

## Gap Analysis between Hype Cycles and Trends in Digital Media

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**Abstract.** Recently, many companies adopted various technology life cycle models to identify promising scientific technology in the early stage and predict the direction of development. Gartner Hype Cycles is one of the widely used models to visualize market expectations and conditions on technology. However, because generating the hype cycle takes a lot of experts, money, and time, studies have lately attempted to analyze the market expectation variable as an interest in technology in digital media. Research that examines how the degree of interest in various digital media fluctuates during the hype cycle is required for this, but integrated studies that can offer a comprehensive view are currently lacking. This study analyzes the trend of figures mentioned in 17 domain technologies in various digital media and how this trend is related to the hype cycle. In other words, each hype cycle phase's characteristics as they relate to digital media are contrasted, and changes, as they relate to each phase, are examined from the perspective of digital media.

**Keywords:** hype cycle, Gartner, text analysis, Google trends, search traffic.

## 1. Introduction

Human technology has recently risen rapidly based on computer and internet technologies, demonstrating what Ian Morris claims: "Social development needs a foundation, and once the foundation is established, the pace of development accelerates"[6]. Thus, as many companies consider finding promising technologies and having technology competitiveness based on growth potential as important factors in securing market competitiveness of their products, they are conducting continuous analysis of the usage trend of the latest technology or the scope of future development[8]. To be specific, they are developing and utilizing various kinds of products or lifecycle models of technologies in order to predict social changes, as well as discovering new technologies or convergence technologies at an early stage in a variety of academic fields like management, marketing, technology management, and science and technology policy[3]. Among them, the Hype Cycle proposed by Gartner, technological research and consulting firm is a widely used model that visualizes how public expectations and market conditions change according to the life cycle of technology in the area of information and communications[9]. In other words, when a new technology is introduced, the hype cycle model is used to describe how expectations for that technology evolve, and how that technology is established in the marketplace and utilized by companies[2].

Gartner has invested a lot of money and time in hiring experts to collect large amounts of data and analyze them to derive individual models by hiring experts. This study explores how many times digital media has been mentioned at each phase of the hype cycle under the assumption that public expectations and market conditions can be described in various digital media in the current era of the Internet. In practice, many researchers are conducting studies comparing and analyzing the numbers mentioned in each phase of the hype cycle and specific digital media of independent technology. However, there are difficulties remained to provide overall relations due to the limited types of technologies and digital media covered in each study. To this end, this study examined the number of cases mentioned in various digital media that are likely to be related to the hype cycle with other diverse domain experts. This means that the experts conducted a quantitative analysis of the frequency with which each domain is mentioned in various digital media, including news from both domestic and international sources, research papers, patents, Google trend analyses, and social media, in addition to looking for differences with trends in the hype cycle. It should be noted that certain technology does not necessarily behave according to the hype cycles model assumptions and the observable model dynamics do not always follow (conform to) Gartner's theoretical framework[9].

In this paper, chapter 2 examines the concept of the hype cycle and previous research on the hype cycle. Chapter 3 describes the analysis procedure and data collection method carried out in this study and chapter 4 explains each phase of the hype cycle and the research results analyzed by the data source. Lastly, chapter 5

summarizes this study suggesting the importance and limitations of the study, and comparing the relationship between the hype cycle and the text from various perspectives. Accordingly, this study will be a reference for future hype cycle-related research.

## **2. Literature Review**

### **2.1 Hype Cycle**

The hype cycle model was created by Jackie Fenn of Gartner to express the level of a technology's maturity as well as the extent of its adoption and commercialization. It has since developed into a useful tool that is widely used by Gartner as well as in many other fields, and it has especially drawn attention for its superior explanatory power [2]. This is a model that visualizes how the technology changes expectations or visibility over time, as shown in Fig. 1, and assumes that the life cycle goes through the five key phases: Technology Trigger, Peak of Inflated Expectations, Trough of Disillusionment, Slope of Enlightenment and Plateau of Productivity, according to the degree of maturity of the technologies. Then, in order to describe the current stage of the technology of interest, the technology is placed on a graph of change in expectations over time.

