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API 実習	2023	6	B	20122077	ROGER MARVIN

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日本語論文：情報関係の大学入試問題の分析とプログラミングをベースとした対策教材の開発

<http://id.nii.ac.jp/1001/00227299/>

英語論文：How APIs Create Growth by Inverting the Firm

<http://dx.doi.org/10.2139/ssrn.3432591>

## 課題論文の要約

Nowadays, in this digital era, a company's net-worth is influenced by how it controls its information or data. An approach, called the "Inverted Firm" strategy, is an strategy emphasizes in sharing and processing data, allowing third parties to contribute significantly to the value of creation. Successful companies such as Alphabet, Meta, and Amazon leverage public APIs to coordinate and control external activities and have grow substantially.

In the face of this digital transformation, many companies are considering the choice of staying to traditional data-guarding approaches or embracing the new strategie such as the Inverted Firm. The traditional approach do involves keeping everything internal, while the Inverted Firm strategy shares data with external partners or third parties, by relying on public APIs as connectors for outside developers to use a company's resources.

Inverted Firm strategy lies in public APIs, which connects communication between computers/devices. Some research shows that companies embracing APIs experience a dramatical growth by involving third parties rather than just solely improving internal processes themselves. Based on the research done, the net-worth firms adopting APIs also increases by an additional 12.9%, excluding the growth in smaller firms building on these platforms.

The network of public APIs connecting companies through third-party apps is expanding and it is benefiting companies that are actively engage with using these APIs. The positive impact and advantages of using API extends not only on big companies, but it also reaches other smaller firms in various other industries. APIs contribute not only in data's volume but also in network position, with firms using and having more central APIs, they experienced a faster growth. On the other hand, companies that use APIs solely for internal efficiency, don't experience any significant market value growth.

Companies that use central APIs experienced a dramatical net-worth growth, with the top 14 are publicly traded firms with high API adding \$6.584 trillion to their net-worth from 2005 to 2021, which is a 580.8% increase. These firms actually played a crucial role in the overall US market value growth during this period. The statistical methods such as the two-way fixed effects, the difference-in-difference, and the synthetic control are used to assess the impact of API adoption on market value. The results indicate a significant increase in market value for companies that use APIs, with the adoption of API resulted in a 38.7% rise in market value for the entire dataset. In addition,

the timing of API adoption also plays a role, it confirmed that companies who adopt the use of APIs earlier are benefiting more than the one that are not.

The Inverted Firm strategy theory suggests that companies are benefiting more if they are central position in the public API network. The evidence supporting this idea is showing a relationship between a company's network importance and its market value growth. The research also looks into the internal effects of API adoption, discovering that the benefits are more seen and felt in the external engagement of the company than internal productivity of the company.

However, despite the benefits, there is a big backlash in using external API adoption, especially in the data security. Implementing external APIs can make a company more vulnerable to data breaches. It is important to carefully manage the information systems to balance the gains and the risks. APIs serve as gateways to the database for the data, and finding the right balance is really important. If an API is too open without a strong security system, a company may risk exposing their private or sensitive data to the public which could cause a lot of casualties to the company. But, on the other hand, if it's too restricted, external engagement will become difficult, and the use of the data will lessen which could also cause financial problems for the company. So, a company should manage and update their APIs more frequently. Companies that frequently update their APIs tend to see larger increases in market value, showing the importance of managing third-party API use over time could benefit both ways. However, the potential for data breaches is still a significant concern, and there is a trade-off between enabling third-party innovations and preventing third-party damage or ransom.

This is the paradox of opening, where publicly opening APIs can result in both positive and negative effects. The risk of data breaches, especially the insider breaches. This increases in the two years following API adoption, really shows that it is needed for a robust security measure. Companies that respond to data breaches do see a short-term decrease in API flows that eventually will rebound back. Well-managed companies do consciously open their external APIs with prioritize security, understanding the risks in opening their API but also taking measures to protect its data against potential attacks in the future. In contrast, there's still some firms that are implementing APIs without the same awareness and precautions may face higher security risks.

In summary, this is a study of the effectiveness of the "inverted firm" strategy, which focused on the role of APIs in companies' digital data resources. This strategy becomes a steppingstone for many companies collaborating with external developers and third parties, enabling them to create value through frontends such as apps by utilizing the companies' data and digital services. The quantitative impact of API adoption shows the dynamic growth of the company digital economy over time, with central APIs playing an important role in shaping the company ecosystems. This study further underscores the importance of external engagement, with developer involvement as the key to market value. Being at the center of the network really boosts the company's net-worth, showing how important APIs are for a company. However, there's also a risk of data breaches, the profit companies make from higher market value is way more than what they might lose. It's all about finding the right balance between working with others and keeping things secure. So, simply said, APIs do play a crucial role in helping companies succeed in the digital world, placing them strategically in networks to get big returns.

