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# OPTIMIZING PATIENT-CENTERED MOBILE APPLICATIONS USING DATA MINING TECHNIQUES

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## **ABSTRACT**

The healthcare industry is thriving and the abundant amount of data involved raises call for help relating to managing and maintaining them. It becomes a hassle to keep the data in it's required place and to pull and retrieve whenever necessary. The search for a proper data mining technique to enhance the process is always appreciated and encouraged. Our era is controlled by the upcoming technologies that are fast paced and yield great results. There is always a scope for improvement and optimization. Every individual from every generation has been an avid user of mobile phone and its applications. Healthcare facilities have slowly begun to depend on applications and technologies associated and supported by mobile phones and other networking platforms in order to have everyone within the facility and also the patients who have ties to the facility have access to the information that they are entitled to have. It all makes sense to have a detailed research on different techniques that can be used to enhance the mobile applications pertaining to patients of a health care facility that will result in faster and better services for the patients and a

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better world to live in by the end. There is an existing claim according to (Fallah, M. & Niakan Kalhori, S.R. 2017), which states that the data mining techniques have greatly improved mobile applications to neatly address the needs of the patients at different levels such as subgroup and individual levels.

**KEYWORDS**

Healthcare; Patient care; Data mining.

**INTRODUCTION**

It is known that healthcare is a renowned sector of finance and economy of different countries of the world. Sans healthcare, there would be a huge impact on humanity. There are different aspects such as expenses, ever increasing costs and complexities of the procedures that make healthcare an essential sector that has scope to evolve and update it, wherever and whenever possible. There is no doubt about the abundance of the data that is made available to everyone involved with the sector, including the patients. To keep track and maintain, different software applications and techniques are built. Applications are in a dire need of enhancements. This would mean that there is a lot of research that needs to be done relating to the data mining ways and procedures. According to (Islam, M.

S., Hasan, M. M., Wang, X., Germack, H. D., & Noor-E-Alam, M. 2018) there is a large body of established and published review/conceptual studies on healthcare and mining that can be used to create awareness and bring certain aspects of patient illness to light that will help in creating better ways to deal with them. Data mining will help in finding intelligent methods to generate necessary data patterns, which will be used for representing the features of mobile applications. Data in Bioinformatics, such as gene expression data, is continually growing (due to technology being able to generate more molecular data per individual), and is certainly classifiable as Big Volume. This suite seeks to solve hardware computational problems through software. The tools in this suite pre-process Big Volume genomic sequence data by breaking up long sequences into relatively short strings which can be stored in a Bloom filter-based hash table, helping both the ability and efficiency of analysis of Bioinformatics data.

Clinical Informatics research involves making predictions that can help physicians make better, faster, more accurate decisions about their patients through analysis of patient data. Clinical questions are the most important question level in Health Informatics as it works directly with the patient. This is where a confusion can arise with the term “clinical” when found in research, as all Health Informatics research is performed with the eventual goal of predicting “clinical” events (directly or indirectly). This confusion is the reason for defining Clinical Informatics as only research, which directly uses patient data. With this, data used by Clinical Informatics research has Big Value.

**DATA COLLECTION METHODS**

Process of PRISMA can be used for data collection and further analysis. PRISMA has different phases that are used altogether for analyzing and depicting data. It is an approach that is given preference and proposed by Moher et al.

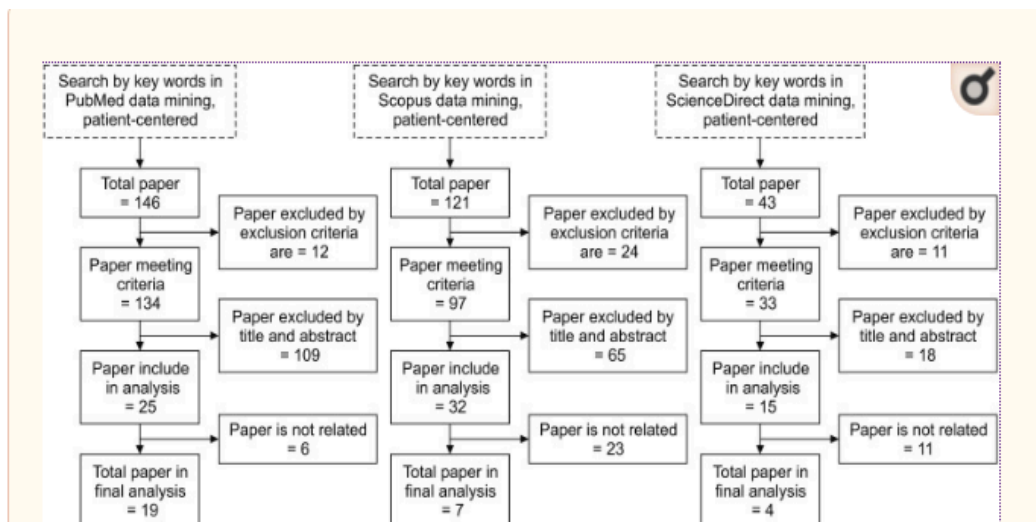


Figure 1

The figure above depicts the process in steps for better understanding.

## DISCUSSION

It is seen and observed how data mining methods have been used to empower applications and make their features more feasible. This gives hope to mobile users who are also patients at different healthcare facilities that provide this option. As mobile phones have become a mandate in each and every individual's lives, it becomes easier to deploy such application options to their phones so that more and more users can access the features that are created and made available. It has been observed and depicted how support vector machine technique has been widely used as it yields better results with great accuracy. The concept of margin inspires SVM methodology, which separates two data classes. Large number of data sets and information doesn't affect SVM and it continues to give the necessary outputs. SVM method is known to be binary, which would allow it to be deducted to a set of multiple binary classification problems. SVM could become a limitation when working with discrete data, which gives scope to further optimization requirements.

## RESEARCH QUESTIONS

My research will focus on finding different ways to use data mining and its various techniques to maneuver the patient-centered applications. This will help in showing if data mining can really prove to be helpful in optimizing the process or not.

## CONCLUSIONS

In conclusion, through reading reviews and papers such as 'A Systematic Review on Healthcare Analytics: Application and Theoretical Perspective of Data Mining' it is seen that embedded data-mining-based feature in mobile apps, such as case detection, prediction/classification, risk estimation, or collection of patient data, particularly during self-management will be able to help in saving, applying and analyzing patient data (this could be both during and after care). Other methods such as artificial neural networks, fuzzy logic, genetic algorithms and even the hybrid methods may result in more patients-centered recommendations that will provide education and awareness of personalized output.

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PRISMA Figure [https://www.ncbi.nlm.nih.gov/core/lw/2.0/html/tileshop\\_pmc/tileshop\\_pmc\\_inline.html?title=Click%20on%20image%20to%20zoom&p=PMC3&id=5688025\\_hir-23-262-g001.jpg](https://www.ncbi.nlm.nih.gov/core/lw/2.0/html/tileshop_pmc/tileshop_pmc_inline.html?title=Click%20on%20image%20to%20zoom&p=PMC3&id=5688025_hir-23-262-g001.jpg)