**WEEK 1**

**POWER APPS:**

**Road Map For PowerApps Developer**

Skills (Technology) :

>Power BI (2015) – BI Reporting / Visualization / Data Story Teller

>Power Appa (2018) - Mobile Apps, Business Apps

>Power Virtual Agents (2019) – Chatbot’s to Clients

>Power Automate (2020) - Automation to Manual task

>Power Pages Preview (2022) – Websites / Web Applications to clients

>Microsoft Products

**Sign up for Powerapps :**

* Visit the Power Apps Website - Go to the official **Microsoft Power Apps website.**
* On the Power Apps homepage, look for the option to start a free trial. Click on “Start free” or “Try free.”
* You need to sign in with a Microsoft account of the university. If not you can create setting up with a new one.
* Fill Out the Sign-Up Form with required details it ask and ull be all set to use Microsoft Power Apps and start creating our own custom applications.

**Sign up For Microsoft dynamic 365:**

* Go to the officia**l** [**Microsoft Dynamics 365 website**](https://dynamics.microsoft.com/)**.**
* Choose Your Dynamics 365 Solution from various option available
* Sign Up for a Free Trial -On the product page, look for a “Free Trial” or “Try Now” button and click it. you’ll be prompted to sign in with a Microsoft account with ur university credentials.
* Complete the Signup Form by filling out the required information as requested.
* By following these steps, we will be able to download, sign up, and start using Microsoft Dynamics 365.

**Week -2**

**Power Apps Assignments :**

1. **What are the key components of Microsoft Power Platform, and how do they integrate?**

**Microsoft power platforms** are the name implies is a collection of Microsoft programs that may be used to construct and build complex business solutions analyze and visualize data automate a business process or create virtual agents for communication.

**Key components of Microsoft Power Platforms**

* **POWER BI** – It is used to analyze data from different data sources. It helps in data driven decisions by assisting users in creating rich data representations with the use of data stored in cds or other databases you may create interesting reports and

Dashboards. These dashboards can be used to track sales, Customer service or any other aspect of business websites or Sharepoint, Teams and apps can all host these dashboards and reports data insights are made simple because power bi apps availability in teams. Additionally, now that the power bi app is available in teams power bi can be simply integrated into any team collaboration activity including chats meetings pr calendar invites.

Power Bi dashboards would also allow you to compare and rate stores.

* **POWER APPS** – Used to build powerful mobile apps for internal use by the organization. These are easy to use applications for common business needs using CDS PowerApps platform you might want representatives to inspect your company’s franchises for example a power app that surfaces and inspection questions might be designed and made available on the Rep’s phone the salesperson might go to the franchise and fill out the information on their phone after that data is saved in the cds power automate would send out messages to franchises about the chores that need to be completed to fix problems.
* **POWER AUTOMATE** – Used to design automated workflows to reduce manual tasks. With simple logic-based interface power allows users to automate typical activities these workflows can be used to synchronize files integrate update data and receive notifications. It supports 200+ apps including common data service for apps and it s constantly expanding power automate provides a better way to get things done by allowing users to quickly automate repetitive time consuming processes.
* **POWER VIRTUAL AGENTS** – Used to develop flexible chatbots that can communicate with external customers. These chat bots with no coding or little coding experience these chatbots can respond to questions from clinets, others staffs or websites visitors. These bots are readily made without the assistance of programmers power virtual agents is accessible as a standalone online app and desktop app these two versions are functionally equivalent one over the other depending on how you want to power virtual agents.

**The Companies uses Power Apps -**  P&G, LEGO, Johnson & Johnson, HP, Hersey,Burberry, Hitachi, Honeywell, Emerson, Berkshire Hathaway INC.

