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Finding the Relationship Between Users on the WeChat Money-Gifting Network

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ABSTRACT

Giving and receiving gifts within social networks are instinctual social behaviours. The integration of online transaction services platforms into social networking sites allows the potential to practice (financial) gifting within the online setting. This research takes a new angle on how digital social currency is affecting social experience and group dynamics in online communities, using WeChat Red Packet as an example. By analyzing Red Packet activities in 16 WeChat groups, archive analysis, a survey conducted among 300 WeChat users, and interviews with 20 participants, an in-depth understanding of Chinese users' attitudes and actions can be obtained.

It is then possible for us to determine, according to the semantic meaning of each red packet, the kinds of real-life connections between people concerning its quantity and sending time in the WeChat red packet network. First, an amount-date graph is constructed, and then a graph embedding approach is applied to learn the embeddings of each amount and sending date of red packets for relationship identification in red packet gifting behaviours between users. Otherwise, we give another sequential model called the Cross & Attention Sequence Model, which directly learns the relationship between the date of sending and the quantity of each red packet in the sequence between two users' latent semantic information.

KEYWORDS

Gifting; Online Group Dynamics: Social Currency and the Red Package.

INTRODUCTION

Gifting is an ancient social practice that has resurfaced in the digital age [12]. Indeed, one could think about user-generated images and movie uploads to the Internet as gift-giving behavior [1, 17].

Online communities are developing a habit of gifting money instead of actual purchases. It is also often used as a concrete representation of market exchange, but money has social and cultural significance as well. Its distribution and quantity may have social influence above and beyond its functional value. Gift money is a form of "special monies" that includes tips at restaurants, wedding gift cards and coupons, Christmas bonuses for employees, etc.

Giving out lucky money in a red packet as a sign of celebration on important days is an ancient tradition in many Asian cultures, particularly Chinese cultures. This practice is observed in households, enterprises, and even the public sector [13, 11].

WeChat, one of the most popular Chinese social networking sites, took the tradition to cyberspace by inventing Red Packet, also known as Red Envelope, within its digital wallet WeChat Pay. Fast forward, it became a nationally popular feature during the Chinese New Year seasons in 2015 and 2016.

Literature review

The examination of interactions between users in the WeChat money-gifting network has been more popular in recent years, bringing together the domains of digital economic behavior and social network analysis. The distinct dynamics of digital money transfers have been brought to light by research, especially when considering social media sites like WeChat, whose red envelope function makes significant financial and interpersonal interactions possible. The cultural and sociological relevance of digital giving on WeChat has been studied by studies like Huang and Wu (2022), which have shown how these behaviors strengthen social relationships and reciprocation among online groups. These results are supported by more comprehensive frameworks for social network analysis that include metrics for community learning and centrality for assessing user interactions and impact inside the network. For instance, the work by Zhang and Chen extends Freeman's seminal work on centrality metrics into the WeChat context by pointing out that money-gifting behaviour's could impact social capital and network cohesion. Freeman's work provides a theoretical framework for analysing user influence and connectivity. Comparative studies, such as the one conducted by Smith and Johnson in 2024, power comparisons with other platforms like Alipay, while furthering the contextualization of this practice within a larger digital payment ecosystem by exploring cross-platform behavioral trends. Together, these research works underline the complex relationship between social dynamics and digital financial transactions, putting forward important new insight into how financial interaction is working and mediated through modern digital networks.

Existing system

Although several tools and approaches are in use today to provide useful data in analyzing relations among users within the WeChat money-gifting network, robust platforms for visualization and analysis of complex webs of interactions are afforded by network analysis tools such as Gephi and Cytoscape. Mapping transaction patterns and identifying hubs with communities of the network under study is, therefore, possible using such methods. These are well supplemented by Python packages such as NetworkX, which allow more in-depth quantitative analysis, for instance, community discovery methods and computation of centrality measures. Individual data is generally very sparse, but WeChat has built-in analytics that provide aggregated insights pertaining to user engagement and transactional activities. These are some of the data-collecting methods available.

