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SMART APPROACH TO RECOGNIZE PUBLIC GRIEVANCE FROM MICROBLOGS

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Abstract. The foremost priority for the government of any country is to resolve the citizen's problems. Indian government provides various ICT (Information Communication Technology) based platforms such as website and mobile application for the Indian citizens to lodge their grievance against ministries and departments. Due to the easy access and transparency of social media, people prefer to raise their voices there. The dissatisfaction and anger that they express through microblogging is also a kind of complaint. This paper discusses the various categories of public grievance, their importance and its redressal mechanism in India. The main aim of this research is to take these social media complaints into consideration and solve them rapidly with the help of Artificial Intelligence where, it's one branch Natural Language Processing, processes the text to retrieve the information from the piece of text and another branch Machine Learning helps to know the priority and severity of the grievance.

Keywords: Artificial Intelligence, Grievance Registration Platforms, Indian Grievance Redressal Mechanism, Microblogging, Public Grievance

List of Abbreviations

Abbreviation	Full Form
AI	Artificial Intelligence
NLP	Natural Language Processing
ML	Machine Learning
ICT	Information and Communication Technology
NeGP	National e-Governance Plan
DARPG	Department of Administrative Reforms and Public Grievance
CPGRAMS	Centralized Public Grievance Redress and Monitoring System
UT	Union Territories
PGOs	Public Grievance Officers

1 Introduction

The grievance against a product or service or people is always of supreme interest for any organization because it helps an organization to identify the demerits and gives a chance to improve the quality

standard. The sooner the complaint is resolved, the stronger the grievant trusts in the management. So, each organization focuses on the prime and swift mechanism for grievance redressal (DARPG) .

The government in any country is the biggest organization on that land. It's upmost priority is to provide the best quality life and infrastructure to its citizens. Hence, it takes care of citizens' needs and always remain active to solve their problems (Rana et al.).

India is a democratic country, always ready to implement the latest systems and technologies to provide the best services to its citizens. The Indian government strives relentlessly to make ICT (Information and Communication Technology) enabled E-governance systems. It has been the priority for the government of India to classify projects with the potential to scale up and put them on the Mission-Mode (Kumar et al.) . The Government of India launched the National e-Governance Plan (NeGP) on May 18, 2006, to make all government services digitally available to Indian citizens (WIKIPEDIA). In Public Administration, E-governance has played a vital role to overcome the obstacles of traditional working methodologies (And and Otike). To receive, monitor and to redress public grievance, the Department of Administrative Reforms and Public Grievance (DARPG) launched Centralized Public Grievance Redress and Monitoring System (CPGRAMS) in the year 2007. Here, a citizen can register and track their complaints online from any geographical location (Https://shodhganga.inflibnet.ac.in) .

Being a citizen of a democratic country, people have the right to express their opinions irrespective of its nature and nowadays social media has become that medium to use this "Right to Speak". Transparency and easy access to social media have attracted people to use them even to show their dissatisfaction towards any government services through microblogging, rather than going for a long process of registration and secrecy behavior of government platforms (Sannusi et al.) .

The core intention of this research is to prioritize the complaints posted on the social media platform. However, microblogging comes with noisy characters that needs to be cleaned to retrieve the right information and Natural Language Processing (NLP) can be used for this purpose. Just like NLP, Machine Learning (ML) is also a branch of Artificial Intelligence (AI) which will perform the major task of identifying the urgency and importance of the grievance.

The rest of this paper is organized as follows:
Section 2 presents, the grievance and its importance.
Section 3 discusses the public grievances.
Section 4 focuses on, grievance redressal mechanism in India.
Section 5 discusses, microblogging on social media – a new way of complaining.
Section 6 consists, a public survey on the popularity of CPGRAMS vs Social Media.
Section 7 explains research idea to use NLP and ML in rapid grievance redressal mechanism.
Section 8 discusses, conclusions and future enhancements.

2 The Grievance and its Importance

Grievances are statements about the expectations that have not been met. They are also the opportunities for the organization to reconnect with customers by fixing a service or product breakdown. In this way, complains are gifts that customers give to the businesses (Moller).

It is apparent from the working of 24x7 call centers that how important the customer is to the company. These customer care centers provide a platform to the customers where they present their inconvenience and can get assistance for the same. Here the organization has the chance to enhance its value by providing quick solution for the problem and to build a faith in the customers (Weald) .