**Integration Between Components**

* **Power BI and Power Apps**: Power BI reports and dashboards can be embedded in Power Apps. This integration allows users to interact with data visualizations within their custom apps, enhancing the decision-making process directly from the app interface.
* **Power Automate and Power Apps**: Power Automate can be used to trigger workflows from within Power Apps. For example, a button in a Power App can initiate a flow that updates records, sends notifications, or performs other automated tasks.
* **Power Automate and Power Virtual Agents**: Power Virtual Agents can utilize Power Automate flows to execute complex actions that go beyond the built-in capabilities of the chatbots. For instance, a chatbot can call a Power Automate flow to fetch data from a database or initiate a process.
* **Power BI and Power Automate**: Power BI can trigger alerts and notifications via Power Automate based on specific conditions or thresholds in the data. This helps in automating responses to changes in data or events.
* **Common Data Service (Dataverse)**: A foundational component that underpins Power Platform, Dataverse stores and manages data used by Power Apps, Power Automate, and Power Virtual Agents. It provides a unified data platform and integrates seamlessly with the other components, ensuring consistency and ease of use across applications.

1. **Explain the differences between Power Apps and Power Automate. Provide examples of scenarios where each would be useful**

**Power Apps**

Purpose: Power Apps is designed for creating custom applications with a low-code or no-code approach. It allows users to build apps that can run on various devices and platforms (web, mobile, tablet) to address specific business needs.

**Key Features:**

* App Creation: Build custom apps with a user-friendly interface for data entry, viewing, and interactions.
* Data Integration: Connects to multiple data sources like SharePoint, SQL Server, Microsoft Dataverse, and external APIs.
* User Experience: Design user interfaces using drag-and-drop elements, forms, and controls.

Examples

1. **Inventory Management App**: A retail company could use Power Apps to create a custom inventory management app. Employees can use this app to scan barcodes, update stock levels, and view inventory reports. The app would connect to a central database to keep track of stock in real-time.
2. **Employee Self-Service Portal:** An organization might build an app for employees to access company policies, and view their benefits. The app could integrate with HR systems to automatically process requests and update records.
3. **Timesheet :** Creating the timesheet for the employee to post their day to day activities and submit.

**Power Automate**

Purpose: Power Automate (formerly Microsoft Flow) is aimed at automating repetitive tasks and workflows. It helps streamline processes by connecting various services and applications to automate tasks based on triggers and conditions.

Key Features:

* **Workflow Automation**: Automate routine tasks such as approvals, notifications, and data transfers.
* **Integration:** Connects with numerous services, including Microsoft 365, SharePoint, Dynamics 365, and third-party applications.
* **Triggers and Actions**: Define workflows that are triggered by specific events (e.g., a new email or a form submission) and execute predefined actions (e.g., sending notifications or updating records).

Examples

1. **Automated Email Notifications:** A business could set up a Power Automate flow to send an automatic email notification to the team whenever a new lead is added to their CRM system. This keeps everyone updated on new opportunities without manual intervention.`
2. **Document Approval Process:** A company might create a flow to manage document approvals. When a document is uploaded to a SharePoint library, Power Automate can automatically route it through an approval process, sending approval requests to designated users and updating the document’s status based on their feedback.

In many cases, you might use both tools together. For instance, a Power App could be used to capture and submit data (like a customer feedback form), and Power Automate could be used to automatically process that data, such as sending a thank-you email to the customer and storing the feedback in a database.

1. **How does Power BI support business intelligence, and what types of data sources can it connect?**

Power BI supports business intelligence by providing powerful tools for data visualization, analysis, and reporting. It allows users to create interactive dashboards and reports that offer deep insights into business performance. Key features include:

1. **Data Visualization:** Create interactive and customizable visualizations such as charts, graphs, and maps.
2. **Data Analysis:** Perform complex analyses using data modeling and DAX (Data Analysis Expressions) for deeper insights.
3. **Data Integration:** Connect to various data sources in real-time, transform data using Power Query, and build comprehensive data models.
4. **Collaboration and Sharing:** Share reports and dashboards with stakeholders, collaborate using Microsoft Teams, and access data across different devices.