Technology Trigger is called the creation phase or the early stage of the technology in which a potential technology begins to receive attention and the media triggers public interest, but commercial viability has not yet been proven because there are no usable products. The peak of Inflated Expectations is a period in which awareness is growing as a number of success stories are disclosed, but most companies are not yet involved. The Trough of Disillusionment is a phase where hype rapidly decreases due to a decline in interest in experimental results or failure to commercialize. This phase is generally due to technical problems of disappointing experimental results, diminished media interest, the aftereffects of excessive marketing exposure, or insufficient usage infrastructure. When technology reaches the Slope of Enlightenment, it may have a better awareness of the precise ways in which it will be useful. At this point, second or third-generation products may also develop, demonstrating advancements over the original product. This is a stage in which conservative companies are paying cautious attention to how the technology will evolve. The Plateau of Productivity is the last phase in which commercial feasibility is recognized and the technology begins to pay off in the market. Depending on the technology, if no cases are found that show a profit model, the technology may not enter the last phase and disappear [2].

In the case of the Gartner group, the hype cycle model is presently used for the majority of new information technologies, and this model is used to illustrate what phase the information technology introduced so far has reached[2]. For certain technologies, longitudinal studies are required to determine how long it takes before

progressing to the next stage; however, most technologies are only included in Gartner's study once, and even then, they are frequently replaced by similar technologies. Therefore, longitudinal studies of technology in the hype cycle are not straightforward and require expert decisions[9]. Although the hype cycle model is widely used in industrial fields and research, the problem is that it is not proven[2][3][9]. There are various studies on the hype cycle, but diversified studies are necessary for verification and application.

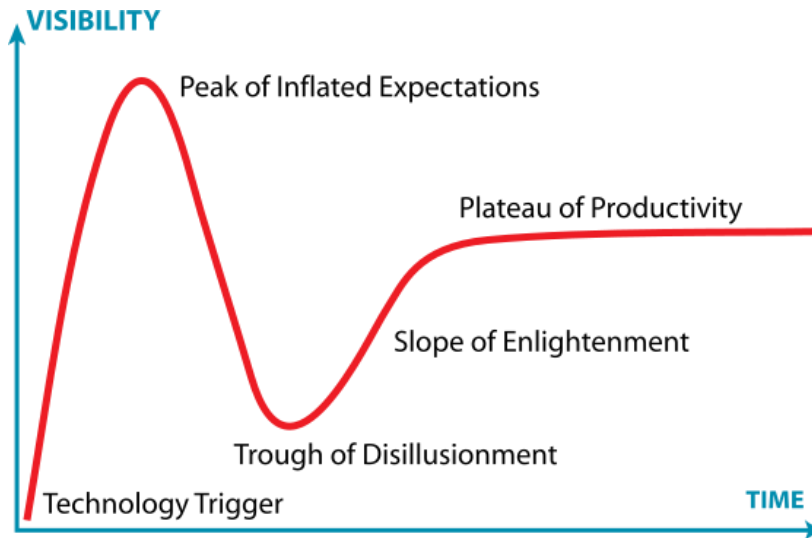


Fig. 1: Gartner hype cycle [14].

## 2.2 Hype Cycle and Text Analysis

There have been many studies that conducted text analysis to verify Gartner's hype cycle. Most studies have analyzed technological maturity stages/Technology Readiness Levels for specific technologies in the hype cycle. News, patents, research papers, search volume, SNSs, etc. were used as data for analysis[2][7]. The hype cycle was analyzed mainly through frequency analysis, which examined how often relevant technologies are mentioned in text data. When analyzing text data, more precise analysis was possible if the content analysis of text data was implemented[13]. In addition, a web mining study was also confirmed to analyze weblog-based text data[11]. The user-centered technology maturity cycle analysis study mainly used search volume. For the search volume, Google's search traffic was used, but similar results were obtained in domestic search traffic[2][3]. The technical maturity phase of the hype cycle and the analysis results through text analysis were not all consistent. In research comparing the hype cycle and news data for three power production technologies, tidal power technology was constant among the three while others were not, depending on the stage of technical maturity [9]. The technology of the hype cycle is difficult to analyze because emerging technologies do not appear in the first phase, but immediately appear in the maturity phase or do not appear in other phases

after the first stage [7]. Therefore, in the hype cycle study, it was important to choose a specific technology [3][7][13]. For the study of the hype cycle, understanding how the various technologies are positioned within the hype cycle is important. Meanwhile, there have also been prior studies to identify how it is used in the health food sector [10].

There were also several studies that conducted comparisons with a number of technologies rather than a study on a specific technology. Representative studies are as follows:

1) A study of collecting news data on individual technology for Information Technology(IT), Nano Technology(NT), Bio-Technology(BT), and Environmental Technology(ET) using six promising new technology classifications suggested by the government and analyzing 116 technologies by categorizing the hype cycle by technology classification [12].

