Enhancing Service Delivery through an Online Complaints System for Northern Ghana's Tertiary Institutions

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Abstract

This study investigated the factors hindering the successful implementation of online complaints system in tertiary institutions in Northern Ghana and developed an effective complaint system to enhance service delivery, using iterative waterfall models with CSS, MYSQL, JavaScript, HTML, and visual studio codes. To identify the factors hindering the successful implementation of online complaints system, a structured questionnaire was administered to a sample of 308 participants to ascertain the factors that influence the implementation of online complaints system. The findings revealed that lack of education and training, and inadequate resources are the key factors hindering the implementation of online complaint system. Consequently, a new complaint system was developed from this study which incorporated speech-to-text, and text-to-speech features to cater for the needs of diverse users, unlike the previous ones. This new complaint system was found to be cost effective since students only need access to internet connectivity to lodge complaints, unlike previous ones where students have to travel to school before lodging complaint. Finally, the new complaint system equally efficiently handles students' complaints by keeping a record of all previously lodged complaints of the user, this particular feature provides educational institutions with insights on the frequency of complaints lodged by users. Based on the results, it is evident that tertiary institutions which are looking forward to adopting and implementing students' complaints system, should consider educating and training for both staff and students on its usefulness. Also, tertiary institutions are encouraged to adopt and implement this system since it is less frustrating and cost effective.

Keywords: complaints, tertiary institutions, complaints management system, Northern Ghana, conventional human voice, complaints status

1. INTRODUCTION

Complaints are generally an objective expression of dissatisfaction and are initiated by dissatisfied customers to express their grievances [1], [2], [3]. According to [3], [4], and [5], when complaints are being responded to, it decreases the level of negative feelings. Complaints system on the other hand, refers to a set of procedures employed by organizations to resolve complaints [6]. According to [7], online complaints can be accessed across platforms, hence making services effective and convenient. In 2020, online complaints became the most popular complaints method used by individuals in lodging complaints [8] and there has been a rise in the preference for online systems since 2010 due to its reliability [9]. Complaints have played an important role for the growth of small and medium sized enterprises (SME). Notwithstanding, [10] posits lack of resources and IT-know-how as challenges facing these small and medium sized enterprises.

As numbers of students increase in tertiary institutions there is the need to develop and adopt a robust system to effectively and reliably handle complaints [11]. The adoption and implementation of complaint management systems would significantly improve user experience and transparency [12], [13]. More also, web-based complaints systems served as a reliable source of data for making informed decision among stakeholders of tertiary institutions [14]. Yet, students of tertiary institutions in Northern Ghana continue to use the manual system of lodging complaints which demand students to call or walk to various offices to lodge complaints.

In the manual system of complaints lodging, students are often given papers to provide their personal information and the problems they are facing, which in many cases are misplaced [15]. This system of lodging complaints used in tertiary institutions is frustrating and time consuming [16], [17] and it does not give students the ability to track the progress of their complaints [18]. Moreover, though several complaints systems have been developed and implemented in many organizations and institutions globally [19], [18], [16], these systems do not have speech-to-text and text-to-speech features to enable the hearing and visual impaired individuals to lodge complaints. Also, many authors [20], [18], [21] have acknowledged that most of the earlier developed online complaints system (OCS) do not show the complaints history of complainers.

Research by [22], pointed out user authentication issues regarding manual complaints login, with complainers always have write their personal information each time they are lodging complaints and also complainers not able to directly lodge complaints to management. Further, [22] posits that the manual complaints system encourages corruption as it is prone to fake complaints which are not possible to verify and complainers not able to give recommendations and

suggestions pertaining to better means of solving problems. In that regard, [16], [17] postulates that the manual system of lodging complaints is time consuming and frustrating.

Moreover, in Turkey for instance, [23] postulates that complainers do not have privacy to the complaints they make in the manual system. In their study, respondents revealed that employees can have access to customers' complaints even when they are not directly involved in resolving them. Besides, their paper reported that many of the companies in Turkey require human presence before complaints can be resolved and therefore concluded that manual way of lodging complaints is not cost effective. This paper therefore, identifies factors tertiary institutions should consider prior to implementing complaints system. It further develops a system which will allow students of tertiary institutions to conveniently lodge complaints online, lodge complaints using speech-to-text and text-to-speech features, view complaints histories and to be able to track the progress of their complaints.

1.1 Factors Affecting the Use of Online Complaints

Following the adoption and implementation of the online aspirations and complaints service (LAPOR) by the Indonesian government to foster engagements and interactions between the government and its citizens, [24] carried out a study to find out the reasons behind citizens support or resistance towards its implementation. Therein, lack of infrastructural and financial resources were found as the main factors hindering the implementation of the system. Notwithstanding, other studies for instance, [25], [7] have indicated that there were sufficient resources available for the implementation of LAPOR. These authors further acknowledged that there was rather, limited skilled personnel for the implementation process [10], [9]. [24] Further asserted that poor planning, lack of innovation by the government and lack of sense of urgency on the municipal assemblies, were also factors that hindered the implementation of LAPOR.

In attempt to make online complaints services better through commitments and innovations, [26] carried out a study to determine the factors that influence the application of strategic agility and web-based complaints systems in licensing services. The study revealed that among three factors considered, characteristics of workers was the most influential factor. More also, [6] postulates that reliability, response, trust, personalization and website design were the determinants on the use of online complaints systems. Again, low level of interest, lack of awareness, abject poverty, insufficient funding, misconceptions, weak administrative and supervisory capacity were identified by [27] as the main challenges associated with the implementation of online complaints systems in Nigeria. In affirmation, [28] posits that law enforcement officials and government should take the appropriate

measures to educate the legal professionals and the public on the essence of e-court.

