

Unstructured Data Management Model for Online Businesses in the New Normal Era

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ARTICLE INFO

Article history

Received: January 03, 2025

Accepted: March 21, 2025

Published: March 31, 2025

Volume: 13 Issue: 2

Conflicts of interest: None

Funding: None

ABSTRACT

This research aims to study unstructured data management for online businesses and to develop an unstructured data management model for online businesses in the new normal era. This mixed-methods study surveyed unstructured data management practices among 400 social media users from platforms such as Facebook, Line, and Instagram, as well as five social media system administrators. The findings revealed that most social media users preferred storing images on devices used for viewing, searching, and purchasing products. Video and text data were primarily stored on devices such as external hard disks, thumb drives, and memory cards, whereas URLs were commonly stored on devices used for browsing and purchasing, similar to images. Regarding sharing practices, images were predominantly shared privately, similar to text data. In contrast, videos were frequently shared across platforms—for instance, from Facebook to Line. Based on these results, an effective unstructured data management model for online businesses in the new normal era was developed by categorizing storage and sharing practices aligned with observed user behaviors.

Key words: Model, Unstructured Data Management, Online Business, New Normal Era

INTRODUCTION

The COVID-19 pandemic has led to significant global transformations in lifestyle behaviors. Activities such as going to work, attending school, and shopping have dramatically shifted as people worldwide were required to quarantine at home, practice social distancing, and limit face-to-face interactions (Axon et al., 2023). When leaving home became necessary, measures such as mask-wearing, maintaining personal distance, frequent handwashing, and using alcohol-based sanitizers became routine. This situation significantly impacted education, necessitating increased online and distance learning, while businesses swiftly adapted by introducing online registration systems and transitioning their sales and services online (Ministry of Higher Education, Science, Research and Innovation, 2020). Over time, these adaptations became normalized, giving rise to the “New Normal,” representing a substantial shift in human behavior (Hemmin, 2013). Consumers increasingly relied on digital services, significantly altering consumption patterns (Iadchalerms & Kosol, 2021). This shift heightened demand for online ordering systems, short-distance transportation, and rapid delivery services (Sribanjong & Liamprecha, 2021). Consequently, businesses and retailers accelerated their transition to online platforms, substantially increasing digital platform usage to enhance customer satisfaction. Consumers of all ages have moved toward online purchasing for clothing, cosmetics, skincare products, electronics, and

various other goods. This trend of online shopping is expected to persist even after the COVID-19 crisis ends, becoming an integral part of daily routines and continuing even when physical stores fully reopen (Hemmin & Wijitthamaros, 2014; Thanyarattanavanich, 2021).

In the modern era, businesses increasingly rely on technology to enhance trading systems and respond promptly to customer demands (Grewal et al., 2021). Online customer data, which includes consumer interests and purchasing behaviors on websites and applications, is considered a valuable asset (Botmat, 2010). Possessing such data allows businesses to analyze current consumption trends and customer preferences, enabling them to develop precise business strategies that drive efficiency. Every digital interaction—whether through mobile phones, computers, or other communication devices—generates personal data necessary for accessing online platforms. As a result, a vast amount of structured data is created, which can be systematically organized and leveraged by businesses. For instance, companies can utilize customer data to develop a subscription model, predicting when past customers may need to repurchase certain products based on their purchasing behavior, order volume, and product interests. This enables brands to proactively offer promotions or products at the right time to meet customer needs. More importantly, businesses that can accurately process and analyze data will be able to deliver personalized offers that align precisely with individual customer preferences. This capability provides a significant competitive advantage, strengthens

customer retention, and ensures long-term business growth (Piyavirojsathien & Chaimueangma, 2020; Perez-Vega et al., 2021; Li et al., 2024).

The focus of this study arises from the fact that while unstructured data—such as images, video clips, and text—are widely used for communication, they often lack systematic organization for effective utilization. Despite the growing volume and popularity of unstructured data, there is still no established method for managing and leveraging it efficiently. Therefore, the research team aims to develop an unstructured data management model for online businesses in the new normal era. This model seeks to provide entrepreneurs and other stakeholders with a practical approach to utilizing unstructured data effectively, enhancing business operations, and maximizing its potential benefits.

LITERATURE REVIEW

Social Media

Social media refers to a type of website designed for creating social networks among internet users, allowing them to express their interests, document activities, and connect with the interests and activities of others. Social networking services typically include features such as chatting, messaging, email, video sharing, music uploads, photo sharing, and blogging (Senkaew, 2015; Gkatzola & Papadopoulos, 2024).

