

Vernin – Android Platform for PWDs to connect with voluntary Scribes & Readers

Kunal Kasa^{1*}, Ajit Goud¹, Akash Mishra¹, Shweta Sharma²

¹Student, Computer Engineering, Atharva College of Engineering, Mumbai University, India

²Asst. Professor, Computer Engineering, Atharva College of Engineering, Mumbai University, India

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*Corresponding author:

Kunal Kasa

e-mail: meetkasakunal@gmail.com

Abstract

Physically challenged students do not have it easy when finding suitable Scribes and Readers for their examinations. The reasons are evident as there is no one particular platform for them to post their requirements to get quick responses, unlike the traditional means that are not efficient and take a lot of time and effort. Availability, Compatibility, Eligibility of Scribes/Readers are a few of the major concerns for PWDs while finding a suitable Scribe/Reader. For this problem, a single platform that will help to connect PWDs with Scribes/Readers who are voluntarily interested in helping PWDs with their examinations is necessary. Vernin is an Android platform for PWDs and voluntary Scribes both to create a better community for PWDs and Scribes where effective communication can be carried out. On this platform, PWDs can post their requirements and on the other hand, interested Scribes can accept those requests, connect with the PWD and ultimately help them with their examinations. They were resulting in reducing the gap between PWDs and Scribes. The purpose of this paper is to discuss the existing solutions, their drawbacks, proposed solution, methodologies implemented, and techniques used to achieve the required result.

1. INTRODUCTION

In the past only visually-impaired people could avail for Scribes/Readers/Lab assistant for their exams and the examination board would provide Scribes to PWDs but after “The Rights of Persons with Disabilities Act, 2016, Gazette of India (Extra-Ordinary); 28 December, 2016”, there was a change in the number of categories of disabilities who could now avail for scribes/readers/lab Assistants, 21 new different categories of disabilities were added. The Scribe/Reader/Lab Assistant facility should be allowed to people with benchmark disability, which is defined under section 2(r) of the Rights for PWD Act 2016. Also, now the PWDs can bring their own Scribes/Readers, thus resulting in people opting for own Scribes/Readers for their examinations. The current methods adopted for finding Scribes/Readers are inefficient; platforms like Social Media, Schools, Colleges, NGOs etc. are being used for finding Scribes/Readers. An efficient solution for this problem is evident as finding suitable Scribes/Readers is a difficult task for PWDs. To make this entire process of finding Scribes/Readers who are voluntarily interested in helping out the community, we have “Vernin,” an Android platform where PWDs can post their requirements and Scribes/Readers who are interested in volunteering for that examination can accept the request and connect with the PWD on the provided messenger functionality within the application. Thus, ultimately making the process of finding suitable Scribes/Readers easy. This then helps to boost the morale

of the PWD to concentrate on their exams rather than on the possibility of finding a scribe/reader.

2. LITERATURE SURVEY

2.1. Current methods for finding Scribes/Readers

A common approach PWDs use to find Scribes/Readers is Social Media. Platforms like WhatsApp, Facebook, Twitter, etc. are being used, on WhatsApp messages are drafted with the specific requirements of the PWD,

- Exam Venue
- Date and Timings
- Eligibility/Qualifications
- Number of Exams
- Exam Medium
- Type of Exam etc.

and are circulated through Student, Organizational WhatsApp Groups so as to hope to receive a response from someone. Also, WhatsApp status is also used to share the message with a specific person's contacts quickly. Several Organizations are operating for the welfare of physically challenged students they also use this method for finding Scribes/Readers for PWDs in their organization. Facebook and Twitter are also few of the Social Media sites where messages/tweets are shared to reach out to more audience. [5]

2.1.1. Problems faced when Social Media is used for finding Scribes:

Target Audience is the key point to be noted when Social

Media is considered, things get saturated when messages are circulated to no avail. Target Audience is not specific every time, consider a message for a Scribe requirement is shared in a group of 60 people who haven't ever been a Scribe ever before. The chances of getting a Scribe from that group is very less. So, Target Audience is a matter of concern when using Social Media for finding Scribes/Readers. Indeed, there can be specific groups with people who have volunteered as scribes in the past, but again availability and eligibility are to be considered.

