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Designing a personalized gamification social network platform using machine algorithms (clustering) (Use case: User suggestion for doing data science learning projects in work teams)

Amir Haji Ali Beigi[a], Mohammadreza Sanaei[a,*], Ali Bozorgi-Amiri[b]

[a]*Faculty of Management and Accounting, Qazvin Islamic Azad University Branch, Qazvin, Iran*
[b]*School of Industrial Engineering, College of Engineering, University of Tehran, Tehran, Iran*

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Abstract

The role of social media is undeniable, important and influential in today's world. The Var game emphasizes using game design elements in non-game fields, a concept that will reach a value of 5.5 million dollars in 2018, based on the predictions made. One of the applications in which gamification has been used is in the field of better learning and cooperation. One of the mistakes in the design of game elements is having the same content creation strategy for all users. In this personal gamification article, based on specific specifications and features, suitable teams are suggested to people to carry out data mining projects on the designed platform. One of the ways to personalize the game is to use machine algorithms (data mining). The main goal of this article is to improve the design of the personalized gaming social network platform using unsupervised clustering machine algorithms to carry out personalized gaming data science projects in this field using unsupervised algorithms.

Keywords: social media, gamification, clustering algorithm, gamification personalization
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1 Introduction

With the emergence and expansion of the communication industry at the same time and along with the Internet as a global communication and information network, a new space was created in the field of life, which can be mentioned with titles such as "second space" and "virtual space". One of the most important of these technologies is gaming. VAR is a concept whose main origin is the field of business, but in the last few years, it has been used for success in other fields, including the media space. On the other hand, increasing engagement and audience attraction are still considered the main reasons for the success of a media outlet. In this regard, you can use the advantages of the VAR game to improve the interaction of users with the media. In addition to being successful in the field of business,

*Corresponding author
Email addresses: amir.alibeigi.it@gmail.com (Amir Haji Ali Beigi), amir_alibeygi@yahoo.com (Mohammadreza Sanaei), alibozorgi@ut.ac.ir (Ali Bozorgi-Amiri)

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the VAR game has also been successful in attracting audiences to the media. You have probably heard the phrase "variation game" around you, or seen it while reading a book or scientific journal, or heard it at a conference or meeting. But as it appears from its written form, most people have a wrong understanding of this term. People think that when we want to gamify something, we must turn it into a game. This confusion is understandable, but this is not the case, and the truth is something else. In fact, gamification does not mean that you turn your work or website into a game. According to the definition ofthe VAR game site, gamification means "bringing or adding game-like features in anything that cannot be normally and traditionally considered a game. The game was considered. In this definition, special attention should be paid to the word feature. The purpose of the diversification game is not to turn something into a game, but the diversification game, by using the understanding and awareness of all the basic human desires that include all of us, can turn the living and working environment into a game for us and improve business [16].

Gaming is not a one-dimensional concept. There are a variety of different applications for VAR games. Teachers and educators use VAR games to help students learn faster and better by focusing on the learning topic. Companies and organizations use gamification to motivate employees and improve their productivity. Trading and marketing companies use gamification to improve customer loyalty and engagement, which increases sales and profitability.

In most research, to obtain answers to research questions, the researcher must collect data that has the characteristics of high-quality accuracy and reliability. Since this has a great impact on the validity of the research, therefore, if data collection is done with measured and accurate methods, it will usually lead to high-quality information and obtaining valid results, otherwise, it will lead to invalid results. In fact, the traditional methods of obtaining information, such as observation, interview, and internet questionnaires, which are considered to be the main basis of current research, have limitations that can affect the results of the research. Environmental, time-consuming and costly methods, lack of correct understanding of questionnaire questions, the possibility of giving false answers by people, the unwillingness of people to present their views and other similar cases were pointed out [1]. Therefore, the need is felt to use new methods based on innovative concepts to collect data in addition to the mentioned methods.

Today, the strong need in the field of data collection and information acquisition has created conditions for the emergence of new methods for this, because most activities from academic research to executive processes require gaining knowledge about people's information and a better understanding of their way of thinking, and this is important Using reliable data collection and analysis methods will not be possible [25].

The increasing development and advancement of new information exchange systems between people in all processes, including research activities and applied business, and the importance and benefits of using such systems are not hidden from anyone. One of the new techniques that is used today is the gamification technique, which, while satisfying the need of people to play, this need is used for the benefit of businesses [18]. The current research is trying to answer the question, what is the model of how people think about a specific issue? By presenting a new approach based on the technique of gamification in the context of the social network produced, to obtain high-quality, accurate and reliable information from people, concerning a specific issue, and in this way to achieve their way of thinking about that issue. Also, the sub-questions of how the presented framework affects the speed, quality and accuracy of data collection from users and increases the participation of the respondents have also been addressed.