Furthermore, [29] states that perceived usefulness, trust and satisfaction strongly influence the implementation of web application. These authors argued that application providers should improve their security responsibility commitment because it can directly or indirectly affect trust as already mentioned by [30]. Also, [31] argued that lack and inadequate training were the factors influencing the implementation of online applications. More also, [32] conducted a study using two experimental methods with sample sizes of 424 and 203 for case 1 and 2 respectively. The study found that the perception of conventional human voice (natural voices used in speaking without any digital effects) is a factor hindering online complaint in web-care.

1.2 Existing Online Complaints Systems

Study by [22] in response to the challenges faced by India in managing public complaints, developed a comprehensive complaint management platform to coordinate, track, monitor and resolve online complaints. It aided organizations with a tool, to target identified complaint areas and monitor organizations complaints management trends to facilitate improvements in business. Before the development of the proposed platform by the authors, there was prajavani. Clients used to register their complaints on prajavani however, they could not get feedbacks and they could not suggest solutions as to how their complaints could be resolved. The proposed online complaints system by [22] was an improvement on Prajavani, for it gives customers the ability to suggest solutions to their problems, get details of funds and it gives accurate location details of users.

Also, [18] undertook a case study to design a students' online complaint platform for English students. These authors used the prototype model called system development method to reduce the paper method of complaints lodging. The platform was developed to reduce the time and energy used by students in lodging complaints. However, the authors did not include features such as the administrator's login, text-to-speech and speech-to-text, forget password feature and students could not track their complaints. In view of this, [33] used micro service spring boot to design and develop a backend application for public complaints. They argued that micro service spring boot would help break the system requirements into smaller pieces and aid in increasing fairness and transparency in complaints lodging processes. However, the authors could not incorporate text-to-speech and speech-to-text features into the application to aid customers lodge complaints through speech.

Also using a generic approach, [19] developed an "electronic-customer complaints management system (E-CCMS). The implementation of this system opens opportunities to many organizations in building their own systems, regardless the number of complainers. However, the proposed electronic-customer complaints management system only accepts text as inputs and also, customers could not track their complaints and their complaints status were unknown until they are resolved.

An online police complaint management software was developed by [34] employing block chain technology in order to prevent unauthorized access to police complaints. The portal provided strong evidence of filled complaints, in instances where the police denied receiving complaints or forgot to document complaints due to pressure. It was found that the portal, helped reduce corruption activities and the handwritten format of filling complaints. Similarly, [35] developed an application for lodging complaints in Wilaya of Mila and named it "FixIt and FixIt W". The application was developed to replace "VoraxAgent", which was used in Wilaya of Mila. It was designed to handle large numbers of complaints and to provide 24 hours service, to enable complainers to lodge complaints anytime of the day and at anywhere.

Study by [36] built a citizen's online complaint system used in Labuhanbatu, Indonesia named LAPOR. It was designed using the waterfall model, which includes four different phases: starting with analysis of system requirements pertaining to the functional and non-functional requirements of the system design, implementation, and testing. LAPOR was designed to aid the citizens of Labuhanbatu to make online complaints, track complaints and receive reports on the status of their complaints. However, it was not flexible to be adjusted to the needs and structure of tertiary institutions, as it was strictly designed to aid citizens lay complaints to the government. In a related study, a complaints registration and management Software was developed by [37]. The application aided users to lodge complaints without necessarily going to the officers involved until the problem is resolved. It aided citizens to lodge complaints in relations to faults in street lights, water pipes leakages, rain water drainage, garbage systems and road construction works. The implementation of the program transformed the manual system of complaints lodging, to an automated system for better management of complaints however, it was designed for android devices only.

Complaints handling system is considered as one of the important platforms for companies and organizations to improve upon their customer service. Leveraging on the importance of online complaints systems, [23] proposed an online complaint handling platform for customers, to conveniently lay their grievances, dissatisfaction and disappointments. A global positioning system (GPS) device was introduced into the proposed program to enable it track locations of users with ease [38]. However, the developers could not incorporate text-to-speech and speech-to-text features into the program to aid customers lodge complaints

through speech. Furthermore, [39] undertook a study to develop online complaints management platform, it was designed on the basis that the existing system only allows users to post complaints but do not get details of their complaints. Also results from their study proved that the existing platform was not user friendly. The programmers therefore developed a complaints management system, to make it easier to coordinate, monitor and resolve complaints. They also provided companies with effective complaint tools to identify problem areas, and to enhance the processes of resolving complaints within the shortest period of time.

More also, a students' web-based complaint management platform was developed by [16], using waterfall methodology. It was found that the designed platform aided students to lodge complaints in an easier manner and also helped students to track their lodged complaints. However, it lacked a feature where visual and hearing impaired persons would be able to use for lodging complaints. Similarly, [17] using the prototype model developed a system which manages students' complaints. The literature reviewed shows that several research works have been done on the factors influencing the implementation of online complaints systems in many organizations and countries [25], [26], [24]. Perhaps, much attention had not been paid on how insufficient funding, lack of technological facilities, organizational structure of the institutions, education and training on the relative advantage of the system and availability of IT personnel, influence the implementation of online complaint systems in tertiary institutions across northern Ghana. Also, the literature reviewed indicates that, the existing systems do not display complaints history [17], [20], [21]. The literature reviewed indicates further indicated that, the existing systems used in institutions and organizations lack features such as administrators' login, updates on administrators' information, forgotten password, speech-to-text and text-to-speech. Hence, this paper proposes an online complaints system which gives students updates on the progress of their complaints, shows complaints history and give visual and hearing impaired the opportunity to lodge complaints by using speech-to-text and text-to-speech feature.

