predicted that FTF interaction would be superior to CMC in solving hidden-profile problems when a time constraint was imposed.

Hypotheses 3a and 3b predicted that team problem-solving performance would be positively associated with information-exchange and information-processing performance, respectively. To examine these hypotheses, we regressed problem-solving performance on information exchange and information processing performance. As shown in Table 5, the exchange of unique information was significantly associated with problem-solving performance ($F = 14.1$, $p < 0.01$, Adj. $R^2 = 0.812$). In addition, there was a significant relationship between the processing of unique information and problem-solving performance ($F = 10.0$, $p = 0.04$, Adj. $R^2 = 0.82$). These results were consistent with Hypotheses 3a and 3b.

5. Discussion and conclusion

Our study compared the performance of FTF and computer-mediated teams in a hidden-profile auditing task. Unlike most of the prior CMC research, established rather than ad hoc groups were used. The results of research using *ad hoc* groups may not generalize to established groups, which are typical in auditing and consulting firms. Moreover, our study used a task that required participants to use domain-specific (accounting) knowledge. Considering the additional cognitive load, results of prior research may not generalize to such settings such as ours. An additional contribution was the imposition of a time constraint: professional auditors and consultants typically work under strict time budgets. We found that imposing a time constraint heightened the

Table 1
Exchange of uniquely held information.

		CMC	FTF
Panel A: descriptive statistics			
Distribution of number of uniquely held information items conveyed (out of 4)	All four items	33%[a]	71%
	Three items only	13%	29%
	Two items only	40%	0%
	One item only	13%	0%
	None	0%	0%
	Mean rank	12.0	20.5
	Mean	2.7[b]	3.7
	Median	2.0	4.0
	Std. deviation	1.1	0.5
	n (4-person teams)	15[c]	17
Panel B: Mann–Whitney *U*-test results			
Pairwise comparison of information conveyence score distributions	Mann–Whitney *U* statistic		Significance level
CMC vs. FTF	60.0		0.005

[a] Thirty-three percent of the teams using CMC conveyed all four uniquely held items, 13% conveyed three of the four items, 40% conveyed only two of the items, and 13% conveyed only one of the uniquely held items.

[b] Each team's maximum possible number of uniquely held information items shared was 4. Score = 4 if the team members shared all four, score = 3 if three items were shared, score = 2 if two of the four items were shared, score = 1 if only one was shared, and score = 0 if none of the uniquely held items were shared.

[c] The analyses of information conveyance were based on 15 CMC teams and 17 FTF teams. Seven CMC teams were dropped because their *WebBoard* dialog files were not saved due to technical problems and six FTF teams were dropped due to partially inaudible videotapes.

(see Table 2). The Mann–Whitney *U*-test indicated a significant difference between FTF and CMC teams' distributions of conveyance scores for both commonly held and uniquely held

Table 3
Analyses of information recall.

	Communication mode	Mean	Std. deviation	*n* (individuals)
Recall of information learned during discussion (out of 3 possible)	FTF	2.12	0.64	68
	CMC	1.30	0.72	60
Recall of information known prior to discussion (out of 10 possible)	FTF	7.13	1.66	68
	CMC	7.02	1.64	60

Table 2
Exchange of uniquely held and commonly held information combined.

		CMC	FTF
Panel A: descriptive statistics			
Distribution of number of uniquely and commonly held information items conveyed (out of 14)	12–14 items	0%[a]	41%
	9–11 items	40%	35%
	6–8 items	27%	18%
	3–5 items	33%	6%
	0–2 items	0%	0%
	Mean rank	11.8	20.6
	Mean	7.2[b]	10.4
	Median	7.0	10.0
	Std. deviation	2.5	2.6
	n (4-person teams)	15	17
Panel B: Mann–Whitney *U*-test results			
Pairwise comparison of information conveyence score distributions	Mann–Whitney *U* statistic		Significance level
CMC vs. FTF	57.5		.008

[a] None of the teams using CMC shared 12 or more of the 14 information items, 40% conveyed between 9 and 11 items inclusive, 27% shared between 6 to 8 items, and 33% conveyed less than 6 of the items.