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Digital Media

Digital media is an innovation developed to replace traditional media, offering lower costs while maintaining or improving quality and usability. Unlike analog media, digital media generally refers to electronic media that operates using digital encoding. Modern programming is based on a binary system, where digital data is represented by distinguishing between “0” and “1.” Computers typically interpret binary digital data and process it through multiple layers of digital processing. Digital media, including audio, video, and other digital content, can be created, referenced, and distributed via digital data processors. Compared to analog media, digital media has led to significant transformations in how content is produced and consumed (Dewdney & Ride, 2013; Manu, 2016; O’Lynn, 2023).

Types of Social Media

Social media networks can be categorized based on their primary purpose and shared characteristics. The classification considers the main objectives of usage and common features of websites that fall under each category. According to Phanchat (2017) and Kim (2023), social media networks can be divided into nine types:

Identity Networks

These social media platforms allow users to create an online identity, share personal stories, and connect with others. Users can share their experiences through images, videos,

or blog posts. Additionally, these platforms often focus on reconnecting with old friends or finding new connections. This category includes two subtypes:

- **Blogs:** A shortened form of “Weblog,” blogs function as online journals where individuals document their thoughts, experiences, and ideas. Bloggers typically write posts to share opinions or personal reflections with readers.
- **Microblogs:** These platforms allow users to post short messages that can be shared online or sent directly to mobile devices. Examples include Twitter, Blaulk, Weibo, Tout, and Tumblr.

Creative Networks

These platforms serve as virtual galleries where users showcase their creative work, including videos, images, music, and other multimedia content. The primary goal is to share content with other users who have similar interests. Examples include YouTube, Flickr, Multiply, Photobucket, Instagram, Vimeo, Pinterest, and SlideShare.

Passion Networks

Passion networks function as online bookmarking platforms, allowing users to store and share web pages of interest. These platforms help people with similar interests find and reference relevant content. Users can also vote on or rate bookmarks based on their usefulness and popularity. Examples include Digg, Zickr, Ning, del.icio.us, Catchh, and Reddit.

Collaboration Networks

These platforms are designed to encourage knowledge-sharing and collective learning among users with expertise in various fields. Users contribute, refine, and update information, fostering continuous improvement. Collaboration networks primarily attract scholars, experts, and professionals who aim to share knowledge for the benefit of the community. Examples include Wikipedia, Google Earth, Google Maps, Google Groups, Yahoo Groups, and Pantip.

Virtual Reality Networks

Virtual reality social networks primarily focus on online gaming communities. These platforms offer interactive, three-dimensional gaming experiences where users assume roles and interact with other players in a virtual world. The immersive nature of these networks fosters social engagement among players with similar interests. Popular examples include Second Life, Audition, Ragnarok, Pangya, and World of Warcraft.

Professional Networks

These networks are designed for career development, allowing users to create professional profiles, showcase their work history, and connect with others in their field. Additionally, companies can search for potential employees based on the

profiles available on these platforms. A well-known example is LinkedIn.

Peer-to-Peer (P2P) Networks

These networks enable direct communication and data sharing between users without intermediaries. Peer-to-peer networks facilitate fast and efficient exchange of information. Examples include Skype and BitTorrent.

Social Networking Sites

These platforms allow individuals and organizations to create, share, and exchange information. Users can post updates, share photos and videos, express opinions, and interact with others through comments, likes, and shares. Examples include Facebook, Badoo, Google+, LinkedIn, and Orkut.

Social Network Applications

These applications integrate social networking features into mobile devices, allowing users to engage in activities such as instant messaging, geo-spatial tagging (location sharing with comments and images), and multimedia sharing. Examples include Line, Facebook, WeChat, and MSN.

Concept of the New Normal Era

According to the Department of Mental Health, Srithanya Hospital (2020), the concept of new normal behavior among Thai people is based on data from the Dharmniti website, which published survey findings from Super Poll outlining key aspects of the new normal lifestyle in Thailand. These aspects include: (1) increased reliance on technology and the internet, such as online learning, working from home, video conferencing, online shopping, digital transactions, and various forms of online entertainment, including movie streaming and music; (2) social distancing, which involves maintaining greater physical distance, using technology to facilitate communication and daily activities, reducing physical interactions and visits to public places, and emphasizing home-based activities; (3) heightened health awareness for both oneself and others, stemming from the COVID-19 crisis, which reinforced the importance of hygiene and preventive measures to reduce the spread of infections; and (4) achieving a better work-life balance, as remote work and reduced office attendance have led people to reconsider how they structure their work and personal lives, allowing for a more balanced lifestyle.

