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Data Modeling for Corporate Digital Assets Management: A Repository for Sustainable Growth and Engagement

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Abstract

Corporate digital assets become valuable for an organization's sustainable growth. In facing the rapid evolution of the digital landscape, the extensive volume of digital assets should be optimized. Aiming to design a corporate digital assets repository, using web content analysis and benchmarking on several corporate social media, a set of business rules, and a conceptual model of the corporate digital asset has been implemented. The study contributes to data modeling of corporate digital assets, assuring utilization of preservation of digital content. Related descriptive metadata has been added for future enhancement targeting data retrieval capabilities and friendly visualization.

Keywords: Corporate content management, Corporate Digital Asset, Data Modelling, Corporate Reputation, Engagement

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1.0 Introduction

In an era where digitalization is reshaping the industry's narratives, corporations should take a bold step forward by curating a dynamic digital collection that transcends boundaries and embraces the limitless possibilities of the digital realm. Managing and preserving corporate digital assets is essential for a positive corporate reputation. Digital assets include any content an organization owns and uses in its operations, such as documents, images, videos, and multimedia files (Hannila et al., 2022). Effective content management involves organizing, storing, and retrieving these assets efficiently. Effective management guarantees that all essential information is readily available, regularly updated, and uniformly presented across platforms. This is critical for maintaining a coherent brand image and fostering stakeholder trust (Cornelissen, 2023; De Las Heras-Pedrosa, 2020). The study aimed to design a business requirement and data model for managing corporate digital assets in a sustainable organization. The importance of social media data, such as posting, number of likes, and number of followers, has proven to impact most business fields in monetary value, social, or even emotional values. (Farooqui et al., 2022; Zhu et al., 2022).

2.0 Literature Review

In an era where digitalization is reshaping the industry's narratives, corporations should take a bold step forward by curating a dynamic digital collection that transcends boundaries and embraces the limitless possibilities of the digital realm. Managing and preserving corporate digital assets is essential

2.1 Corporate Digital Assets

Corporate digital assets comprise any digital content or resources owned by a company or organization. Various corporate digital assets, such as high-resolution images, video, and interactive media, have been utilized for engagement (Simões-Coelho et al., 2024; Beng & Ming, 2020). Managing corporate digital assets across websites and social media platforms is a complex challenge in the digital landscape where media anarchy persists (Babka, 2023; Beng & Ming, 2020). Through the "4C" of content management: contribution, categorization, control, and centralization, the codification of digital content can be applied and will be beneficial for the organization in attaining its organizational goals (Rahman et al., 2023).

A corporate digital asset can be organized and indexed effectively by implementing a comprehensive digital asset management system (DAMS) that functions like a robust digital library. This involves categorizing assets using metadata, tags, and standardized naming conventions to ensure easy retrieval and organization. Metadata includes descriptive information such as title, author, creation date, and keywords, which enhances searchability. Advanced indexing techniques, such as AI-driven content analysis and automated tagging, further streamline the process by automatically categorizing assets based on their content. Additionally, implementing user access controls and version management ensures that only authorized personnel can access, modify, or delete assets, maintaining the integrity and security of the digital library. Regular audits and updates to the indexing system help keep the digital library relevant and efficient, facilitating seamless knowledge sharing and operational efficiency across the organization.

2.2 Digital Assets Management (DAMS)

Digital Asset Management (DAM) has become essential for organizations to effectively manage digital content, including videos, media releases, and posters (Alqahtani & Alqahtani, 2022). DAM systems enhance efficiency, productivity, and access to digital assets, potentially saving time and money (Masand et al., 2022). Key elements for effective DAM practice include selecting an appropriate system, managing metadata, and understanding user needs (Xing, 2021). DAM encompasses various business services, including new media, web content management, and virtual organizations (Chimakurthi, 2020). It also involves managing digital rights and permissions, which is crucial for copyright protection (Chimakurthi, 2020).

The implementation of DAM depends on an organization's environmental, cultural, and financial state (Chimakurthi, 2020). As companies evolve, DAM provides an agile solution to optimize operations and improve performance across departments (Alqahtani & Alqahtani, 2022; Masand et al., 2022). Digital Asset Management System (DAMS). Authorized personnel can easily share and access Well-managed corporate digital assets, reducing redundancy and ensuring that valuable knowledge is retained and disseminated effectively within the organization. By leveraging digital platforms to facilitate the exchange of information, companies can enhance collaboration among employees, streamline workflows, and promote innovation.

