Lisbon School of Economics & Management
Universidade de Lisboa

MASTER

DATA ANALYTICS FOR BUSINESS

MASTER´S FINAL WORK

PROJECT

ENHANCING BUSINESS EFFICIENCY THROUGH DATA ANALYTICS POWER PLATFORM SOLUTION FOR DIRIYAH

JULIA TEIXEIRA

02-2025

Lisbon School of Economics & Management
Universidade de Lisboa

MASTER

DATA ANALYTICS FOR BUSINESS

MASTER´S FINAL WORK

PROJECT

ENHANCING BUSINESS EFFICIENCY
THROUGH DATA ANALYTICS
POWER PLATFORM SOLUTION FOR DIRIYAH

JULIA TEIXEIRA

SUPERVISION:
SÉRGIO NUNES

02-2025

GLOSSARY

PEAS – Performance Excellence Assessment System.

PE – Performance Excellence

ABSTRACT, KEYWORDS AND JEL CODES

The integration of data analytics with automation is transforming how business achieve greater efficiency in the daily tasks. This Master's project investigates the contribution of applications in the Microsoft Power Platform, such as Power BI, Power Apps, and Power Automate, driving operational efficiency and innovation across Diriyah's business landscape. With the integration of multiples data sources, it exemplifies the possibility of building analytics and automation solutions.

As one of the cities with the greatest cultural significance in Saudi Arabia, Diriyah represents both cultural heritage and modern development. It was the birthplace of the First Saudi State and is transforming into a smart city through an ambitious modernization effort, combining its historical legacy with modern urban planning and business ventures.

The project will research how Power Apps and Power Automate can digitize workflows, enhance collaboration, and reduce manual effort to align with Diriyah's vision of sustainable and technology-driven growth.

This project brings together modern technology with the historical context of Diriyah and its emerging business opportunities to provide a framework for leveraging data analytics and automation in support of efficient, innovative, and culturally respectful development in one of Saudi Arabia's most iconic cities.

KEYWORDS: Data Analytics; Power Platform; Process Automation; Productivity.

JEL CODES: M15; O33; O31.

TABLE OF CONTENTS

TABLE OF FIGURES

ACKNOWLEDGMENTS

First, I want to thank my parents for their constant love and support. To all my dear sisters, for always being there for me. I also want to thank my adorable nephews, whose joy and energy brightened my life. A special thanks to the Cunha’s family, who welcomed me with open arms and gave me all the support I needed while I was away from home during my master's. This experience wouldn't have been the same without all of you

ENHANCING BUSINESS EFFICIENCY THROUGH DATA ANALYTICS: A DIVERSE POWER PLATFORM SUITE FOR DIRIYAH

By Julia Teixeira

This Master Project explores how Microsoft Power Platform applications can improve business efficiency and foster innovation in Diriyah. By utilizing tools like Power BI, Power Apps, and Power Automate, the project supports Diriyah's vision of becoming a smart city. It focuses on leveraging automation to streamline workflows and enhance productivity within the organization.

1. INTRODUCTION

Saudi Arabia, with the ambitious project 2030, is a reference for the balance between modernity and tradition. While preserving its deep roots, culture, and history, the country has made significant investments in technology and innovation, establishing itself as a Middle Eastern innovation hub.

As a city of significant historical and cultural importance in Saudi Arabia, Diriyah is a good example. Popularly recognized as the "Jewel of the Kingdom," Diriyah holds At-Turaif, a UNESCO World Heritage Site, and is known as the birthplace of the first Saudi kingdom. The Diriyah Company, responsible for the restoration and development of this historic site, is leading initiatives to transform Diriyah into a cultural and tourist attraction worldwide.

Diriyah's transformation extends to the preservation of its rich past while also creating an evolving urban environment that promotes innovation and sustainability. This dual focus presents distinct issues, especially in handling extensive data, organizing parties, and maintaining effective workflows across diverse projects. These complex challenges require solutions that combine speed, accuracy, and adaptability, creating an opportunity to implement modern technological tools. The Microsoft Power Platform offers an extensive variety of tools for data analysis, process automation, and application development, making it an ideal fit for such demands.

The main objective of this project is to design, implement, and evaluate Power Platform-based solutions tailored specifically for the requirements of Diriyah Company.

By adopting the Scrum methodology, the project will generate tailored workflows, applications, and dashboards that align with the company's goals and operational

infrastructure. This methodology, structured by iterative sprints and incremental deliverables, facilitates continuous evaluation and adjustment of developed solutions through regular meetings and sprint reviews. It ensures clear and effective communication between team members, promotes a more collaborative work environment, and streamlines the scope and execution of the project. Moreover, it guarantees all project objectives and business requirements remain continuously aligned with organizational priorities and user expectations.

This project seeks to demonstrate how technology, when utilized with the right strategies, can effectively drive sustainable growth and modernization through the Microsoft Power Platform. It further explores how the complex demands of large-scale projects can be efficiently met using data-driven decision-making, process automation, and effective collaboration.

Upon completion, the project will result in significant improvements by optimizing existing workflows, guaranteeing higher effectiveness and efficiency in daily operations. Furthermore, it seeks to provide a comprehensive and scalable framework that functions as a model for utilizing technology in other areas of business. Through these outcomes, the project aspires to establish a model for sustainable modernization that can be adapted to diverse contexts and challenges in other companies.

The subsequent chapters are organized to facilitate a clear and focused analysis of the project. Chapter 2 describes the context and basic understanding, providing an overview of Diriyah Company, the Power Platform, and the associated challenges and benefits of workflow digitization, highlighting its alignment with sustainable growth. Chapter 3 presents the methodology, defining the framework for creating customized solutions, the tools and technologies utilized, and the strategy for workflow design and automation. Chapter 4 delivers implementation, including data integration, Power Apps development, automation processes, and strategies for overcoming technical and operational challenges. Chapter 5 presents the results, emphasizing significant achievements, enhancements in efficiency and collaboration, and insights gained, while considering cultural factors. Chapter 6 concludes with a summary of findings, recommendations for future enhancements, and reflections on the role of technology in Diriyah's sustainable transformation.

2. LITERATURE REVIEW AND CONTEXT

2.1. Overview of Diriyah Company

Diriyah is known as the birthplace of the Kingdom of Saudi Arabia. It was in 1744 that Al-Diriyah became the stage for one of the most important moments in Saudi Arabia's history—a place where Muhammad bin Saud and Sheikh Muhammad bin Abdulwahab combined political power and religious reform, transforming Diriyah into the first capital of the Saudi State (Al-Harithy, 2020).

Riyadh replaced Al-Diriyah as the capital in 1818 after the Ottomans invaded the city. An important moment in Saudi history was marked by this incident. After years of neglect, the Riyadh Development Authority began a massive restoration effort in 2000 with the goal of restoring Diriyah's heritage and turning it into a global cultural center. To coordinate the renovation and rebuilding of Al-Diriyah, the Diriyah Company was officially formed.

The company emerged as a key player under the umbrella of Saudi Arabia's Vision 2030, which emphasizes the importance of cultural preservation, economic diversification, and sustainable development.

One of the most visited spots in the city is the At-Turaif Heritage Site, which underwent a restoration plan to preserve the traditional Najdi style while integrating it with new constructions around the entertainment complex where it is located. The modernization plan includes the Bujairi Terrace project combines premium dining and shopping with cultural experiences blending local architecture with modern luxury, creating a stunning environment for all visitors. The proximity between the two sites serves as a gateway for visitors to explore the rich history of Diriyah and enjoy gourmet dining options during the same visit. It features well-designed public spaces, gardens, and pathways where visitors can relax, dine, and enjoy cultural events.

Building Diriyah into a cultural hub demands a meticulous process of planning and operation from the business side. The company collects data from visitors' interactions across attractions to serve as a source for continuous improvement. Performance Excellence and Digital Solutions teams play a crucial role in collecting and analyzing data from the daily operations and work alongside to turn it into valuable insights to the company decision-makers.

The Digital Solutions team is the business department responsible for managing all IT infrastructure, providing full support, and analyzing vital information generated onsite, and it functions as a key driver of innovation. This involves information regarding consumer behavior, parking, visitors, and other important metrics that are essential to the business's overall efficiency and success.