Theories related to mass media have been constantly revised based on new technologies and their use. We have already witnessed the arrival of a new type of media that has expanded and changed a wide range of possibilities related to social technologies for public communication. However, it seems too early to predict what will happen. What is important is predicting the possibilities and testing the basic social and cultural results that have emerged so far. There is a fundamental assumption here that media is not just a functional technology for conveying certain symbolic concepts or just connecting the parties of an exchange. Rather, it is a perfect example of a set of social relations that interact with the effects of modern technology. A new theory is only needed when there is a fundamental change in the form of social institutions related to media technology and in the social relations that are common or in what is called the "structure of dominant tastes and emotions" [7].

The new media discussed here are actually a distinct set of communication technologies that have certain characteristics, along with the renewal of digital facilities and wide availability for personal use as communication tools. Our attention is specifically focused on a set of activities, especially in the general use of the Internet, which includes online news, commercial ads, the use of production programs such as music downloads, and similar items, participating in discussions and conversations, using the network. The World Wide Web is the search for information and potential and special forms of communication. We look less at personal e-mail, games and other private services provided by the Internet [15].

This discussion focuses on the definition of the characteristics of new media, their use, and their synchronization

with communication experiences. But in general, the new media were welcomed (even by the old media, and a lot of optimistic and even exaggerated predictions and an overemphasis on their importance were directed at them, but despite this story, little by little more informed words and hadiths are heard, and along with this optimism, there are warnings about the consequences of the spread of this phenomenon, especially in the absence of legal frameworks and necessary controls. An idea related to the works of modern media is much higher than what can actually exist. It is to the extent that researchers in this field are working to reduce these expectations. The main purpose of our discussion is to examine the current situation and re-evaluate the theory and actual effects of new media [11].

Social media is the application of web-based mobile technology to transform communication into a two-way dialogue. Social media are media for social interactions that use highly accessible and scalable communication techniques. The term "social media" was first used consistently in July 2006. Chris Shipley (Founder and Director of Global Research at Global Guidance Group) is often credited as the first person to use modern social media reform. Shipley believes that social media is driving future events for conversation; it is an event that is discussed. In blogging, the social network wiki and related technologies are used in collaborative media forums. However, the term was also previously used by Tina Sharkey, the current president of BabyCenter, in 1997 to describe a type of Internet content management community. In 1995, this term was coined to describe multimedia software systems that facilitate community participation and the mind's experience of shared space. does not have. In the definition of social media, Brian Solis says that social media consists of democratic content and has a correct understanding of the process of people's role; because their role is not only to read and publish information, but they also produce information and share it with others. Also, another definition states that social media is the description of online tools that people use to share content, profiles, opinions, views, experiences and thoughts, so social media facilitates dialogues and interactions. Characteristics of social media, contrary to the idea that they have no rules and principles, social media have professional characteristics and structures. Social media is briefly introduced below: two-way dialogue Social media is based on dialogue. The creation of dialogues by audience users is always productive of a dialogue. Creating conflict involving users in social media is one of the ways to return them to these media. Encouraging participation in social media always encourages users to participate in processes. Enabling: Collaboration Collaboration and helping audiences to each other is one of the factors in the development of social media users. Arousing the personality of users' identity is strengthened in social media. The non-expensiveness of content production in social media is very cheap compared to mass media; In other words, content production is free. From small tasks to large tasks, users' tasks in social media are changing from easy and small tasks to large and professional tasks. Social media credibility building is a space for building credibility by individuals, companies and organizations. Moderation and equality of social media facilities are the same for all users. User-generated content The main foundation of social media is user-generated content. The sense of ownership of content. Creating content by users creates a sense of ownership. Increasing honesty Creating honesty in profiles increases intelligent communication. A place for hot content Important content from social media and other media is published on social media.

2 Research background

In this section, which is a review of the theoretical literature and the empirical background of the research, firstly, the concepts of public opinion and attitude measurement of gamification and the results of previous research in this regard are presented, then an overview of the social network as a digital platform used in this research of social network production done will be paid.

Public opinion and attitude measurement In our era, along with the expansion of the media and the increase in the level of public literacy, the power of public opinion has gained double importance. Politicians. This issue is not exclusive to any of the disciplines, and this is exactly why all research fields deal with public opinion, images and mental patterns of users in some way. The concept of public opinion has a long history and, like any other concept, public opinion in different ways. It is defined as a set of beliefs as a form of social organization [14].

A phenomenon limited to new societies, a widespread phenomenon [5]. Attitude measurement is a valuable tool for evaluating the state of public opinion on any issue [3]. It shows the mental/psychological orientation of society [27].

Opinion polling is a research technique that allows us to know people's opinions on a certain topic at a certain time, while public opinion is a social process that is formed over time [10].