The present technology era has given more power to the buyers. Rather than going for the long process of IVRs (Interactive Voice Response Systems) to talk with customer care executive, customers prefer easy way by posting their unsatisfaction in the form of complaint on social media under the particular company's handler or on its official page which is publicly viewed. They can also share their diverse review about the product, service or the company on the various platforms of the internet. Positive reviews lead the business in an upward direction without any marketing which is actually a boon. According to the research done by Esteban Kolsky, 13% of unsatisfied consumers share their complaint with 15 or more people. Only 1 in 25 directly complains the company, and those who do not react, just switch to the new merchant (MacDonald).

A satisfied consumer is a sign of a progressive business. To keep them happy, the organization needs to fulfil their all requirements. Even a customer's smaller complaint matters a lot in growth. So, solving the issues rapidly on a priority basis is the prime responsibility of the company. The sooner the complaint is resolved, the stronger the customer's trust becomes.

John Goodman founded a company named TARP in 1971 and he did pioneer customer service research through it. Research showed that, tentatively 4% of customers were "wronged" by a company complain, but the other 96% stop buying and tell 9 -10 others within a week about their poor treatment which is negative mouth to mouth publicity. If the Company satisfactory solve the issue of that 4% then they will tell to 6-7 others within a week that the company solved their problem which is positive word of mouth marketing and they will add more good things about the company overall. And it helps in generating more business (KALB) . Table 1 shows the brief idea of this research.

3 Public Grievances

The government is the largest organization made up of groups of people who serve the citizens and runs a country. The socioeconomic development of any country depends on the dedication of its government towards its people. The main factors are what it does, how it does and how quickly it resolves citizen's problems. No organization is error-free. To a large or small extent, there are always some defects. The gap between the performance of administration and the expectations of the people create a negative image of administration. This results in public grievances towards the administration. According to Chambers dictionary, grievance means a 'ground of complaint, a condition felt to be oppressive or wrongful' (http://hdl.handle.net) .

Table 1. Word-of-Mouth Marketing by the Customers

Out of 26	In Per-centage	Customer's Behavior	Word-of-Mouth People/week	Total Average People/week	Nature of Publicity
1	4%	Register Complaint and get Solution	6-7	7	Positive

25	96%	Never register complaint but stop buying the products	9-10	250	Negative

Analysis has shown that most of the complaints are due to inability to make quick decisions. Often these decisions are not even made for months and years. What happened to the complaints made and whether they were disposed or not, people also feel dissatisfied due to lack of transparency in all these matters. It has also been observed that if the complaints are prioritized and resolved expeditiously, the complainant does not re-contact the department(CPGRAMS) .

To keep the citizen's faith intact, the administration has to redress the public grievances with high priority. Happy and satisfied citizen is the sure sign of responsible government (Https://shodhganga.inflibnet.ac.in) .

4 Grievance Redressal Mechanism in India

India is a progressive country and its government is committed to serving the people. For most of the things in life, the citizens depend on the facilities and various services provided by the different government agencies. Getting the services is not that difficult, however the quality of that service is not as satisfactory as expected in many of the cases. This dissatisfaction forces people to complain with the hope of rapid redressal (Ignou) .

Indian government understands very well that no administration can claim to be accountable, responsive and user-friendly unless it establishes a potent and robust grievance redressal mechanism which is the gauge meter to measure government's efficiency and effectiveness as it provides important feedback on the working of the administration (Cell) .

Indian Government receives public grievances on various issues which are handled by three main agencies in Central Government. 1. The Public Grievance Wing of the PMO, 2. DARPG, Ministry of Personnel, Public Grievances and Pensions, 3. Directorate of Public Grievances, Cabinet Secretariat (Cell) .

CPGRAMS is a Government of India portal aimed at providing the citizens with a platform for redress of their grievances. People can lodge their complaint online irrespective of geographical location (See Fig. 1). Only registered users can lodge the grievance so for that user has to register first (See Fig. 2). After registration a member can submit the complaint as well as track the status of it.