2) A study of collecting the hype cycle from 1955 to 2017 and analyzing 360 technologies in a stage of the hype cycle mentioned in the model [7]. However, studies comparing a number of technologies are somewhat insufficient compared to studies on the specific technology. Hype cycle technology analysis was also used in research on method development for user acceptance of innovative technologies or technology planning [3][13]. Although the maturation phase of hype cycle technology is somewhat insufficient in empirical studies, research on hype cycle and text analysis is meaningful in that there are also many utilization studies.

### **3. Research Methodology**

#### **3.1. Research procedure**

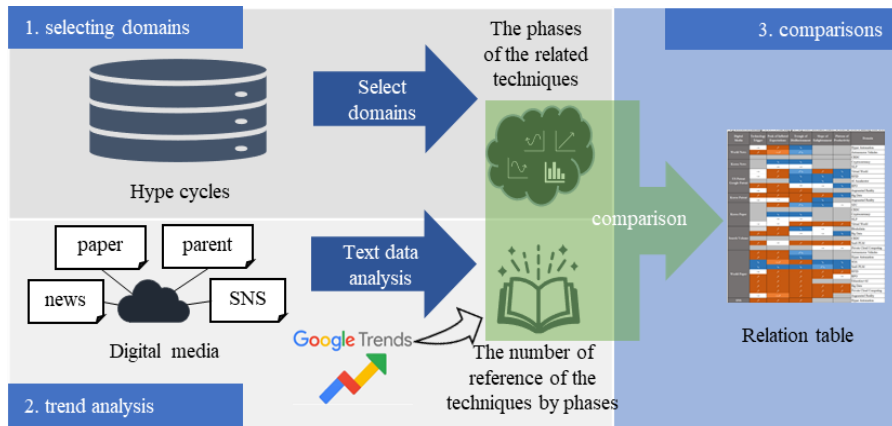
This research was conducted in three stages with 16 domain experts as shown in Fig. 2 domain technology selection, trend analysis, and comparison.

First, in the stage of interesting field selection, technologies in 17 fields were selected as a result of asking domain experts to select technologies for analysis in their fields. Then, a hype cycle model including technologies related to the technical field of interest was collected. Depending on the field, there have been instances when only one hype cycle was present, as well as instances where many hype cycles are suggested. In a particular technological sector, there have also been instances in which the technology itself was identified as such, as well as instances in which other technologies were marked as representative examples of the detailed technology.

Next, researchers collected relevant references to ask the experts to select digital media that are expected to be able to express the expectations of the technology field. The collection method varies depending on the method provided by each digital media. To be specific, in the SCI journal, it was possible to directly download the result by making a query from the DB, and in Naver which provides information on domestic news, the provided API was used. If no special data collection method is

provided, related documents were collected by crawling. For the collected information, after pre-processing using Data Cleaning, Tokenization, Lemmatization, Stop Word, and n-Gram processing, the number of documents by year was analyzed. In order to analyze detailed technology by field, there are practices where topic modeling was performed, but in the case of Google Trends where annual trends are already provided, the analysis data was used as it is.

Fig. 2: Research procedure



In the last part of the comparative analysis, the technology life cycle phase of the technology concerned was collected in the first stage and the frequency trend of mentioning technology in the second stage was compared and analyzed. The frequency trend of mentioning technology by phase of the technology life cycle was classified into six categories: rise after a steady, rise, a fall after rising, fall, steady, and no data.

### 3.2. Collecting data

The technical data of the hype cycle was examined which stage the relevant technologies in the domain belong to in the hype cycle by referring to the hype cycle for the technologies in the domain area that was selected by domain experts and comparing the stages of technological maturation for the relevant technologies displayed in the cycle. In other words, 16 domain experts collected two types of raw data: Gartner's hype cycle model including technologies of interest for their field, and text data collected by each digital media. Technologies not shown by year in the hype cycle were identified by limiting the stage of technological maturity. Fig. 3 shows the relationship between the referenced technology on the hype cycle and the digital media that analyzes the technology trend in a Sankey diagram. The meaning of each colored bar in the diagram indicates the type of hype cycle model, technology on the hype cycle, domain area, text data, and the digital media from the left in Fig. 3.