Among the methods of measuring mental association, characteristics of a strong, desirable and unique brand are qualitative techniques that are used to identify potential mental associations. Projective techniques such as complementation, including photo interpretation and brand personality descriptors, especially when consumers are

unwilling or unable to express their feelings, are another method used [26]. For most marketing researchers, the best method to show the mental associations of the brand is the free association method, in which the interview participants are asked using structured but unexpected questions, and in this way, the answers that the consumer has in mind are identified [19]. The concept of gamification was born in order to benefit from society's growing interest and passion for games and instrumental exploitation of their components and playful thinking in creating motivation to change behaviour and solve problems. Varsani game is not a new game that can be played with a mobile phone or tablet, but, in fact, it is a new approach that takes its functions and game mechanism from these social games. Mechanisms such as promotion and progress rewards are used to keep actors motivated by rewarding their performance and behaviour [4]. The importance of gamification in learning and the increasing importance of gamification has led to it in many universities today. show more attention that shows the increasing popularity of this technology. In the meantime, we can mention Temper University in Finland, Copenhagen University of Information Technology in Denmark, North Carolina University, and Kursk Scientific Research Laboratory in Russia (Department of Games in Culture and Education), which investigate the category of games and its effects in non-game contexts [24]. Wharton College at the University of Pennsylvania offered a course called gamification, which has been taught since 2012.

The elements that make up the game include the following four elements: Game mechanics. The mechanics include the rules and method of the game and describe the purpose of the game. The story is the unfolding of events in the game and can be linear and pre-written or branched and resulting from other events. The aesthetics of the sound, the taste, and the mood of the game are called aesthetics, and since it is most related to the player's experience, it is one of the important elements of the game. Technology is the platform where aesthetics happen, mechanics happen, and stories are told. The important point is that all four elements are necessary, and none of the elements is more important than the other. Betoli et al. The principle of a VAR game means mechanics, dynamics and emotions are introduced. There are four types of people with different tasks in the VAR game. Players, designers, spectators, and observers all differ in some respects, including whether they feel active or passive or whether they are attracted or floating. In general, players are people who compete in a game-like experience. They are true performers, actively competing at work and very buoyant. Players can include new employees, existing employees, or customers of a company. Designers are the decision-makers in the organization who design and develop gamified activities and usually manage and maintain them. For example, in the field of improving employee interaction, designers should be human resource managers, or in the field of increasing customer interaction, designers should be customer relationship managers. Spectators are people who do not directly participate and compete in the gamified experience, but their presence affects how the gamified experience works. Observers are outsiders who are passively involved and attracted to the activity. They do not have a direct impact on the game-like experience and are only able to watch it from the outside, however, the presence of observers adds to the popularity of the experience. In the non-game environment, a supervisor can include employees of other departments or offices of the organization [8].

Designers adopt roles, content settings, types of interactions, and situational boundaries for gamification to specify goals [17]. The dynamics of the war game is the type of behaviour of people who are present as players in the experience [22]. The emotions of the war game include reactions and effective mental states among the players.

2002, which is said to be the year that the game of war was invented, and at the beginning of this decade when war was becoming a slogan, many researchers such as [9], [23], [13] and Other researchers considered different and attractive aspects of gamification. Some of them have examined the dimensions of design, and others have considered the psychological dimensions of it. For Sebastian Deterding and his colleagues, this shows that games and built-in applications have created a different perspective. The gamification phenomenon is a supplement to the entertainment phenomenon. They provide a definition of gamification.

There has been research on the effects of gamification in the field of social media. [6] defined a gamification model for online communities. Although this study is not about real social media service gamification and is only about online communities, it provides relevant information about how gamification can be used. According to [6], despite the differences between commercial portals and social communities, engaging visitors is still considered as the main reason for the success of a media. In this way, the benefits of gamification can be used to improve user interaction in social media. According to [6], three challenges in online communities can be involved with gamification.

3 VAR game

All definitions that have been given since 2002 for game war. It is based on the idea and opinion that digital computers and special games for these computers form its basis, however, the pre-digitalization period of VAR games was popular much earlier than digital computers and decades before programmable computers such as Z-3 To be

introduced, signs of gamification and turning work into a fun mode can be seen in the works of author Pamela Lyndon Travers [12].

In the section on the structure of computer games, the MDA framework was introduced, which includes three levels of foundations, capabilities, and aesthetics. This framework has introduced the structure of computer games as Deterding considers it useful for system thinking about the structure of games and their application outside of games. This framework has been revised and redesigned by Werbach in the field of gamification. Rabakh, who is one of the first experts in this field, has applied tangible changes in this framework. He has used the term game components instead of game aesthetics, and he believes that the aesthetics of the game includes the whole game and the game components and is not considered as its components and is a whole, which is the external manifestation of its internal components. Wambach has considered three levels for the Varsam game.

