

# Corporate Communication Network and Stock Price Movements: Insights From Data Mining

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# ABSTRACT

- ▶ Grounded on communication theories, we propose to use a data-mining algorithm to detect communication patterns within a company to determine if such patterns may reveal the performance of the company.
- ▶ Specifically, we would like to find out whether or not there exist any association relationships between the frequency of e-mail exchange of the key employees in a company and the performance of the company as reflected in its stock prices.
- ▶ If such relationships do exist, we would also like to know whether or not the company's stock price could be accurately predicted based on the detected relationships.
- ▶ To detect the association relationships, a data-mining algorithm is proposed here to mine e-mail communication records and historical stock prices so that based on the detected relationship, rules that can predict changes in stock prices can be constructed.
- ▶ Using the data-mining algorithm and a set of publicly available Enron e-mail corpus and Enron's stock prices recorded during the same period, we discovered the existence of interesting, statistically significant, association relationships in the data.

# EXISTING SYSTEM

- ▶ RECENT research reveals the existence of interesting communication patterns [1] among different participants of different social network platforms.
- ▶ These patterns have been shown to be useful in predicting product sales [2] and stock prices [3]. Compared to a social network, which can be considered as representing connections among people in the public, a corporate network connects only employees in a big corporation.
- ▶ While participants of a social network can express opinions on any issues of interest, members of a corporate communication network are expected to mainly talk about company-specific business. If human communication patterns can be discovered in the social networks to predict product sales or stock performance,
- ▶ one may wonder if such patterns also exist among members in corporate communication network to allow the same to be done. Unlike social networks, in a corporate communication network, e-mails have long been used as a tool for interorganizational and intraorganizational information exchange.

# CONTD

- ▶ Based on these broad corporate communication theories, we hypothesize that every company has its own communication approach with identifiable patterns.
- ▶ In the same way, a social network platform is able to capture participants' behavior and their opinions about various issues and events.
- ▶ Thus, we argue that a corporate communication network in the form of an e-mail ecosystem also contains insightful information, such as organizational stability and robustness [4], about a company's development.
- ▶ We believe that these communication patterns can reflect how a company manages major corporate activities (such as mergers, acquisitions, new ventures, new process improvement approaches, going concerns, or bankruptcy) that may subsequently affect the company's performance in the stock market.

# DISADVANTAGE

- ▶ we would like to find out whether or not there exist any association relationships between the frequency of e-mail exchange of the key employees in a company and the performance of the company as reflected in its stock prices.
- ▶ If such relationships do exist, we would also like to know whether or not the company's stock price could be accurately predicted based on the detected relationships

# PROPOSED SYSTEM

- ▶ we propose that a company's performance, in terms of its stock price movement, can be predicted by internal communication patterns.
- ▶ To obtain early warning signals, we believe that it is important for patterns in corporate communication networks to be detected earlier for the prediction of significant stock price movement to avoid possible adversities that a company may face in the stock market so that stakeholders' interests can be protected as much as possible.
- ▶ Despite the potential importance of such knowledge about corporate communication, little work has been done in this important direction.

# ADVANTAGE

- ▶ we also discovered that these relationships can predict stock price movements with an average accuracy of around 80%.
- ▶ The results confirm the belief that corporate communication has identifiable patterns and such patterns can reveal meaningful information of corporate performance as reflected by such indicators as stock market performance.
- ▶ Given the increasing popularity of social networks, the mining of interesting communication patterns could provide insights into the development of many useful applications in many areas

# HARDWARE REQUIREMENTS

- ▶ Processor – Pentium -III
- ▶ Speed – 1.1 Ghz
- ▶ RAM – 256 MB(min)
- ▶ Hard Disk – 20 GB
- ▶ Floppy Drive – 1.44 MB
- ▶ Key Board – Standard Windows Keyboard
- ▶ Mouse – Two or Three Button Mouse
- ▶ Monitor – SVGA

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# SOFTWARE REQUIREMENTS

- ▶ Operating System : Windows 8
- ▶ Front End : Java / DOTNET
- ▶ Database : Mysql / HEIDISQL

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# CONCLUSION

- ▶ this paper also reveals important practical implications. Without looking into the details of communication contents, this paper relied only on communication frequency to detect the organizational performance such as stock performance via the proposed algorithms.
- ▶ In order to identify the significant changes of stock price, or detect the early stage of organizational crisis, the corporate can observe the employees' communication network and monitor its robustness.
- ▶ In the past, auditors, regulators, the public and researchers were searching for hints and signals to detect corporate fraudulent behavior [38] or the early stage of going concerns and corporate bankruptcy.
- ▶ This paper demonstrates the practical possibility to do so by monitoring the patterns of a corporate communication network.

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