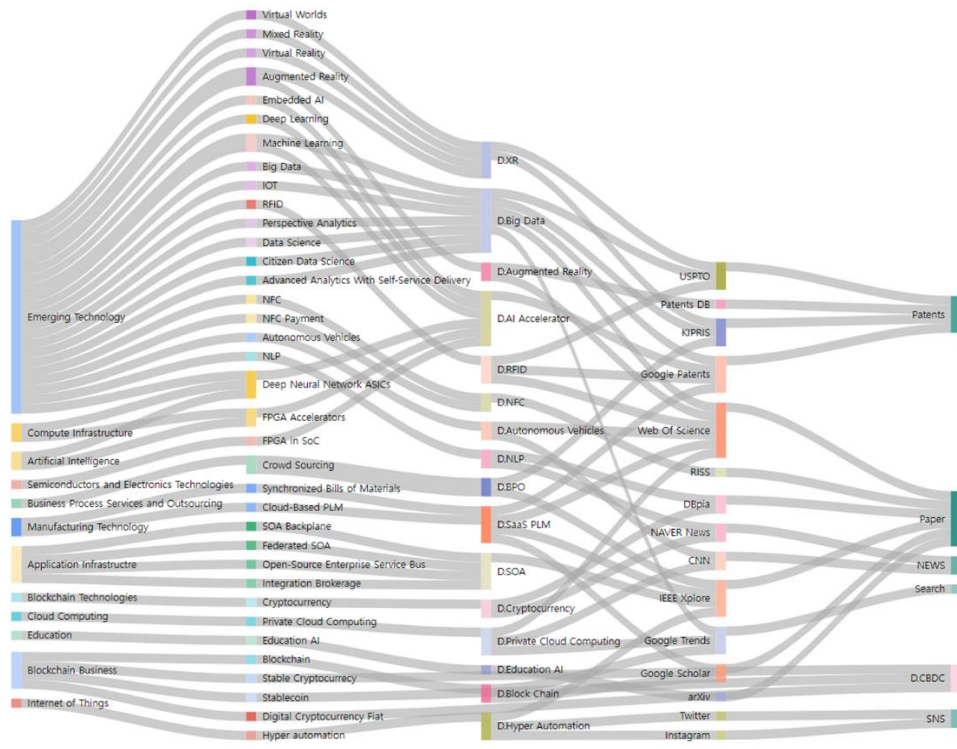


Fig. 3: Hype cycle technologies and analytical data relationships.

The first and second colored bars on the left of Fig. 3 are the type and technology of the hype cycle. 36 hype cycle technologies and 12 hype cycles connected to the domain area's technology, including "Emerging Technology," were chosen. They are believed to be the best qualified to choose from the "Emerging Technology" hype cycle since they are subject matter experts in the field of information technology. The hype cycle technology selected and mapped all those that correspond to 17 domain technologies, that have a similar meaning to the domain technology or have been expanded due to technological development.

The third colored bar from the left of Fig. 3 is a technology of the domain area. The domain area is 17 fields chosen by domain experts. Regarding each technique, there are augmented reality-related technologies XR (Augmented Reality, Mixed Reality, Virtual Reality, Virtual Worlds), Big Data, artificial intelligence-related technologies such as AI Accelerator, Education AI, NLP, Hyper Automation, tagging technologies such as RFID and NFC, Autonomous Vehicles, service-related technologies such as BPO(Business Process Outsourcing), SaaS PLM, SOA, Cryptocurrency-related technologies such as cryptocurrency, Block Chain, and lastly, Private Cloud Computing.

The fourth colored bar from the left of Fig. 3. is digital media. The digital media data collected in this study can be broadly classified into news, research papers, patents, search volume, and SNSs. As regards news data, Naver news in Korea and CNN articles in overseas news were crawled and the collected data was simply calculated by adding up the document volume by year or data corresponding to keywords similar to domain technology were collected through text analysis of crawling data. The research data were collected using files or APIs from domestic and overseas journal websites. DBPia and RISS for domestic papers and Web of Science(WoS), IEEE Xplore for international papers, were mainly used. Additionally, information about Block Chain technology was found for all works on the Google Scholar website. Typical data collection channels for a patent date are USPTO, KIPRIS, and Google Patents. The USPTO website was used to collect US patent data, and KIPRIS was used to collect domestic and foreign patents. Google Patents was used to collect data related to AI Accelerator and Big Data in the domain area. The data was downloaded in the form of a file, or on a site that provides APIs a large amount of data was collected by using the crawling technique. In the instance of RFID among other domain areas, patent numbers were taken from the US patent site in order to gather patent data, and a significant quantity of patent data was gathered by downloading the detailed page from the Google Patents site as HTML. With regards to SNS data, web scraping of Instagram and Twitter posts was used to collect data related to the Hyper Automation domain area however, it was confirmed that the frequency of use of SNS accounts was low for the reason of collecting data on IT-related professional technology. Future research will need to refer to earlier studies on the gathering and processing of big data on SNS[5] and the evaluation of responses to more than 30 million tweet streams[4]. Search volume data can be checked the changes in interest over time in a graph by typing keywords of domain area using various categories in Google Trends. Trend analysis was greatly aided by the ability to download the number of papers each period as a CSV file. Google Trends is an analysis data that has been normalized and widely used in trend analysis[2].