2.3 Business Rules for Managing Corporate Digital Assets

Business rules are the mandatory elements in understanding the business flow and corporate direction (Simões-Coelho, Figueira, & Russo, 2024), assets audit (Caballero et al., 2022), and health care (Blaisure, Jonathan & Ceusters, Werner, 2017). Business rules in managing corporate digital assets have been discussed broadly from several perspectives, including business and corporate communication (Cornelissen, 2023), and information technology (Stankic et.al, 2012). Literature focusing on database development (Stankic et.al., 2012; Caballero et al., 2022) suggests a set of business rules that have been established in developing a comprehensive corporate digital asset management as listed below:

- BR 1: One admin can create many media releases (1:M)

BR 1 concentrates on the content dissemination of corporate information. Corporate content such as media releases, reports, videos, and posters can enhance an organization's corporate reputation by connecting its audience with interactive and engaging content (Cornelissen, 2023; Kim et al., 2021). A media release is an official statement issued to media outlets to announce something newsworthy. It serves as a fundamental tool in public relations for conveying information to the public through various media channels. Media releases can cover various topics, such as new product launches, organizational changes, events, or significant achievements. From the reputation management perspective, media releases help build and maintain an organization's reputation. Companies can position themselves as industry leaders and maintain a positive public image by regularly disseminating newsworthy information.

- BR 2: One admin can maintain many videos (1:M)

BR 2 concentrates on the content management of corporate information. Video content metadata is crucial in increasing user engagement and enhancing corporate reputation. Metadata helps improve the discoverability, accessibility, and attractiveness of videos, which can boost engagement and positively contribute to an organization's corporate image. Metadata descriptions that can be optimized are video titles and descriptions. A compelling video title should be concise but informative to attract viewers. Descriptives with relevant keywords can capture the audience's attention and improve search engine rankings, making the video more discoverable.

- BR 3: One admin can maintain many media reports (1:M)

- BR 3 concentrates on the content security of corporate information.

News content reported or posted by an organization on its official corporate website is also considered a digital asset that can enhance corporate reputation. Regularly updated news content helps establish the organization as a credible and authoritative source of

information. It demonstrates transparency and informs stakeholders about the organization's activities, achievements, and industry developments. News content allows the organization to control the narrative and respond promptly to any misinformation or negative publicity, thus protecting and enhancing its reputation.

- BR 4: One admin can attach many posters (1:M)
- BR 5: One Video can have many Content_interaction (1:M)
- BR 6: One Poster can have many Content_interaction (1:M)

BR4, BR5, and B6 concentrate on the content interaction of corporate information. Digital assets such as videos and posters are commonly shareable throughout multiple social media channels. Monitoring how audiences interact with digital assets provides valuable data on what content resonates most with them. This information can tailor future content to meet audience preferences and expectations. Later, analyzing trends in content interaction helps organizations stay updated with their audience's latest preferences and behaviors, enabling them to produce timely and relevant content (Najda-Janoszka & Sawczuk, 2021; Beng & Ming, 2020). In the long run, regularly monitoring and responding to content interactions can build trust and demonstrate that the organization values its audience's feedback and engagement. Business rules are necessary in database design to ensure data relevancy and meet the organization's requirements. The next phase was conceptual model design, once information gathering and verification of all business rules were completed.

However, existing digital asset management systems (DAMS) often fall short in several key areas when preserving corporate digital assets. One significant gap is the lack of operational efficiency, which makes the organization lose control over data management processes. Deploying isolated DAMS will make the organization counter integration challenges, and the integration with advanced AI and machine learning capabilities is still in the study phase (Jani, 2020; Seabright et. Al, 2022). Considering the importance of maintaining good reputation management, it is best to protect the integrity and confidentiality of corporate information, which is essential for maintaining public trust and a positive corporate image. Thus, by developing a tailored database, organizations such as Government-linked companies (GLCs) can better safeguard their digital assets to ensure long-term sustainability and resilience.

Additionally, most GLCs have complex business flows and different operational landscapes. Using the ready package of DAMS, extended customization can be made, which affects the cost and also makes it difficult for non-technical staff to understand the system flows. The biggest challenges will be customizing long-term digital preservation strategies, including insufficient measures for regular backups, format migrations, and protection against data corruption or loss. Most existing DAM systems often lack comprehensive compliance and rights management features, leaving companies vulnerable to legal risks. These deficiencies highlight the need for more robust, intelligent, and user-friendly DAMS to ensure the effective preservation and utilization of corporate digital assets. Designing its database structure for corporate digital assets may be usable for enhancing existing DAMS. Thus, this study aims to design and develop a robust corporate digital asset repository that centralizes, organizes, and preserves the extensive corporate content of an organization, and instantly monitors its dynamic content interaction.

