Critical Path Training Course Description

Building Business Solutions with PowerApps and Flow

Building Custom Solutions on the Power Platform

Course Code	BBSPA
Audience	Citizen Developers and Technical Professionals
Format	In-person and Remote
Length	3 Days
Course Description	Building Business Solutions with Power Apps and Flow is an intensive 3-day training class for professional solution builders working with Office 365 and/or Dynamics 365. Students will learn best practices for building canvas apps and flows to update and manage content in SharePoint Online, Azure SQL and the Common Data Service. After providing a foundation for building canvas apps and flows, this course teaches students how to build business solutions with the Common Data Service (CDS) by creating custom entities, model-driven apps and business process flows. The class examines advanced techniques required in real-word PowerApps scenarios such as creating custom connectors and conducting application lifecycle management (ALM) using managed solutions and multiple environments for development, UAT and production. This course also includes in depth coverage of the newest Power Platform features such as building PowerApps Portals and AI Builder.
Student Prerequisites	All students will require a Windows PC for lab exercises running Windows 10 or Windows 8.1. It is recommended that students have prior experience with Microsoft Excel, Office 365 and SharePoint Online.

Course Modules

1. **Getting Started with the Power Platform**
2. **Building Data-driven Canvas Apps**
3. **Building a Canvas App with a Shopping Cart**
4. **Getting Started with Microsoft Flow**
5. **Building Flows to Manage Content and Approvals**
6. **Integrating PowerApps with External Systems**
7. **Building Common Data Service Solutions**
8. **Integrating PowerApps with Power BI**
9. **Designing and Developing PowerApps Portals**
10. **Creating PowerApps Solutions using AI Builder**

Course Module Detailed Outline

Module 01: Getting Started with the Power Platform

This module introduces students to the Microsoft Power platform and explains the role of canvas apps, connectors and flows in building business solutions. The module introduces the Common Data Service for Apps (CDSA) and explains how it provides support for creating custom entities and building model-driven apps. Students will create canvas apps with PowerApps Studio and learn to write advanced expressions for screen and control properties. The module examines connectors and data binding and demonstrates using the Start with Data template. Along the way students will learn to build a canvas app for mobile devices that reads and writes customer data to a table inside an Excel workbook in OneDrive for Business.

Topics Covered

- Getting Started with the Power Platform
- Creating Canvas Apps
- Writing PowerApps Expressions
- Working with Connectors and Data Binding
- Understanding Delegation

Hands-on Lab: Getting Started with PowerApps Studio

- Exercise 1: Create a new Microsoft 365 Trial Tenant
- Exercise 2: Create a Trial Subscription for PowerApps Plan 2
- Exercise 3: Create a Canvas App using the Start From Data Template
- Exercise 4: Test the Expense Tracker Application From a Mobile Device
- Exercise 5: Create a Canvas App using the Start from Blank Template

Module 02: Building Data-driven Canvas Apps

This module teaches students the best practices for building data-driven canvas apps using connections, galleries, item templates, forms and data cards. Students will learn best practices for tracking application state using global variables, context variables and collections. The module introduces students to the principles of delegation and explains how to filter, sort and search through a large Azure SQL database tables and a large SharePoint lists without compromising performance. Students will learn how to build a user experience to add and update data using edit forms and data cards. The module concludes with an examination of the PowerApps integration feature with SharePoint Online which makes it possible to customize the SharePoint list forms to provide business users with an enhanced user experience for editing content in a SharePoint Online.

Topics Covered

- Screen Design Guidelines
- Displaying Repeating Data using Galleries
- Using Table Functions to Filter and Sort Data
- Updating Data using Edit Forms and Data Cards
- Customizing SharePoint List Forms

Hands-on Lab: Building a Data-driven Canvas App

- Exercise 1: Create a SharePoint List to Store Customer Data
- Exercise 2: Create the Customer Ordering Canvas App
- Exercise 3: Implement the Browse Customers Screen
- Exercise 4: Implement the Add Customer Screen
- Exercise 5: Implement the Edit Customer Screen
- Exercise 6: Integrate a Custom Connector to Provide New Customer Data

Module 03: Building a Canvas App with a Shopping Cart

This module examines building a canvas app which allows users to browse a set of products and to add products into a shopping cart tracked using a local collection. Students will learn how to implement the required data access behavior for writing the shopping cart data out to an Azure SQL database or to a SharePoint list. The module examines techniques required to update data across two tables at once for scenarios where adding an Order record also requires adding multiple OrderDetail records with the primary key of the parent Order record. The module concludes with an examination of using PowerApps Studio to create Reusable Components which can be exported and shared across multiple canvas apps.