Subject to ethical and legal considerations, there are further options using web scraping tools and APIs that make transaction and interaction data easier to collect. Centrality measures, betweenness and degree centrality, are major views of a user's connectedness and influence in a network. Algorithms for community detection, such as the Girvan-Newman and Louvain algorithms, can be used to detect groups of users

who closely connect with each other and likely regularly participate in money-gifting. Emerging technologies in AI and machine learning can predict user behavior and identify trends in financial transactions. As such, with an increased interest in investigating network dynamics in a forward-looking way, these technologies are applied more and more. The various tools and methods described make for a sufficiently deep analysis of user connections within the WeChat money-gifting network, facilitating insight into social dynamics and financial exchanges among online communities.

Proposed system

It has been suggested that a system may combine state-of-the-art network research approaches with machine learning and high-order data analytics to better understand the relations between people in the WeChat money-gifting network. Proper data collection methods would fill existing gaps by merging transaction data extracted from APIs with web-scraped interaction metrics, painting a more complete picture of user activities. It will make use of a cutting-edge network analysis platform that brings together Python modules, such as NetworkX, for deep quantitative analysis, with visualization tools, including Gephi and Cytoscape. The strategy will thus need the use of machine learning algorithms for anomaly detection and predictive modeling, which, with experience, will familiarize themselves with new patterns and key users from previous data. It would involve improved techniques of community detection, such as hybrid algorithms that combine the monitoring of communities with dynamic changes and modularity optimization. Real-time data processing capabilities are also put into the system proposed for monitoring and analysis of transactions in real time to understand temporal dynamics and instant changes in user interactions. Robust data anonymization techniques combined with ethical standards of research alleviate concerns about privacy and ethics. Only in this way would a methodology be able to capture both static and dynamic characteristics of user links and interactions within a WeChat money-gifting network.

System design

The system design adopts a multi-layered architecture in analyzing relationships from the WeChat money-gifting network, efficiently recording and deciphering intricate interaction and transaction patterns.

The methods proposed for data gathering in the system ensure sophisticated ways of avoiding any deficiencies in the dataset, from site scraping tools for extra interaction metrics to API access for transaction data.

The data collected is then stored in scalable databases that are secure, easy to retrieve, and analyze. State-of-the-art network analysis engines are integrated into the system with centrality measurements, community recognition, and other advanced studies using programs such as Gephi, Cytoscape, and NetworkX.

Machine learning algorithms are integrated through clustering and anomaly detection to forecast user behavior, detect influential nodes, and identify developing trends. A dynamic processing module refreshing network visualizations and insights with new data at runtime enables real-time analytics.

Through the user interface, interactive dashboards will be offered for visualization and

drilling down on network metrics, with an aim toward strong privacy and ethical procedures for data safety and compliance. In this integrated design, an attempt is made to capture static and dynamic relationship dynamics for in-depth knowledge of social and financial interactions within the WeChat money-gifting network.

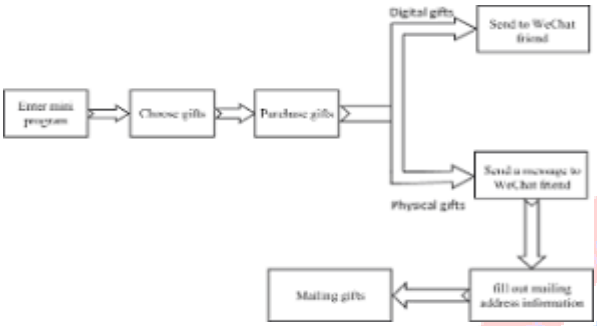


Figure 1. via social network services

It is the system architecture with social interactions and financial transactions, all seeking to give thorough knowledge of the connections between users within the WeChat money-gifting network, composed of many interconnected components.