3.0 Materials and Methods

The research-based project applied the Database Life Cycle (DBLC) guideline as the basis of corporate digital assets repository implementation (Coronel & Morris, 2019). Focusing on the three precedence stages of DBLC, the database initial study, database design, and database implementation have been gone through.

In the initial database study stage, the website content analysis procedure was employed. This procedure involved benchmarking the corporate digital content available at three GLC corporate websites. The analysis involved identifying the corporate contents, content authorship, authority, and content dissemination. Table 1 indicates the observation elements.

Table 1. Rapid observation and website content analysis elements

Element	Descriptions	Examples
Corporate Contents	All digital content has been shared through the organization's or company's website.	Logo, poster, corporate photo, video.
Content Authorship & Authority	The role or division authorized to manage the organization and corporate content.	Updated by, page categorization, and page labeling.
Content Interaction	The mechanism of how corporate digital content interacts with its audience and stakeholders on the World Wide Web.	Shared to, number of likes, number of shares.

(Source: self-created)

The website content analysis procedure took place over three weeks in Jun 2024. Each week, 2 hours had been allocated for reviewing the content and understanding the content organization. The three selected GLC corporate websites were among the top GLCs in Malaysia and most visible among Malaysian audiences.

The database design and implementation process focuses on these three main stages: conceptual modeling, logical modeling, and physical modeling. Table 2 shows the material used according to each stage. The Lucid tool creates an Entity-Relationship Diagram (ERD) representing the database schema. This ERD includes entities for each type of digital asset and their attributes gathered from the initial data requirement, and the relationships between entities are also constructed based on business rules defined earlier, such

as each poster will have many content interactions. The requirements and logical validation have been done to ensure the ERD accurately reflects user requirements and business rules. The ERD was reviewed and validated with development teams, corporate officers as end users, and related organization stakeholders. Some necessary adjustments have been made based on their feedback.

Table 2. Material used according to the stage

Element	Descriptions
Conceptual Design	Lucid online tool using the Entity-Relationship Diagram shape https://lucid.app/documents#/documents?folder_id=home
Logical Design	MySQL using phpMyAdmin
Physical Design	Web Hosting server https://www.000webhost.com/ with database manager embedded with phpMyAdmin functional capabilities.

(Source: self-created)

The Logical design translates the abstract conceptual model into a logical structure. Based on the ERD, tables for each entity are created, defining primary keys, foreign keys, and constraints as needed. Using phpMyAdmin, the MySQL settings are configured for optimal performance and security (Hamidi et al., 2022; Kurien et al., 2022). MySQL is widely used due to its speed and inexpensive cost of ownership (Zhang & Pan, 2022). Once the tables are set up, existing digital asset data is imported into the database using phpMyAdmin's import feature. Data management uses phpMyAdmin to ensure the data is up-to-date and accurately reflects the organization's digital assets.

4.0 Project Outcomes and Discussions

The analysis revealed that various elements of corporate digital assets need to be managed for the organization's visibility. In enhancing the management and utilization of the organization's digital content for corporate reputation improvement, the corporate digital assets database can be a data source to deposit media releases, media reports, corporate digital assets database can be as a data source to deposit media releases, media reports, corporate videos, posters, and other relevant digital content of the organization integrate with its real-time content interaction.

Table 3 shows the rapid observation and web content analysis of the three Malaysian GLCs' website content structures specific to their corporate content..

Table 3. Rapid observation and website content analysis elements

Element	Descriptions
A	Organization A organizes its corporate content on the website by categorizing reports into different types, such as integrated and annual reports, financial reports, operational reports, sustainability reports, and human rights reports. Each report is tagged with the publication date for easy access. Users can filter reports by type and year, enhancing the navigation and retrieval. This structured approach lets users quickly find specific reports and ensures comprehensive coverage of the organization's activities and performance.
B	Organization B website structures its corporate content under the "Media & Investors" section with key categories such as News & Highlights, Energy Watch, Financial Info, Share Info, Demand Sales & Foreign Shareholding, Annual Reports, Sustainability Reports, AGM Minutes & Appendices, and Circulars/Notices to Shareholders. This organization facilitates easy navigation and access to information on the organization's activities, financial performance, sustainability initiatives, and shareholder updates.
C	Its corporate digital content is labeled as the "Investor Relations" section, which includes categories such as Financial Information, Stock Information, News & Events, and Resources. The Resources section provides access to reports, presentations, and other relevant documents. This organized structure ensures that investors and stakeholders can easily find and access necessary information about the organization's financial performance, stock updates, news, and other corporate materials.

