CHAPTER 3 DIGITAL TRANSFORMATION PROJECT IMPLEMENTATION AND DESIGN

3.1 Digital Transformation Framework

Digital transformation will leverage an organization to speed up and optimize current performance into a better digital ecosystem, either it's for restructured business strategy, or business innovation (Cennamo, Dagnino, Di Minin, & Lanzolla, 2020).

In the digital era, finding the best and most suitable business model to improve revenue and minimize identified risks and skepticism is important in executing a digital transformation strategy (Correani, De Massis, Frattini, Petruzzelli, & Natalicchio, 2020).

PT. XYZ already use digital technology in daily usages, such as social media platform, online platform, and offline platform. Social media platforms are used for marketing campaigns and product awareness and also as tools to engage customers with the purpose to attract customer repurchase intention (Qing, Al Mamun, Makhbul, & Zainol, 2022).

As for the online platform, PT. XYZ already have a webstore that connects both online and offline database to get a better customer experience. Also, collaboration with marketplace systems enables wider customer markets. On an offline platform both Point of Sales (POS) System, and ERP (Enterprise Resource Planning) system, along with other supporting programs such as attendance system and business intelligence systems already used.

The main problem and challenge experienced by PT. XYZ is ineffective work from employees who require inputs in more than one application to generate reports, it's causing report delays. The problem impacting in product lifecycle and organization revenue, since the reports use by top-level management to decide the strategic plans for business sustainability.

The objective of this digital transformation project is to have an application to summarize all applications and systems used by executives for decision-making purposes. With this executive information system, business decisions will be faster and employee performance will increase within 2 years. Another benefit of this system is revenue predictions which are usually affected by global economic changes, competitors, and operational efficiencies (Wang & Gu, 2022).



Below is the digital transformation on PT. XYZ.

Systems or applications designed in digital transformation projects should be able to answer and accommodate PT. XYZ objective and problems. The application must be able to utilize data and information on each PT. XYZ channels

27 Executive Information System Development to Improve Customer Retention: Case Study in PT. XYZ, Fransiskus Tantono, Universitas Multimedia Nusantara

and offers accuracy and performance speed in generating reports. The executive

information system itself isn't meant to replace employee roles, instead, the system's presence improves employee contribution and reduces unnecessary and duplicate work.

Organization trends in generating value, preventing fraudulent transactions, and reducing costs from complex data analytics encourage technology adoption (Halper, 2022). Digital Maturity Model (DMM) from The Data Warehouse Institute (TDWI) is chosen to identify the current and future state of the organization.

Current condition in PT. XYZ, each of the applications has its database and not all applications are integrated. Due to integration issues, data delay will affect report generation need to wait until employees finish retrieving the data manually from each application and combine it.

The expected Future state will be data generated in almost real-time (depending on the integration method and application characteristic) and each of the applications will be connected to an analytical tool platform, user should be able to gather the data easily and let the system generate the report automatically with less effort.

Roadmap started with the development process from 4 teams: the web development team, mobile development team, ERP team, and Marketplace support team. The internal support team will be involved more when the project almost deployed successfully in a production environment; this team will help end users familiar with the system implemented.

As for development, testing, and deployment will use CI/CD concept (Continuous Integration/Continuous Delivery), this method uses to accommodate organization requirements, especially in chasing trends.

After it was implemented, monitoring will be conducted for at least 2 months, 1 month to observe, bug fix, and system optimization, and another 1 month for the babysitting phase (user training and sharing knowledge).

3.2 Development and Implementation of Digital Maturity Model

The urgency of implementing Digital transformation is to improve the organization effectivity and increase the organization's performance and revenue, The Data Warehouse Institute (TDWI) analytic maturity model was chosen to evaluate and check current organization maturity in analytics.