METHOD

Population and Sample

The population and sample for this study consist of social media users from platforms such as Facebook, Line, and Instagram, as well as social media system administrators. The research team selected an appropriate sample group as follows:

For quantitative research, data were collected through a survey of social media users, including Facebook, Line,

and Instagram users. The sample size was determined with a 95% confidence level and a 5% margin of error, considering an indefinite population (Infinity: ∞) of social media users in the new normal era, which introduced a level of population uncertainty (Tirakanan, 2012). Based on these parameters, a sample of 400 respondents was selected.

For qualitative research, in-depth interviews were conducted with five social media system administrators.

Research Instruments

The study employed multiple research instruments, as detailed below:

For quantitative research, data were collected through a questionnaire divided into three sections:

1. Personal information of the respondents.
2. Social media usage behavior in the new normal era.
3. Unstructured data management characteristics on social media.

The research team validated the questionnaire before use by assessing its validity using the Item Objective Congruence (IOC) index to ensure the questionnaire items aligned with the research objectives (Turner & Carlson, 2003). A panel of experts rated the items for relevance using the following scale:

- +1: The item is highly relevant to the content.
- 0: Uncertainty about the item's relevance.
- -1: The item does not align with the content.

A question was considered valid if it received an IOC score of 0.5 or higher; otherwise, it was deemed unsuitable. The final validity assessment yielded an IOC score of 0.68, confirming the questionnaire's appropriateness.

To assess reliability, a try-out was conducted with a group of 30 social media users in Bangkok, similar to the target population. The internal consistency of the questionnaire was measured using Cronbach's Alpha, with a required threshold of ≥ 0.70 for individual items and ≥ 0.80 for the entire questionnaire. The final reliability test resulted in Cronbach's Alpha score of 0.98, indicating high reliability.

For qualitative research, interviews were conducted with social media system administrators using a structured interview guide and an assessment form for evaluating unstructured data management models suitable for online businesses in the new normal era. A computer-based program was used to test and manage unstructured data on social media platforms.

Data Analysis

The collected data were reviewed for completeness before analysis using the following methods (Mehrens & Lehmann, 1991):

- Descriptive analysis: The survey data were analyzed to assess respondents' personal characteristics, social media usage behaviors in the new normal era, and unstructured data management patterns on social media. A five-point Likert scale was used to interpret responses (Allen & Seaman, 2007):
 - 4.50–5.00: Very high level
 - 3.50–4.49: High level

- 2.50–3.49: Moderate level
- 1.50–2.49: Low level
- 1.00–1.49: Very low level
- Interview data analysis and synthesis: The qualitative data from the interviews were analyzed to determine guidelines for unstructured data management in online businesses.
- Integration of survey, interview, and secondary data: The results from the survey, interviews, and relevant secondary sources were synthesized to develop an appropriate unstructured data management model for online businesses in the new normal era.

Statistical Methods

The statistical analysis (Sincharu, 2007) in this study included:

- Frequency – representing the number of occurrences of data points.
- Percentage – calculated as the proportion of data relative to the total dataset.
- Mean (Average) – representing the central tendency of the data.
- Standard Deviation (SD) – measuring the dispersion of data points around the mean.

This methodological approach ensures a comprehensive understanding of unstructured data management for online businesses in the new normal era.

RESULTS

The study on the unstructured data management model for online businesses in the new normal era is divided into five sections.

Analysis of Respondents' Personal Information

The findings indicate that the majority of respondents were female, accounting for 77.25% (309 individuals). The largest age group among respondents was 20–30 years old, making up 37.50% (150 individuals). In terms of education, most respondents held a bachelor's degree or an equivalent qualification, representing 45.75% (183 individuals). Regarding occupation, the majority were private-sector employees, constituting 35.25% (141 individuals). Additionally, most respondents had an average monthly income of 10,001–25,000 Thai Baht, accounting for 44.50% of the total sample.

Analysis of Social Media Usage Behavior for Viewing, Researching, and Purchasing Products

The study analyzed respondents' behavior regarding the use of social media platforms such as Facebook, Line, and Instagram for product viewing, researching, and purchasing. The key findings are as follows:

1. The majority of respondents (34.25%, 137 individuals) accessed social media platforms to view, research, or purchase products more than five times per day.