The Performance Excellence team focuses on ensuring operational efficiency and optimize onsite processes to enhance visitor's experience. Their responsibilities frequently include significant manual interactions, particularly with field teams, to monitor and manage information related to on-site operations. These activities can be time-consuming as well as open to human errors. This presents a clear bottleneck to operational efficiency where we have decided to use Power Platforms as an innovative solution to these challenges.

Significant transformations can be rapidly adopted by companies with low-code platforms revolutionizing workflows and adopting automation across business processes triggered by the need for improved operational effectiveness and the increasing demand for digital transformation solutions (Consulting, 2024). This approach, by providing power and mobility, digitizing workflows, automating data collecting, significantly facilitates communication between field workers and decision-makers, resulting in much less human labor and more accurate and timely insights.

2.2. No-Code Low Code Development Platforms

A focus on enhancing speed and accessibility in application development has led to the rise of low-code platforms. Conventional software development methodologies can be time-consuming, resource-intensive, and, in most cases, demand advanced technical skills. Low-code & no-code platforms appeared at the time of these challenges, enabling people with little or no coding skills to develop essential software and automate business processes.

As per Leung (2017) with these platforms, IT departments will be less reliant on those who use them and be able to empower "citizen developers"—employees outside traditional tech titles who create solutions meeting immediate business needs. Example: Mendoza (2022) explains how the fast-paced development cycle of low-code platforms

enables businesses to have the flexibility required to stay ahead in a fast-moving landscape.

No-Code/Low-Code Platforms

Salesforce Lightning Platform: One of the leading low-code options, particularly in customer relationship management (CRM). This enables organizations to build custom applications and automate workflows that integrate natively with Salesforce's CRM capabilities. An emphasis on CRM is a double-edged sword, though, limiting you at times in other business situations, and it is complicated, so training and certification are required, resulting in a rougher learning curve (Weston, 2023).

Google AppSheet: This approach seduces organizations already anchored in Google Workspace to an accessible and lightweight style of App dev and is also what Google AppSheet has to offer. It has been designed to build simple mobile and web apps that connect to Google Sheets and other cloud services. However, AppSheet's capabilities are less useful in scenarios with larger data volume and in more complex and enterprise-ready applications when compared to platforms such as Power Platform (Mendoza, 2022).

OutSystems: This platform also happens to be a low-code development platform capable of building complex, scalable enterprise applications. There are advanced customization features available and integrations with various third-party services are part of the package. They are originally from Portugal. However, its excessive costs and the need for specialized development knowledge pose barriers to organizations looking for a more accessible solution (Leung, 2017).

Mendix: Within the Siemens ecosystem, operates on the enterprise end of the spectrum catering to those with large, complex, and scalable requirements. It provides advanced device customization and caters to low-code or traditional development. As flexible and powerful, it is also often known as best reserved for larger organizations with the budget to manage its complexity and cost (Weston, 2023).

Power Platform: The components of the Power Platform are Power BI (data analytics), Power Apps (application development), Power Automate (workflow automation), and Power Virtual Agents (chatbot development). The platform is one of its kind which has the best integration with Microsoft, Microsoft 365, Azure, and Dynamics 365 services.

According to Leung (2017), Power Platform empowers non-developers/ novices/casual users to develop role-based business applications by using intuitive interfaces for quickly building applications, combined with drag-and-drop features. According to Mendoza (2022), its wide array of connectors lets organizations automate workflows and import data from hundreds of external services.

As highlighted by Weston (2023), Power Platform enables advanced customizations with capabilities such as custom connectors and integrations with APIs, thus suiting both simple and complex use cases. Moreover, the platform also includes out-of-the-box security & compliance capabilities required by organizations that are functioning in a regulated environment.

To better understand the differences between the Power Platform and other leading low-code/no-code development platforms, the following comparative table outlines key features, customization potential, and scalability of each.

Table I

COMPARISON BETWEEN PLATFORMS

Platform	Key Features	Customization & Scalability
Salesforce Lightning	Low-code platform for CRM apps. Deep integration with Salesforce. Intuitive for non-technical users.	Scalable, but can be costly. Customization is moderate, suited for CRM processes.
Google AppSheet	No-code platform for app creation. Integrates well with Google Workspace. Easy for business users.	Limited scalability and customization. Affordable for small businesses.
OutSystems	Enterprise low-code platform. Robust integrations with multiple systems. Ideal for large apps.	Requires technical skills for deeper customization. Scalable but more expensive.
Mendix	Low-code platform for building enterprise apps. Integrates with ERP and CRM. Focus on team collaboration.	High flexibility for complex systems. Scalable but needs technical expertise for deep customization.
Power Platform	Low-code for building apps and automating workflows. Integrates seamlessly with Microsoft tools.	Scalable with multiple pricing tiers. High customization, good for all organization sizes.

By comparing these platforms, it is possible to assess which platform best meets their unique needs, particularly when it comes to business app development, process optimization, and automation.

In conclusion, all the platforms come with features and functionalities suitable for business needs, but the Power Platform stands out when it comes to integration with the Microsoft tools, ease of use, and robust data analytics capabilities via Power BI. Its flexibility in enabling rapid prototyping, business process automation, and incremental delivery positions it as an excellent choice for organizations like Diriyah that aim to modernize processes with a scalable, customizable, and cost-effective solution. However, other platforms may command stronger functionality or integration in specific areas depending on the focus of the organization and thus may be worth exploring further.

2.3. Overview of Power Platforms

Microsoft Power Platform is a comprehensive suite of tools designed to empower organizations by optimizing processes, boosting productivity, and enabling data-driven decision-making. This disruptive platform includes three essential components: Power Apps, Power Automate, and Power BI, each providing distinct functionalities to improve business processes.

Power Apps: It enables business to develop customized applications with minimal or no coding required. It accelerates application development, enabling organizations to automate workflows, substitute manual procedures, and tackle unique operational difficulties with agility. By optimizing application development, it provides customized solutions with rapidity and efficacy.

Power Automate: It simplifies activities by automating tasks across many systems and apps. By minimizing redundant tasks, it improves productivity and guarantees smooth integration across platforms.

Power BI: Is a powerful business analytics solution that converts raw data into meaningful insights. Users may explore, analyse, and disseminate data meaningfully through interactive dashboards and customisable reports. Power BI facilitates real-time analytics and data-driven decision-making, enabling companies to discern patterns, monitor performance, and strategize for future success.

Together, these tools improve operational efficiency by automating operations, simplifying processes, and increasing power of data analytics. Microsoft Power Platform facilitates sustained development and innovation, empowering enterprises to excel in a swiftly changing digital environment.

2.4. Power Platform as a Solution

The advantages of the Power Platform are numerous and significant for modern businesses. Quick development that allows organizations to speed up development time for business applications, leading to quicker prototype and shorter time to launch is one of its main advantages. It also encourages employee's development enablement, allowing non-programmers to create solutions that address specific business requirements without substantial technical background.

Another great benefit is efficient connectivity, as it integrates natively with Microsoft services and has an extensive library of third-party connectors, offering flexibility for data integration and process automation. In addition, its storage on cloud provides versatility and cost optimization, which significantly cuts down the required development resources.

While such benefits exist, the Power Platform does have some limitations. Scalability Potential Complexity: One of the biggest challenges we face is that projects that have been heavily customized and may find it difficult to scale effectively. Licensing: Another one, the development cost could be quite fair but as the company scales within a big enterprise, it could become an expensive affair.

The other is silent reflection — how the data perform based on your Power Apps usage. Unlike more traditional development environments, which can typically manage large data sources or datasets, performance must be carefully managed in front-end web applications to avoid negatively impacting the user experience or application responsiveness.

When compared to alternative platforms like Salesforce, OutSystems, and Mendix, Power Platform is the most balanced offering in terms of accessibility, flexibility, and integration. Although other platforms have unique strengths (e.g., Salesforce in Customer Relationship Management, Mendix in scalability), Power Platform's versatility and easy integration with the Microsoft ecosystem make it an attractive option for businesses looking to automate processes, visualize data, and build custom applications rapidly.

According to Mendoza (2022), the fact that Power Platform democratizes application development is a notable change for enterprises seeking to promote a culture of innovation. Unlike more inflexible solutions, it lets businesses experiment and iterate quickly without the prohibitive cost.