[b] Each team's maximum possible number of information items shared was 14. Score = 14 if the team members conveyed all items.

mailed for that invoice. The vendor insists that the check has not been received and threatens to turn Hush Corporation's account over to a collection agency.

Investigation of the loss has determined that only four people had knowledge of this particular transaction–Ms. Spring, Mr. Summer, Ms. Autumn, and Mr. Winter. One member of the audit team interviewed Ms. Spring, another member interviewed Mr. Summer, another interviewed Ms. Autumn, and another interviewed Mr. Winter. You should assume all interviewees answered truthfully. In addition, you, and the other members of the audit team, have reviewed the supporting documents for this transaction.

Notes summarizing your interview and review of supporting documents are shown on the next page. You should assume that all notes are correct. Your team's task is to discuss the notes made by each team member and determine answers to the following four questions:

What happened to the $300,000 check? (2) How much money is owed and to whom? (3) What specifically needs to be done to fix the financial error? (4) What specifically needs to be done to fix the system that allowed the error?

The second sheet contained ten audit notes that were needed by each student when performing the task. Nine of them were common to all team members, but each team member's sheet had one statement that was unique to that team member. All four unique statements were necessary to complete the case correctly. Although participants were told that their interview sheet was the product of one interview and that other team members' sheets were the products of interviews with other client employees, participants were not informed that their sheets contained a combination of commonly held and uniquely held information. An example of an audit notes sheet is shown in Appendix A.

3.3. *Pre-treatment test*

The pre-treatment phase of the experiment began as each participant received his/her written description of the task, instructions, and audit notes. Each participant was allowed sufficient time to read the task description and instructions and study the audit notes. They were then told to place the task description and audit notes face down on the floor under their chair. Each was then given a sheet of paper and asked to list as many of their audit notes as they could recall. These recall sheets were then collected from each participant, and they were told to retrieve their task description and audit notes from under their chairs.

3.4. *Hidden-profile task*

Immediately following the pre-treatment phase, teams separated to perform the hidden-profile task. Teams in the FTF condition were seated around tables in separate conference rooms and monitored via closed-circuit televisions. The entire FTF meeting for each team was videotaped. One member in each team was designated as the team scribe to write the team's solutions to the case. Before beginning their discussions, participants were told that a large pad of paper was available for the team's scribe to write notes and that it should be positioned so that each member could see it at all times. Participants were not allowed to show their original list of audit notes directly to teammates.

Teams in the CMC condition used the *WebBoard* system

Exchange of unique information	2	5.7	14.1	<0.001
Exchange of common information	7	3.2	2.3	0.082
Unique × common	5	1.2	1.2	0.375
Model	15	30.2	9.9	<0.001
Error	16	3.3		
Adjusted $R^2 = 0.812$				
Panel B: problem-solving performance regressed on information-processing performance				
Processing of unique information	8	15.5	10.0	0.042
Processing of common information	12	9.1	3.9	0.144
Unique × common	7	5.2	3.8	0.149
Model	28	32.9	6.0	0.081
Error	3	0.6		
Adjusted $R^2 = 0.82$				

As each team completed the case, the experiment's facilitators collected the case materials. Each participant was then given a sheet of paper and told to list as many of his or her own audit notes, as well as audit notes learned from other teammates. Participants then completed a debriefing questionnaire, were thanked for their participation, and dismissed.

4. Results

4.1. *Effect of communication mode on information exchange*

Hypothesis 1 addressed the exchange of uniquely held information items, comparing the performance of teams using a CMC chat tool and FTF. The number of information items exchanged was determined by examining the videotape transcripts for FTF and the WebBoard session logs for CMC. A Mann–Whitney *U*-test was then employed, with communication mode as the independent variable and the number of uniquely held information items exchanged as the dependent variable. Descriptive statistics and *U*-test results are presented in Panels A and B of Table 1, respectively, arranged according to communication mode.