3.1 The basics of the gamification

Considers foundations as the general and conceptual aspects of interest in the game or modified game systems and compares them to grammar or hidden rules; But some people mentioned game thinking instead of game foundations; Which, of course, is a more general concept and suggests the need to think like game designers to implement a modified game platform.

Game Features Game features are the rules that make the game process; That is, the aspect that makes it fun, challenging, satisfying and motivating. These feelings are created by human needs and motivational methods, which are called game foundations.

The game components do not mean the parts that make up the game; Rather, it is tangible elements in the game or modified game platforms, such as levelling points, badges, leaderboards, mission feedback, luck, etc. This definition is often classified as game stimuli [28], but some also classify it separately, and Rabach is one of these people who considers game elements as a toolbox for game development and defines it with the title that distinguishes game elements from stimuli. He believes that three of these elements can be separated from the rest due to their universality and importance in the game of Varsaz. Badge score and scoreboard or ranking table) for short, these three are called PBL, has been used in many modified game platforms. He believes that the use of these elements is not always effective, and to implement gamification, we must make purposeful and meaningful choices [21].

In general, the method of gamification can be defined as a series of consecutive activities that can be used for any purpose or activity related to a specific business model that is supposed to be gamified. To create an effective gamification project, you can follow the steps below:

Defining the most important goals Identify the most important parts of your career that you intend to gamify. Usually, any job or profession you want to do has a main goal that can be clearly defined. These goals should be such that they attract people's attention and interest. We are going to create a game-based system based on them to help improve people's motivation and interest. Determining the required game mechanics, choose mechanics that are in harmony with your goals and also meet and support people's motivational needs. Self-selection, competition, and communication Some of these mechanics are: Autonomy, Profiles, Avatars, The ability to grow, The ability to build relationships, Alternative activities, Personal control, Control, Notification, competition, Feedback, positive, optimal challenges, Being informed of your progress, Direct controls, Points, Levels, Medals, Leaderboards, Communication Groups, messages, blogs, communication with social media, dialogue, review the effectiveness of your business game project in terms of audience attraction, fun, and service quality based on satisfaction indicators. Check the fun based on the analysis of criteria related to gaming presented by Sánchez González, by testing users using questionnaires completed by users measuring them against specific criteria or by conducting an exploratory evaluation by experts who are involved in all gamification systems. It is used. To check the effectiveness of the game project, our work from one. We use the service quality model and analyze the previously fixed quality parameters. This work is done by comparing the quality parameters before the work gamification process and based on the results obtained based on the application of the work gamification. One of the best service quality models that can be specially used for gamification is by university professor Ander Billet. Presented by Oliver Richard. This model seeks to integrate and unify customer satisfaction and service quality [2].

Comprehensive support for emotions and providing a context for different experiences are considered one of the uses and potentials of gamification. There is a difference between intrinsic motivations and extrinsic motivations. Intrinsic motivations originate directly from within the individual, while extrinsic motivations are often created following a specific external goal, for example, compensation and improvement of the situation (financial). Traditional incentive mechanisms were often formed based on increasing external motivations; for example, Financial rewards were considered. These methods often had difficulty increasing motivation in the long term, as their effectiveness

decreased over time. However, gamified services were able to stimulate users' intrinsic motivation, for example, to use the proposed core. User Satisfaction Documenting an individual's behaviour, for example, his progress, and depicting the attainability of his individual goals, provides rapid feedback, so the user will experience a good sense of his individual performance. Conveying a sense of optimism, gamification evokes a sense of attainability of goals or a desire for subsequent successful experiences. In facilitating social interactions, gamification is often presented as a way to enter a community and thus enable social interactions or competition. Providing meaningful gamification experiences allows users to participate in solving high-level problems and, thus, become familiar with areas beyond their individual capabilities under normal conditions.

These mechanisms provide an understanding of the control of individual autonomy and entertainment, which is the central goal of all presented experiences. Large populations who voluntarily use gamified services improve both their motivation and performance. However, the intrinsic motivations as well as the population using the system can be increased by setting external incentives; Therefore, incentives such as "marks" not only stimulate intrinsic motivation but also stimulate extrinsic motivation to gain a better social position. As a result, gamification allows the design of persuasive incentive mechanisms that go beyond financial incentives. It is not far from reality to say that gamification has a high potential to change behavioural patterns and support educational processes.

- Changes: Behavioural gamification by providing positive behavioural feedback will be associated with behavioural changes. Gamification can introduce new patterns of behaviour or modify old patterns. Such patterns of behaviour are often unconscious and automatic, so traditional incentive schemes have little effect on them. To provide positive emotions, gamification may break current habits and change them. Update with new behaviours or stabilize new behaviours after implementation by continuously setting appropriate stimuli.
- Support for the gamification of the learning process divides goals into smaller goals. Users can use trial and error to solve these sub-objectives and learn a specific skill at each level. If the sub-goals are designed from easy to hard, the educational content can be taught to people with their help.