The method of organizing text data for text analysis was different according to domain experts. The arrangement method is to classify the collected data such as news, papers, patents, and search volume by year based on the date of publication or application/registration, and use the number of cases for analysis. The collected data does not require additional work and is a very intuitive method because it draws a trend on the number of cases per year and compares it with the hype cycle. However, there is a disadvantage in that it cannot be used for research if the reliability of data collected from domain technology is low. Utilizing text analysis to organize the gathered data before analysis is another option. Crawling is a method of extracting target keywords by preprocessing the text corresponding to the technology of the domain area among the extracted data and the collected data needs filtering to see if it corresponds to the technology of the domain area. The crawled data is huge and



cannot be processed manually, so trial and error processes such as filtering and preprocessing were conducted in order to derive reliable results. Each technology and the secured data can be seen in Fig. 3.

## **4. Results and Discussion**

### **4.1. Trend interpretation for individual technologies**

This subsection explains how the trend of individual digital media is determined with an example of RFID to compare the trend of the hype cycle and domain technology. In 2013, RFID saw its first hype cycle, and as of 2021, it was feasible to track the life cycle of the stabilization period and the period that followed the bubble period. The digital media selected were patents and research papers. Patent data were again classified into patent application date and patent registration date and summed up by year and research papers are summed up by year based on the date of publication. Through this process, a line graph as shown in Fig. 4 was created. Next, the trends of each digital media for each hype cycle were examined. Even though there is a slight difference in parallax and slope, the number of mentions of RFID in papers and patent applications has increased in the developmental period and bubble period. Starting from the bubble period, the number of overseas patent applications begins to fall. However, the number of papers continued to increase during this period. The number of patent registrations appears to lag behind the number of patent applications in terms of trend, whereas the latter appears to better reflect the hype cycle.

In the same way, this study compared the hype cycle and trends of digital media document volume for the remaining 16 technologies. In order to compare trends, analysis was conducted by life cycle and digital media in 5 stages, such as rising/falling/maintaining.

### **4.2. Analysis by life cycle**

Differences in the life cycle of the hype cycle are examined by analyzing the relationship between the hype cycle phase and technology-related text data in the domain area.

The number of US patent applications, international papers, and Google searches for related keywords are all rising quickly in the Technology Trigger stage. It has also been confirmed that, despite technological differences, the number of US patent registrations, domestic papers, and domestic patents closely followed the hype cycle's trend. Big Data in the domain area confirmed a trend that is similar to the initial stage in 2012 through the number of patent documents after crawling USPTO US patents, and Education-AI in the domain area confirmed a trend that is similar to the initial stage of the hype cycle in 2017 after checking the number of overseas papers.

Moreover, in the second phase of the Peak of Inflated Expectations, it was confirmed that the trend of the hype cycle was similar to the period with the highest

number of US patent applications and the number of documents in most domains area increased equally until the Peak of Inflated Expectations. RFID, a domain technology corresponding to this stage reached its peak in 2005 through Peak of Inflated Expectations, as in Fig. 4. For the domain, it was confirmed that the document volume based on the patent filing data was similar to the hype cycle rather than the document volume based on the patent registration date.

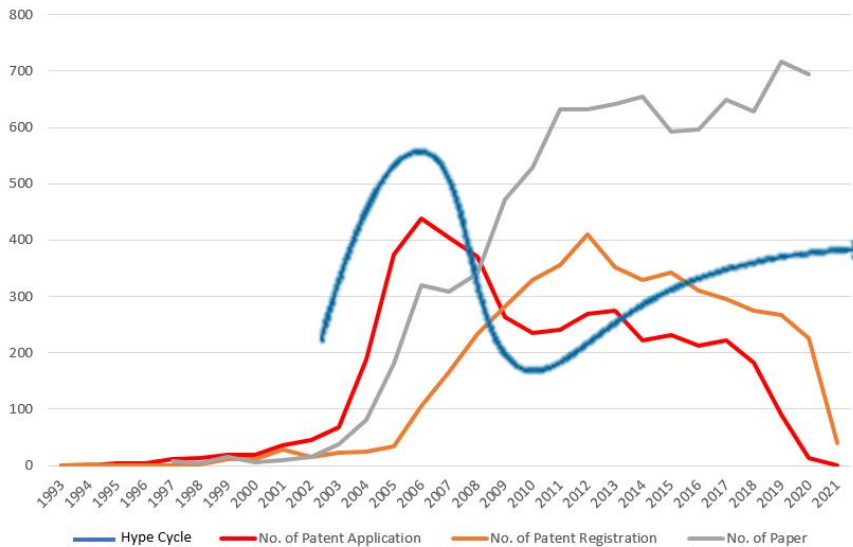


Fig. 4: Comparison of domain RFID hype cycle and patent/paper document volume.