TDWI Analytic Maturity Model has five dimensions of measurement which are organization, resource, data infrastructure, analytics, and governance. TDWI was founded in 2006 and is also a group of 1105 Media, Inc. As one of the trusted training partners and experienced in data intelligence, TDWI also has TDWI Certified Business Intelligence Professional Certification (TDWI Overview, n.d.).



Figure 3.2 TDWI Analytic Maturity Model

Source: (Halper, 2022)

Organizational maturity consists of leadership, culture, impact, and strategy, this dimension evaluates the culture of an organization in decision-making using analytics. Resource dimensions consist of funding. talent/skills, roles/responsibilities, and training, all of these sub-dimensions to check on organization preparation and capabilities in both manpower and budget. While Data infrastructure is used to weigh data components which consist of diversity, data access, data integration and management, and data architecture. Level of analytic measure in Analytics dimensions, with four sub-dimensions, scope of capabilities, automation/augmented, deployment and delivery approaches, and innovation. Dimension measurement checking data governance, based on data governance processes and tooling, model governance processes and tooling, governance roles, and security/privacy (Halper, 2022).

Executive Information System Development to Improve Customer Retention: Case Study in PT. XYZ, Fransiskus Tantono, Universitas Multimedia Nusantara

Resource maturity, Data Infrastructure maturity, and Analytics maturity are dimensions to evaluate and quantify organization capabilities.

TDWI maturity model consists of 5 Stages (Nascent, Early, Establish, Mature, Advanced/Visionary). The Chasm is a stage between the established stage and the mature stage, this stage often occurs in an organization with established maturity and faces several obstacles, for example, the need for data science and users' improvement in data analytics to become data literate (Halper, 2022).



Nascent maturity reflects organization in a pre-analytic environment, in some cases, the company still uses spreadsheets and has zero analytic support team. The organization culture in the nascent stage is not analytic friendly, and each decision is made more by intuition other than data-driven.

The stages start with Nascent, which can be categorized as baby stages since companies have low awareness of big data. As for the Early stage, the organization already start pre-investment in analytics technology such as data warehouse, Business Intelligence tools, etc., despite the contribution remaining partial or centralized in one department, such as the IT department.

At Establish stage, the organization already implements it in analytics technology, for example having dashboard reports are needed in analytical and decision making. Data-driven journey starts here in gaining insight and transforming business, thus the data might own by IT, while the analytics own by the business department, the two's start their collaboration in this stage.

Organizations started to innovate in analytics, such as enriching the data from unstructured data, in the mature stage, all the decisions are data-driven. The last stage is Advances/Visionary, which is the top-level stage, when the

³⁰

Executive Information System Development to Improve Customer Retention: Case Study in PT. XYZ, Fransiskus Tantono, Universitas Multimedia Nusantara

organization's perspective is analytically oriented, and culture reflects the organization's orientation. Employees in the advanced stage mostly feel enjoyment in using analytics in every part of their work, data exploration is widely used as well.

There are 54 questions to evaluate stages of the TDWI Analytic Maturity Model that represent five sub-dimensions in each 5 dimensions can be assessed at <u>https://tdwi.org/analytics-assessment</u>, each dimension has a maximum score of 20 points. After completing the assessment, the score of each dimension will reflect on the five dimensions stage.

| Score Per Dimension | Stage |
|---------------------|-------------|
| ≤5 | Nascent |
| 6-10 | Early |
| 11-15 | Established |
| 16-19 | Mature |
| 20 | Visionary |

Table 3-1 TDWI Analytic Maturity Scoring per Dimension

Source: (Halper, 2022)

Below are the current and future state measurements:

| | Current State Measurement | Future State Measurement | | |
|-----------------------------------|---|--|--|--|
| Data Collection Method | Observation | Interview | | |
| Respondents | Merchandiser, Marketing, Internal Auditor, Inventory, Finance, Accounting, and IT team of PT. XYZ | Board of Directors and General Managers of PT. XYZ | | |
| Validity and Reliability check | Data observation record | Interview record | | |
| Tools/Instrument Quality | Use related sub- dimension selections | Improve interview protocol | | |
| Source: Author (2023) | | | | |