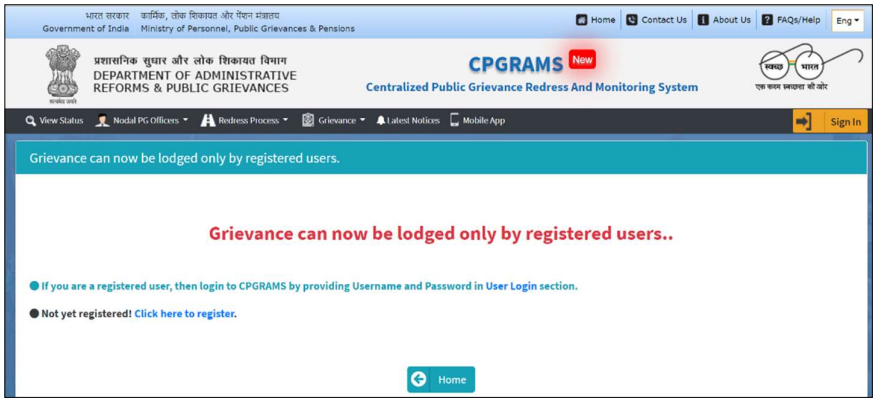

Fig. 1. CPGRAMS Website Interface to Lodge the Grievance (image source : https://pgportal.gov.in/Home/LodgeGrievance)

The Department of Administrative Reforms and Public Grievances introduced CPGRAMS in 2007 which enables the PGOs to register the grievances received by Post/hand and also to monitor the grievances received from the nodal agency/higher authority online.

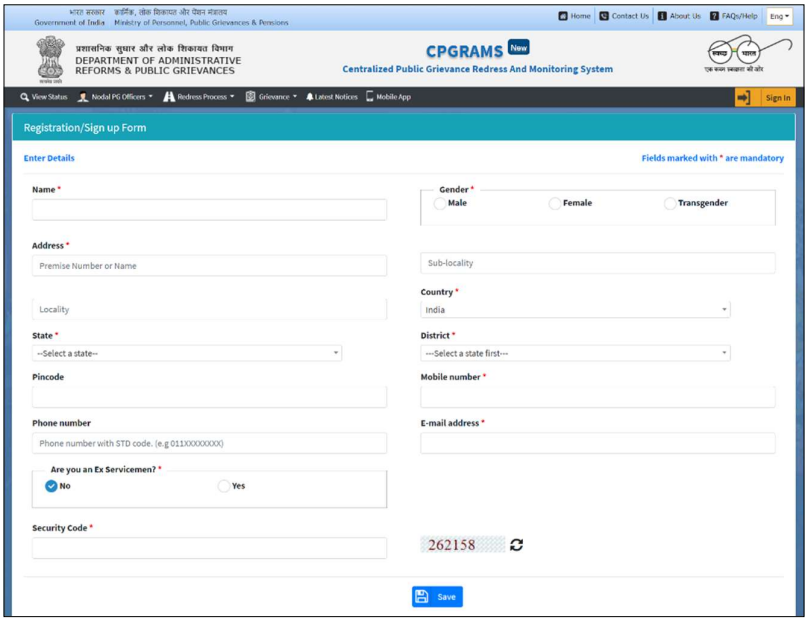

Fig. 2. CPGRAMS Website Interface for the Registration Process (image source : https://pgportal.gov.in/Registration)

Once the grievance received by the Department, is forwarded to the concerned State Government/Departments/UTs/Ministries, who are dealing with the substantive function linked with the grievance for redress under intimation to the complaint. The Department 'takes up' about 1000 grievance every year depending upon the severity of the grievance and follows them regularly till their final disposal and final update also sent to the applicant (See Fig. 3) (CPGRAMS). .

Apart from the website, there is also a mobile application which serves a platform for public to lodge the grievance where they can track the real time status. This app of PGPORTAL which is 'MyGrievance' is developed by National Informatics Centre (NIC) in collaboration with the Department of Administrative Reforms & Public Grievances (DAPRPG) (N. & DARPG) (See Fig. 4) .