**Data Sources Power BI Can Connect To:**

1. **File-Based Sources:** Excel, CSV, Text files.
2. **Databases:** SQL Server, Oracle, MySQL, PostgreSQL.
3. **Cloud Services:** Azure SQL Database, Azure Data Lake, and other Azure services.
4. **Online Services:** SharePoint Online, Salesforce, Google Analytics.
5. **Web-Based Sources:** APIs, OData feeds.
6. **Other Sources:** Power BI Dataflows, Dynamics 365.
7. **What are Power Virtual Agents, and how can they be used to improve customer engagement and automate support services?**

Power Virtual Agents is a Microsoft service that allows businesses to create and deploy intelligent chatbots or virtual agents without requiring extensive coding. These chatbots can interact with users in natural language, handle various customer queries, and perform tasks based on predefined workflows. Here’s how Power Virtual Agents can be used to improve customer engagement and automate support services:

1. **24/7 Customer Support:**
   * **Always Available:** Virtual agents provide round-the-clock support, allowing customers to get answers and assistance at any time, even outside business hours.
   * **Instant Responses:** They offer immediate responses to customer queries, reducing wait times and improving user satisfaction.
2. **Handling Routine Inquiries:**
   * **Automated Responses:** Virtual agents can handle common questions and requests, such as checking order status, resetting passwords, or providing product information, freeing up human agents to focus on more complex issues.
   * **Efficient Routing:** They can guide customers through a series of questions to understand their needs and direct them to the appropriate resources or human agents if necessary.
3. **Enhanced User Experience:**
   * **Natural Language Processing:** Power Virtual Agents use natural language processing (NLP) to understand and respond to user queries in a conversational manner, creating a more engaging and intuitive experience.
   * **Personalized Interactions:** They can be programmed to provide personalized responses based on user data and interaction history, improving the relevance of their assistance.
4. **Integration with Other Systems:**
   * **CRM Integration:** Virtual agents can integrate with customer relationship management (CRM) systems to retrieve and update customer information, track interactions, and offer more contextual support.
   * **Automated Workflows:** They can be connected to other Microsoft services, like Power Automate, to trigger automated workflows based on user interactions, such as creating support tickets or sending follow-up emails.
5. **Scalability and Customization:**
   * **Easily Scalable:** As businesses grow, virtual agents can handle increasing volumes of customer interactions without requiring proportional increases in staffing.
   * **Customizable Dialogues:** Businesses can design and customize the dialogue flow and responses based on their specific needs and customer requirements.
6. **Data Collection and Insights:**
   * **Analytics:** Power Virtual Agents provide analytics and reporting features to track the performance of the chatbots, such as response accuracy, user satisfaction, and interaction volumes. This data can help in continuously improving the virtual agent’s effectiveness.

**Examples of Use Cases**

1. **E-Commerce:** A retailer can use a virtual agent to assist customers with product searches, order tracking, returns processing, and FAQs, enhancing the shopping experience and reducing the burden on customer service teams.
2. **Healthcare:** A healthcare provider could deploy a virtual agent to schedule appointments, provide information on services, and answer common health-related questions, improving patient access to information and services.
3. **Financial Services:** Banks and financial institutions can use virtual agents to help customers check account balances, process transactions, and provide information on financial products, streamlining support and enhancing customer satisfaction.
4. **IT Support:** An IT department might use a virtual agent to guide users through troubleshooting steps, reset passwords, and log support tickets, reducing response times and improving overall efficiency.

Power Virtual Agents enhances customer engagement and support services by providing automated, intelligent interactions through chatbots. They offer 24/7 support, handle routine inquiries, integrate with existing systems, and deliver personalized user experiences, ultimately improving efficiency and customer satisfaction.

**Q1. "In a Canvas app, how do you manage and optimize performance when dealing with large datasets? What techniques would you use to ensure the app runs smoothly?"**

**Canvas apps** are a type of app created within Microsoft Power Apps, a low-code development platform. They provide a flexible and intuitive interface for building custom applications with minimal coding.