Teams interacting FTF exchanged more of the uniquely held information items, with 71% of the FTF teams conveying all four uniquely held items but only 33% of the CMC teams doing so. Mann–Whitney's *U*-test revealed that the distributions of teams' conveyance scores across the two communication conditions were significantly different ($U = 60.0$, $p < 0.01$). Thus, the results of the test support Hypothesis 1 that FTF interaction was superior to CMC for the exchange of uniquely held information when a time constraint was imposed.

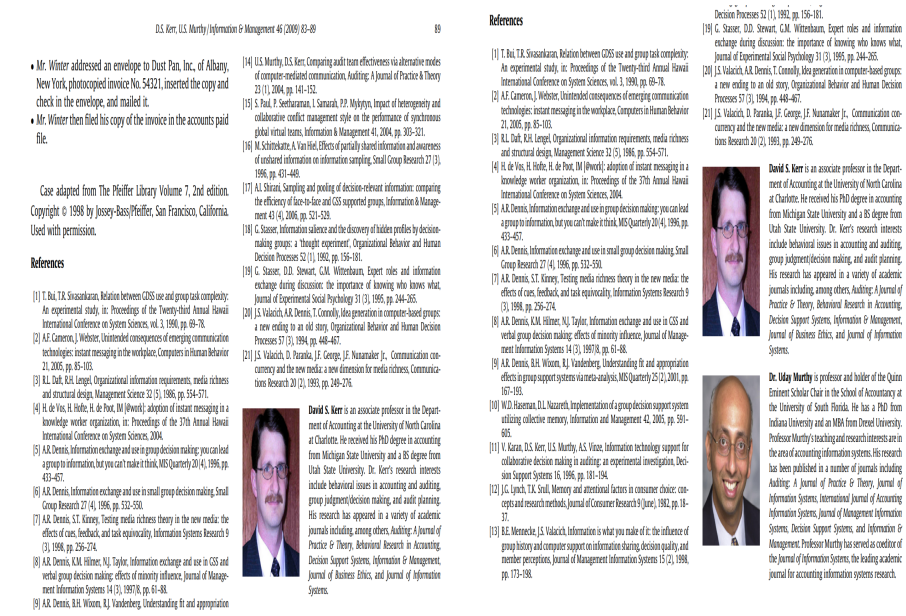
Analysis of the total number of items exchanged again revealed that FTF teams exchanged a greater number of information items, with 41% of the FTF teams conveying at least 12 of the 14 possible salient, allowing it to be processed more effectively.

Acknowledgements

We thank participants at the European Accounting Association's 29th Annual Congress, workshop participants at Texas A&M University, and the anonymous reviewers for helpful comments on earlier versions of this paper

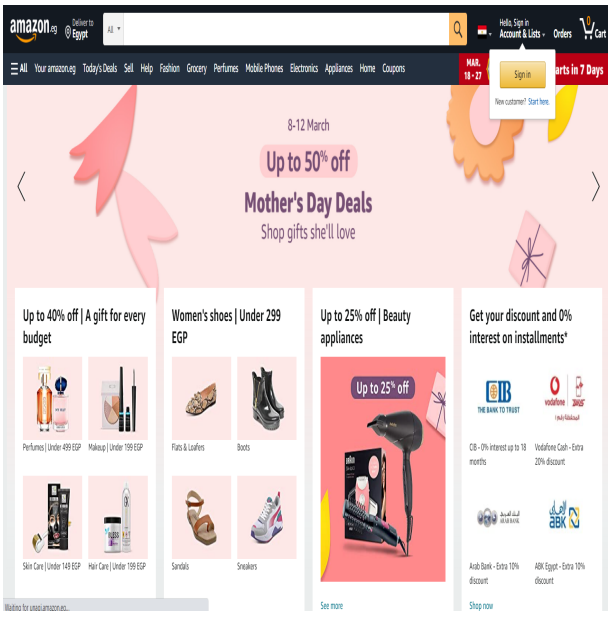
Appendix A. Audit notes–Team Member A (based on interview of Mr. Winter – Accounting Clerk – and review of supporting documents)