4 Methodology and database

The purpose of clustering is to divide the existing data into several groups, and in this division, the data of different groups should have the maximum possible difference, and the data in one group should be very similar.

Unlike the classification (which we will see below) in clustering, the groups are not known in advance, and it is also not known according to which characteristics the grouping is done. As a result, after clustering, an expert person must interpret the created clusters, and in some cases, it is necessary that after examining the clusters, some of the parameters that are considered in clustering, but are irrelevant or not very important, are removed, and the clustering flow from first [20].

After the data has been divided into several logical and justifiable groups, we can use this division to obtain information about the data or to divide new data.

The most important algorithms used for clustering are Kohnen and K-means. Clustering is one of the branches of unsupervised learning, and it is an automatic process. Consider, for example, the distance criterion that can be used for clustering, and objects that are closer to each other can be considered as a cluster, which is also called distance-based clustering. For example, in the figure below, the input samples on the left are divided into four clusters, similar to the figure on the right. In this example, each of the input samples belongs to one of the clusters, and no sample belongs to more than one cluster.

In fact, the clustering algorithms are often such that a series of initial representatives is considered for the input samples, and then it is determined which cluster the sample belongs to based on the degree of similarity of the samples with these representatives. In this step, new representatives are calculated for each cluster, and again, the samples are compared with these representatives to determine which cluster they belong to. This work is repeated until the representatives of the clusters do not change.

Clustering is different from classification. In the classification, the input samples are labelled, but in the clustering, the input samples do not have a primary label, and in fact, it is by using clustering methods that similar data are specified and implicitly labelled. In fact, it is possible to perform clustering on the samples before the data classification operation, and then calculate the centers of the resulting clusters and assign a label to the centers of the clusters, and then perform the classification operation for the new input samples. gave In this model, let's divide the data into k separate clusters. This algorithm is divided into two separate phases: in the first phase, we obtain one point for each

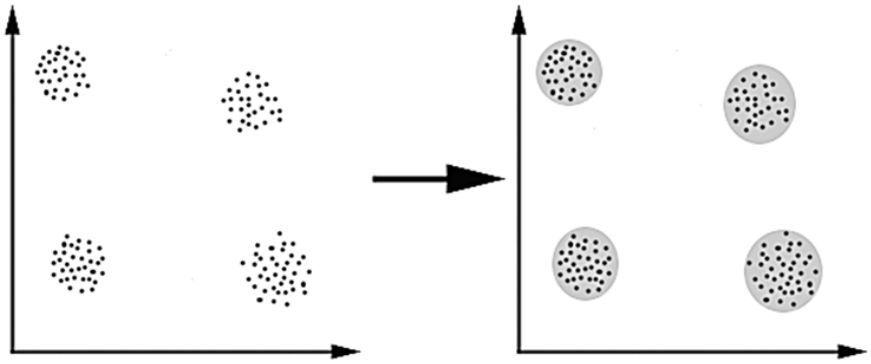

Figure 1: Clustering of input samples

cluster as the center point of the cluster and in the next phase, we obtain which point of the set is closest to the center of the cluster. and we attribute that point to the corresponding cluster. In general, the Euclidean distance is used to obtain the distance between the data points and the centers of the clusters. When all the points are placed in the clusters, the first stage is completed, and the initial clustering is done. Then again, we get new centers for the clusters and measure the distance of each point to these central points to update the clusters, and this work continues until the clusters converge.

But the main drawback of this algorithm is that different clusters are produced according to the number of primary centers, and as a result, the quality of the final clusters strongly depends on the choice of the primary centers of the clusters. This algorithm is computationally expensive and takes time depending on the number of points, the number of clusters, and the number of iterations. In the next part, we will examine the modified algorithm of Cummins, which has fixed these problems.

As stated, the standard Cummins clustering algorithm is computationally heavy, and the quality of its cluster results is highly dependent on the selection of the primary centers of the clusters. For this reason, researchers have tried to solve these defects by providing methods and improving the Cummins algorithm.

In the improved Cummins method, each two-phase Cummins algorithm has been modified to improve its accuracy and efficiency. In the first stage, the initial cluster centers use a systematic method instead of random selection to generate clusters with higher accuracy. The second stage starts with the formation of primary clusters based on the relative distance of each point from the primary centers of the clusters. These clusters are subsequently adjusted by a heuristic method, thus improving performance.