1. **Delegation:** Offload data processing to the server by using delegable queries and functions. This reduces the amount of data handled by the app, speeding up performance and ensuring efficient handling of large datasets.
2. **Minimize Controls:** Reduce the number of controls on a screen to lower rendering times. Use galleries or data tables to efficiently display large data sets, enhancing responsiveness.
3. **Optimize Formulas:** Simplify complex formulas by breaking them into smaller components or using intermediate variables. This improves calculation speed and reduces the load on the app.
4. **Pagination and Lazy Loading:** Implement pagination to load data in chunks rather than all at once. Lazy loading fetches data as needed, improving initial load times and overall app performance.
5. **Cache Data:** Store frequently accessed data locally to reduce repeated data source calls. Caching minimizes network load and speeds up access to commonly used information.
6. **Monitor Performance:** Use tools like Power Apps Performance Analyzer to identify and address bottlenecks. Regular performance testing helps in optimizing the app and ensuring smooth operation over time.
7. **Reduce Unnecessary Data :** Only load and process the data you need by using show columns function.

**Q2."How do Model-driven apps in Power Apps differ from Canvas apps in terms of structure and functionality, and in what scenarios would you choose a Model-driven app over a Canvas app?"**

**Model-driven Apps:**

1. **Data-Centric Design:**
   * **Structure:** Built around a data model and the Common Data Service (Dataverse). They rely heavily on the underlying data structure and business processes.
   * **Functionality:** Automatically generates forms, views, and dashboards based on the data model and relationships. This results in a consistent user experience across different modules.
2. **Built-in Components:**
   * **Structure:** Includes built-in components such as grids, charts, and business process flows. These components are generated based on the data schema and relationships defined in Dataverse.
   * **Functionality:** Offers out-of-the-box functionality for managing data and business processes, such as workflows and automation.
3. **Configuration Over Coding:**
   * **Structure:** Customization is achieved through configuration rather than custom code. You set up data entities, relationships, and business rules using a design interface.
   * **Functionality:** Provides a standardized approach to data management and user interface design with less need for manual coding.

**Canvas Apps:**

1. **Flexible Design:**
   * **Structure:** Designed from scratch with a drag-and-drop interface, allowing complete freedom over layout and user experience.
   * **Functionality:** Users can build highly customized interfaces and interactions using a wide range of controls and visual elements.
2. **Customizable Components:**
   * **Structure:** Users add and configure controls like buttons, galleries, and forms manually. The app’s functionality and appearance are entirely up to the creator.
   * **Functionality:** Supports custom logic and integration with multiple data sources, including those not based on Dataverse.
3. **Low-Code Development:**
   * **Structure:** Relies on a low-code approach with formulas and expressions to handle logic, which allows for greater flexibility and creativity in app design.
   * **Functionality:** Ideal for applications that require custom workflows and unique user interactions.

**When to Choose Model-Driven Apps:**

1. **Complex Data Models:**Choose Model-driven apps when you need to manage complex relationships and large volumes of structured data. They are well-suited for scenarios involving detailed data management and process automation, like CRM or ERP systems.
2. **Standardized Business Processes:**Opt for Model-driven apps when you need to implement standardized business processes and workflows that are integrated with business rules and data governance.
3. **Built-in Features:**Use Model-driven apps when you want to leverage built-in features like business process flows, advanced data visualization, and out-of-the-box form generation, without extensive custom development.

**When to Choose Canvas Apps:**

1. **Highly Customizable Interfaces:**Choose Canvas apps when you require a highly customized and unique user interface, including custom layouts, complex interactions, and tailored user experiences.
2. **Multiple Data Sources:**Opt for Canvas apps when you need to integrate data from various sources beyond Dataverse, or when the app needs to interact with different APIs and services.
3. **Quick Prototyping:**Use Canvas apps for rapid prototyping or scenarios where you need to quickly build and iterate on user interfaces and interactions, with the flexibility to make frequent changes.

**Compare the two app types, and their use cases, and discuss when each one should be chosen based on business needs**

**Model-driven apps** are best for complex, data-centric solutions like CRM systems, where standardized data management and built-in business processes are crucial.

**Canvas apps** excel in creating customized, user-centric interfaces for scenarios like a tailored expense reporting tool, offering flexibility across various data sources.

Choose Model-driven apps for structured data needs and Canvas apps for unique UI designs and diverse integrations.

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