Social Media is saturated in nature; with all different types of content, groups, posts, messages etc., circulating in Social Media it is easy to skip over the matter at hand, which is important. Even there are specific groups for scribes, the number of groups will again create saturation of community. This will then lead to spamming of messages in every group, leading to ignorance of the message and PWDs not getting desired Scribes.

Another approach that PWDs use to find Scribes/Readers is approaching NGOs or Foundations. These NGOs/Foundations provide PWDs with Scribes from the different child shelters and homes. Schools and Colleges also take an active part in providing Scribes for several examinations for PWDs. Some schools are known to handpick good students and send them as scribe for various PWD examinations. Training camps are also organized for students with acquaintance sessions and mock tests for the student and the writer. This, helps in getting the students and writers familiar to each other and balances the compatibility issue.

The problem associated with most of these organizations not providing scribes/readers is that the students who wish to be scribe/reader also have exams during the same time period. This is a major concern for students not being a scribe/reader when they wish to be one.[6]

2.2. Existing Solution and Features

The only application related to the current problem at hand in India is "Scribe Finder" developed by Bangalore-based students Sri ram and Shrikant. Here, a Needy/Visually impaired student can find Scribes/Readers from different locations and contact them regarding their requirements, and if any Scribe/Reader is interested, then they can volunteer as a Scribe/Reader.[3]

2.2.1. Key features include

- Sign up/Login for both Scribes and Visually challenged students
- Document upload and verification system
- Search Scribe functionality
- Study Material Section
- Upload Notes/View uploads

2.2.2. Working

First, both the scribes and needy/visually impaired students can register themselves on the application, details required vary between Scribe and Needy/Visually impaired students. Both have to provide legal documents that will then be verified successful verification of documents registration process will be completed. The Needy/Visually impaired students then have an option of Search for Scribe. This then allows them to access 2 more options: "Search near me," and the second is "Location-based search." In the first option, the system will give a list of volunteers and contact information present in the given range of Needy/Visually impaired students. The second option allows searching for a list of volunteers based on location details; the Needy/Visually impaired student enters details like state, district, and city. On doing this, the needy/visually impaired students will be provided with a list of contact information of volunteers present in that location; details like contact number and mailing information are present. With both the contact and mail information of the Volunteers available the Needy/Visually impaired student now may contact the Volunteers for his/her availability and explain his requirements of the examination. Thus, resulting in the communication of Needy/Visually impaired student and volunteer. Also, there is a section for Study Material and an option for uploading notes. Here, students and volunteers can find various good books, notes made by students, and references to help with their examinations. It's a good repository of study material from where Needy/Visually impaired students can collect resources for their examinations. [3]

2.2.3. Current Limitations of ScribeFinder

- Limited Languages and Locations
- Need to contact each volunteer individually
- Explaining details every time
- No Volunteer qualification details
- No Profile system
- Lengthy process
- No Feedback system

3. PROPOSED VERNIN SYSTEM

3.1. Essential Functional Modules

3.1.1. Registration Module

Verification and Validation of documents uploaded by the Scribes and Certificate of Disability uploaded by PWDs provided that the candidate's documents are legit; a confirmation E-mail will be sent via an automated mailing system to the registration E-mail address. Later the same E-mail will be used for login. Option for Google account

Login via the Google API is also provided to ease the process of registration using Google Account.

3.1.2. Post Module

Examination details along with the assigned documents like hall-ticket should be posted. System validates the exam details, pushes the post onto the Scribe view side based on the location of the scribe when he first registered, enabling efficient delivery of posts, to avoid spam and conveying to the point message.

3.1.3. Messenger

With the inbuilt messenger feature present in the application, the PWD can connect with the corresponding scribe who has successfully accepted the post. With this messenger, both the PWD and Scribe can exchange information on further details and improve compatibility.

3.1.4. Live Location Tracking

With this feature, the PWD can check if the scribe is on the way to the examination. Last moment cancellations being the major issue faced by PWDs, this feature enables us to keep this problem at bay.

3.1.5. Dashboard

Dashboard functionality enables to keep track of all the different components of the application. Tracking of the

current applications and posts, messenger functionality, notification panel reporting and help window etc., are provided here.