2. Most respondents (28.50%, 114 individuals) spent 30–60 minutes per session on social media for product-related activities.
3. A significant proportion of respondents (41.00%, 164 individuals) did not have a fixed time for using social media to view, research, or purchase products.
4. The majority of respondents (85.75%, 343 individuals) used mobile phones or smartphones to engage in product-related activities on social media.
5. Facebook was the most popular platform for product-related activities, used by 64.75% (259 individuals).
6. Clothing, shoes, and bags were the most frequently purchased product categories, accounting for 50.8% (203 individuals) of respondents.
7. 58.00% (232 individuals) of respondents shared product-related information with friends after viewing, researching, or purchasing products.
8. 51.00% (204 individuals) had 1–3 years of experience using social media for product-related activities.
9. The majority of respondents (83.00%, 332 individuals) saved product information of interest on their devices, such as mobile phones or computers.
10. 61.00% (244 individuals) preferred sharing product-related information on Facebook.
11. More than half of the respondents (52.00%, 208 individuals) had no experience selling products via social media, whereas 48.00% (192 individuals) had experience in social media-based selling.

These findings provide insights into consumer behavior on social media platforms in the new normal era, highlighting trends in product engagement, sharing preferences, and online purchasing patterns.

Analysis of Unstructured Data Management on Social Media

Key findings on unstructured data management on social media

1. The majority of respondents (68.10%) preferred storing product-related information in the form of images.
2. Most respondents (62.45%) stored images on the devices they used for viewing, researching, or purchasing products, followed by text-based data stored on these devices (15.88%).
3. A significant proportion (45.33%) stored images on external storage devices such as external hard disks, thumb drives, and memory cards.
4. The majority (47.81%) saved product-related images on cloud storage, while only 5.26% stored URLs in the cloud.
5. Most respondents (56.65%) preferred sharing images, while URLs were the least shared type of data.
6. A considerable percentage (49.02%) shared images publicly, whereas URLs were not shared publicly.
7. The majority (51.19%) shared images privately, while URLs were not shared privately.
8. Nearly half (49.6%) engaged in cross-platform sharing, such as sharing videos or links from Facebook to

Line, whereas URLs were not commonly shared across platforms.

Additional findings on unstructured data management on social media

1. Respondents occasionally verified the accuracy of product information before storing or sharing it (*Mean* = 3.29, *SD* = 1.255).
2. They occasionally stored or shared up-to-date product information (*Mean* = 3.28, *SD* = 1.224).
3. Respondents frequently stored or shared product information that aligned with their interests (*Mean* = 3.50, *SD* = 1.195).
4. They often searched for and gathered product information from multiple sources before making a decision (*Mean* = 3.63, *SD* = 1.197).
5. Most respondents frequently sought product information from credible online stores or sources that could be verified (*Mean* = 3.72, *SD* = 1.203).

These findings provide insights into how users manage unstructured data on social media, highlighting their preferences for storing, sharing, and verifying product-related information.

Findings from Interviews with Social Media System Administrators on Unstructured Data Management

For experimental and quasi-experimental designs, there must be a description of the flow of participants (human, animal, or units such as classrooms or hospital wards) through the study. Present the total number of units recruited into the study and the number of participants assigned to each group. Provide the number of participants who did not complete the experiment or crossed over to other conditions and explain why. Note the number of participants used in the primary analyses. (This number might differ from the number who completed the study because participants might not show up for or complete the final measurement.)

Intervention or Manipulation Fidelity

Data storage and sharing

The interview findings reveal that social media system administrators store all types of data, including images, videos, text, and URLs, as well as other digital file formats. The most commonly used storage method is cloud-based storage (Cloud).

Regarding data sharing, the approach depends on the primary platform managed by the administrators, such as YouTube, Twitter, Line, Instagram, or blogs. The sharing methods include both redistributing existing content in its original format and creating new content for sharing purposes.

Data management

In terms of data management processes, all (100%) of the social media system administrators reported that they verify the accuracy of product information before saving or sharing it. Additionally, they collect and cross-check product

information from multiple sources, ensuring that the data comes from reputable and verifiable online stores.

Furthermore, 80% of administrators stated that they store or share only up-to-date product information, avoiding outdated or discontinued content. They also ensure that the stored or shared product information aligns with user needs and interests.