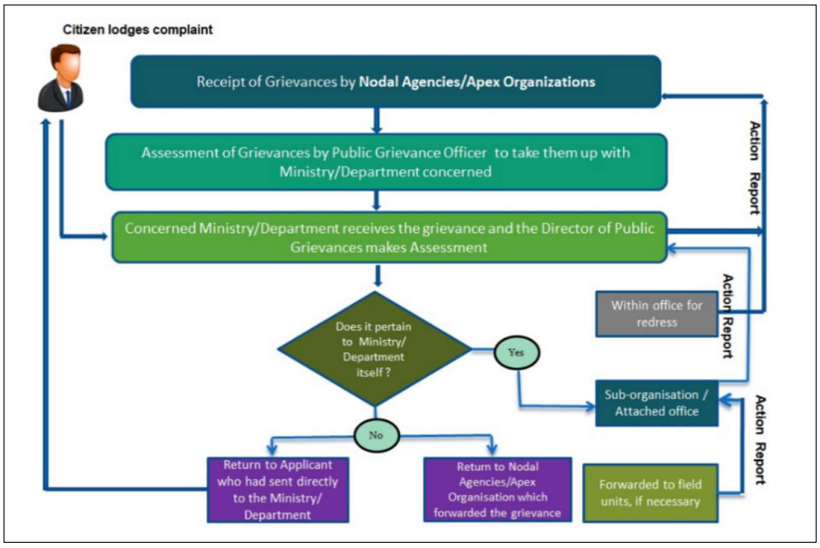

Fig. 3. CPGRAMS Redress Process Flow (image source: https://pgportal.gov.in/Home/ProcessFlow)

5 Microblogging on Social Media – A New Way to Express Dissatisfaction

The influence of social media has changed the way people express their views publicly. Here they have chance to exhibit their views and opinions to the world (Sannusi et al.). Statistics shows how much does global social media growth rates increased year on year. In the year 2020, there are 3805 million active users on social media around the world that is an increase of 9.2% from 3484 million active users from the year 2019. Earlier in the year 2015, this number was 2078 million which was increased 11%, 21% and 9.0% in the year 2016,2017 and 2018 respectively (See Fig. 5) (Dean).

Microblogging is a small piece of content on social media which could be text, links, pictures and short videos. Microblogging tools provide a light-weight and easy way of communication with the world where user can broadcast and share information, knowledge, viewpoint, status and activities (Java et al.).

Microblogging is an example of individual's freedom which changes with the evolution of state of art technologies. This microblogging service has a large and rapidly growing micro-bloggers base where they post status messages for updating what is on their mind. Not only this, also they express their opinion towards services, events, products, people and a government as well, irrespective of the nature of the opinion (Gokulakrishnan et al.).

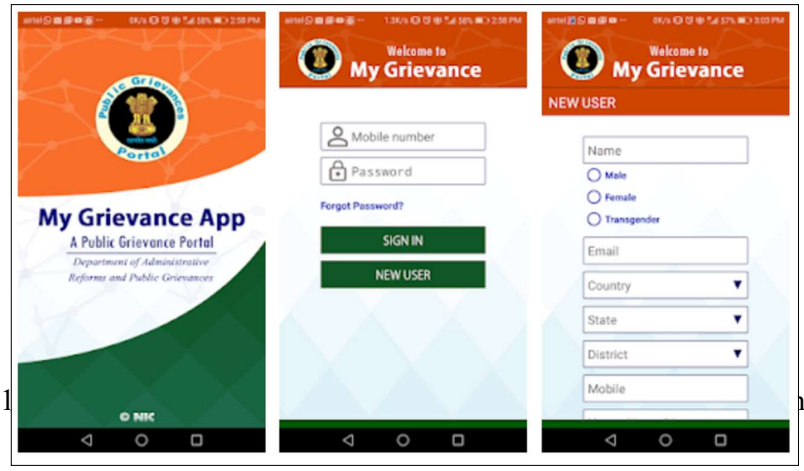

Fig. 4. A Mobile Application to Lodge the Grievance (image source : https://play.google.com/store/apps/details?id=nic.org.mygrievance)

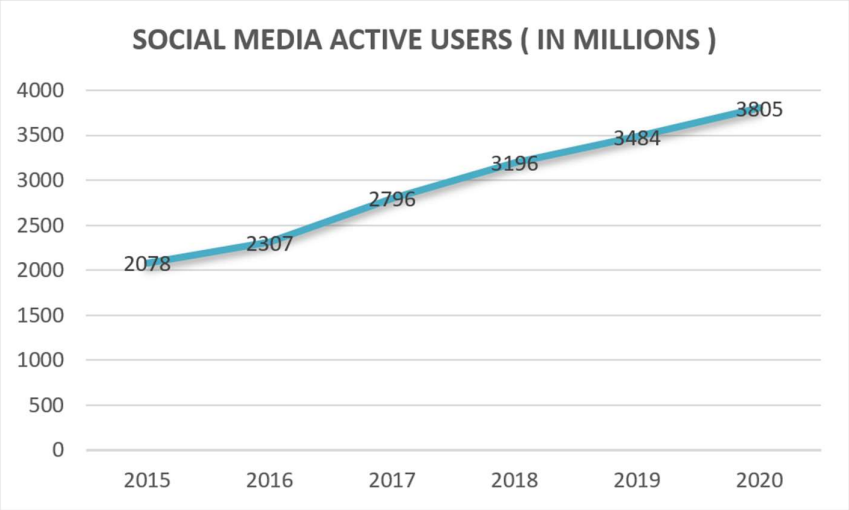

Fig. 5. In the last 5 years, there has been an increase in the number of active users on social media (data source: https://backlinko.com/social-media-users)