3.1.6. Feedback Module

Based on the feedback taken from both the Scribe and PWD after the exam, analysis of the feedback is done using NLP and the system generates appropriate polarity values, which then will be matched with a credit table giving credits to the scribe based on his performance. Later-on, after an accumulation of enough credits, gifts, vouchers etc., can be availed by the scribe.

3.2. Working

The users must first register as a PWD or a Scribe; here all the necessary details and documents are collected to ensure verified users. As mentioned earlier, the system will have a server-side model which will check the uploaded document whether it's legit or not. Next, the PWD can post if he/she requires a scribe for an examination; here full details of the examination are to be mentioned in the post along with the hall ticket. This post then will be posted on the scribe's home page from where he/she can see the post and accept the request if he/she is eligible and interested to be a scribe/reader for the PWD, here based on the scribe's location the posts are shown, the system checks for all the Scribes within a given range of locations and then sends the post to all Scribes who fall under that location range. Now say, for instance, more than one scribe accepts the post then the Scribes who accepted the post later will be listed in a queue, the queue will have at max 2 members, this can be viewed as a backup plan. If the First scribe is unable to attend the examination at the end moment then the Scribes in the queue are notified and if available, they can attend the examination.

On successful acceptance of post the PWD is notified about the scribe; via a messenger system of our application they can communicate and discuss further details. Our notification system will send 3 notifications in intervals one day prior to the exam. Also, with the live location tracking feature the PWD can track the scribe's location on the day of exam. After the exam, both the Scribe and PWD receive a feedback notification. Here they have to give feedback of the experience they had, anything they would want to say about the other person; rate, criticize and report the other person. The system then collects the feedback of the PWD, and a NLP model then takes this feedback as input and gives out credit points to the scribe.

4. PROPOSED METHODOLOGY

The methodology used is Agile which enables for rapid development of android applications. Development in Agile methodology is best suited for Android application

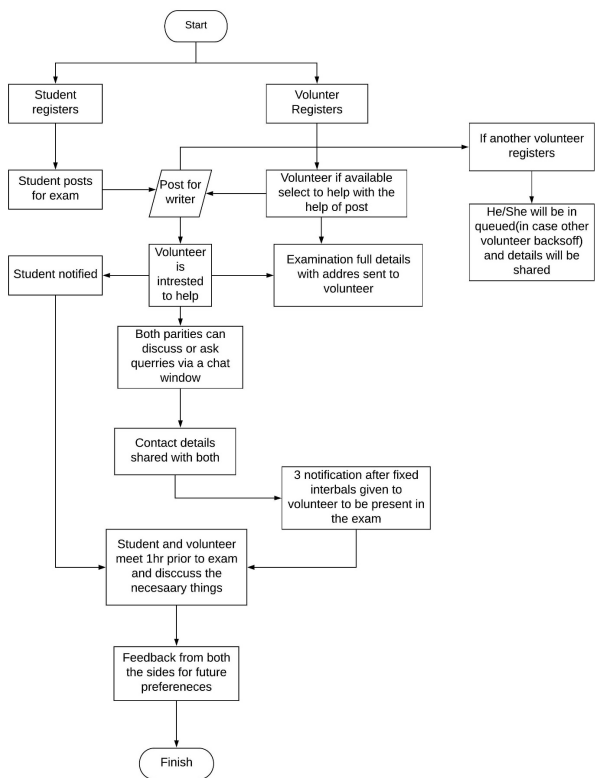


Fig. 1: Proposed block diagram

development compared to other methodologies. Agile offers quick and reliable method for development of Android applications. Android development involves programming, model building, integration, testing, debugging, the building of application; these steps are volatile and are required in each iteration, agile methodology with support for rapid development and minimal documentation allows for better development of the application. As per the client demands, changes are made, and feedback is required within the deadline. To keep up with those changing requirements agile methodology offers a better platform and flexibility in development.[1]

Agile development is,

- Compatible with changing requirements
- Reliable and Quality Assurance
- Flexible in nature
- Suited for Quick development and delivery of applications
- Encourages Stakeholder involvement in project

Client plays a key role in Agile Development, this involvement and interaction ultimately makes the entire process of production/development of application smoother and quicker. [1]

4.1. Steps in Agile

4.1.1. Procedure Flow

Higher-level components in the application are resolved. For instance - conditions, for example, client login or administrator login and related advances are characterized.