In the third and fourth stages, the Trough of Disillusionment and Slope of Enlightenment, the number of US patent applications began to decline during the period Trough of Disillusionment and in most cases, the domain area stood still rather than decreased in the number of documents or searches. Depending on the technology, there have been instances during the Trough of Disillusionment where the volume of documents decreased; nevertheless, it has also been established that the volume of documents grew in the case of news. In the case of self-driving cars, negative news has increased on society page as the number of human casualties caused by accidents during autonomous driving has increased however, the technological stage is regarded to have entered the phase of Trough of Disillusionment. As pointed out in previous studies [13], it is expected that in the case of news, the accuracy of trends can be improved through positive/negative evaluation using sentiment analysis[1] as well as frequency analysis.

Lastly, with regard to the Plateau of Productivity, it was confirmed that the growth in the number of documents relating to the use of technology, rather than its development, was what caused some technologies to change in terms of their domain

names as a result of technological advancement. Concerning domestic patents, it was confirmed that patents have a tendency to be filed mainly for applied technologies that utilize technology, rather than for the purpose of developing the technology itself. In 2014, Service Oriented Architecture (SOA) in the domain area was in the hype cycle's Trough of Disillusionment and Slope of Enlightenment phase. However, the reason why it was not recognized in the following cycle is thought to be the same as above, and the relationship was confirmed by the quantity of IEEE research papers. Few technologies are included in the phase of the Slope of Enlightenment and Plateau of Productivity in the hype cycle and difficulties to determine the level of technological maturity in the analysis process led to similar results to previous studies [7].

### **4.3. Analysis by digital media**

The sources of collected data are news, patents, search volume, research papers, and SNS. Comparative analyses are performed on News, patents, Google trends, papers, and SNS used for data collection as a data source compare with the hype cycle. Overall, patents and news data showed relatively similar results to the hype cycle. Between domestic and foreign data, the emergence of domestic data appears somewhat late in terms of technology. In some domains, there were sections that were difficult to analyze due to no technical stage of the hype cycle. Research papers do not follow the technical steps of the hype cycle. The increased amount of reference produced regardless of the technology stage of the hype cycle indicates that academic research is being studied steadily irrespective of industry trends.

As a result of analyzing news documentation volume, the hype cycle trend showed signs of decline, but the news documentation volume increased year by year. Due to the whole volume of negative news documents for the domain area, it is required to validate positive news after eliminating it using emotional analysis research. In the case of Autonomous Vehicles of the domain area, the hype cycle trend peaked in terms of technological maturity in 2015, and then it declined from 2016 to 2020, however CNN's number of papers increased every year starting in 2012. On the other hand, the Block Chain of the domain area entered the phase of Trough of Disillusionment from the Peak of Inflated Expectations in 2020, as can be seen from the continuous decrease in the amount of Naver news documents from 2018 to 2020. Even with the same news data, the results were different depending on whether it was domestic news or foreign news, and whether the text data analysis included the entire news article or only the title and headline.

This is considered to be due to: 1) differences in overseas news sources, 2) inclusion of all related articles after crawling or 3) inclusion of only articles that mention domain technology in titles and headlines in document volume. In addition, the concept of exposure through news, etc. can be interpreted more accurately than comparison through frequency or intensity[9].