Social media is a new platform for consumers to communicate their grievance to the merchandiser, so it has become increasingly important for the companies to understand the online customer behavior (Istanbulluoglu). Before lodging complaint with the company or the consumer court, people post their anger as a caustic comment on social media to take that message to a big audience. (Mondal). This type of comments are harmful for any business so taking care of these comments by solving the issues soon has become the priority for the companies.

6 A Public Survey on the Popularity of CPGRAMS Vs. Social Media

To know the popularity of CPGRAMS and Social Media to lodge the grievance, a survey form was designed with 10 questions, with the help of google forms and shared with the people through email and WhatsApp. Questions were designed in such a way to get the information about the popularity of CPGRAMS and Social Media among population which can help to understand the importance of micro-blogging grievances.

Total 468 responses received from different age groups from both male and female genders. First four questions are about the name, surname, age and gender. Out of 468, 60.3% of male and 39.7% of female responded, which shows the active participation of male gender is high (See Fig 6.).

The next question was about the awareness of CPGRAMS where only 23.9% people are aware about the CPGRAMS in India while 76.1% people said that they don't know about the CPGRAMS which seems to be a major concern for the Government of India (See Fig. 7). Out of 23.9% CPGRAMS aware people, only 5.8% have registered with it (See Fig. 8).

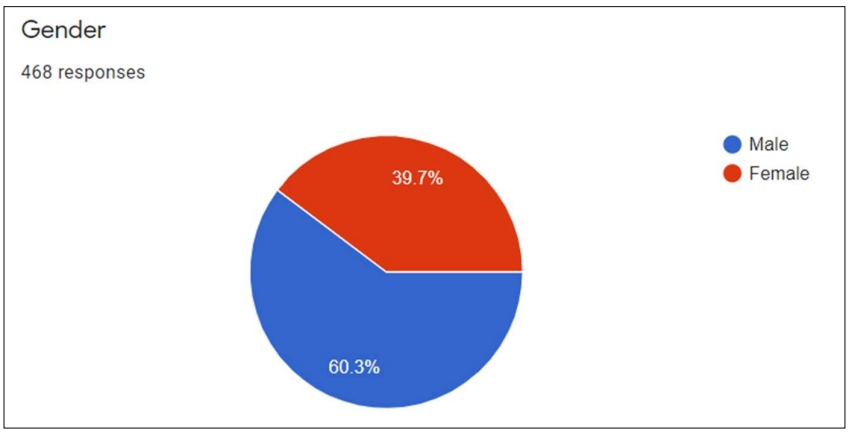

Fig. 6. Percentage of male female from total responses

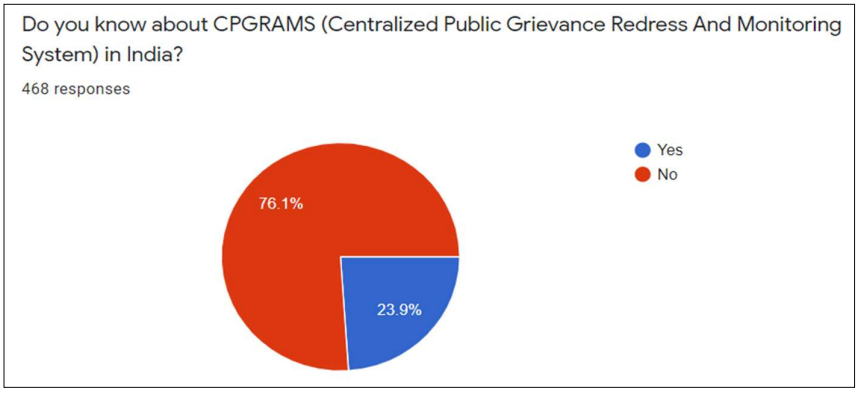

Fig. 7. Number of people know about the CPGRAMS in India

Next questions were about the popularity of Social Media. Here author has taken Twitter as an example of Microblog. From the received responses, 96.8% people are aware about the Twitter and among them 45.3% people actively use it (See Fig. 9).