2.5. Challenges and Benefits in Workflow Digitization

Organizations often encounter a variety of challenges while transitioning from manual to automated processes. One of the primary obstacles is resistance to change, driven by fears of increased workloads or disruption to established routines. However, integrating digital tools offers advantages, it facilitates seamless access to relevant information, reduces dependence on manual processes, and enhances departmental productivity. Moreover, it fosters more efficient communication and collaboration among teams and stakeholders, creating a more agile and connected work environment (Collence Takaingenhamo Chisita, 2007).

While implementation costs can often be a barrier to workflow digitization, low-code platforms like Microsoft Power Apps offer an affordable alternative. These platforms significantly reduce development costs by enabling users with minimal technical expertise to create custom applications tailored to their operational needs. (Perri, 2024) states that low-code development decreases application development time by as much as 70%, resulting in reduced costs for enterprises pursuing digital transformation.

According to Shekar Bandi (2017), efficient digitization depends on careful workflow planning to effectively execute access and preservation processes. Digital tools enable real-time aggregation of data from various sources, offering valuable insights for decision-making. Additionally, implementing digital systems creates upskilling opportunities for the existing workforce, generates jobs in the tech sector, and helps promote transparency. Beyond their operational effectiveness, it helps Diriyah to focus on promoting its history, and enhance its value, ensuring its legacy is safeguarded for future generations.

3. USECASE AND METHODOLOGY

3.1 Performance Excellence Application

To ensure efficiency and operational excellence in Diriyah, the project focused on a specific use case: the development of an application that simplified the evaluation of employee performance and business procedures. The Performance Excellence team led this initiative and was responsible with controlling and ensuring the standards of conduct, appearance, and operational performance established in internal rules and contractual agreements on site.

The evaluation of employee work performance in Diriyah was previously a manual process based on the paper and pen method to help gather data. Notes were taken in handwriting and later transcribed into Word documents by two hardworking office workers. The data was then consolidated and manually input into Excel spreadsheets for analysis. However, the time-consuming nature of this manual process led to delays and inefficiencies that hampered operational efficiency.

Various steps in this workflow, all within the context of complexity. Each observation took between 10 and 15 min to complete, and observations were on average conducted once per week (one hundred observations total). Then there is the time-consuming process of transcribing these notes into Word documents (adding another 5 to 10 minutes per observation, followed by manual data entry into Excel, and taking about the same amount of time). 5 to 10 minutes of reviewing and validating the information for each observation and then preparing it for presentation in PowerPoint took 1 to 2 full days.

This bottleneck in operations imposed strict limitations on the team to scale the number of observations or respond quickly in performance. Relying on physical documentation and a multitude of manual steps gives space for errors and delays needing reworks to ensure complete accuracy. This inconsistent approach only highlighted the need for an automated solution to accelerate productivity, improve data accuracy, and enable timely decision-making, in line with Diriyah's vision for operational excellence.

3.2 Scrum Metodology

Agile methodologies, particularly Scrum, have been recognized for their ability to improve project deliverables in environments requiring speed and innovation. According to Schwaber and Sutherland (2020), give a great overview of how Scrum structures work in a sequence of iterative and incremental cycles, one after the other, creating functional pieces of the product. Moreover, studies, for example, those conducted by Rigby, Sutherland, and Takeuchi (2016), indicate organizations who embrace Scrum are not just more valuable delivering organizations, they are also able to change with the times when circumstances fluctuate. Such features are a prerequisite for digital transformation and innovations like process automation, as explored in the case of Diriyah.

Scrum is based on Agile principles, focusing on iterative development, collaboration, and continuous improvement, making it highly effective for optimizing complex workflows like this one. Using Scrum for automating performance evaluation process helps mitigating the issues associated with current manual performance evaluation process utilizing a structure and flexible way of achieving automation. In this approach, the team becomes a Scrum team dedicated to work, creating a backlog of work that is prioritized and then build incrementally through time-boxed sprints.

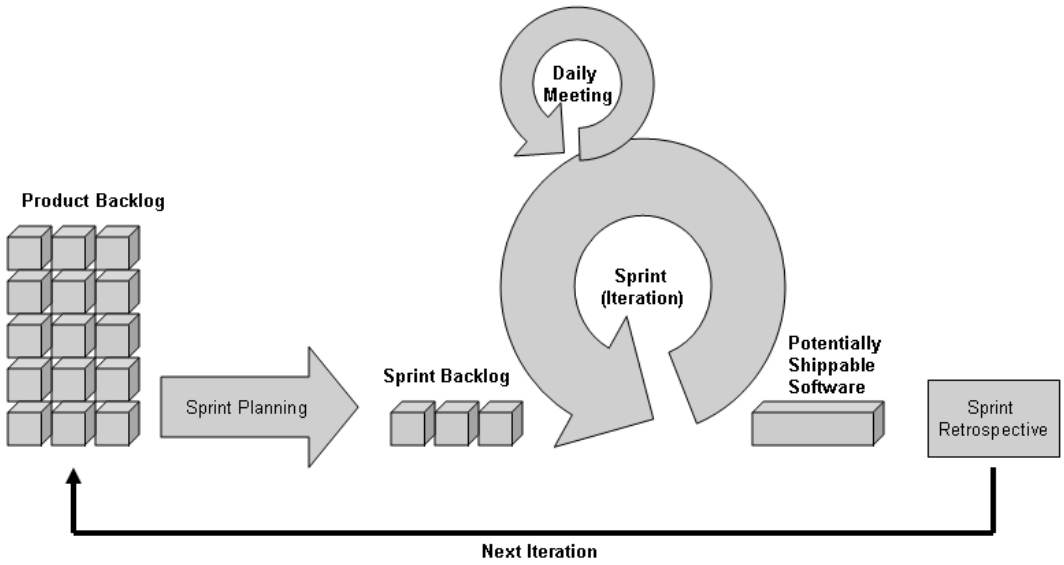

Figure 1 - Scrum Cycle (Source: adapted from Schwaber & Sutherland, 2020)

The image above illustrates the Scrum framework, the process begins with the Product Backlog, where tasks and requirements are listed and prioritized. During Sprint Planning, a subset of these items forms the Sprint Backlog, which guides the team's work for a defined period called a Sprint. Daily stand-up meetings help the team stay aligned, removing blockers and adapting to changes. At the end of the Sprint, a potentially shippable increment of the product is delivered, followed by a Sprint Retrospective to reflect and identify process improvements for the next iteration. This cyclical structure ensures continuous delivery and learning, reinforcing the Agile values of adaptability and collaboration

The performance of Scrum is based on well-defined roles and responsibilities. As Schwaber (2020) detail, Product Owner, Scrum Master, and Development Team are not just roles that help the process run; they are also roles that help organize themselves to meet the needs of the organization. In Diriyah, the Product Owner ensures that priorities align with strategic objectives and grants a focus on reducing delays and increasing data accuracy. Literature outlines that Scrum Master's role is not limited to facilitation but also about the identification of obstacles that could affect team collaboration and must be removed (Hoda, 2017). Well-defined responsibilities and team autonomy are key to Scrum success — providing the flexibility needed to enable quick adjustments and continuous improvement.

Scrum Process

At the beginning of every Scrum project, in the product backlog, you have the roadmap for developing the solution. According to Poppendieck (2003), creating an optimally refined backlog requires more than simple task-amount minimization, rather it requires continuous engagement of the Product Owner in interactions with stakeholders. The backlog, should reflect a blend of technical and operational requirements when it comes to automating and, hence, evaluating performance.

Once the backlog is built, the work is split into sprints, which usually last two weeks. As a result, sprints themselves must be structured to allow for partial deliveries that can be reviewed and improved across the entire process. According to Sutherland (2014), shorter, clearer cycles help to deliver visible results and constant feedback, making

solutions more effective with time. These iterative time boxes concentrate on enabling concrete, usable enhancements.

For the first sprint we can have as an example the output of create a prototype for the app as a tool to gather digital observation forms and test these with a limited number of test-users. A second sprint might automate the process of taking information from the forms and putting them into a single database so that the information does not have to be transcribed manually. Subsequent sprints may produce automated reporting tools, which pulls insights directly from the database. This back-and-forth allows for a clear path to continuous progress while making changes as feedback comes in.

Regular meetings help the team stay on the same page and overcome problems. During these brief sessions, team members provide updates on what they did yesterday, what they plan to do today, and any obstacles they are currently facing. Building trust through this constant way of communication develops transparency and resolves problems efficiently to keep the project moving.