4.1.2. Framework Building

Planning and improvement of use engineering are performed it is done right now. Coding is done to offer life to the application.

4.1.3. Usefulness Inclusion

Database segments, web-based life, and different highlights are actualized and together coordinated in the application.

4.1.4. Demo of Alpha

Developed application alongside the combined UI is run on the gadget to test for smooth working.

4.1.5. Testing

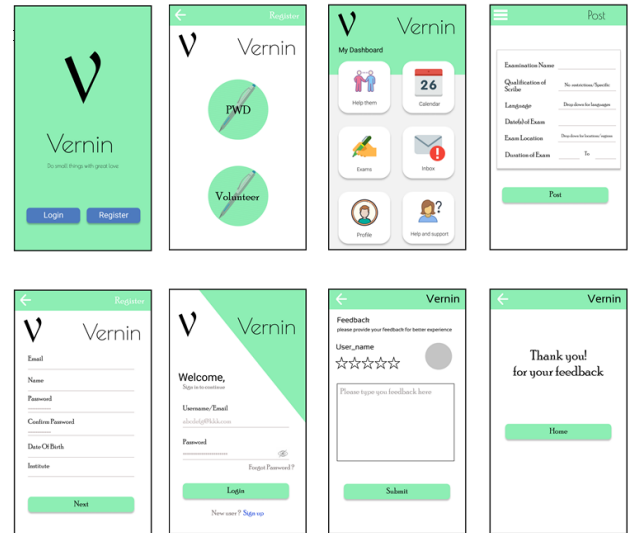
The application is tried for bugs by running different projects, performing checks at various conditions to guarantee it is powerful and immaculate.

4.1.6. Last Release

The completely tried and checked application is, at last, made accessible to end clients.

5. RESULTS & ANALYSIS

5.1. Sample Screenshots



5.2. Survey Analysis

A survey was conducted to test the mass population's knowledge and views on the current scenario, systems, problems faced by PWDs, the process of scribe finding, and their will to be a Scribe provided the opportunity.[2] Following are the questions from the survey:

1. Name of the candidate.
2. Gender of the candidate.
3. Age of the candidate.
4. Are you aware about the requirements for a Scribe/Writer for PWDs?
5. Have you been a Scribe(writer) for special children/PWD in the past?
6. If yes, please describe your experience :) Else NIL
7. What are the common channels where one can find Scribes/Writers?
8. Would you like to be a Scribe yourself and help the community?
9. What are your views about an online portal for finding suitable Scribes for Special Children?
10. Are you willing to use such portal?
11. What features as an end-user you would like to see in the portal (both as a Scribe and physically challenged student)
12. How likely are you to recommend such a portal to your friends, family, colleagues & NGOs?
13. Following are the analytics for the key questions:

5.2.1. Age?

Of the 50 responses, 74% of the people were junior college and undergraduate students. This is a good sign because for

majority of the exams Scribes need to be students and have qualification criteria.

5.2.2. Are you aware about the requirements for a Scribe/Writer for PWDs?

5.2.3. What are the common channels where one can find Scribes/Writers? (can select multiple options)

The top two channels where a PWD can find Scribes as per this survey are NGOs 68% and Schools/Colleges 66%.

5.2.4. Would you like to be a Scribe yourself and help the community?

On this question 50% of the people responded with maybe, 42% with Yes and 8% No. This shows that people are uncertain about if they want to be a Scribe themselves. They are hoping in the future the responses changes.

5.2.5. How likely are you to recommend such portals to your friends, family, colleagues and NGOs?

The final question on how willing people are to tell about this portal to their friends, family and other organizations had a great response. The data showed the majority of candidates are interested in helping PWDs and would want to use such an application. About 54% people rated 5 points on the recommendation scale and 26% rated 4 out of 5. [2]

5.3. Comparative Analysis

A comparative analysis on the existing systems and Vernin system has been done. The results are shown below in the form of a comparative table, comparing the different features provided by each solution. Realizing what all features are important for an application which aims to curb the communication gap between Scribes and PWDs. We have 3 columns Features, ScribeFinder and Vernin, these indicate the features and two different systems which provide the solution for the problem at hand, respectively. We have 14 distinct rows with different features listed; these features are present in either or both the systems offering solutions. If a system has a said feature, then a “YES” is marked in the corresponding column under the respective system; similarly, if a system doesn’t have a feature listed then a “NO” is marked in the corresponding column under the respective system.