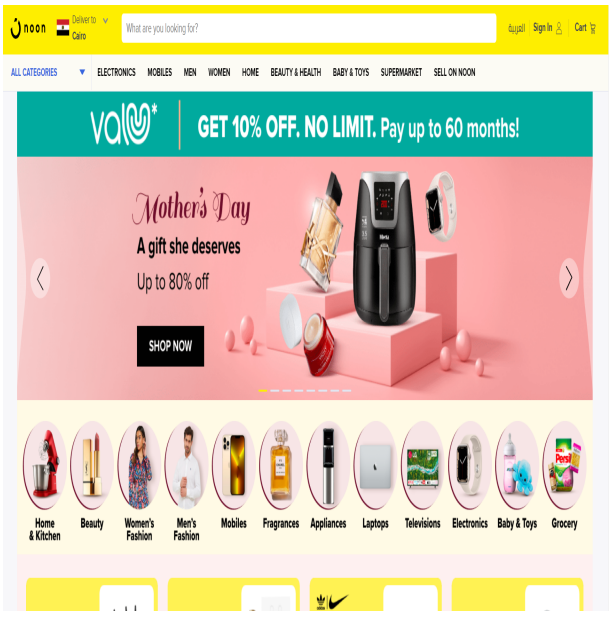
- On September 3, Ms. Spring, *the shipping and receiving supervisor*, supervised the receipt of laser-guided dustpans valued at $1000 each from Dust Bin, Inc., of Albany, Georgia.
- Ms. Spring amended invoice No. 54321 in light-blue pencil to show the number received and forwarded the invoice to the Inventory Control Department.
- On September 4, *Mr. Summer, the inventory control supervisor*, received invoice No. 54321 from the Shipping and Receiving Department.
- Mr. Summer personally inventoried the stock and verified the receipt.
- Mr. Summer photocopied the invoice and sent the copy to the Accounting Department for payment and filed the original invoice in his files.
- On September 5, *Ms. Autumn, the accounts payable supervisor*, received a photocopy of invoice No. 54321 and authorization for payment from Mr. Summer.
- Ms. Autumn then drafted a check for $300,000 and placed the completed check and invoice in the out-basket on her desk.
- On September 6, *Mr. Winter, an accounting clerk*, picked up a copy of



Criticism: Multi-channel retailing has boomed in the last 2 years since the COVID-19 outbreak. So, retailers went online to be able to adapt to the new circumstances which lead people to order most of their needs online. From clothes, tech products, home appliances, and even cars online. With that being said, there must have been an online hygienic website in order to fulfill people's needs for these types of products.

2.2 Business Applications





3 System Description

3.1 Problem Statement

Eama group is an importing company, that is concerned with importing hygienic products like toothbrushes, toothpaste, wipes, masks, etc. Afterward, they are used to selling to big pharmacies, and companies. And here comes the problem, that they only sell by wholesale, not for individuals. Moreover, after 2019, people became so lazy to order anything in person, and they got easier by the enormous amount of online stores. That's when our role comes in, building a web application to act as their online store and to allow normal individuals to have their hands directly on their products without going through pharmacies. Consequently, increasing their profits.