2. METHODS

This research considered quantitative approach by administering a structured questionnaire to gather empirical data on the various aspects of the problem to be addressed. Quantitative research approach involves assessing and measuring variables in order to create results. It encompasses examining numerical data by utilizing appropriate statistical methodologies to produce responses to queries [40]. As this study seeks to analyse numerical data using various statistical tools to provide answers to the research questions, thus used quantitative approach. [41] accounted that a quantitative study is best designed for describing and determining the level of relationships and influences between two or more variables, and a

suitable choice for studies that used questionnaires as data gathering tools. This research considered the quantitative approach because the study delved into factors that influence the implementation of online complaints system using a structured questionnaire. It also integrated iterative waterfall methodology to achieve its aims. The stages involved in iterative waterfall model are illustrated in Figure 1.
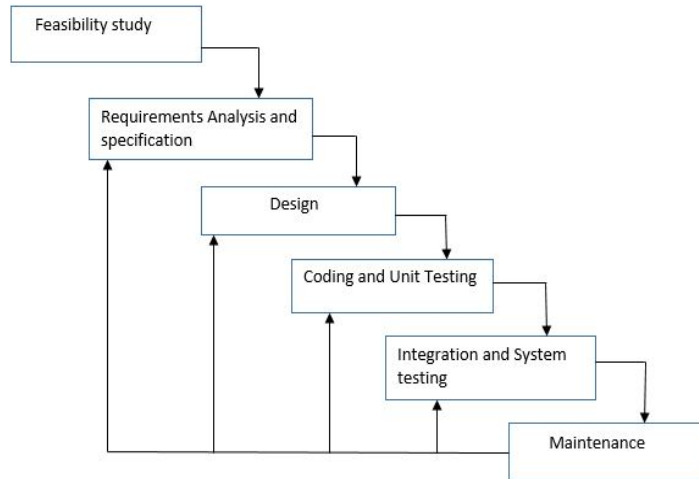

Figure 1. Iterative waterfall model

2.1 Feasibility Study

Feasibility study was carried out to assess how the online students' complaint system could be implemented. Results from the questionnaire have shown that tertiary institutions in Northern Ghana have the needed support from stakeholders, IT personnel, funding, technological facilities, willing to migrate onto online, know the usefulness of the system and have the needed systems to integrate the online students' complaints system. However, education and training were needed to successfully implement it.

2.2 System Requirements Analysis and Specification

Taken into consideration all the setbacks and the weaknesses of the existing online complaints system, the functional requirements for the online students' complaints system (SCS) were identified. The functional requirements are as follows:
1) The system should be able to run on web-based devices
2) Users should be able to do registration and log onto the system
3) Users should be able to lodge complaints either using text or using speech-to-text/ text-to-speech
4) Users should be able to view and track their laid complaints

5) Users should be able to update their lodged complaints
6) Staff would be able to view and resolve laid complaints
7) Admin and staff would be able to add and delete students
8) Admin would be able to view all complaints laid, add and delete staff and resolve complaints

2.3 System Design

System design is the conceptualization and creation of the software or its components. This implies that the requirements gathered during requirements analysis phase would be translated into a detailed design that defines the system's implementation and operations.

2.3.1 Use Case Diagram of Online Students' Complaint System

Use case diagram simply illustrates what the system does and how the system interacts with various actors [18]. The use case diagram shows the features and functionalities of system and how students, staff and the system administrators use the features available in the system to accomplish tasks as shown in Figure 2.
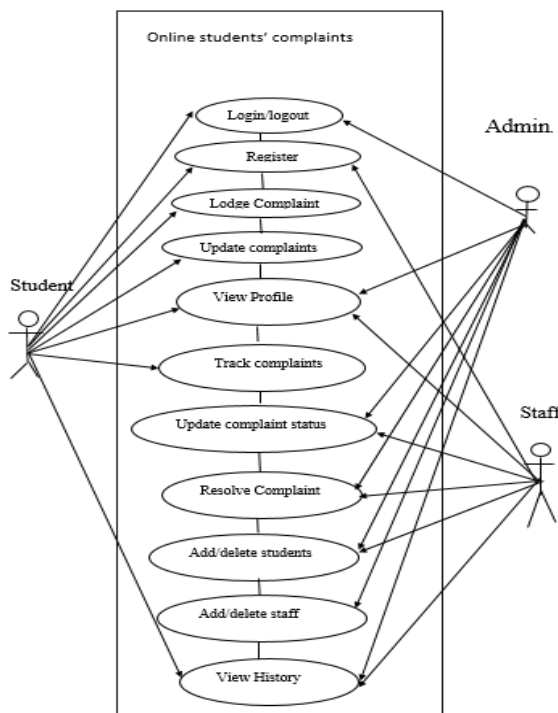