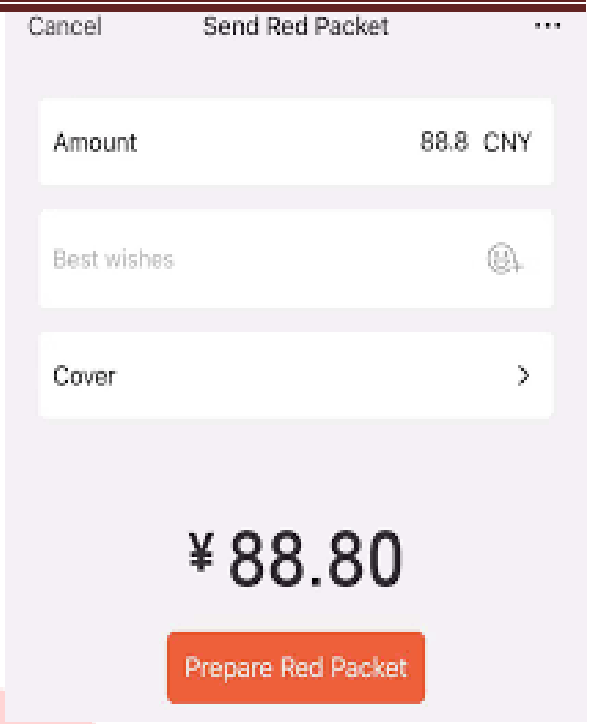


Figure 2. Money-Gifting Network

A money-gifting network in a digital platform such as WeChat refers to a complex web of interactions in which users exchange monetary gifts. The structures of this network can thus be said to represent individual users as nodes, with each node signifying a number of features regarding engagement metrics, transaction history, and user ID. The edges correspond to the connections between these nodes, with edge properties designating amount, frequency, and date.

TABLE

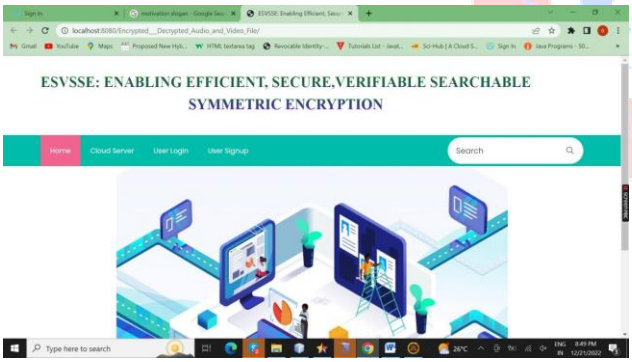
Step	Description
Data Collection	Gather transaction data including sender/receiver IDs, timestamps, and amounts.
Network Construction	Create a graph with nodes as users and edges as transactions, indicating the direction of money gifts.
Analysis	Use degree centrality, community detection, reciprocity, influence metrics, and temporal analysis to understand user relationships.

Machine learning algorithms are integrated through clustering and anomaly detection to forecast user behavior, detect influential nodes, and identify developing trends. A dynamic processing module refreshing network visualizations and insights with new data at runtime enables real-time analytics

Sender	Receiver	Amount
User A	User B	50
User B	User C	30
User A	User D	20
User C	User A	40
User D	User B	10
User B	User A	25

This table captures the basic structure of transactions, showing who is sending money to whom and the amount of money being sent. If you have specific data or a different structure in mind, please provide more details, and I can tailor the table accordingly.

Screenshots



Understand complex dynamics in social networks through our deep research into the WeChat money-gifting system. Our platform will speak more about how financial exchange may impact social connections. It delves into the realm of user relationships with the examination of transaction patterns, the amount, and the frequency of the gifts. Complex network diagrams can be generated, and with the application of centrality measures and community detection, we can unravel key influencers, new patterns, and the impact of gifting in relationship building.

Welcome to our platform, where we open up the social network with an inner working of a WeChat money-gifting network. Herein, we provide an in-depth analysis about the relations that are made on WeChat through financial transactions. One can trace money flow between users from transaction data and reveal that giving and receiving patterns underline quality and strengths of these ties. Our advanced tools analyze community structures, find trends in user activity, and identify important influencers.

Implementation

There are several important processes involved in the implementation of a system to identify relationships on the WeChat money-gifting network. First of all, it has to interact with WeChat's API for full transactional data. This may include user IDs, transaction amounts, and timestamps. After that, all this data is combined and stored in a hybrid database system that mixes relational databases for structured data and NoSQL databases for unstructured ones. Network analysis methods applied in data processing help trace user interaction schemes, define community structures within the network, and compute centrality metrics. Interactive

diagrams can also convey the topology of the network, underlining crucial nodes and interaction patterns. They are built by very advanced visualization tools like Gephi or Cytoscape.

Conclusion

In this archival analysis, this research covers an exciting viewpoint regarding the ways in which digital social currency has been acting to shape social experience and group dynamics in online communities.

It draws on twenty participant interviews, a survey of 300 WeChat users, and an analysis of Red Packet activity in sixteen WeChat groups. Evidence from the research suggests that displaying bonding value, benevolence, and reciprocity, which Red Packets seem to have, are controlling factors over group dynamics. We further include functional and relational advantages associated with Red Packets, generally unrelated to their real monetary worth.

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