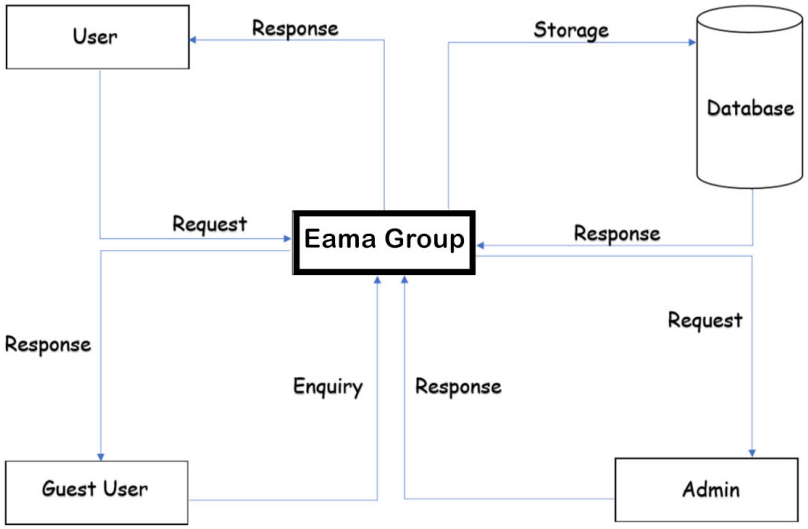
3.2 System Overview

The remaining sections of this document provide a general description, including the characteristics of the users of this project, and the functional and data requirements of the product. A general description of the project is discussed in section 2 of this document. Section 4 gives the functional requirements, data requirements, constraints, and assumptions made while designing the Eama website. It also gives the user viewpoint of the product. Section 3 gives the specific requirements of the website. Section 4 also discusses the external interface requirements and gives a detailed description of functional requirements. Section 6 is for supporting information.

3.3 System Scope

- The system shall have a stable link to the database.
- The system shall be instantly updated according to the number of stock left in the warehouses.
- The system shall provide the user to buy online, with different buying methods.
- The system shall have different method for huge no. of products to be sold to pharmacies, and supermarkets.
- The system should have good and easy interface to use.

3.4 System Context



3.5 Objectives

- The user shall be able to order online, and save it to his preferred list.
- If the user is supermarket, or pharmacy, he shall have discounts on the business propositions.
- The admin, shall be able to edit the products list, add them, remove them.

3.6 User Characteristics

Expected users are those who care about online shopping after the pandemic of COVID-19. Either for trying to buy hygienic products or for business propositions. They must have some basic knowledge about dealing with online shopping and should be able to deal with the user interface to search for a product and then to buy it.

4 Functional Requirements

4.1 System Functions

- The user shall register to buy from the website.
- The user able to see all displayed products.
- The user able to add/delete/edit from cart.
- The user shall rate the products.
- The admin shall be able to manage the database.
- The admin shall be able to manage users edit/delete.
- The admin shall be able to add users to be admins.
- The admin shall be able to manage registered users.

4.2 Detailed Functional Specification

function name Function Description	
Function	Register
ID	01
Priority	High
Critical	10/10
Description	Allow user register to the system
Input	User data
Output	Alert with registration status
Precondition	User not have account
Post-condition	User can buy online
Dependency	-
Risk	Internet connection is required

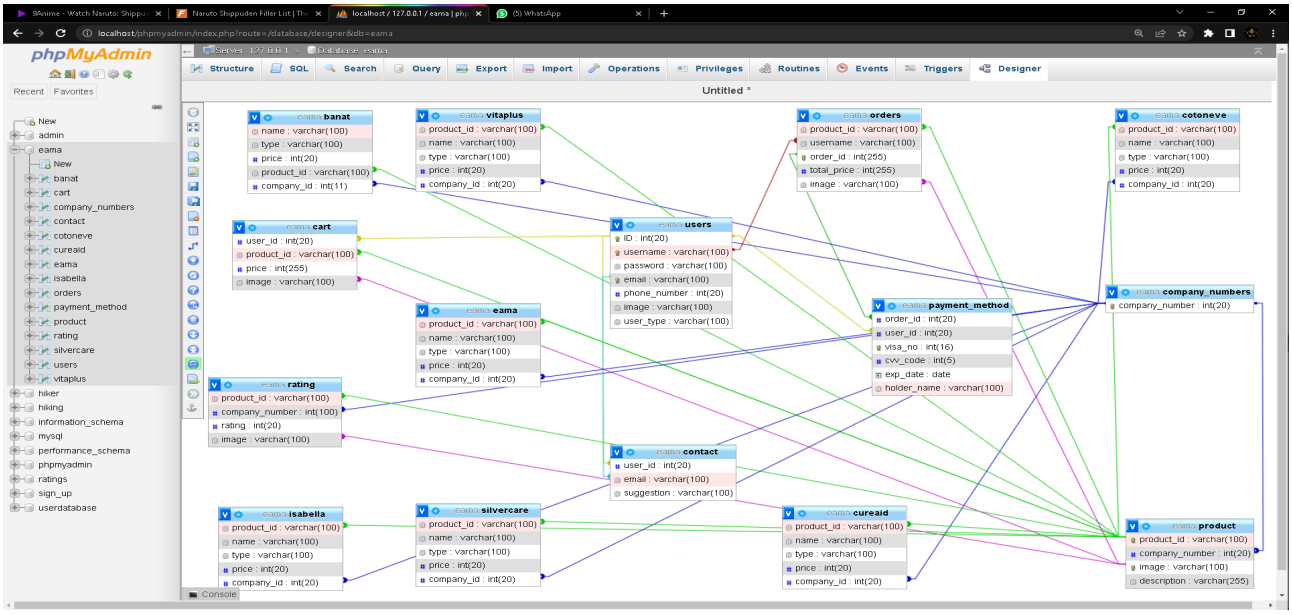
function name Function Description	
Function	Login
ID	02
Priority	High
Critical	9/10
Description	Allow user login to the website
Input	username and password
Output	login with account
Precondition	User already registered
Post-condition	User can buy online from website
Dependency	F01
Risk	Internet connection is required