Figure 2. Use case diagram of the proposed system

2.3.2 Flowchart of the Online Students' Complaint System

Figure 3 is a flowchart depicting the step-by-step processes involved to complete tasks in the designed online complaints system. Users launch the system, to a login page where they have to authenticate their details in order to have access into the system. Users may login, as administrators, staff or students. As shown in Figure 3, students have access to lodge, update, track and view complaints status while staff and other administrators have access to view, resolve, update complaints status have full control over the system. The system's modules were tested to ensure that each was properly performing as expected.
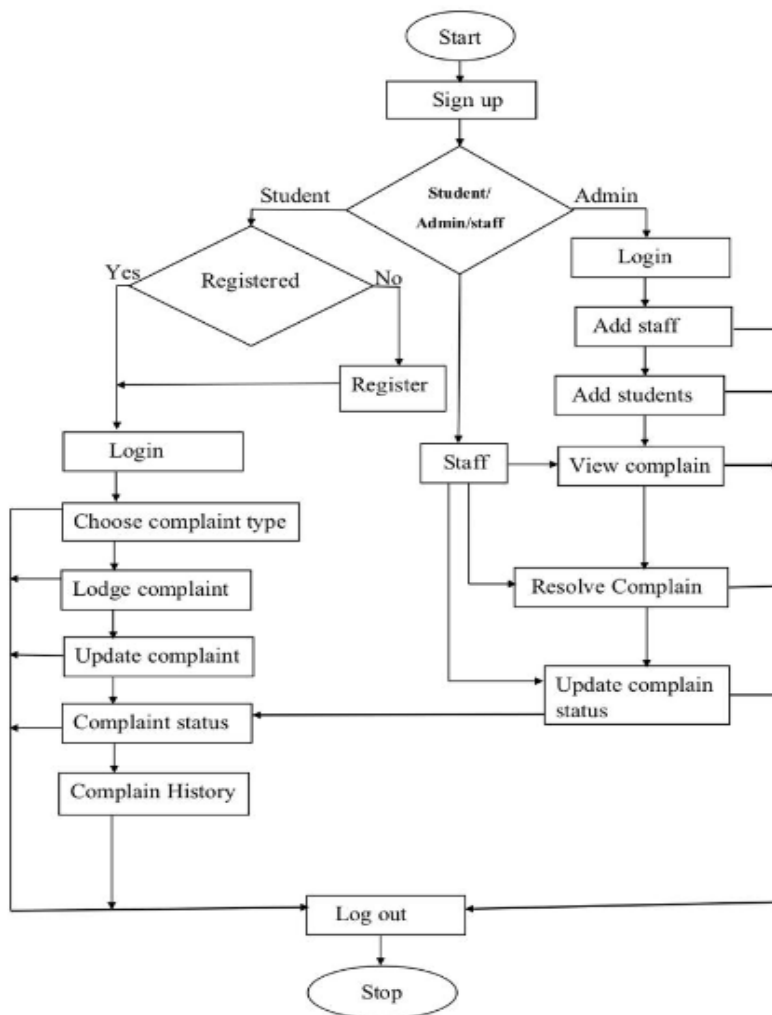

Figure 3. Proposed online students' complaint system flowchart

2.3.3 Entity relationship Diagram for the Online Students' Complaint System

Figure 4 depicts the entity relationships in the system. It illustrates the relationship between entities in the designed students' complaints systems. It details how entities such as students, complaint count, users, complaints, staff, and administrators are related to each other within the system.
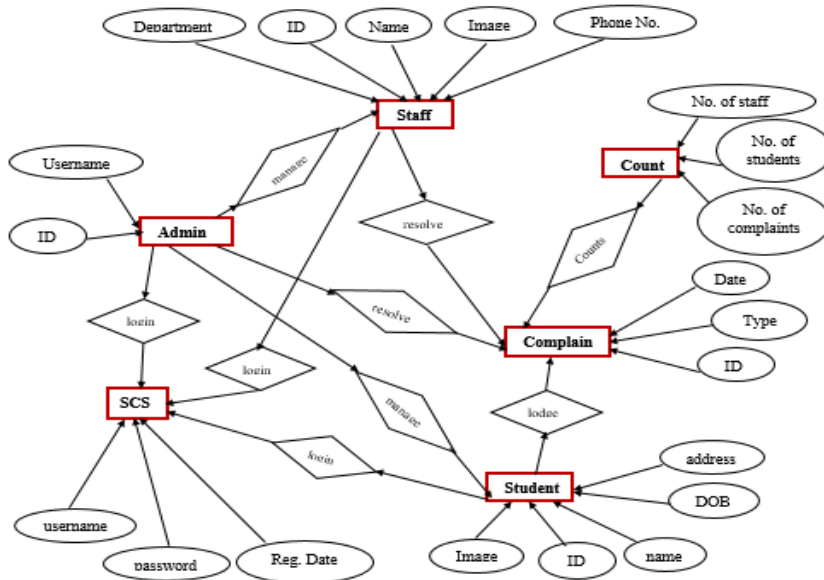

Figure 4. Entity relationship Diagram for SCS

2.4 Coding and Unit Testing

The various modules of the system were coded, after which each module was tested, and was found working properly as expected. Unit testing was done to check the software unit data structures, logic, and boundary conditions against the design. Unit testing was done to make sure that each module is working properly. Isolating and testing individual units ensures they function properly and complete their tasks.

2.5 Integration and System Testing

The software system interactions and interdependence was tested by integrating the modules, which enable the developer to analyze how they work together and to identify any potential faults that would arise for maintenance.

2.6 Target Population, Sample and Sampling Techniques

The sample for this study is derived from the targeted population of tertiary institutions across Northern Ghana. According to the Ghana Tertiary Education Commission report (2023), there are 23 accredited tertiary institutions in the five regions of northern Ghana. Data on the population was unavailable. As a result, it was difficult to ascertain the total number of individuals within the target population. Hence, non-probability sampling technique (convenience sampling) was employed. Convenience sampling is a sampling technique where participants of a study are selected based on their availability, accessibility and willingness to participate in a study [42], [43]. The participants for this study were selected based on their accessibility and relevance to the study's objectives. Among the lot, the link to the questionnaire was shared to 308 participants agreed to take part in the study. This was made up of 255 students, 13 parents and 40 staff, with parents contacted through their wards.

2.7 Data Collection Tools and Procedures

Data for this study was collected through a structured questionnaire, which was developed using Google forms and administered to students, parents and staff, across various tertiary institutions in northern Ghana, through their class WhatsApp platforms with the facilitation of both class representatives and lecturers. The participants were allowed to freely participate in the study with no one coerced or pressured.