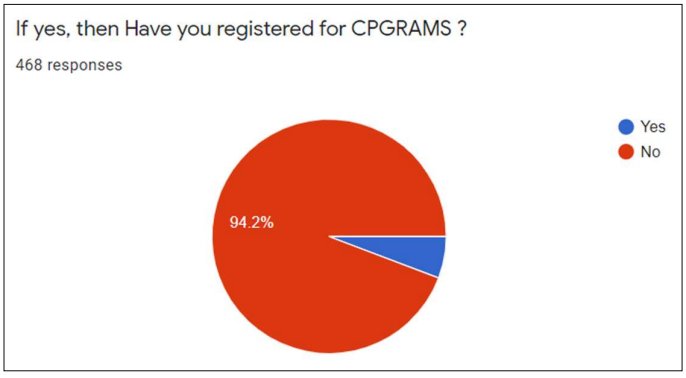

Fig. 8. Registered people at CPGRAMS, from total aware people

The next question was asked to know that how people like to show their dissatisfaction or which way they prefer to register the complaint against Government's ministries and departments for their services. Result shows that 24.6%, 17.9% and 7.3% people prefer e-Mail service, Customer Care and letter writing respectively while 23.5% people say that they do not believe in registering complaint. From 468 total responses, 20.9% prefer to use Twitter where only 5.8% people think to use CPGRAMS.

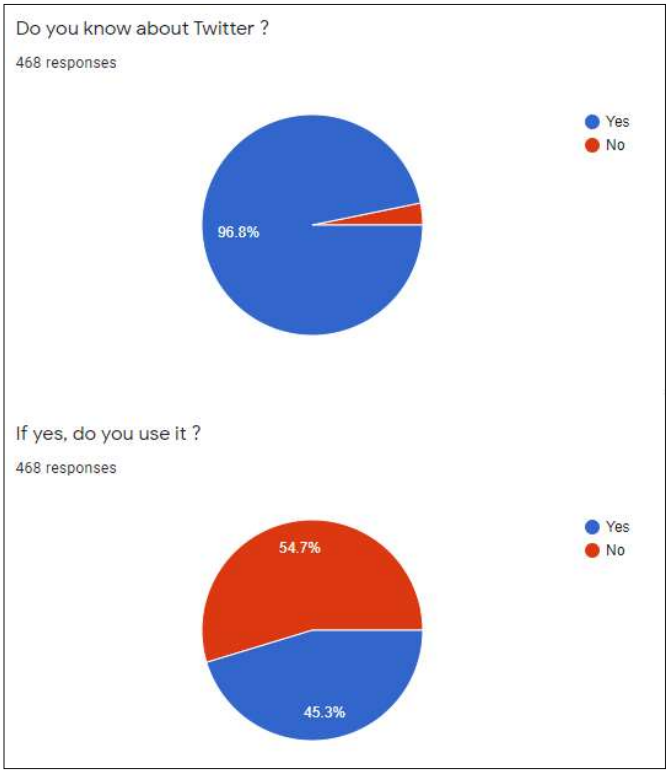

Fig. 9. Awareness of Twitter and the active use of it

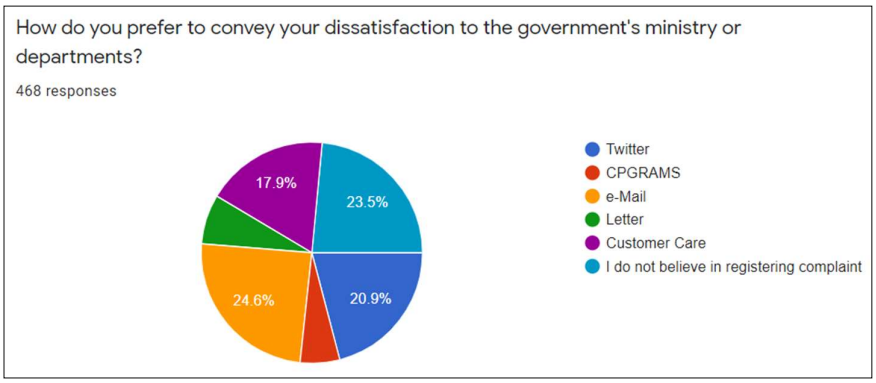

Fig. 10. How people like to convey their dissatisfaction to the Government's Ministries and Departments for their services

When asked to the respondent that why in most of the cases people do not register complaint, then 65% (303/468) people said that because of "No Response" from the Government while 35% (165/468) gave the reason of "Delayed Response".