Scrum's success is based on the concept of continuous feedback. The completion of work does not come only with the Sprint Review and Sprint Retrospective giving an opportunity to reflect on what was delivered, but also with the ability to pivot the project toward the organization increasingly (Kersten, 2019). Both, Sprint Review, and a Sprint Retrospective follow the end of each sprint. The Sprint Review allows showing the finished product to the stakeholders and to receive their feedback, which can further improve the results in further sprints. The Sprint Retrospective is an internal team meeting to reflect on what went well, what could have been better, and how to improve under future iterations. Such regular feedback and reflection ensure that the project works and is updated to meet the needs of the organisation.

Adapting short cycles and continuous iteration is essential in developing a culture of continuous improvement (Nonaka, 1986), and its also fundamental for a place like Diriyah, where it is looking into the automation of its processes. As a result, they have shown to be less prone to failure and more effective and informed over time by quickly adapting to an evolving landscape through regular reflection. This iterative process can be seen in the many organizations that have adopted an agile methodology to improve operations.

One of the strengths of Scrum, as discussed by Highsmith in (2002), is its emphasis on incremental value delivery. From this principle, we cannot adopt the approach of launching with the final product, as it often leads to failure and requires significant additional work. On the contrary, Scrum lets beneficial functionality be provided over time and from the very first sprints. Instead of waiting for the entire system to be ready, the team delivers functional parts of the solution after every sprint. For example, digital forms designed in the first sprint can begin to eliminate the time spent on handwriting and transcription. Automated data integration from the second sprint can save time and reduce errors; in the following sprints, real-time dashboards and automated presentations can reduce delays. This process of delivering small, visible features, every two to four weeks provides confidence to stakeholders about the future of the project.

Incremental delivery means quicker results, allowing Diriyah to start receiving value from improvements sooner. Automating manual processes offers the most relevant benefit: increased efficiency, improved data accuracy, and the ability to free up staff to focus on higher-value tasks. Summarizing, an essential part of this system is a feedback loop, allowing it to be continuously improved and tailored against the growing needs of the organization. The goal is that their solution will improve with each iteration, allowing the team to discover and address issues early. It also allows Diriyah to focus on features and enhancements that drive the most value, ensuring that resources are channelled where they can make the biggest impact. This allows the organization to be agile and responsive to evolving business contexts and stay in tune with real-time insights, enabling them to change the development process promptly.

3.3 Framework for Developing the Solution

A structured process was used to develop and implement the PE Assessment System to ensure the solution was designed to address key operational pain points and meet user needs. It all started with a genuine understanding of the existing workflows and bottlenecks, progressing through design, automation, and solution development phases. The following is a detailed overview of this process:

The first step was to understand the problem well. This included outlining the current workflow to determine the bottlenecks — problems like time-consuming transcription of assessments and consolidation of data. Key contributors and beneficiaries of the new

system were identified as stakeholders. These range from field teams who needed to gather data, to managers who wanted timely insight, to IT staff responsible for keeping the app running. It included engaging all stakeholders in regular meetings to obtain their ideas and inputs, which were then incorporated into the system design.

When the problem became understood, clear goals were agreed. Reduce manual effort, enhance data accuracy, and standardize for real-time reporting were the original objectives. User-based objectives also were a priority, as the solution needed an easy-to-use interface that would not require extensive training for field teams to adopt the tool. The success of Power Platforms implementation was evaluated based on those targets.

Next step was to analyse the existing workflow to find out where the work should be automated. Focusing in on each stage of the manual process — from data collection through reporting — inefficiencies were identified. Paper forms were replaced with digital forms which were pulled into a central database, replacing manual data entry into Excel. Creation of optimized workflows with Power Automate to minimize effort in data collection, transport, and processing across all operational phases.

Once the workflows were defined the solution architecture was designed to suit the organizational requirements. Power Apps was chosen to develop easy-to-use digital forms for field data capture, while Power Automate managed data integration and processing. Real-time dashboards and reports were developed using Power BI, giving managers immediate access to actionable insights. It focused on modularity and scalability in its architecture so future improvements could be made as operational needs changed.

The system was built using Scrum methodology. A small group of users were able to view a prototype that was built. This iterative cycle ensured that the solution was continually refined in alignment with real-world requirements and user input. Some training sessions were held for all stakeholders to ensure seamless adoption. Field teams were trained on the use of the ap, while the managers were introduced to the reporting dashboards. During training it was encouraged to provide feedback around potential issues or concerns.

Once the solution was evaluated and validated it was implemented in stages, first within a small team and then companywide. Once deployed, a feedback loop was created

to assess performance and take suggestions for further improvements. A continuous improvement approach which enabled the system to adapt when requirements change overtime.

3.4 Workflow design and Automation - Tools and Technologies

The application was designed to facilitate the creation of assessment reports, enabling supervisors and team leaders to evaluate staff working in various locations within Diriyah. A structured processes was designed to ensure clarity, accountability, and operational efficiency between the operational team and approval managers.

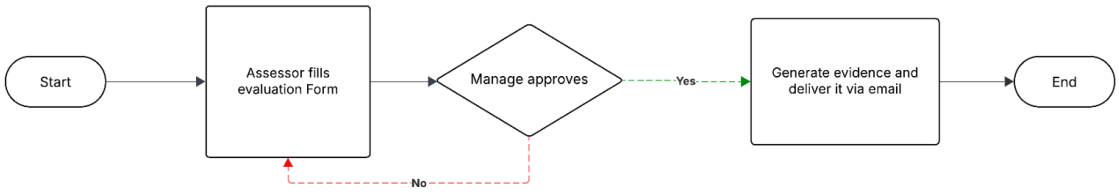

Figure 2 - Resumed Workflow

This workflow outlines the process of a PE assessment, including assessment, approval and review. It starts with Assessor, who logging into system with their credentials. The Assessor picks the form from the library, meaning they are using the right template for their specific assessment. Once a form is selected, the Assessor fills it out with the relevant details and submits it for review. The Head of PE can then accept the form, with optional comments for any further details if needed, or, if required, add mandatory comments for top relevant points to highlight key findings. This ensures that results are recorded accurately (with tracking of status and rating) and transparently once the PE form is approved by the review process and its status is updated in the system.

The Head of PE can serve as an assessor and skip further approval if they assess their own quality data. Navigating the Topics Templates will have a standardized single selection “radio button” format. Two operational groups can be used to designate assessors; however, all assessors will be Diriyah employees.

Forms are scored on a scale of 100% (with “N/A” responses excluded and scores reassigned for other remaining records). A score of over 60% is considered a pass; lower marks are a failure. Forms will have a “Details” table that pulls from Active Directory,

and assessors will complete other fields via drop-down lists. Requiring all fields of a form to be filled out ensures that data is accurate, and assessments are complete.

The business requirements for the PE Template and Assessment System emphasize efficiency, transparency, and accountability in creating, using, and reviewing PE templates. The system must retain all previous versions of PE checklists, storing each usage as a separate record for historical reference. Assessors can only edit forms saved as drafts, ensuring data integrity after submission. Admins hold exclusive authority to create or edit templates, with changes automatically approved.

By digitizing the assessment process, the solution not only enhances the accuracy and consistency of evaluations but also provides valuable insights into operational performance. These insights allow decision-makers to identify areas for improvement and implement targeted training or corrective measures, ensuring that visitors experience the highest quality of service.

4. IMPLEMENTATION

4.1 Data Infrastructure and Integration

As an illustration to visualize the relation and functions of the PEAS tables, the image bellow provides a great overview of how those interconnects, shows their responsibility in the system, and organizes the system to manage the data properly. This allows to get a solid understanding of the information flow and dependencies between each of the tables.