Executive Information System Development to Improve Customer Retention: Case Study in PT. XYZ, Fransiskus Tantono, Universitas Multimedia Nusantara

| Table 3-3 TDWI Analytic Maturity Model Stages Description | | | | |
|---|----------------|---------------------|----------------------------|---------------------|
| Table 5-5 TDWT Analytic Maturity Model Stages Description | T_{-1} | A | M. J.I.C. | n D · · · · · · · · |
| | Ianie - IIIVVI | Αηαιντις Μιατιή | πv worel \mathbf{N} | ages Descrimmon |
| | | Inconverte Informer | ily mouce of | ages Description |

| Dimension / | Nascent | Early | Established | Mature | Advance / Visionary |
|------------------------|--|--|--|--|---|
| Organization | Has not nonetheless began or unaware to explore analytics. | Aware of analytics technology but organization culture not yet formed. | Gets excited regarding the prospects for how analytics could improve decisions and outcomes more broadly, more people start to come on board | Realize that analytics could be a competitive differentiator, Innovation in knowledge and data analysis could be a core worth, and an analytics culture prevails. | Executives read big data analytics as important and commonplace for the way to try and do business, unceasingly crucial new ways to use and make value from analytics, collaboration becomes culture. |
| Resources | There is no strategy to move forward because the business doesn't care enough to do so | The mindset is generally around experimentation. The team is making an attempt to adopt analytics technology to resolve business issues | Start setting up data literacy programs to help business users | Budget and enablement team are in place to help support data literacy. | Analytics is a way of daily life. Analytics is becoming more common and urgency of thinking outside the box and looking for monetization opportunities. |
| Data Infrastructure | Having some sort of data management strategy. But data are typically siloed for analysis. | Having some sort of data warehouse. But its data strategy and data life cycle management strategy are not strong. | Have data collected as files of different formats, potentially with division or enterprise standards for naming and storage management. | Data integration supports modern tooling. Coherent architecture to support data access by multiple personas and the company is able to scale its data management infrastructure | Can manage complexity, data is shared across the organization. Integrate new sources of data for analytics. |

32 Executive Information System Development to Improve Customer Retention: Case Study in PT. XYZ, Fransiskus Tantono, Universitas Multimedia Nusantara

M U L T I M E D I A

| Dimension / | Nascent | Early | Established | Mature | Advance / Visionary |
|-------------|--|---|--|---|---|
| Stages | | | | | |
| Analytics | Most of the analysis is slicing and dicing. Data access are limited and restricted. | Analytics are still rudimentary, but pockets of advancement are starting to occur. | May be utilizing descriptive or even predictive analytics, depend on the problem to solve. | New data coming can be analyzed quickly and incorporated into the logical infrastructure. Analytics might be automated or integrated with the business process using new technologies such as Machine Learning/Neuro Linguistic Programming. | Makes use of all kinds of data, including real-time data, and uses this as part of its decision making and incorporates into business processes. |
| Governance | Governance | Have a steering committee | Have corporate | Have program governance | The program is treated as |
| | strategy is more | overseeing the program | sponsorship and | with PMO and steering | mission critical and given |
| | 11 centric than | from a governance | infrastructure, but yet | committee, executed program | the right amount of |
| | business-and-IT | perspective. | settle governance | as budgeted and planned | staffing and skills. |
| | centric. | | team. | enterprise initiative. | |

Source: (Halper, 2022)

33 Executive Information System Development to Improve Customer Retention: Case Study in PT. XYZ, Fransiskus Tantono, Universitas Multimedia Nusantara

MULTIMEDIA

3.3 Benefits of Using Technology

Business analytic implementation in PT. XYZ requires some updates in software and integrations within the application.