(Source: self-created)

Each organization effectively organizes its corporate digital content into clearly defined categories. These categories typically include sections for financial reports, news and updates, investor information, and sustainability reports. Each site employs a user-friendly interface with advanced search and retrieval features, metadata tagging, and secure access controls (Hamidi et al., 2022; Kurien et al., 2022). This structured approach ensures that stakeholders can easily navigate and access relevant information, enhancing transparency and facilitating informed decision-making.

Next, the outcome from the observation and web content analysis above, a set of business rules is formulated and represented in the ERD as shown in Figure 1. The ERD is a conceptual model that represents the whole view of data management needed for corporate digital assets.

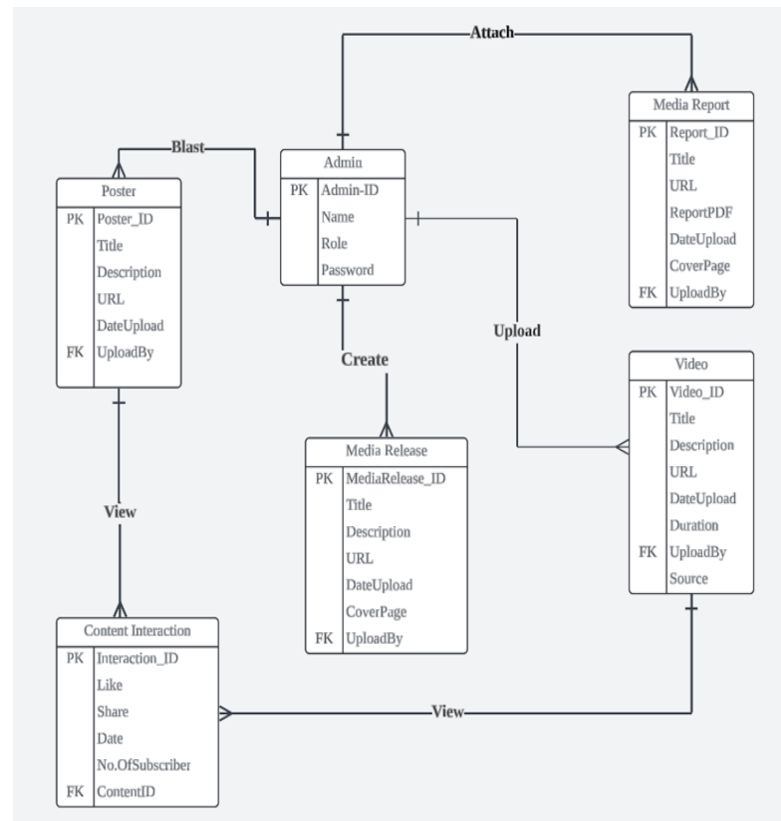


Fig. 1: ERD for Corporate Assets
(Source: self-created)

A total of six tables, which are media releases, media reports, posters, videos, content interaction, and admin. Each table, especially media releases, media reports, posters, and videos, are a corporate digital asset for the organization and needs to be managed accordingly. Hannila et al (2022) understand that corporate data assets nowadays vary in structural format, either in the structured, semi-structured or unstructured format of data and all are crucial to support an organization's decision-making. The integration of unstructured data management and blockchain technology would produce an optimized database design of website content, such as images or videos, using content identifiers for each website content (Bahauddin et al., 2023).

Figure 2 shows the logical structure of corporate digital assets tables which are media releases, media reports, posters, and video tables.