Similar to the classical average c algorithm, in this algorithm, the number of clusters (c) is specified in advance. The objective function defined for this algorithm is as follows:

$$J = \sum_{i=1}^{c} \sum_{k=1}^{n} u_{ik}^{m} d_{ik}^{2} \|x_k - v_i\|^2. \tag{4.1}$$

In the above formula, m is a real number greater than one, and in most cases, the number two is chosen for m, x_k is the k-th sample, and v_i is the i-th cluster representative or center. U_{ik} shows the degree of membership of the i-th sample in the k-th cluster. The symbol $\|*\|$ is the degree of similarity (distance) of the sample with (from) the center of the cluster, which can be used for any function that expresses the similarity of the sample and the center of the cluster. From U_{ik}, a matrix U can be defined, which has c rows and n columns, and its components can have any value between zero and one. If all the components of the U matrix are zero or one, the algorithm will be similar to the classical mean c. Although the components of the U matrix can have any value between zero and one, the sum of the components of each column must be equal to one, and we have:

$$\sum_{i=1}^{c} u_{ik} = 1 \qquad \text{for all } k = 1, ..., n. \tag{4.2}$$

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$$v_i = \frac{\sum_{k=1}^{n} u_{ik}^{m} x_k}{\sum_{k=1}^{n} u_{ik}^{m}} \tag{4.3}$$

and

$$u_{ik} = \frac{1}{\sum_{j=1}^{c} (\frac{d_{ik}}{d_{jk}})^{\frac{2}{(m-1)}}}. \tag{4.4}$$

4.1 Database

To evaluate the level of acceptance and use of personal gamification social networks, first, a gamified social platform was created in the field of data science learning with the following goals: where people can define data science projects and experiences and how to work as well as work progress in addition to learning. view They can also participate in each other's projects by selecting in the system and talking about the projects in the same system. This platform can be accessed at https://www.teamdatascience.ir. This environment has a social network of experts and scholars together. In this social network, there is a lot of information, including news, posts, experiences, pamphlets, articles, and files related to various professors in the field of data science using modified game German. One possibility for this site is to do data science projects. Different people can collaborate on a project and define and play their roles in this field. Various facilities are available to users, such as recording the work experiences of chat rooms and levelling people, holding challenges, etc. In order to increase students' motivation and achieve effective game design, game design elements should be designed based on students' needs. Game design elements, such as points and badges, are used in this study. Game design elements, such as points and badges, are used in this study. C# MVC programming languages and SQL SERVER database have been used to design the modified game system. Bootstrap, Jquery, Json technologies for data transfer.

4.2 Clustering system implemented for personalization (algorithm description)

Clustering algorithms have been used to personalize the designed system. During registration, various data is taken from the user. In addition, some fields have been extracted from various data and logs that the user has made in the system. For example, the number of clicks and reading of different contents and the number of likes will lead to the extraction of special interests. The dataset is created for clustering.

The statistical population of this research is 428 users of the platform. The statistical sample of the research is randomly selected. According to the obtained results and the summary of the obtained information, the most important features can be stated as follows. The number of clicks and reading of various contents, the number of likes and the individual's profile are shown in the figure below:

Each of the above factors can play a role in providing suitable teams to people. For this purpose, we intend to use machine learning algorithms for clustering, kmeans, dbscan, and fuzzy algorithms. And the result is expressed in clustering. Providing suitable teams to people is expressed numerically between one and three. which is shown in the form of three clusters below:

5 Systematic review

After two months of students using the gamification system, the following functions were achieved.

6 Conclusion

In this study, Python was used to implement clustering. Different algorithms have been used to implement the model. Various performance evaluation criteria are used for the accuracy and analysis of clustering systems. In this study, after checking the data and performing pre-processing, various algorithms were used to create the model, and