function name Function Description	
Function	Display products
ID	03
Priority	Low
Critical	7/10
Description	Allow user to display products
Input	-
Output	list the products
Precondition	User logged in
Post-condition	User can list products
Dependency	F02
Risk	Internet connection is required

5 Non-functional Requirements

- Security: Users' passwords shall be encrypted by hashing functions to be securely saved in the database.
- Portability: It is a web-based system, so it can run on any device, either a computer or mobile device or any other device with an internet connection.
- The system shall have a user-friendly view, the interface should be easily used by the users. Functionality does not need time to be learned by the user.
- Performance and Speed: Performance is not an issue when it comes to our application, it can work perfectly and smoothly on any device.
- Evolution: The system is easy to update.

6 Data Design



7 Preliminary Object-Oriented Domain Analysis

8 Operational Scenarios

An admin will be able to enter the website, to add, edit, remove products from the website. This will include all the products, their information, their prices, and even products' description in case there's a product that has some ingredient changed. This is ultimately important because we're talking about hygienic and health products, so the percentage matters. Then the admin will specify a specific amount, if it got exceeded, the end-user will not be treated as an individual anymore, he will be treated as a wholesale customer buying in bulk. For example, if I bought 100 toothbrushes, that means that I probably own a pharmacy or a supermarket, so that I'll take a special discount with special post-sale treatment.

9 Project Plan

ID	Task	Number of Days	Start Date	Team Member
1	Requirement Gathering	1	26/2/2022	All
2	Requirement Analysis	2	28/2/2022	All
3	Architectural Designing	1	28/2/2022	All
4	Proposal Document	5	6/3/2022	Mohamed Mohamed, Mario Shady, Helmy Magdy
5	SRS	6	19/3/2022	Mohamed Mohamed, Mario Shady, Helmy Magdy
6	Database	5	17/3/2022	Mostafa Ashraf, Mohamed Mourad
7	FrontEnd	10	19/3/2022	Mostafa Ashraf, Mohamed Mourad
8	BackEnd	2	25/3/2022	Mostafa Ashraf, Mohamed Mourad

10 Appendices

10.1 Definitions, Acronyms, Abbreviations

- GUI : Graphical User Interface.
- COVID-19 : Coronavirus disease.

10.2 Supportive Documents

- https://www.sciencedirect.com/science/article/abs/pii/S0378720611000711
- https://sci-hub.se/10.1016/j.im.2008.12.002
- https://www.emerald.com/insight/content/doi/10.1108/13612020510586433/full/pdf?title=a-consumer-shopping-channel-extension-model-attitude-shift-toward-the-online-store
- https://sci-hub.se/10.1145/2337542.2337546