3. RESULTS AND DISCUSSION

3.1 Predominant Factors that Influence the Implementation of Online Complaints System in Northern Ghana

Figure 5 provides a detailed summary of factors that influence the implementation of online complaints system by tertiary institutions in northern Ghana in an ascending order. The summary of the results shown above indicates that, education and training (which had the highest average mean score of 3.57) is the predominant factor influencing the implementation of students' online complaints system in tertiary institutions across northern Ghana, followed by perceived usefulness of the system, resistance to change, institutional support, IT personnel, compatibility, technological facilities and lastly funding and planning. This indicates that there is the need to incorporate education and training session (user guides) into the system, to train and educate users on how to use the designed online students' complaints system (SCS).
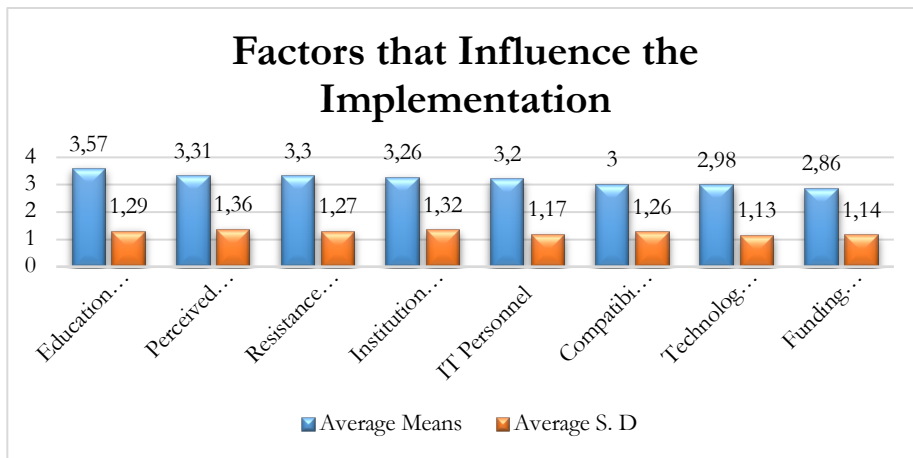
Figure 5. Factors influencing the implementation of online complaint system

3.2 Components of the Online Students' Complaints System (SCS)

The proposed SCS is categorized into three main phases, these include: administrator, staff and students' phases. The students' phase allows students to lodge, track, update, and view their complaints. This phase is specifically designed to enable students make online complaints. After students have successfully lodged their complaints, the system directs the complaints to their respective departments for resolution. The staff phase is designed to enable members of staff from the various departments, to have access into the system. It gives staff the ability to view complaints lodged to their department and it gives staff the ability to resolve complaints that were lodged by students. The administrators phase highlights the principal functionalities that are available to the administrators. These functionalities include add and delete staff, resolve complaints, update information in the about tab, and the ability to add and delete students. The various sections of the online students' complaint system have been outlined in the Figures 6-14.

SCS Home Page User Guide Page: The home page serves as the landing page for visitors, it provides brief overview of the system. This page also serves as the starting point for users launching the system as depicted in Figure 6. Also, in Figure 7 is the user guide page which provides training and education on how to use the designed online complaints system. It provides a step-by-step guideline on how to use and navigate through the system*.*
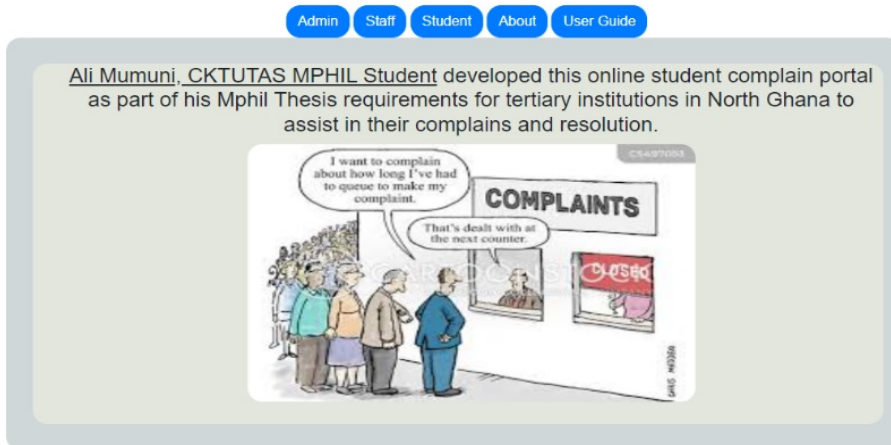
Figure 6. SCS Home Page

User Guide Page: This page provides training and education on how to use the designed online students' complaints system. It provides a step-by-step guidelines on how to use and navigate through the system. Users can read and learn about the various functionalities that are available in the system in a systematic manner.
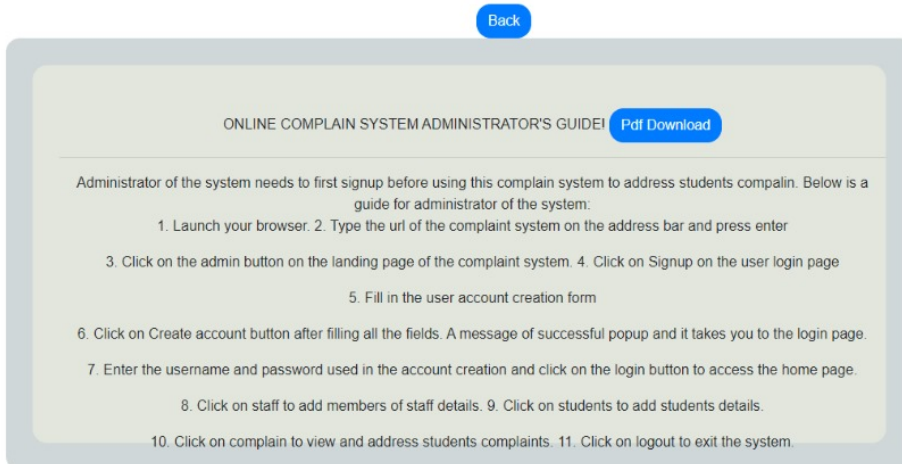