The technology used in this digital transformation project is:

- 1. Business analytic tool, Power BI (Business intelligence) will be used as a presentation layer to executives.
- Database server, Microsoft SQL Server use needs to be upgraded to the latest version, SQL Server 2019
- 3. Website version, website CMS (Content management system) used needs to be upgraded to the latest version.
- 4. Communication and Operational tools,
 - a) Instant messaging applications: Slack, WhatsApp, Google Chat, Skype
 - b) Video conferencing applications: Google Meet, Microsoft Teams, Skype
 - c) Office application software: Microsoft Excel, Microsoft PowerPoint, Google Docs, Google Sheets, Google Slides, Microsoft Azure.
 - d) Network and dashboard monitoring tools: New Relic, Amazon Cloud-Watch, Azure Monitor

The benefits of using technology are:

- 1. Executives' improvement in decision making.
- 2. Reduce time consumption in inputting similar data.
- 3. Improve business perspective by viewing past data and forecasting.
- 4. Ease of measurement in the marketing program
- 5. Customer behavior Insight.
- 6. Business strategy prediction and forecast.

M U L T I M E D I A N U S A N T A R A

34

Executive Information System Development to Improve Customer Retention: Case Study in PT. XYZ, Fransiskus Tantono, Universitas Multimedia Nusantara

3.4 Digital Transformation Project Implementation

Combining all data from online and offline platforms plus additional resources such as social media platforms and hardware (IoT machines), the technology transformation will give a new perspective on how customers react and behave on purchasing products. Currently, the report requires lots of effort and is time-consuming, after the project is implemented for around 1 year, the employee workload will be decreased and analytic culture will be formed to improve the maturity stage.

In terms of updates, it is recommended to update the platform and supporting application in the newer version, to anticipate bugs and security issues that often occur. Observation was used to measure the current state, the assessment questions can also be found in <u>Appendix B</u>.

Measurement result on the current state shows all five dimensions (organization, resources, data infrastructure, analytics, and governance) in the Early stages.



Table 3-4 Current State Measurement Result

Analytics Maturity Model Stages



Executive Information System Development to Improve Customer Retention: Case Study in PT. XYZ, Fransiskus Tantono, Universitas Multimedia Nusantara

3.5 Formulation Plan of Digital Transformation Case Study

The case study occurs in PT. XYZ refers to Sales Forecasting, Market Analysis, and Performance Assessment for US Retail Firms: A Business Analytics Perspective (Wang & Gu, 2022). The study uses business analytics with four modules, which are descriptive analytics, diagnostic analytics, predictive analytics, and prescriptive analytics to support retail executives in decision-making related to sales forecast, market analysis, and performance assessment in US retail locations. Previous research used for this case study is listed in Appendix A.

Previous research limitations in data collection and STP (Segmentation, Targeting, Positioning) issues which were not considered, will be included in this research with business analytic tools to map customer demographic and create more effective marketing and promotion plans.

Advantages of this digital transformation in PT. XYZ are:

- 1. Increase employee productivity.
- 2. Better decision in marketing program development
- 3. Data integrated and use efficiently based on its function and purpose.
- 4. Easy-to-use dashboard monitoring system.
- 5. Improve customer retention.

Below is the business process flow for future integration processes based on procedures to build an executive information system. The orange and green arrows added for API integration propose the integration will decrease and eliminate delays in data transfer for future data processing.

One of the objectives of this digital transformation is to calculate customer retention rate based on existing data, with the formula described below, prediction analysis should be easier to conclude based on customer retention rate percentage and improve sectors that lack attention.



Source: Author (2023)

Customer Retention Rate = ((E-N) / S) * 100%

- E = Total customers in the end period
- N = Total new customers in the end period
- S = Total members in the early period

UNIVERSITAS MULTIMEDIA NUSANTARA

37

Executive Information System Development to Improve Customer Retention: Case Study in PT. XYZ, Fransiskus Tantono, Universitas Multimedia Nusantara