This study paper is about how APIs could affect a company market value. The base line here is the strategy called Inverted Firm Strategy. This strategy is where firms share data seeking to become platforms by opening digital services to third parties and capturing part of their external surplus. So simply said that company with excess dataset or information that is no longer need is being shared to the public to be used in many kinds of ways. Such as research or study. But to be able to do this a company need to use an APIs so that the third parties or external developers could use the data stores in company database server. By using this method, it is proven that a company market value is increasing so dramatically which appeal other company to start to do the same to raise their market value. Though this method is very effective in rising a company net-worth, it is also important to understand that by allowing external people to access a company internal database service could raise a risk such as data breach which is not a small problem. By using APIs, hackers could pass through the security and gain the company sensitive information and sometimes could also cause in ransom which is problematic to smaller company. So in order to avoid those problem it is important to do a frequent check and update the APIs. Though even with intensive update and checking it is still risky to have the open the server publicly. So company that are interested in gaining market value have to work hard in balancing the gain and the risk effectively.

In my opinion, by having an open public service that everyone could use is a very important for a company to do because by allowing a third parties to access a company's information, not only that it could improve the company net-worth, but it could also be a chance use it as a free advertising. While it is risky to use this method, by separating the database location of accessible data and sensitive data, a company could effectively manage their data flow. In addition, the company could also make their service accessible with subscription which mean the have to pay to be able to use and it is easier to control the data flow. Having a stronger security system also helps in decreasing the risk of data breach. So, in conclusion, the Inverted Firm Strategy is a need to be implemented in companies especially in this digital era, but to do it effectively, it is important to control the data flow between the internal and external parties which can be done by making the access subscribable, separating the database, or even improving the security defense power.

## 課題論文で使われている用語の説明

- Net-worth: the value of the assets a person or corporation owns, minus the liabilities they owe.  
<https://www.investopedia.com/terms/n/networth.asp#:~:text=Net%20worth%20is%20the%20value,of%20its%20current%20financial%20position.>
- Inverted Firm Strategy: firms share data seeking to become platforms by opening digital services to third-parties and capturing part of their external surplus.  
[https://digitalcommons.chapman.edu/cgi/viewcontent.cgi?article=1278&context=economics\\_articles#:~:text=A%20new%20%20Inverted%20Firm%20paradigm,the%20firm%20itself%20creates%20value.](https://digitalcommons.chapman.edu/cgi/viewcontent.cgi?article=1278&context=economics_articles#:~:text=A%20new%20%20Inverted%20Firm%20paradigm,the%20firm%20itself%20creates%20value.)
- Public APIs: an application programming interface made publicly available to software developers.  
<https://www.techtarget.com/searchapparchitecture/definition/open-API-public->

[API#:~:text=An%20open%20API%2C%20also%20called,a%20universal%20access%20to%20consumer s.](#)

- Digital Transformation: the integration of digital technology into all areas of a business, fundamentally changing how you operate and deliver value to customers. <https://enterpriseproject.com/what-is-digital-transformation>
- Statistical Methods: Statistical methods are mathematical formulas, models, and techniques that are used in statistical analysis of raw research data. <https://www.nature.com/subjects/statistical-methods#:~:text=Statistical%20methods%20are%20mathematical%20formulas,the%20robustness%20of%20research%20outputs>.
- Dataset: A collection of data, often used for analysis and research. [https://en.wikipedia.org/wiki/Data\\_set#:~:text=A%20data%20set%20\(or%20dataset,the%20data%20set%20in%20question](https://en.wikipedia.org/wiki/Data_set#:~:text=A%20data%20set%20(or%20dataset,the%20data%20set%20in%20question).
- Market Value Growth: the increase of the price an asset gets in a marketplace. <https://www.investopedia.com/terms/m/marketvalue.asp>
- Centrality: the quality or fact of being in the middle of somewhere or something. <https://en.wikipedia.org/wiki/Centrality>
- Paradox of Exposure: A situation where the act of making something public (like APIs) can have both positive and negative consequences.
- Insider Breaches: a cyber security risk that originates from within an organization. <https://www.opentext.com/what-is/insider-threat#:~:text=is%20Insider%20Threat%3F-,Overview,organization%27s%20networks%2C%20systems%20and%20data>.
- Robust Security Measures: encryption, firewalls, and access controls, can prevent unauthorized access and keep sensitive data safe. <https://fastercapital.com/startup-topic/Robust-Security-Measures.html#>
- Trade-off: exchange something of value, especially as part of a compromise. <https://dictionary.cambridge.org/dictionary/english/trade-off>
- Innovation: new or changed entity, realizing or redistributing value. <https://en.wikipedia.org/wiki/Innovation#:~:text=Innovation%20is%20the%20practical%20implementation,%2C%20realizing%20or%20redistributing%20value%22>.
- Precautions: a measure taken beforehand to prevent harm or secure good. <https://www.merriam-webster.com/dictionary/precautions>
- Awareness: knowledge and understanding that something is happening or exists. <https://www.merriam-webster.com/dictionary/awareness>

- Security Risks: someone who could damage an organization by giving information to an enemy or competitor. <https://www.merriam-webster.com/dictionary/security%20risk>