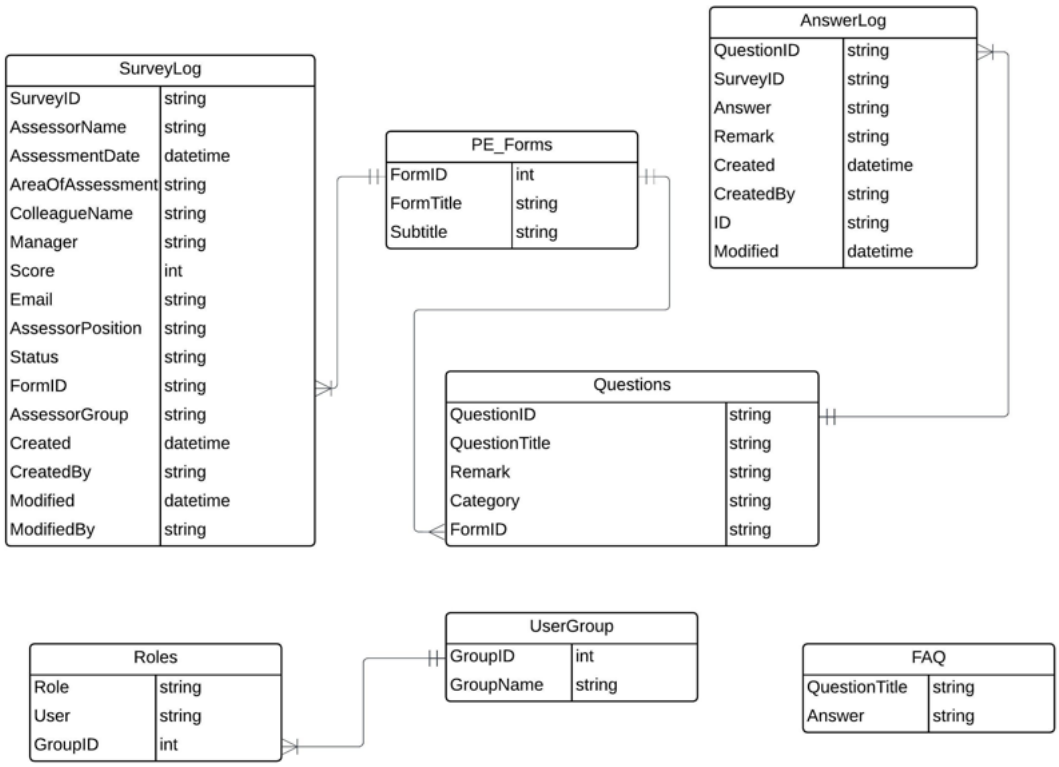

Figure 3 - Database Model

Below is a detailed description of all the tables in the Performance Excellence Assessment System.

PE - Survey Log: This table tracks all survey sessions conducted by assessors, logging important information such as scores, dates, and participants. It forms the core of the system's assessment tracking.

Purpose: To manage the details of each PE assessment session.

Fields:

- SurveyID: A unique identifier for each survey.

- AssessorName: The name of the assessor conducting the survey.
- AssessmentDate: The date when the survey was completed.
- AreaOfAssessment: The location or context of the assessment.
- ColleagueName: The name of any colleague being assessed.
- Manager: The manager responsible for reviewing or overseeing the assessment.
- Score: The overall score achieved during the assessment.
- Email: Contact information for communication purposes.
- AssessorPosition: The role or designation of the assessor.
- ColleagueName: Names of colleagues involved in the assessment.
- Score: Total score achieved in the survey.
- Status: The current status of the survey (e.g., completed, pending).
- FormID: Links the survey to the form used.
- AssessorGroup: Indicates the group or team to which the assessor belongs.
- Manager: The manager reviewing the survey.
- Created: Timestamp for when the survey log was created.
- Created By: User who created the record.
- Modified: Timestamp for the last update.
- Modified By: User responsible for the modification.

PE – Questions: This table stores the metadata of questions used in the PE assessment process. It acts as the foundation for building PE forms and ensures that each question is properly categorized and linked to a specific form.

Purpose: To manage and categorize the questions included in PE assessments.

Fields:

- QuestionID: A secondary identifier, possibly used for internal references.
- QuestionTitle: The actual text of the question used in assessments.
- Remark: If the questions enable notes as answers.

- Category: The classification of the question, to group the assessment type.

- FormID: Connects the question to the form it is part of.

- Area/LocationOfAssessment: Specifies where or under what context the question applies.

PE - Answer Log: This table logs the responses provided by assessors during the PE process. It ensures that every answer is traceable back to its corresponding question and survey.

Purpose: To store individual answers for analysis, reporting, and tracking.

Fields:

- QuestionID: Links the answer to the related question.

- SurveyID: Connects the answer to a specific survey or assessment.

- Answer: The recorded response for the question.

- Remark: Additional comments or context provided by the assessor.

- Created: Timestamp indicating when the answer was recorded.

- Created By: The user who provided the answer.

- ID: Unique identifier for each answer record.

- Modified: Timestamp for any updates made to the answer.

- SurveyID: Links to the survey session.

PE - Form: This table organizes the assessment types.

Purpose: To define and manage types of assessments.

Fields:

- FormID: Unique identifier for each form type.

- FormTitle: The name of the form.

- Subtitle: Subtitle of the form

PE - User Group: This table organizes users into groups, allowing for more streamlined management of assessors, their roles, and permissions.

Purpose: To define and manage user groups for access control.

Fields:

- ID: Unique identifier for each group.

- GroupName: The name of the group.

PE – Roles: This table manages the roles assigned to users, ensuring that permissions and responsibilities are appropriately distributed.

Purpose: To define roles and link users to their respective groups and responsibilities.

Fields:

- Role: The specific role assigned to a user (e.g., Admin, Assessor, Head of PE).

- User: Name or identifier of the user.

- UserGroup: The group to which the user belongs.

PE – FAQ: This table provides support and guidance for system users through frequently asked questions and their answers.

Purpose: To serve as a resource for troubleshooting and guidance within the system.

Fields:

- QuestionTitle: The question being addressed.

- Answer: The explanation or solution provided.

These tables collectively form the backend of the PE Assessment System, ensuring that every aspect of the quality assurance process is traceable, organized, and efficient. Those databases were created as a SharePoint list, hosted in the SharePoint environment, which ensures secure and controlled access under different profiles. The database is structured under different lists that are highly interconnected.

The application is used to access and manipulate data based on the Power Apps integration within SharePoint, which uses direct connectors that perform operations such as reading the records, inserting new records, and updating the records, performed within the robust security model. The security of the application is safeguarded by Microsoft Role-Based Access Control, which gives various permissions to the user's role.

The application only allows authenticated users with permission on Microsoft 365 account from the Company Tenant to access Power Apps with the information stored and retrieved. Based on the group assigned, the permissions are restricted, which allows users of certain groups to read, insert, update, and delete the records.

The administrator group has all permissions; assessors only insert and update assessments in specific survey and response lists and have no access to delete vital records. The group that has an end-user profile, which has read-only permission and is only allowed to read records relevant to their profile. SharePoint integration provides an additional layer of security through the application of permissions on lists. More efficient practices are applied to reduce the application load on SharePoint to improve the performance of the application, like delegable queries, with these filtering and searching operations are run on SharePoint instead of processing it locally on Power Apps. This minimizes latency and helps the application feel more responsive when rendering long lists.

One long-term potential alternative is the adoption of Microsoft Dataverse, which allows building a stronger data structure, complex relationships support, and more advanced security provided by superior access control policies. The solution provides a secure integration with SharePoint List, and enforced access control and data tracking, represent an effective solution for information management. Both the permission-based security architecture and the implemented audit logging and process automation ensure adherence to data governance best practices. However, further analysis of improvements, such as Dataverse migration and analytical intelligence integration, can increase the solution’s reliability and performance.

4.2 Developing PE Assessment System

As described in section 3.1, the primary goal of the PE Assessment System is to automate the monitoring and analysis of service quality, allowing administrators and assessors to record and manage evaluations in a structured manner.

The system would be utilized by administrators, PE managers, and assessors, each with specific permissions. The administrator has complete control over creating and editing evaluation form templates, assigning them to specific assessor groups, managing users, defining user groups, and accessing all system reports.

The PE manager would have access to the forms submitted by the assessors, be an assessor when necessary, and view reports on their team's evaluations. Assessors, on the other hand, could complete and submit evaluation forms, viewing only their previous evaluations and reports.

Reporting was an integral component of the platform, which enabled users to see relevant assessment data according to their rights. Administrators got to see every evaluation across the entire system, PE managers got to see assessments only pertaining to their team, and assessors were limited to their assessments alone. The users were allowed to search by form name, assessor name, group, date range, and status, thanks to the advanced filtering options included in the app.

App Interface

Upon accessing the app, users encounter a clean and intuitive interface designed to facilitate navigation through its functions. The main page features four functional modules: the Appearance and Behaviour & Service Promises Form, Procedures Form, Assessment Reports, and User Management.