Figure 7. User Guide Page

Login page: Shown in Figure 8, is the login page which allows users who have already signed up onto the system, to have access to the various functionalities. Users must enter a valid username and password in order to have access into the system.
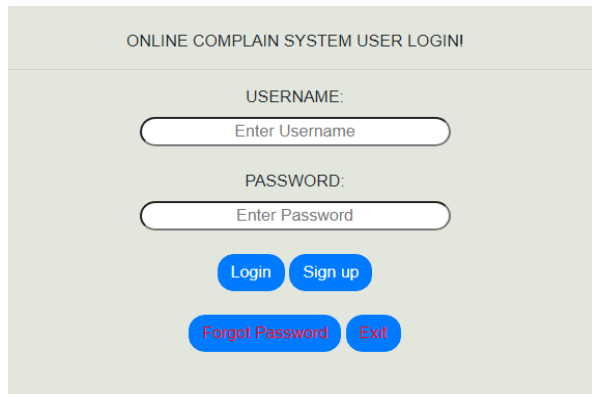
Figure 8. Login page of SCS

Lodge Complaint Page and Start Tab: The lodge complaint tab on the students logged in dashboard shown in Figure 9, allows students who have successfully logged into the system to make complaints. It allows students to lodge complaints by selecting the complaint type and students can lodge complaints either by typing or through speak-to-text feature by clicking on the start tab.
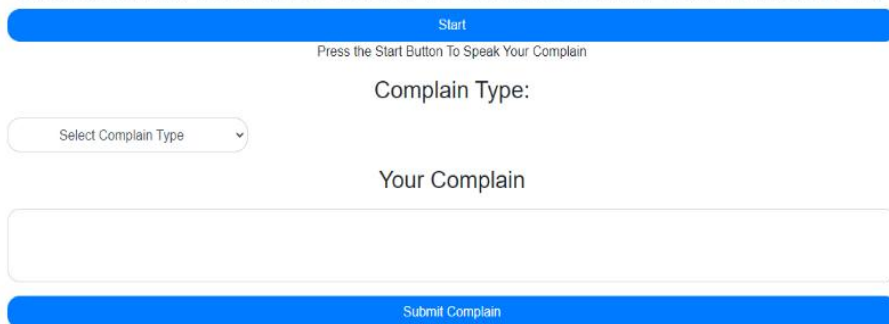

Figure 9. Lodge Complaint Page

Complaints Status: Figure 10 below show the complaint status of lodged complaints. when a complaint is lodged its status will be indicated as pending and a short message will be sent to the complainer's number, indicating his or her complaint is pending. When viewed by a staff the status will change to read and the name of the staff who viewed it will equally appear. Also, if the complaint is finally resolved the system will indicate to the user that, it has been resolved and it will display the name of the staff who resolved the complaint. The System will indicate otherwise if the complaint isn't resolved.

S/N	Ref	Type	Status	Date	Action
1	275854	Academic	READ by Ali Muniratu	12-05-24	Read||Listen||update
2	583467	General	READ by Ali Mumuni	13-05-24	Read||Listen||update
3	645235	ICT Directorate	RESOLVED by Ali Muniratu	15-05-24	Read||Listen||update
4	975263	Financial	LISTENED by Ali Mumuni	14-05-24	Read||Listen||update
5	982573	ICT Directorate	PENDING	15-05-24	Read||Listen||update

Figure 10. Complaints Status

Delete and add Students Page on the Staff Dashboard: This section allows staff to view complaints lodged to their department and it enables the staff to add new student, delete existing student from the system, update students' details and make quick searches on students' details in the system. Figure 11 shows view and add student page of the staff dashboard.

Figure 11. Delete and Add Students Page on the Staff Dashboard

Complaint Page for Staff: After a staff has logged into the system, this dashboard gives staff access to view complaints which were lodged to their department. It further contains resolve complaint tab, which allows staff to resolve complaints from students and as well as search for students' complaints.

Figure 12. Complaint Page for Staff

Resolve Complaint Tab: The resolve complaint tab allows administrators to resolve complaints. Figure 13 shows the resolve complaints pages of the admin, which allows administrators to resolve lodged complaints from students.
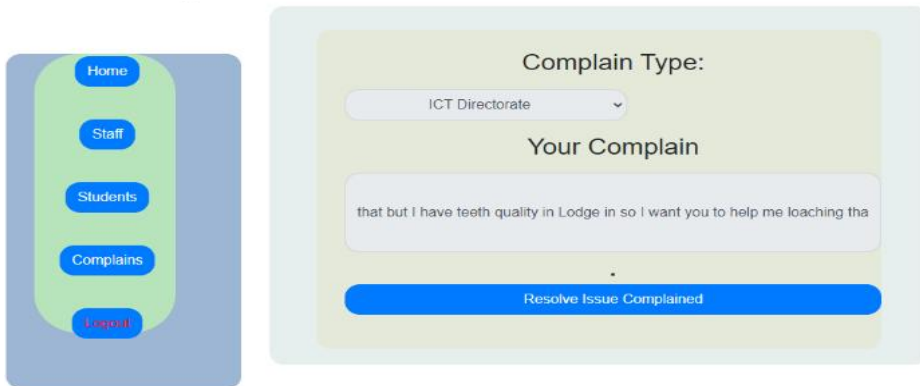
Figure 13. Resolve Complaint Tab of the Admin

Listen Tab: This tab gives users the ability to listen to lodged complaints instead of reading, users who might be facing visual issues and users who might not be facing these challenges but prefers to listen than reading can opt to use this feature. The listen to complaints tab is shown in Figure 14, this tab is available on users' dashboards.