These findings highlight the structured approach social media system administrators take to ensure data accuracy, credibility, and relevance when managing unstructured data on online platforms.

Unstructured Data Management Model

Figure 1 illustrates the unstructured data management model for online businesses in the New Normal Era.

DISCUSSION

The unstructured data management model for online businesses in the new normal era presents several key discussion points.

The new normal lifestyle in Thai society emerged as a result of crises that transformed daily life and behaviors. This shift, known as the New Normal, introduced new habits such as social distancing, increased health awareness, careful decision-making regarding purchases and investments, and the growing reliance on the internet in the digital marketing era. Consumers now interact with businesses through websites, social media, applications, and digital platforms, requiring companies to adapt their marketing strategies. Traditional marketing approaches based on the 4Ps (Product, Price, Place, Promotion) have transitioned to digital marketing principles aligned with the 4Es (Experience, Exchange, Everyplace, and Evangelism) to enhance convenience, engagement, and organizational sustainability. This perspective aligns with Yodkaew (2021), who highlighted how the evolution of digital marketing has reshaped consumer behavior in Thailand, leading to greater reliance on communication tools for data storage.

The findings of this study indicate that most consumers prefer storing product-related data as images on the devices they use for product viewing, research, and purchases. Due to the large file size of video content, users commonly store videos on external hard disks, thumb drives, or memory cards, similar to text data. Additionally, URLs are primarily saved on the same devices used for browsing product information, following the same trend as images.

Regarding data sharing, the study found that images are the most commonly shared type of information, often stored as private data, similar to text-based information. Conversely, videos are more frequently shared across platforms, such as sharing videos or links from Facebook to Line. This aligns with Kayanant (2011), whose study on social media behavior and its impact on Facebook usage revealed that online communication channels have become an integral part of daily life due to continuous technological advancements. Whether accessed via computers, mobile phones, or smartphones, these digital interactions have solidified the modern era as the age of information technology.

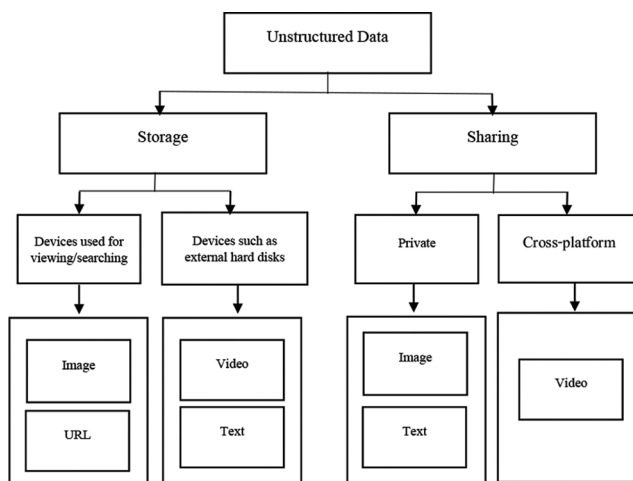


Figure 1. Unstructured Data Management Model for Online Businesses in the New Normal Era

CONCLUSION

The findings indicate that most users prefer storing product-related data in the form of images, primarily on devices used for viewing, researching, and purchasing products. For video content, users commonly store it on external storage devices, such as external hard disks, thumb drives, and memory cards, similar to text-based data. Additionally, URLs are typically stored on the same devices used for browsing and purchasing products, following the same trend as images.

Regarding data sharing, the study found that images are the most frequently shared type of information, often stored as private data, similar to text-based content. However, videos are more commonly shared across platforms, such as sharing videos or links from Facebook to Line.

In terms of data management, users prioritize gathering product information from reputable and verifiable online sources. This is followed by searching for and compiling data from multiple sources to ensure accuracy and reliability. The stored or shared product data aligns with user interests and needs, with data accuracy verified before storage or sharing. Furthermore, users tend to store or share only up-to-date product information, avoiding outdated or discontinued content.

Further research should be conducted on additional types of data to expand the understanding of unstructured data management. Additionally, the development of an unstructured data storage system should be pursued to enhance its practical applications.

ACKNOWLEDGEMENTS

This research was successfully completed with the generous support and assistance of many individuals and organizations. It was funded by a research grant from the revenue budget of Ramkhamhaeng University, under the category of university funding, provided by the Institute of Research and Development. The research team would like to express their deepest gratitude to everyone who offered encouragement and support in various ways, contributing to the successful completion of this study.

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