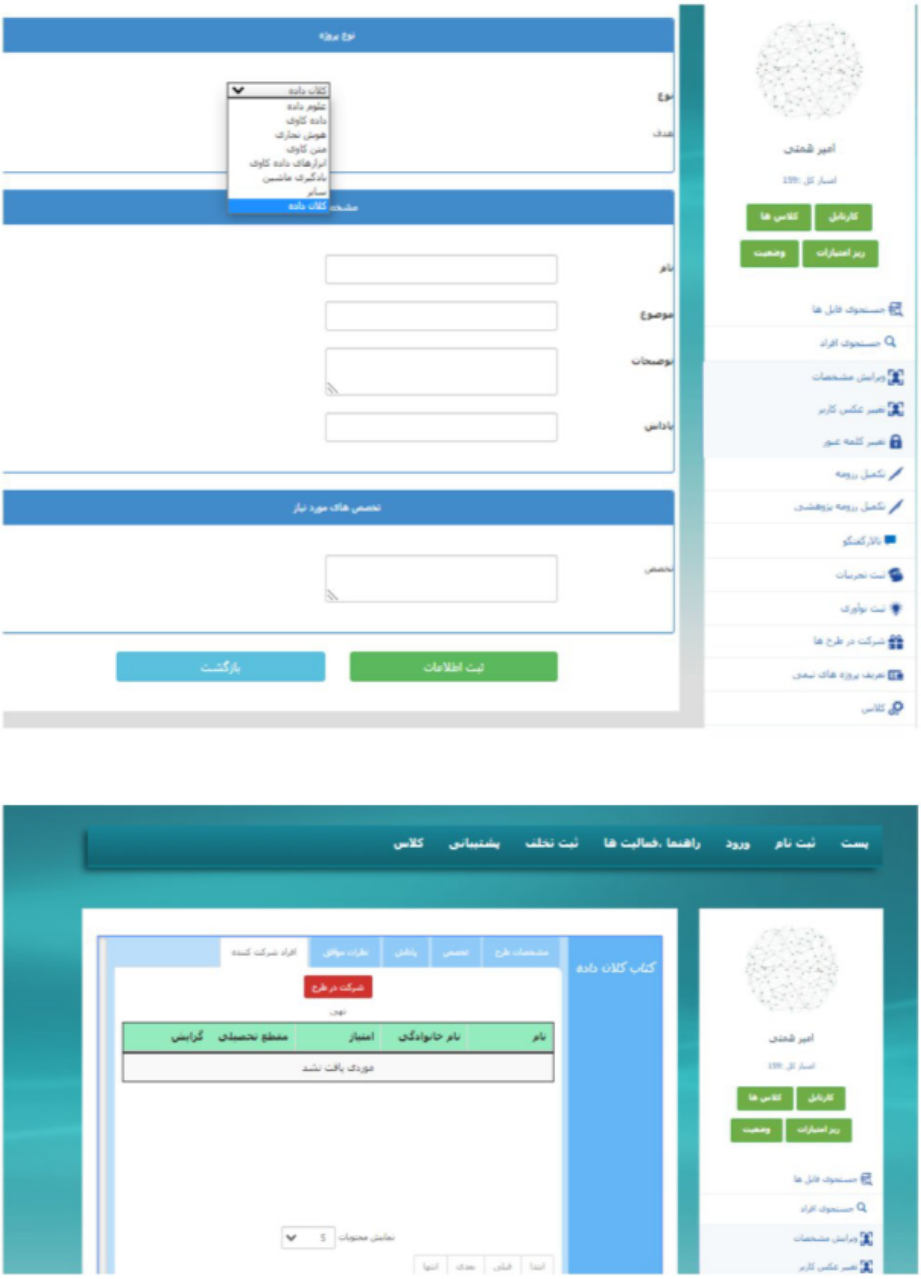

Figure 2: Part of the website images

Table 1: Systematic review and comparison of methods

Performance after using personalization games	Personal customization pregame	New project registration number
105	70	The number of project completions
765	60	The number of formed teams
455	40	New project registration number