Topics Covered

- Caching State using Variables and Collections
- Using a Collection to Track Shopping Cart Data
- Using Patch Instead of an Edit Form
- Writing Shopping Cart Data to Back to SharePoint
- Designing Reusable Components

Hands-on Lab: Building a Shopping Cart for Processing Orders

- Exercise 1: Create The Browse Products Screen
- Exercise 2: Implement Shopping Cart Collection for Ordering Products
- Exercise 3: Create SharePoint Lists for Orders and Order Details
- Exercise 4: Create the Submit Order Screen
- Exercise 5: Create the Order Confirmation Screen (If you have time)

Module 04: Getting Started with Microsoft Flow

This module introduces the fundamental concepts of Microsoft Flow and gets students started building and testing flows in the Microsoft Flow designer. Students will learn how to use flow triggers to build flows that can be scheduled, executed in response to external events or run on demand using a button on a mobile device. The module explains how data within a flow is propagated from step to step and discusses how to use control-of-flow actions to author advanced business logic. Students will learn the syntax for writing advanced expressions in Workflow Definition Language (WDL) to retrieve dynamic content, to perform type conversion and to design flows using loops, variables, arrays and custom objects.

Topics Covered

- Understanding Flow Fundamentals
- Creating and Testing Flows
- Using Control-of-Flow Actions
- Writing Flow Expressions
- Automating Document Generation

Hands-on Lab: Getting Started with Microsoft Flow

- Exercise 1: Create and Test a Flow with Flow Button Trigger
- Exercise 2: Create a New Twitter Account for Testing Purposes
- Exercise 3: Create a Flow to Track Twitter Data in an Excel Workbook
- Exercise 4: Create a Flow to Generate a Word Document from a SharePoint List Item

Module 05: Building Flows to Manage Content and Approvals

This modules focuses on using Microsoft Flow to update, manage and transform content in SharePoint Online and OneDrive for Business. The module demonstrates how to build a scheduled flow to enumerate the items in a SharePoint list to clean up and validate the data entered by business users. Students will learn build flows that upload documents and images to SharePoint Online and OneDrive for Business and to convert document content between common file formats such as JSON, XML, HTML and CSV. The module demonstrates building flows to automate the generation of Word documents and PDF files using the using the Word Online connector. This module examines the support in Microsoft Flow for automating an approval process using the Start an Approval action. Students will learn how to build flows to automate an approval process including document approval in SharePoint Online.

Topics Covered

- Converting and Reshaping Data
- Uploading Photos to SharePoint
- Automating Approval Processes
- Integrating Flow with Microsoft Forms
- Handling Runtime Errors
- Understanding Parallel Execution

Hands-on Lab: Managing Content and Approvals in SharePoint Online

- Exercise 1: Create Two SharePoint Document Libraries for Uploading Photos
- Exercise 2: Create a New Canvas App to Upload Photos to SharePoint
- Exercise 3: Create A Flow to Automate a Photo Approval Process
- Exercise 4: Test the Photo Approval Flow

Module 06: Integrating PowerApps with External Systems

This module examines how to integrate data from external systems and on-premises data sources. Student will learn to build flows with the HTTP action to call external web services and to parse JSON from an HTTP response. The module also explains how to build flows with HTTP triggers which can be used to process forms and surveys created using Microsoft Forms. The module explains the purpose of custom connectors and examines real-world scenarios in which they are required. The module introduces students to swagger file definitions and demonstrates using the PowerApps portal to create a custom connector to communicate with a custom web service. The module demonstrates creating custom connectors which can handle OAuth2-style authentication with web services protected by Azure AD such as the Microsoft Graph API and the Power BI Service API. The module concludes with a discussion of how to install and configure an On-premises Data Gateway which makes it possible for canvas apps and flows to read and write data from on-premises data sources such as SQL Server and local SharePoint farms.

Topics Covered

- Calling External Services using HTTP Actions
- Executing Child Flows from a Parent Flow
- Creating and Testing Custom Connector
- Configuring a Custom Connector to use OAuth

Hands-on Lab: Integrating PowerApps with External Systems

- Exercise 1: Use the HTTP Connector to Retrieve Data from an External Web Service
- Exercise 2: Execute a Child Flow from a Parent Flow
- Exercise 3: Create a Custom Connector for an External Web Service
- Exercise 4: Creating a Custom Connector for the Power BI Service API

Module 07: Building Common Data Service Solutions

This module introduces students to the Common Data Service (CDS) and explains how CDS solutions provide builders with essential features for deploying and upgrading Power Platform apps and components in a production environment. Students will learn to access CDS data using Canvas apps as well as how to import data into the CDS using PowerApps dataflows. The module introduces students to model-driven apps and demonstrates how they provide a more-attractive alternative to canvas apps when creating apps to view and update data in CDS entities. The module teaches best practices for creating custom entities and customizing entity forms and views. The module also explains how extend a custom entity with server-side logic using business rules and business process flows.