Table. 1: Relationship between hype cycle trend and text data analysis results

Digital Media	Technology Trigger	Peak of Inflated Expectations	Trough of Disillusionment	Slope of Enlightenment	Plateau of Productivity	Domain
World News	→	↗	↘			Hyper Automation
	↗	→↗	↗↘			Autonomous Vehicles
Korea News		↘	↘			Cryptocurrency
		→	→			NLP
US Patent Google Patent	→	↗	↗↘	↗	↘	Virtual World
	→↗	↗	↘	↘	↘	RFID
			↘	↘		AI Accelerator
	↗	↗	→	→	↘	BPO
	→	↗	↗			Augmented Reality
Korea Patent	↗	↗	↗	↗	↘	Big Data
	→	→	↗	↘		Augmented Reality
Search Volume		↗	↘	→		Blockchain
	↗	↗	→	→	↘	Big Data
	↗	→	↗	↗	↗	SaaS PLM
				→	→	Private Cloud Computing
Korea Paper		↗	↗↘	↘	→	NFC
		↘	↘			Cryptocurrency
		→	→			NLP
	→	→	↗	↗	↗	Virtual World
World Paper	↗	↗	↗↘			Autonomous Vehicles
	↗	↗	↘			Hyper Automation
	↘	→↗	↗	↘	↘	SOA
	↘	↘	↘	↗↘	↘	SaaS PLM
	→↗	↗	↗	↗	↗	RFID
	↗	↗	↗	↗	→	BPO
	↗	↗	↗			Education+AI
	↗	↗	↗	↗	↗	Big Data
	↗	↗	↗	↗	↗	Private Cloud Computing
→	→↗	↗	↗		Augmented Reality	
SNS	↗	↗	↗			Hyper Automation
Legend	→↗	↗	↗↘	↘	→	

As a result of checking through US/domestic patents and Google Trends, AI Accelerator, Big Data, RFID, and Virtual World of domain area was more similar to the hype cycle when comparing the trends by year based on the filing date rather than the patent registration date. While SaaS PLM is a domain area where the relationship with the hype cycle has not been demonstrated owing to lack of significance, virtual reality has revealed that domestic patents generally follow the pattern of the hype cycles.

According to the results of gathering and comparing data for all categories based on keywords, Blockchain and Private Cloud Computing showed a similar trend to the hype cycle. This was determined by analyzing the document volume by category in various domains using Google Trends, Domain technology, and Big Data that is

collected through the Google Trends News category. Google Trends allows people to compare the world's interest in their favorite topics and see how often they have been searched on Google over time. Moreover, all results of search statistics in the data go through a normalization process, and the influence of variables is removed by dividing them into common variables[2]. Therefore, it was discovered that the hype cycle and the majority of the domain areas followed a similar trend.

As a result of the trend study on a research paper, the trend of the number of documents was confirmed similar to those of the hype cycle based on the publication date of the paper. RFID, Hyper Automation, and Education-AI domain region did not simply add up the number of documents based on the publication year, but extracted keywords included in the summary of the thesis and confirmed the correlation through the frequency by year.

The data sourced SNS collected and analyzed Twitter and Instagram data through web scraping from domain technology Hyper Automation, but the correlation with the hype cycle could not be found.

#### **4.4. Application Example/ Case Study**

To apply this study as a case, domain technology was adopted. The domain technology was selected as the technology of The Peak of Inflated Expectations, which is a relatively early stage, rather than the Slope of Enlightenment or the Plateau of Productivity in the Gartner hype cycle stage. In consultation with the researcher, we selected a Super-app that could not reach the stage of the Slope of Enlightenment or the Plateau of Productivity while sufficient research data could be collected with case domain technology. Super-apps are mobile or web applications that can provide multiple services including payment and financial transaction work [15].

For digital media analysis, domestic news, Google trends, and research papers data were used. In the case of domestic news, data were searched for with the keywords “superapp (in Korean)” or “super-app” in bigkinds[16] and the analysis results by year were used. For search traffic, data was collected from Google Trends[17] with the search term “Super-app” and the results were used. Finally, research papers were searched using the search terms “super-app”, “super app”, “super apps”, “super-apps”, and “superapp (in Korean)” in Google Scholar[18], including domestic and overseas papers by year. The number of cases per year was confirmed. The data collection period was from 2004 to 2021, but domestic news data was from 2010 to 2021, excluding the period when the collected data was insufficient.

The results of applying this research method to each digital media are shown in [Figure. 5][Table. 2]. Analyzing the results of the survey by digital media, a domain technology “Super app” can be determined to be at either the peak of Inflated Expectations or entering the phase of Trough of Disillusionment in the Gartner hype cycle.