6. CONCLUSION

In this paper, we have seen the different methods used by PWDs to find Scribes and the inefficiencies related to those methods. Also, the existing solutions and the different features associated with them. Next, how the proposed solution is used to solve the current problem, related features and functionalities have been discussed alongside the comparison chart, detailing the additional

Table 1: Comparison Table

Features	Scribe Finder	Vernin
Registration for PWD and Scribe	Yes	Yes
Document verification	Yes	Yes
Study Material and Notes	Yes	NO
Scribe search	Yes	Yes
Post system	No	Yes
Profile system	No	Yes
Scribe contact info	Yes	Yes
Messenger	No	Yes
Feedback system	No	Yes
Live location tracking	No	Yes
Credit system	No	Yes
Dynamic notification	No	Yes
Dashboard	No	Yes
Urgent post alerts	No	Yes

functionalities available. The development strategy and the methodology used for developing an Android application was highlighted. An analysis of a survey conducted is shown with the questionnaire. Concluding, the application with its unique features, functionalities and simple user interface aims to ease the process of finding scribes/readers for PWDs and to have a lasting impact which will help in creating a healthy community for both PWDs and Scribes, ultimately helping the PWDs achieve their academical goals and achieve new heights.

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APPENDIX Survey Analysis

This appendix consists of analysis of few survey questions, their answers and visual representation of the results in form of pie and bar charts.

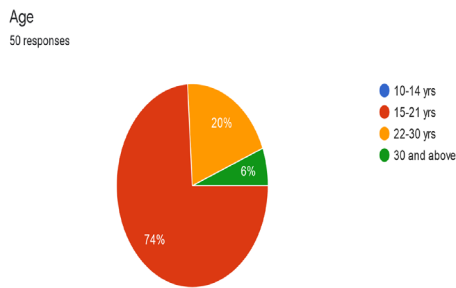


Fig. 2: Survey Question 1

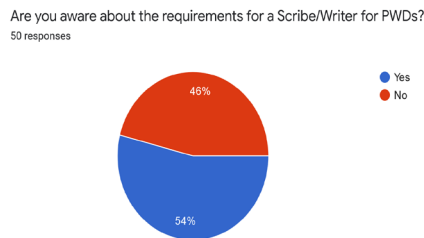


Fig. 3: Survey Question 2

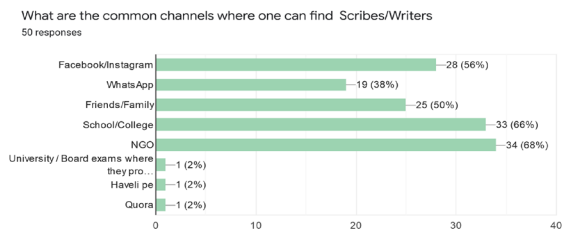


Fig. 4: Survey Question 3

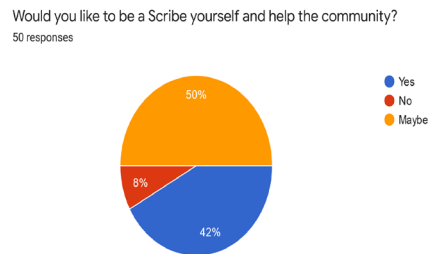


Fig. 5: Survey question 4

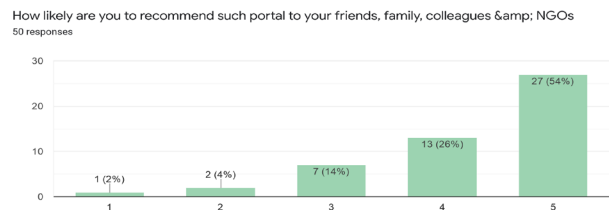


Fig. 5: Survey question 5