Figure 14. Listen Tab

3.3   System's Effectiveness Evaluation

The following analysis was conducted to evaluate the effectiveness of the designed online system for the targeted tertiary institutions. This is shown in Table 1 through to Table 3.

Table 1. Evaluating the Phases and Usability of the Online Students' Complaints System

Students' phase		
Responses	Frequency	Percent (%)
Agree	60	94
Disagree	1	2
Not sure	3	4
Total	64	100
The staff phase		
Responses	Frequency	Percent (%)
Agree	51	80
Disagree	8	13
Not sure	5	7
Total	64	100
Administrators' phase		
Responses	Frequency	Percent (%)
Agree	62	97
Disagree	0	0
Not sure	2	3
Total	64	100
How would you rate the performance of the online students' complaints system?		
Responses	Frequency	Percent (%)
Excellent	45	70
Average	17	27
Poor	2	3
Total	64	100.00
Are you satisfied with the existing complaints system used in your school?		
Responses	Frequency	Percent (%)
Satisfied	5	8
Dissatisfied	59	92
Total	64	100.00
Generally, how satisfied are you with the online students' complaints system?		
Responses	Frequency	Percent (%)
Satisfied	63	98
Dissatisfied	1	2
Total	64	100.00
Suggestions for the improvement of SCS		
Responses	Frequency	Percent (%)
No suggestions	42	66
Upload complaints tab	8	13

Students' phase		
Email messaging	14	21
Total	**64**	**100.00**

Table 1 presents the evaluation of phases of the online students' complaints system (SCS), in supporting important processes relating to complaints management. Assessing the students' phase: 60 respondents representing 94% agreed to the importance of this phase and 1 respondent representing 2%, disagreed with the statement, whiles 3 respondents representing 4% were unsure about its significance. Also, in assessing the staff phase, 51 respondents representing 80% agreed that this phase was crucial towards complaints management. 8 respondents representing 13%, disagreed to some extent, while 5 respondents representing 7% were not sure about the relevance of this phase. In evaluating the administrators' phase, 62 respondents representing 97% agreed that it is important to include this phase. No respondents disagreed, 3% were unsure.

Table 1 presents the evaluation of the usability of the online students' complaints system, including its performance, satisfaction, its helpfulness and suggestions for improvement.   Regarding the performance of SCS, 45 respondents which constituted 70% rated its performance as excellent. 17 respondents representing 27% rated its performance of the system, average and 2 respondents representing 3% indicated that SCS performance was poor. In terms of users' satisfaction in respect to the existing complaints management system used in their schools, five (5) respondents which constituted 8% indicated that they were satisfied with the existing complaints system used in their schools. However, 59 respondents representing 92% indicated that they were dissatisfied with the existing complaints system. More also, 63 respondents which constituted 98% indicated that they were satisfied with the proposed online students' complaints system. However, 1 respondent representing 2% indicated that they were dissatisfied with the performance of SCS. Table 1 further presents the participants' responses regarding their suggestions for improving the online students' complaints system. 42 participants representing 66% did not provide any suggestions. However, 8 participants constituting 13% suggested that there should be an upload tab, where users can upload documents pertaining to complaints. Also, 14 participants (21%) suggested that email messaging should be incorporated to update users of their complaint's status.

Table 2. Evaluating the Usability of the Online Students' Complaints System (SCS)

Do you agree that the designed online students' complaints system is easy to use?		
Responses	**Frequency**	**Percent (%)**

Yes	59	92
No	5	8
Total	64	100

Do you agree that the existing complaints systems is easy to use?

Responses	Frequency	Percent (%)
Yes	15	23
No	49	77
Total	64	100

Which of these complaints systems do you think is user friendly?

Responses	Frequency	Percent (%)
Online students' complaints system	60	94
The existing complaints system	4	6
Total	64	100

Do you agree that the online students' complaints system is reliable?

Responses	Frequency	Percent (%)
Yes	55	86
No	9	14
Total	64	100.00

Do you believe that existing complaints system is used in your school is reliable?

Responses	Frequency	Percent (%)
Yes	13	20
No	51	80
Total	64	100.00

Does the designed online students' complaints system provide all the functionalities you needed?

Responses	Frequency	Percent (%)
Yes	62	97
No	2	3
Total	64	100.00

How would you rate performance of the existing complaints system used in your school?

Responses	Frequency	Percent (%)
Excellent	10	16
Average	9	14
Poor	45	70
Total	**64**	**100.00**

Table 2, shows the usability validation of the online students' complaints system. In terms of the designed online students' complaints system being easy to use, 59 respondents representing 92% agreed that it easy to use. While 5 respondents representing 8% disagreed.15 respondents representing 23% agreed that the existing complaints management system is easy to use whiles 49 respondents representing 77% disagreed to the statement that it is easy to use. More also, 60 respondents representing 94% agreed that the online students' complaint system (SCS) is user friendly whiles 4 respondents representing 6% believed that the existing complaints management system user friendly. Regarding SCS being reliable for managing complaints in tertiary institutions, 55 respondents representing 86% agreed that the online students' complaint system (SCS) is reliable whereas 9 respondents representing 14% believed that it is not reliable. 13 respondents representing 20% agreed that the existing complaints management system used in their schools is reliable whereas 51 respondents representing 80% disagreed.

Furthermore, 62 respondents representing 97% agreed that the online students' complaints system has all the functionalities they needed. Whereas 2 respondents representing 3% disagreed that SCS has all the functionalities they needed. 10 respondents which constituted 16% rated the performance of the existing complaints management system as excellent. 9 respondents representing 14% rated its performance average whereas 45 respondents representing 70% indicated that the existing complaints management system is poor in terms of performance.