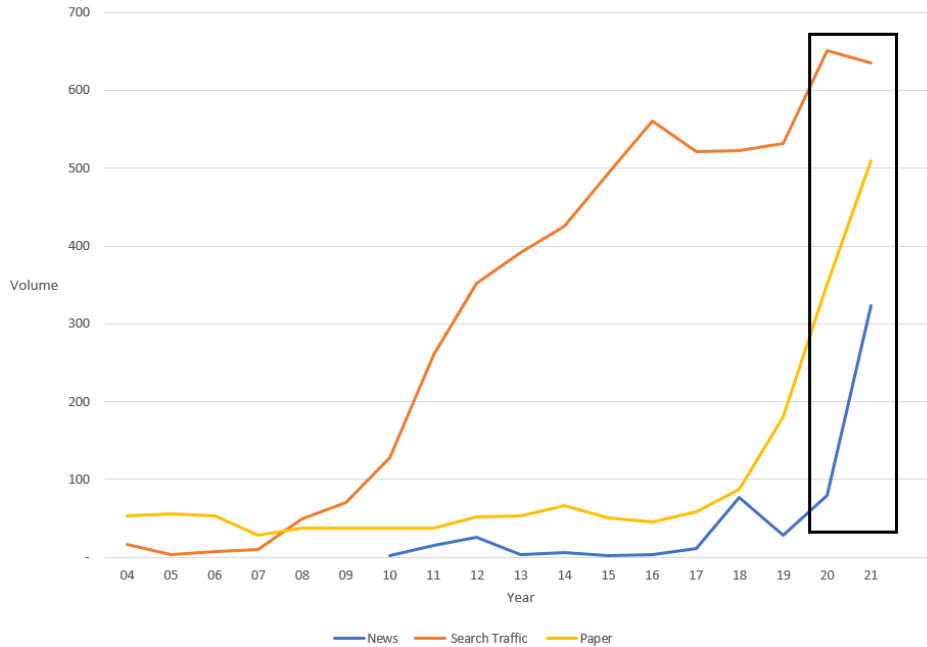


Fig. 5: Comparison of domain super-app news and search traffic/paper document volume.

Table. 2: Relationship between hype cycle trend and super-app analysis results

Digital Media	Technology Trigger	Peak of Inflated Expectations	Trough of Disillusionment	Slope of Enlightenment	Plateau of Productivity
Korea News	↗	↗			
Search Volume	↗	↗	↘		
Paper	↗	↗			

It was found that there is a difference in data growth by year by digital media. In the case of domestic news, all articles mentioned in the title and body from 2010 to 2021 were collected and summed them up by year, and it has been continuously increasing since 2019. For search traffic, all data which is collected through all categories of web searches since 2004 was analyzed, and has continued to increase from 2009 and decreased in 2021 as its increase has slowed since 2016. Finally, it was confirmed that the number of domestic/overseas research papers increased exponentially from 2017. Although there is a difference in the data increase for each digital media, it can be seen as a stage of reaching the peak of Inflated Expectations or entering the Trough of Disillusionment after the peak.

The fact that the data frequency of case descriptions by year differs by digital media is similar to the study results. Search traffic emerges and grows earlier than other digital media. Since the news is domestic, it can be seen that it appeared

somewhat later than overseas. In the case of papers, it continues to rise after emergence, similar to the research results.

## **5. Conclusion**

This study quantitatively analyzed the hype cycle and the number of associated documents to determine statistical significance. Even if it was not statistically predicted, the process of gathering data by analyzing the trends of various technologies and documents allowed for the possibility of gaining insight into the relationship between each stage of the hype cycle and the changes in the amount of mentioning digital media. First, although the amount of mention of the technology of interest in any specific digital media did not accurately reflect the entire cycle of the hype cycle, in phases of Technology Trigger and Peak of Inflated Expectations, references in relation to technologies have increased in most of the digital media. However, since most of the experts selected the latest technology area in their field of expertise, in many cases, data on the phases of the Slope of Enlightenment and Plateau of Productivity did not yet exist. It has been noted that, depending on the technology, there are certain instances when the volume of mention in digital media deviates from the expected stage in the hype cycle. Further research is required to determine which of these scenarios best reflects the technological trend. Next, depending on the technology, there are cases where the trend is different in Korea and abroad even though it is the same type of digital media. For instance, it was discovered that Korea lagged behind in terms of mentions, and additional investigation is required to ascertain whether this is due to the technological divide between the two nations. The purpose of this study was to gain a broad understanding of how hype cycles and relevant technological trends in different digital media relate to one another. However, in order to accurately predict whether this study will be statistically significant in the future, it is also necessary to apply a standardized analysis method that focuses on highly relevant digital media. Furthermore, it is anticipated that analyzing an already developed technological field—rather than the newest technology—will be more fruitful when examining the entire life cycle of a technology. In addition, it is necessary to predict the phase in the hype cycle by upgrading the trend characteristics of the technological mention volume in digital media which was found in this study.

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