Topics Covered

- CDS Solution Architecture
- Accessing CDS Data using Canvas Apps
- Importing Data into the CDS using Dataflows
- Building Model-driven Apps
- Creating a Custom Entity
- Creating Business Process Flows

Hands-on Lab: Working with the Common Data Service for Apps

- Exercise 1: Create a New PowerApps Environment with a CDS Database
- Exercise 2: Create a Canvas App to Manage Contact Entity Data
- Exercise 3: Create a Model-driven App to Manage Contact Entity Data
- Exercise 4: Create a Custom Entity to Track Products
- Exercise 5: Extend the Product Entity

Module 08: Integrating PowerApps with Power BI

This module examines the points of integration between Power BI, PowerApps and Flow. Students will learn how to embed Power BI dashboard content in PowerApps using the Power BI tile control. The module also explains how to embed a canvas app in Power BI reports using the PowerApps custom visual. Students will learn how to pass data from a Power BI report to an embedded canvas app using a design that allows the app to respond to filtering changes in the report. The module examines how to build real-time dashboards in Power BI by designing flows that push rows of data into Power BI automatically triggering updates to dashboard tiles. Students will practice what they learned in the lecture by building a real-time dashboard to monitor Twitter and to display tweets containing specific keywords.

Topics Covered

- Overview of Power BI Integration Features
- Embedding Power BI Dashboard Tiles in PowerApps
- Extending Power BI Reports using Canvas Apps
- Designing Flows to Update Real-time Dashboards
- Triggering Flows using Power BI Dashboard Alerts

Hands-on Lab: Integrating Power BI with PowerApps and Flow

- Exercise 1: Adding Power BI Content to a New App Workspace
- Exercise 2: Embed Power BI Dashboard Tiles in PowerApps
- Exercise 3: Extend a Power BI Report using PowerApps
- Exercise 4: Use a Flow to Create a Real-time Dashboard in Power BI

Module 09: Designing and Developing PowerApps Portals

The module begins by examining the PowerApps portal architecture and explaining how a PowerApps portal uses the CDS to track the data required for creating and managing website content. Students will learn to use the Portal Editor to create pages and author content. Students will also learn to use the Portal management app to configure site settings and to manage web pages, page template and web templates. The module then introduces attendees to the Liquid template language and examines the process of designing a PowerApps portal using Web Templates, Page Templates, Web Files, Web Links, Snippets and Web Pages. The module demonstrates how to write Web Templates to display Entity Views, Entity Lists and Entity Forms for standard and custom entities. Along the way, attendees will also learn how to set up and work with the essential PowerApps portal developer tools including the XrmToolBox.

Topics Covered

- Understanding Portal Architecture
- Using the Portal Editor to Create and Edit Web Pages
- Configuring Portals using the Portal Management App
- Building Portal Pages using Entity Lists and Entity Forms
- Understanding Web Templates, Page Templates and Pages
- Getting Started with XrmToolBox and the Liquid Template Language

Hands-on Lab: Integrating Power BI with PowerApps and Flow

- Exercise 1: Provisioning a New PowerApps Portal
- Exercise 2: Adding Pages and Portal Content using the Portal Editor
- Exercise 3: Styling a Portal with Custom CSS
- Exercise 4: Authoring Web Templates using the XrmToolBox
- Exercise 5: Converting a PowerApps Portal from Trial to Production

Module 10: Creating PowerApps Solutions using AI Builder

This module provides an overview of the new Artificial Intelligence (AI) features that have been added to the Power Platform. The module begins by explaining the theory and concepts behind AI models and examining scenarios for using binary classification, object detection, text classification and form processing. The module also explains how the Power Platform implements AI models using the Common Data Service and AI Builder. Students will learn how to integrate the Business Card Reader component into a canvas app which runs on a mobile device. Students will also learn to use AI builder to create and train AI models using binary classification, object detection and form processing.

Topics Covered

- Understanding AI Models
- Creating AI Models with AI Builder
- Creating a Canvas App using the Business Card Reader
- Creating AI Models using Binary Classification
- Creating AI Models using Object Detection
- Creating AI Models using Form Processing

Hands-on Lab: Integrating Power BI with PowerApps and Flow

- Exercise 1: Create a AI Trial using AI Builder
- Exercise 2: Build a Canvas App with the Business Card Reader
- Exercise 3: Create and Training an AI Model using Binary Classification
- Exercise 4: Create and Training an AI Model using Object Detection
- Exercise 5: Create and Training an AI Model using Form Processing