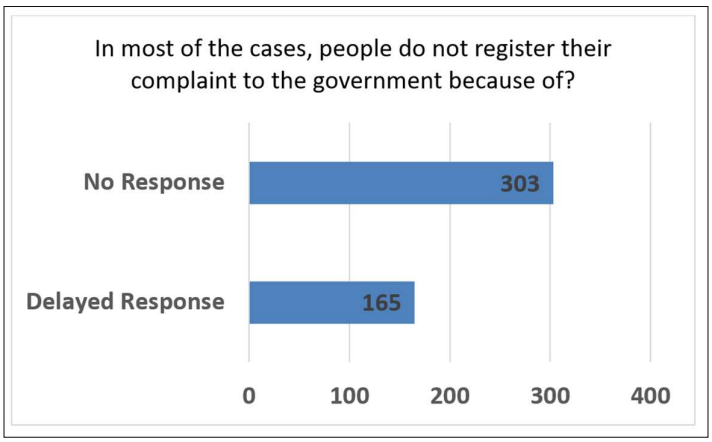

Fig. 11. People do not register grievance in most of the cases and the reasons are either delay in response or no response at all

Table 2. is a summary of the survey which concludes that majority of people are aware about the social media in comparison with the government's CPGRAMS. Also, those who know this service, very less percentage people using it. So, overall, the popularity and use of CPGRAMS is very low. The survey also found that tentative 1/4th of total respondents does not believe in registering the complaint.

7 NLP and ML in Rapid Grievance Redressal Mechanism

NLP and ML are subbranches of AI. NLP is used to analyze human natural languages inputted by users in different forms like text and speech. Various computational algorithms are available in NLP to retrieve and process these raw data to get relevant information (Kalyanathaya et al.) (Tapsai). ML is the study of computer algorithms that have potential to learn and improve automatically through the experiences. These algorithms create a model based on sample data which is known as "training data" and this model predicts the results for future data which is called test data (*Machine Learning*).

In this research, idea is to collect grievance text from microblogs which comes with lots of unwanted words. By using the various NLP techniques, this noisy text can be cleaned and finally get the meaningful information. On this relevant information, ML algorithms can be applied to train the existing or explicitly developed model which can predict the future inputs. Developing mathematical formula to decide the priority of the given grievance is the core research factor in this process.

Table 2. Summary of Public Survey to know the popularity of CPGRAMS Vs. Social Media

Gender Participation	Male	60.3%			
	Female	39.7%			
CPGRAMS Awareness	Yes	23.9%	Registered to CPGRAMS	Yes	5.8%
				No	94.2%
	No	76.1%			
TWITTER Awareness	Yes	96.8%	Active Use	Yes	45.3%
				No	54.7%
	No	3.2%			
Preferred way To register grievance	CPGRAMS	5.8%			
	Letter	7.3%			
	Customer Care	17.9%			
	Twitter	20.9%			
	Don't Register Complaint	23.5%			
	e-Mail	24.6%			
The reason, why people do not register complaint?	No Response	65%			
	Delayed Response	35%			

The steps of algorithm for the proposed system's process flow are as follows:

1. Take the microblogging text (grievance) as an input
2. Do the manual tagging for labeling the data
3. Apply NLP techniques to clean the text and feature extraction
4. Build a model to test the priority of data
5. Train ML model with training data set
6. Test it with testing data
7. Check accuracy of result by applying various permutations and combinations of train-test data

8 Conclusion

Organization's growth is linearly proportional to the customer's satisfaction which comes from the rapid and reliable redressing of their grievances against the service or product which cannot match the expectations. The survey results depict that awareness and popularity of social media is more than the government's legacy grievance redressal system. Hence, social media is more effective, widely accepted and user-friendly platform that can be incorporated with the redressal system. The research aim is to prioritize grievance displayed as microblogging on social media automatically with the help of NLP techniques and by using ML models. If developed and implemented, it will give a novel way to the redress the public grievance which will enhance the speed of redressing and increase the faith in organization's services.

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