Table 3. Comparing SCS to Similar Existing Systems

Features	SCS	LAPOR by Munandar et al. (2022)	Online Complaints Management System by Afify and Kadry (2019)	Student Complaints Management System by Manuhutu and Uktolseja (2018)
User registration	✓	✓	✓	×
User login	✓	✓	✓	×
Forget password	✓	✓	✓	×
Lodge complaints	✓	✓	✓	✓
Update complaints	✓	✓	×	×
Track complaints	✓	✓	×	×

Features	SCS	LAPOR by Munandar et al. (2022)	Online Complaints Management System by Afify and Kadry (2019)	Student Complaints Management System by Manuhutu and Uktolseja (2018)
Complaints history	✓	✓	×	✓
Resolve complaints by Staff	✓	✓	×	×
Admin add and delete complaints	✓	✓	✓	✓
Admin add and delete Staff	✓	✓	×	×
Admin add and delete students	✓	✓	✓	✓
View all complaints	✓	✓	✓	✓
Resolve complaints	✓	✓	✓	✓
Speech to text and text to speech	✓	×	×	×

Table 3 indicates that, some the existing systems used in institutions and organizations lack features such as user authentications, user login, complaints updates, forgotten password, complaints tracking, speech-to-text and text-to-speech. Whereas the proposed online students' complaints system gives students updates on the progress of their complaints, and as well as gives the visual and hearing impaired the opportunity to lodge complaints by using speech-to-text and text-to-speech features.

3.4 Discussion

Education and training were found to be the predominant factor influencing the implementation of online complaints systems. These findings are similar to that of [44] who concluded that lack of training and educations were the factors influencing the implementations of systems. More also, this study's findings is consistent with [28] who found out that education and training were the first

factors to consider prior to the implementation of online systems (e-court). In contrast, perceived usefulness and trust were found to have influence the implementation of electronic systems [29], [30]. [24] found that lack of infrastructural and financial resources were the main factors hindering the implementation of LAPOR. Moreover, several studies for example, [9], [25], [7], [10] have indicated that, availability of skilled personnels should be considered prior to the implementation of online systems.

Further, the features of the proposed online students' complaints system are in line with what [36] suggested during the development of LAPOR. They suggested that, the system should be able to authenticate users' credentials, allow users to make online complaint, view reports on complaints and to tract their complaints. Also, similar features were suggested by [17], [16], [37].

Previous studies conducted by [36], [23], [20] suggest that tracking functionality should be integrated into OCS to aid complainers know their complaints status, by indicating whether their lodged complaints are received, pending, resolved or rejected. This suggestion is consistent with what is being incorporated into SCS to track complaints however, [33] suggest that users of OCS should indicate by themselves, whether their complaints are resolved or otherwise.

Unlike the designed complaints systems by [22], [18], [19], online student's complaints system incorporated feedbacks to update complainers about the progress of their complaints. The complaints status page and the short massage services concurrently indicate to complainers what has been done on their lodged complaints. Also, the proposed online student's complaints system incorporated text-to-speech and speech-to-text functionalities, which allows visual and hearing impaired to be able to lodge complaints, unlike the existing complaints management systems that were designed by [33], [18], [23], [16], [37]. The text-to-speech and speech-to-text functionalities give users the opportunity to either read or listen to lodged complaints. This therefore makes the proposed system more accessible to all users, be it users with or without visual or hearing impairment.

Furthermore, this system displays complaints history, which was not available on the existing student complaints management systems that were proposed by [17], [20], [21]. Regarding security, this system employed a role-based access control which grants users a certain level of access necessary to perform their task compared to the complaints system that was developed by [18]. The functionalities accessible to users on SCS are customized to their roles in the institutions, which provides limits to which users can have access to particular features in the system.

4.   CONCLUSION AND RECOMMENDATION

This study conducted a comprehensive analysis, to identify predominant factors, which influence the implementation of online complaints system in northern Ghana. It developed an online students' complaints systems which incorporated speech-to-text and text-to-speech and complaint tracking functionalities using the iterative waterfall method, to help tertiary institutions across the northern part of Ghana to manage complaints. A questionnaire was used to gather primary data, from students, parents and staff of these tertiary institutions. The results showed that education and training were the predominant factors that influence the implementation of online complaints systems across tertiary institution in the northern part of Ghana, followed by perceived usefulness of the system, resistance to change, institutional support, IT personnel, compatibility, technological facilities and lastly funding and planning. Furthermore, the designed online complaint system was designed and tested and it was confirmed from the test that the system is working as intended. Per the findings of this study, tertiary institutions should focus on educating and training both staff and students on the need and how to use the platform. Effective education and training can help stakeholders of tertiary institutions to effectively use the system. Also, stakeholders' attention should be drawn to the benefits that come with adopting online students' complaints system, especially its potential of reducing cost, saving time and being less frustrating.

The adaptation and implementation of this system will not only reduce cost, increase transparency, accessibility and improves complaints handling efficiency but also serves as a step towards transforming the manual system of lodging complaints among tertiary institutions in Ghana onto digital platforms. More also, the complaints data will guide stakeholders to make informed decisions as to how recurring and emerging challenges could be properly handled in the Ghanaian educational institutions. These informed decisions guide the educational sector in the appropriate allocation of resources. The incorporation of text-to-speech and speech-to-text functionalities give users who are visual and hearing impaired the opportunity to lodge complaints which aligns with the national goal of inclusivity. To establish a broader digital foundation in order to optimize the essence of this system, efforts must be driven towards integrating the proposed system into the electronic platforms of students and administration.   Additionally, future researchers should focus on developing an application version of this system for both android and iOS smartphones.

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