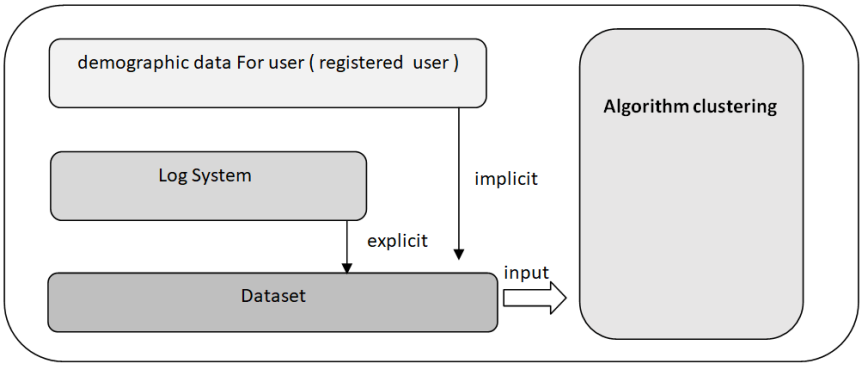

Figure 3: Proposed algorithm

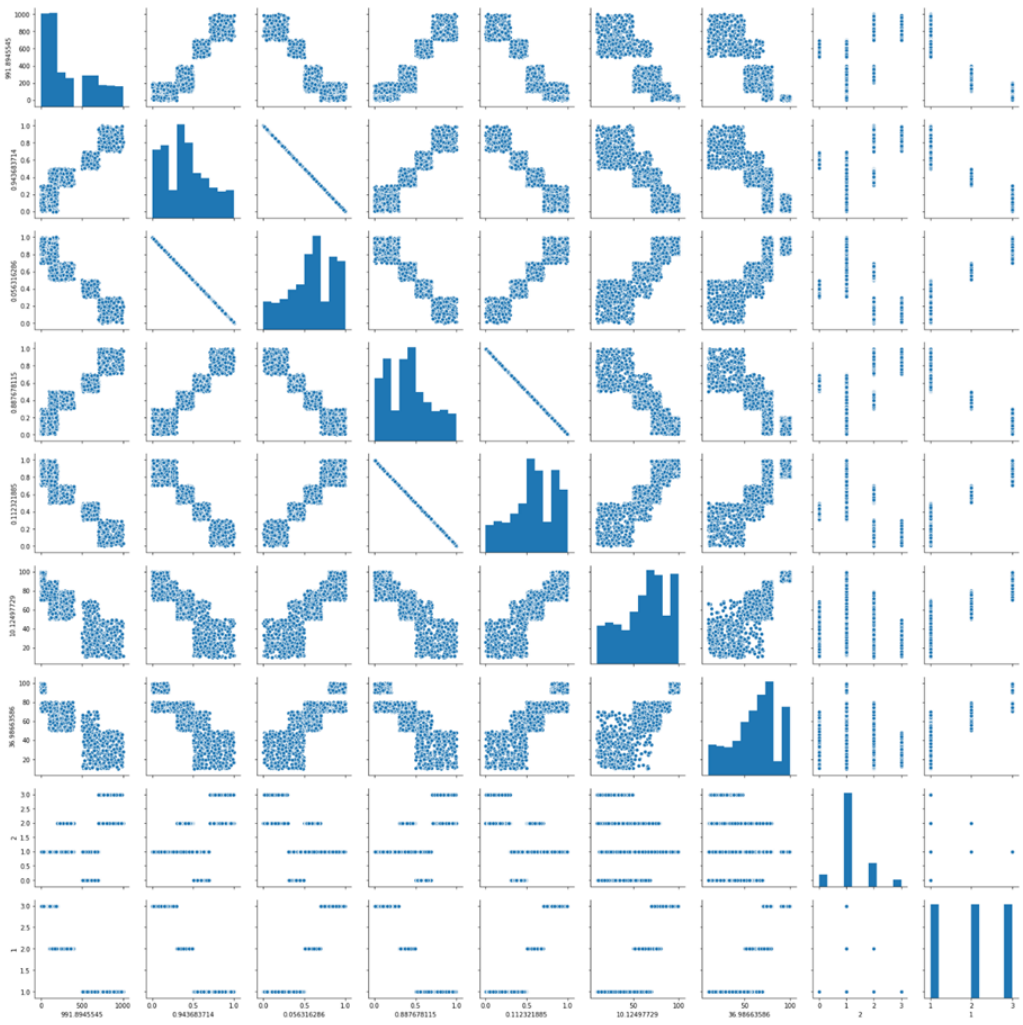

Figure 4: The histogram relation of the extracted features to each other

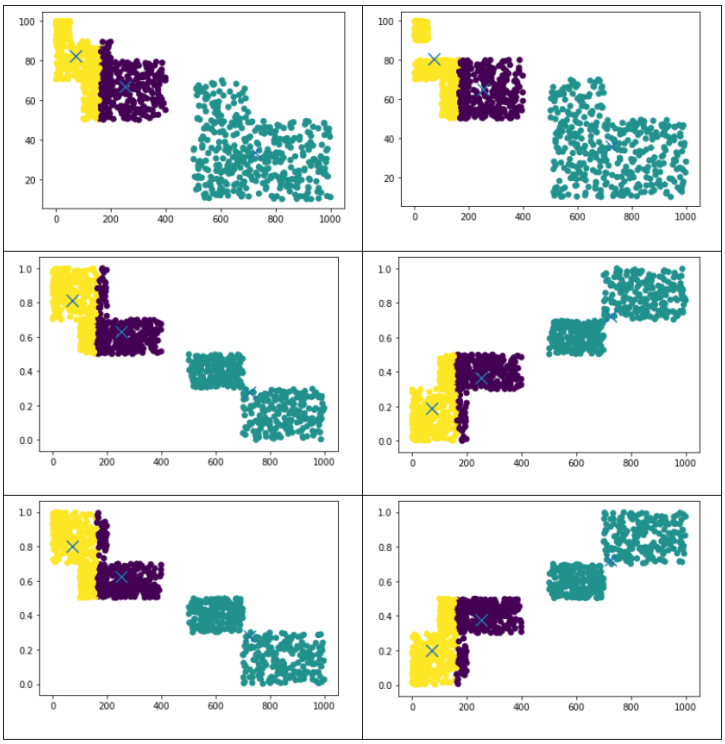

Figure 5:

Table 2: Evaluation of the accuracy of the proposed methods for clustering

precision	accuracy	
74%	87%	kmeans algorithm
73%	88%	dbscan algorithm
87%	93%	Fuzzy algorithm

it was examined with the criteria of these algorithms. On one page, they can view their testimonials and also refer to work teams to carry out data mining projects. Also, this study showed that clustering algorithms can create more dynamics in creating personal gamification systems and creating better participation in social networks in the field of data science.

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