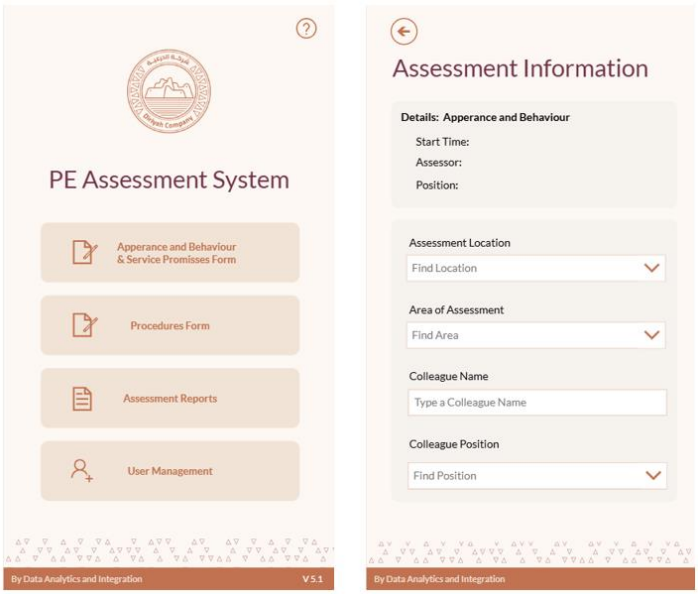

Figure 4 - PE Assessment Snapshot

This layout ensures that assessors can easily transition between various assessment types and administrative tasks, thus supporting a seamless user experience.

The simplicity of the design reflects the system's goal of reducing operational complexity while promoting efficient evaluations. User management module is only available to managers and Administrators.

The Assessment report module enables assessors to check essential details about all previous evaluations. Key fields include the assessment location, operational area, colleague name, and job position, assessment score and more details. This page also summarizes crucial information such as the start time and the role of the assessor, reinforcing transparency and accountability throughout the assessment process.

Within the Appearance and Behaviour form, assessors are guided through a structured observation of employee presentation and conduct. The focus is on maintaining compliance with uniform policies and ensuring that personal appearance aligns with professional standards. Additionally, the Service Promises section emphasizes qualitative elements of service delivery, such as storytelling about Diriyah's cultural heritage, attention to cleanliness, and the creation of a welcoming atmosphere. This emphasis aligns with Diriyah's strategic goal of positioning itself as a leader in heritage-based hospitality services.

The Procedures Form includes a variety of evaluation options tailored to operational activities. These options cover key service areas to ensure that operational guidelines are followed efficiently. For example, assessments can be conducted for processes such as coffee serving, VIP visits at Bujairi Terrace, and guest intercepts.

Other critical service areas include security services management, valet services, wheelchair and baby stroller rentals, and carousel operator management. Each category represents an essential component of daily operations. The Procedures module has a dynamic approach, where the questions vary depending on the procedure selected for evaluation. This functionality allows each section to be customized according to the specific nature of the service under assessment, ensuring a more accurate and context-aware evaluation.

For instance, when selecting "Coffee Serving," the form may include questions related to beverage presentation, hygiene standards, and customer interaction. On the other hand, choosing "Security Services Management" may prompt questions focused on surveillance procedures, adherence to security protocols, and visitor perceptions of safety.

This adaptive logic not only enhances the relevance of the questions presented to the assessor but also promotes the collection of richer and more segmented data. As a result, PE team can identify improvement opportunities specific to each type of service while reinforcing best practices in critical areas.

Each assessment criteria are evaluated using a three-tiered scale: compliant, non-compliant, and not applicable. The addition of a remarks section allows assessors to offer qualitative insights, contributing to actionable feedback and continuous performance improvement.

The Assessment Reports module consolidates completed assessments and aids in decision-making processes. Assessors can reject assessments that fail to meet the required standards, request further clarification, or accept those that comply with expectations. The design of this module promotes immediate feedback and clear follow-up actions, fostering a dynamic environment for performance excellence.

Workflow Overview

The PEAS workflow ensures accuracy, consistency, and efficiency from data collection to managerial approval and report generation. This structured process reduces discrepancies, standardizes assessments, and provides valuable insights for continuous improvement and operational excellence.

The diagram below visually represents the evaluation process, highlighting key steps from form submission to final report generation. It illustrates the structured flow of activities, including automated validations, managerial approvals, and data integration, ensuring a seamless and efficient assessment cycle.

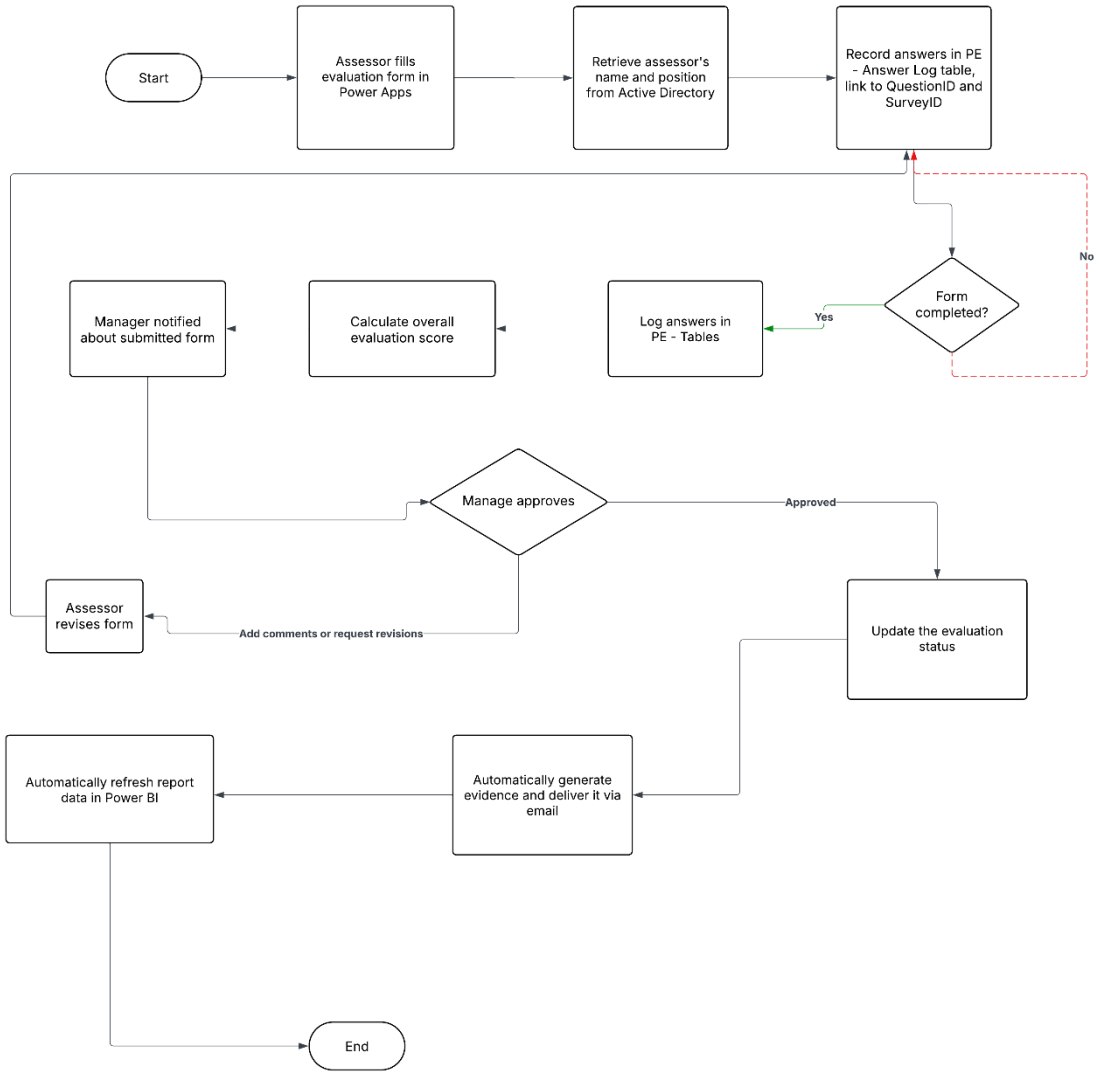

Figure 5 - PEAS workflow

Assessors complete evaluation forms via Power Apps, capturing details such as their name, position, location, time, and relevant information about the evaluated worker. Responses are automatically logged in a structured database, linking each entry to unique question and survey IDs. To maintain data integrity and prevent incomplete submissions, assessments only move forward when all required fields are completed.