#	Name	Type	#	Name	Type	#	Name	Type	#	Name	Type
1	MediaRelease_ID	varchar(15)	1	Report_ID	varchar(15)	1	Poster_ID	varchar(15)	1	Video_ID	varchar(15)
2	Title	varchar(150)	2	Title	varchar(100)	2	Title	varchar(100)	2	Title	varchar(150)
3	Description	varchar(900)	3	URL	varchar(150)	3	Description	varchar(500)	3	Description	varchar(900)
4	URL	varchar(150)	4	DateUpload	date	4	URL	varchar(150)	4	URL	varchar(150)
5	DateUpload	date	5	DocumentPDF	longblob	5	DateUpload	date	5	DateUpload	date
6	CoverPage	longblob	6	CoverPage	longblob	6	UploadBy	varchar(15)	6	Duration	varchar(15)
7	UploadBy	varchar(15)	7	UploadBy	varchar(15)	6	UploadBy	varchar(15)	7	UploadBy	varchar(15)
									8	Source	varchar(15)

Fig. 2: Logical structure of corporate digital assets tables
(Source: self-created)

In the context of folksonomy or social tagging field of study, a good categorizing and structuring of the corporate digital assets will help better information retrieval and easy for users to navigate, and increase content interaction (Al-Thuhli & Al-Badawi, 2020). Analyzing content interaction for corporate digital assets such as media releases, posters, and videos involves tracking and evaluating how

audiences engage with this content. This analysis can provide insights into audience preferences, behavior, and sentiment, which are crucial for improving corporate reputation (Gao, H., & Feng, Y., 2023). Figure 3 shows the content interaction metadata attributes, which store social media interaction values such as the number of subscribers and date of interaction being tracked, together with the number of likes and number of shares for each content.

#	Name	Type
1	MediaRelease_ID	varchar(15)
2	Title	varchar(150)
3	Description	varchar(900)
4	URL	varchar(150)
5	DateUpload	date
6	CoverPage	longblob
7	UploadBy	varchar(15)

#	Name	Type
1	Report_ID	varchar(15)
2	Title	varchar(100)
3	URL	varchar(150)
4	DateUpload	date
5	DocumentPDF	longblob
6	CoverPage	longblob
7	UploadBy	varchar(15)

#	Name	Type
1	Poster_ID	varchar(15)
2	Title	varchar(100)
3	Description	varchar(500)
4	URL	varchar(150)
5	DateUpload	date
6	UploadBy	varchar(15)

#	Name	Type
1	Video_ID	varchar(15)
2	Title	varchar(150)
3	Description	varchar(900)
4	URL	varchar(150)
5	DateUpload	date
6	Duration	varchar(15)
7	UploadBy	varchar(15)
8	Source	varchar(15)

Fig. 3: The content interaction metadata attributes
(Source: self-created)

Through tracking and boasting impactful content, the organization's corporate image can be positively increased. Content interaction data will be regularly analyzed to ensure that the organization's digital presence remains dynamic and audience-focused, ultimately contributing to a stronger corporate reputation.

5.0 Conclusions

In conclusion, the effective management and preservation of corporate digital assets are vital for enhancing corporate reputation. Through robust content management, fostering knowledge sharing, facilitating user interaction, boosting brand awareness, and ensuring technical and legal compliance, companies can protect and enhance their image in the digital age.

The study revealed the specified data model in handling the corporate digital assets for achieving organizational goals such as corporate reputation improvement. Strategically, in-house development of corporate digital asset databases offers the advantage of customization tailored to specific organizational needs and greater control over the system, allowing for quicker problem resolution and easier integration with existing workflows. On the other hand, in-house development requires significant initial investment and huge information system experts and support teams.

The management and preservation of corporate digital assets are crucial for enhancing reputation, operational efficiency, and long-term sustainability. This study emphasizes the importance of customized digital asset management systems (DAMS) tailored to specific organizational needs. To improve the utilization of digital assets, recommendations include integrating advanced AI and machine learning capabilities, adopting blockchain technology for data security, implementing regular audits and updates, enhancing user-centric design, strengthening compliance and rights management, and promoting interdepartmental collaboration.

Some recommendations for future studies and practical implementations include promoting interdepartmental collaboration, which can enhance the utility and adoption of DAMS. This effort may be beneficial for the organization in fostering a culture of shared knowledge and innovation. The organizations can also optimize their digital asset management and position themselves as leaders in digital innovation and sustainable growth. Future research may look at the opportunity to explore integrating emerging technologies like natural language processing and predictive analytics to further enhance the corporate digital assets repository's functionality.

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Paper Contribution to Related Field of Study

This research-based project contributes to the corporate digital assets management and data modeling fields of study. The outcome of the data model can be mimicked and enhanced to suit various corporate departments in any organization, in accelerating their operations.

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