Once submitted, the system notifies the responsible manager, who reviews the responses. An overall evaluation score is automatically calculated based on predefined criteria. Managers can either approve the assessment or request revisions, adding comments and feedback for necessary modifications before resubmission. When approved, the system updates the evaluation status and triggers automated workflows that

generate supporting evidence. This documentation is then sent via email to relevant stakeholders, ensuring transparency and traceability.

Seamless data integration with Power BI allows real-time report updates, giving managers access to performance analytics, trend monitoring, and areas for improvement. Automated report generation reduces manual intervention, enabling teams to focus on strategic decisions instead of administrative tasks.

Strict business rules maintain data accuracy. Assessors cannot edit forms after submission, ensuring reliable records. Only administrators and managers review and approve evaluations, preventing unauthorized changes and ensuring quality control. Performance Excellence managers can operate as independent assessors without additional validations, streamlining audit processes and expediting quality assessments.

4.3 Automating Processes with Power Automate

Power Automate is critical in integrating the PEAS workflow, which helps to eliminate manual intervention, ensure correctness, and expedite the processing of data. With automation of crucial processes like form submission validation, notifications to managers, tracking approvals, and generating reports, it streamlines operations and minimizes human error. Automated workflows integrate each stage of the evaluation process, seamlessly moving evaluations through one process step to the next while preserving data integrity and traceability.

Among the top automation enablement is the assessment form validation in real-time. When an assessor submits a form, Power Automate validates that the required fields are completed before continuing the submission. When a form is incomplete, assessors get an automated notification they need to correct it. If validated, responses are recorded in the central database, and managers receive automatic notifications to facilitate review. This removes lag time from manual checks, confirming that only complete assessments can flow through the workflow.

The resource manager approval and revision cycle. Managers get notified by email and Microsoft Teams automatically whenever an evaluation is received. They either directly approve the assessment or ask for revisions, which are then returned to the assessor with pre-defined comments. All of this operates in a feedback loop that is completely automated, which shortens the response time and guarantees that all

assessments meet quality standards prior to finalization. If an assessment is turned down, Power Automate initiates a revision request; approved evaluations proceed through the workflow, updating the assessment status in real-time.

Power Automate also integrates with Power BI, so that any approved assessments feed into live dashboards & reports. After every evaluation that is done, the new data will be automatically reflected, and the manager can view the updated performance insight. With this automation, data-driven decision-making is empowered by instant visibility into where compliance is on the upward trend, where service quality metrics are in healthy balance, and where operational gaps need action.

Power Automate also help with the creation of evaluation evidence and report distribution apart from the assessment. When an assessment is completed, the system collates the findings into structured PDF certificates that are dispatched automatically to key stakeholders via email. Automating these processes boosts efficiency while also increasing transparency by sharing real-time performance data with all stakeholders.

Utilizing the capabilities of Power Automate, the PEAS workflow refines each level of the assessment process, minimizing administrative load, and accelerating more accurate evaluations. This, in turn, guarantees that assessments are passed accurately, feedback is processed instantly, and insights are available for ongoing improvement. Accordingly, Diriyah’s initiatives in performance excellence remain agile, data-based and in line with the ultimate standards of operational efficiency.

5. RESULTS AND DISCUSSION

5.1 Key Achievements and Metrics

The solution implemented has revolutionized operations, setting a benchmark for efficiency, productivity, and data-driven strategies. This transformation reflects key principles outlined by Lean Software Development - Poppendieck (2003) - and Agile frameworks - Schwaber (2020)- which emphasize iterative improvements and customer-centric process optimization.

Although the original workflow functioned correctly, its predominantly manual nature made it both time-consuming and labour-intensive, creating significant bottlenecks in operational scalability. Scalability, a central challenge in digital workflows, is widely discussed in literature, including Shekar Bandi (2017), who emphasize the need for carefully planned digitization processes to handle growing operational demands. For PEAS, each observation required a minimum of 10 minutes, with tasks often extending to 15 minutes per session. Teams typically averaged 100 observations per week. Beyond the observation process itself, data entry added an additional 5 to 10 minutes per observation, followed by another 5 to 10 minutes for data review. This cumulative effort led to inefficiencies that restricted operational output and created a highly labour-intensive workflow.

The burden did not stop at observation and entry; converting bits of fragmented data into actionable insights demanded substantial time investments, often consuming up to 2 days in the data transfer and reporting phases. This issue echoes similar cases examined by Chisita (2007), where organizations struggled to efficiently transition from data collection to insight generation. The manual nature of the workflow left room for errors and inconsistencies, reducing both data quality and decision-making confidence. While the workflow initially served its purpose, the volume of pipeline work required soon became unmanageable, limiting speed, scalability, and overall operational resilience.

To tackle these challenges, the introduction of a custom application transformed operational processes. The app automated and streamlined every step of the workflow, embodying the principles articulated by Mendoza (2022) on the impact of low-code solutions in business environments. With its user-friendly interface and robust automation

features, the app enabled teams to conduct over 200 observations per week at peak — a milestone that would have been unattainable under the previous manual system.

Efficiency gains were immediate and measurable. The time required for each observation dropped dramatically, taking only 3 to 5 minutes per session, thanks to the app's intuitive design and automated data capture capabilities. What was previously a cumbersome, error-prone process of manual data entry was eliminated. Information was now collected directly at the point of observation, approved, and processed in a matter of seconds. This enhancement is consistent with Palmer (2020), who identified digital transformation strategies as critical for reducing human intervention and increasing operational accuracy.

A key enabler of these improvements was Power Automate, Microsoft's automation service that seamlessly connected different applications and workflows. By leveraging Power Automate, routine and repetitive tasks such as data transfers, approvals, and notifications were fully automated. This not only further reduced human intervention but also ensured faster processing times and consistent task execution. According to Weston (2023), automation through Power Automate allows organizations to scale operations without increasing headcount, a crucial factor in maintaining operational efficiency.

One of the most significant improvements involved the near-total elimination of human error in data entry. By automating data collection and validation, the solution increased both the accuracy and reliability of operational data. These improvements not only streamlined daily operations but also ensured more consistent and trustworthy data for decision-making processes.

The final and arguably most impactful enhancement was the app’s seamless integration with Power Automate and Power BI, a business intelligence platform recognized by Weston (2023) for its transformative potential in real-time data visualization. This integration allowed for an entirely automated pipeline of reporting and visualization, transforming what once required manual labour over several days into instantaneous insights with the click of a button.

The advantages extended beyond time savings. Decision-makers, who previously relied on outdated reports, were now equipped with precise, up-to-date data, empowering them to respond confidently and swiftly to emerging trends and initiatives. As highlighted

by Forrester Research (2024), platforms like Power BI and Power Automate enable organizations to transition from reactive to proactive decision-making by democratizing access to data insights.

The project's success underscores the value of adopting agile methodologies for digital transformation. Agile frameworks, such as Scrum Sutherland (2014), played a critical role in ensuring that the solution was delivered incrementally, continuously refined, and aligned with user needs. By embracing these agile principles, the development team was able to maintain flexibility and adapt to emerging requirements, ultimately delivering a solution that not only resolved operational bottlenecks but also set a new standard for efficiency and productivity.

This case exemplifies the strategic importance of digital transformation in modern operations. By leveraging tools such as Power Apps, Power Automate, and Power BI alongside agile methodologies, organizations can achieve remarkable improvements in scalability, speed, and data-driven decision-making. The literature demonstrates that thoughtful digitization and agile practices are essential in overcoming operational challenges, enabling businesses to thrive in an increasingly competitive environment.

6. CONCLUSION AND RECOMMENDATIONS

6.1 Summary of Findings

The impact of this new solution cannot be overstated. This not only has allowed the organization to double its observational capacity, but it has also reduced the time and effort at each step of the workflow by large margins. What was a broken and painful series of steps is now an operating model, speedy and high-quality. Now the new app has not only automated data collection, streamlined reviews of the incoming data and integrated with advanced analytics tools, it has turned something that was once a bottleneck into a competitive advantage.

Now, teams can focus on higher-value tasks, make better decisions, and achieve improved outcomes, all powered by accurate and timely insights. This solution has laid the foundation for more innovation, scalability, and long-term success.

Beyond efficiency gains, the system enhances compliance and accountability by ensuring all assessments follow standardized criteria, reducing inconsistencies and improving regulatory adherence. The automatic logging of evaluations reinforces transparency at all operational levels. Real-time visibility is another major improvement, as managers receive instant notifications and dashboard analytics that enable proactive decision-making rather than reactive problem-solving. Seamless communication and collaboration have also been strengthened, with automated report generation and email distribution eliminating manual bottlenecks and ensuring that stakeholders receive timely and structured insights.

6.2 Limitations and Obstacles

In order to successfully implement and scale the PE Assessment System, we faced some limitations. Performance Management of Data was one common challenge. Power Platform synchronization of data (real-time) made performance operation of large datasets with multiple users at the same time was a challenge. It did not work with as much efficiency as traditional solutions in first time. After some round of testing and changes on coding part, we could fix it and ensure that the amount of data was managed well enough not to affect the performance of the application and the experience of the users. This behaviour made sense to data flows in the PE Assessment System and was used as techniques for optimization.

The other limitation was the unwillingness to change. When transitioning from manual to automated processes, staff feared that automation would lead to longer workloads or changes to existing workflows. This challenge was tackled through proper planning, clear communication, continuous development of personnel, and the involvement of the very people that digitalization was meant to benefit. When working through the PE Assessment System, we focused on addressing questions early, and provided support throughout to help ease the transition.

Another important part was the workflow planning. To enable a smooth digitalization process, the already existing workflows had to be mapped meticulously to identify long lasting activities. Absent this, after the automation resulted in poorly defined processes. To ensure that the PE Assessment System operated smoothly and eliminated potential bottlenecks, it was necessary to redesign and optimize workflows prior to automation.

Other challenge was dependence on connectivity. In areas with intermittent or poor connectivity to the internet, it was challenging to keep the app connected. To address this, a study was conducted to assess areas with coverage, and the assessment areas were defined based on the available connectivity.

Since Power Platform was designed for ease of use, however, the training was still sufficient so that all users, not just the field staff and managers, were able to use the platform correctly. The tech company recognized that to maximize the tool's potential and to avoid frustration on the part of users involved in performance evaluations, training tailored to user needs was essential. Diriyah now holds monthly training for all users and regularly collects feedback to keep improving the pipeline of development for this app.

Finally, maintenance was needed to ensure that the solution continued to meet the changing needs of the organization. Regular updates to the underlying platform were challenging to plan at the start, but after a few sprints and a better understanding of the data workflow, we were able to organize the scope of work. These proactive measures were crucial in keeping the solution effective and aligned.

6.3 Recommendations for Future Enhancements

The current solution is an immense success, and it is a phenomenal opportunity to replicate its capabilities over other domains of the organization. By extending the app to other departments, business units, or geographic locations with similar workflows, the

organization can replicate this success and build a consolidated system to bring synergies and drive consistency and operational excellence at a larger scale. This expansion would make things easier, open cooperation for all processes. To best implement this approach, it would be wise to conduct a careful feasibility assessment to determine and prioritize areas of highest return on investment.

Moreover, the implementation of machine learning and artificial intelligence opens an attractive way forward. And harnessing such technologies may lead to richer insights from existing data collection. For instance, predictive analytics could be used to predict trends, spot new patterns, and anticipate future needs, empowering teams to stay on the front foot. The second aspect enabled by machine learning models is to further improve the operational efficiency by providing recommendations, flagging any anomalies, and suggesting process changes in real time. Improvements to visualization tools in Power BI could help convert dashboards into more dynamic and interactive formats, allowing stakeholders to make faster decisions based on data.

Offline capability is another important area to be improved. So that the app in environments with weak/absence connectivity will still work, and the app will still be working regardless of how many users there are. Data captured while offline could sync with the system as soon as the connection was restored, thus minimising disruptions and broadening the usability coverage of the app to a wide set of use cases.

Finally, make sure to establish the app's long-term scalability and maintenance trajectory. The creating of a lifetime roadmap of further developments will ensure the solution is continually relevant and meets the needs of the organization moving forwards. This roadmap might involve identifying key areas for development, such as increasing the use of cloud platforms or Internet of Things integration and guiding companies through the process of adopting these technologies. This would necessarily include recommending regular software updates, upgrading infrastructure, and partnering with technology providers to ensure that businesses are kept up to date on key technology trends. With scalability and maintenance addressed head-on, the organization can safeguard the value of operational innovation by protecting the app for future proofing.

This approach builds the foundation for future growth as well as ongoing improvement, allowing the app to grow with the organization and providing the functionality necessary for success.

6.4 Reflections on Technology's Role in Diriyah's Development

The project not only solved operational challenges in the short-term but also set the stage for a larger cultural and technological shift in how the company thinks of innovation. By transforming workflows into digital formats, automating data input, and smoothly embedding powerful analytics, the project meshes directly with Diriyah's overall long-term position of being a destination for culture, history, and sustainable development at a global scale. It reflects the spirit of Vision 2030, a place where heritage and high-rise coexist to protect the city's historic significance while facing the future.

As a testament to the initial success of this initiative, the company is more dedicated than ever to the tech revolution and are exploring ways to establish a full team of and Power Platform champions across the organization. The new team vision: To leverage Power Platform as not merely a tool, but a catalyst for growth, collaboration, and creative problem-solving. By having a dedicated team of developers, Diriyah will be ready to take its operational capabilities to the next level and pursue innovative initiatives that will benefit both the visitor experience and its back office.

All the new projects build on the momentum established here, forming a culture of continuous improvement and modernization. The possibilities are endless, from integrating smart city solutions to improving digital experiences for visitors. This journey summarizes a powerful story: Diriyah is not only the hometown of Saudi Arabia, but also a clear message of how the old world and the new world can coexist and thrive. By using technology as a fusion link to its storied past and ambitious future, Diriyah is laying down a template for how historical cities can evolve into thriving, future-oriented cultural hubs. With this project, Diriyah is truly laying the groundwork to ensure that it is at the forefront of innovation but also stays connected with its heritage and legacy for coming generations.

REFERENCES

Al-Harithy, H. (2020). *The Role of Religion in the Politics of Saudi Arabia.* JSTOR. Mimeo JSTOR.

Chisita, C. T. (2007). Working Knowledge: How Organizations Manage What They Know. *Harvard Business Press*.

Collence Takaingenhamo Chisita, O. O. (2007). *Evaluating the Processes and Procedure of Digitalization Workflow*. IntechOpen.

Consulting, F. (2024). *The Total Economic Impact™ Of Microsoft Power Platform.* Cambridge, MA: Forrester Research.

Highsmith, J. (2002). Agile Software Development: The Cooperative Game. *Addison-Wesley*.

Hoda, R. N. (2017). The Scrum Development Process and Agile Practices. *Springer*.

Kersten, M. (2019). The Essential Guide to Scrum and Agile Retrospectives. *It Revolution Press*.

Leung, T. (2017). Beginning Power Apps: The non-developers guide to building business mobile applications. Apress.

Mendoza, E. (2022). Microsoft Power Apps Cookbook: Apply low-code recipes to solve everyday business challenges and become a Power Apps pro. *Packt Publishing*.

Nonaka, T. a. (1986). The New New Product Development Game. *Havard Business Review*.

Palmer, T. (2020). *Microsoft PowerApps as an Alternative Solution for Business Application Development.* Theseus.fi.

Perri, L. (2024, 10 2). *Gartner*. Retrieved from https://www.gartner.com/en/articles/generative-ai-can-democratize-access-to-knowledge-and-skills.

Poppendieck, M. &. (2003). Lean Software Development: An Agile Toolkit. *Addison-Wesley*.

Rigby, D. K. (2016). Embracing Agile. . *Harvard Business Review*.

Schwaber, K. S. (2020). The Scrum Guide: The Definitive Guide to Scrum: The Rules of the Game. *Scrum.org*.

Shekar Bandi, M. A. (2017). *Best Practices in Digitization: Planning and Workflow Strategies.* Journal of Information Management and Educational Technology.

Sutherland, J. (2014). Scrum: The Art of Doing Twice the Work in Half the Time. *Crown Business*.

Weston, M. &. (2023). Learn Microsoft Power Apps: The definitive handbook for building solutions with Power Apps to solve your business needs. *Packt Publishing*.