

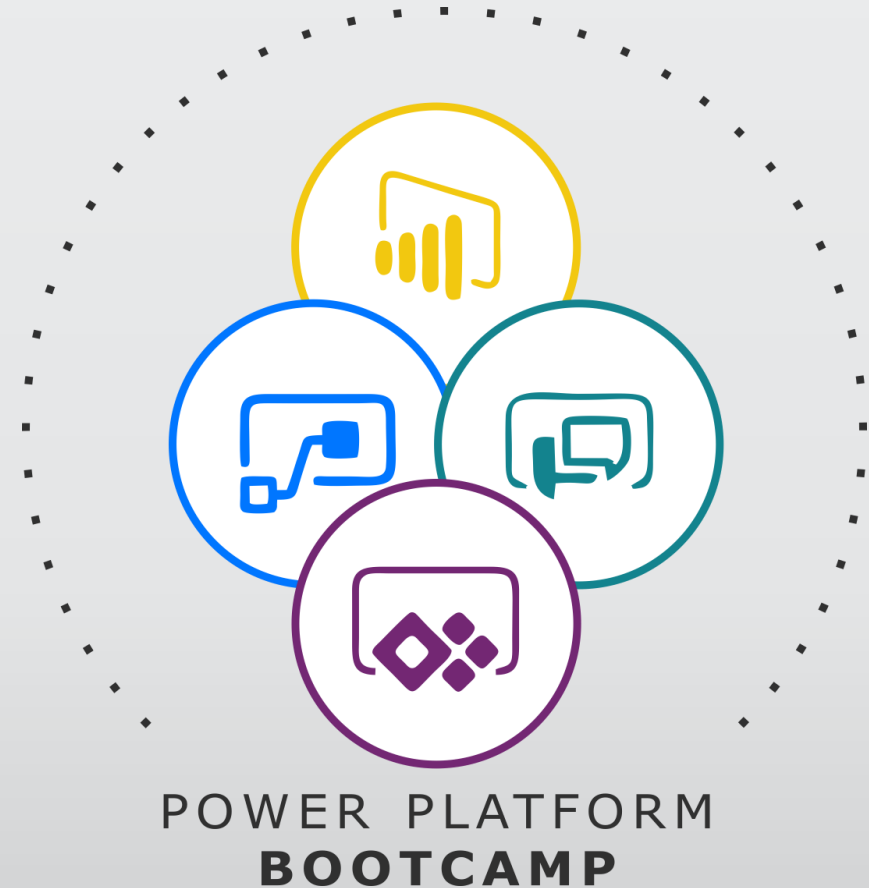
# GLOBAL POWER PLATFORM BOOTCAMP

---

Organized Globally, Held Locally

CDS as the Development  
Platform - A developer's  
perspective

Daniel Cai, KingswaySoft



# CDS as the Development Platform – A developer's perspective

Daniel Cai  
Managing Director and Founder  
KingswaySoft



#GlobalPowerPlatformBootcamp

# Meet the Speaker

- Daniel Cai
  - Founder and Managing Director, KingswaySoft
  - Heavily SDK Focused
    - Primarily Dynamics platform development experience
    - Aspired to create solution that is simple and easy to work with
    - ETL and large-scale integration development are my other interests
  - Previously Microsoft Business Applications MVP for consecutive 8 years
- About KingswaySoft
  - A leading provider of data integration solutions for Microsoft Dynamics 365 software and beyond, with two primary focuses
    - Connectivity
    - Productivity



# What's CDS and why bother?

## What is CDS?

- A rapid development framework to build custom applications
- The same underlying architecture that powers many applications offered by Microsoft, including Dynamics 365 Customer Engagement, Marketing, Human Resources, etc.

## Why does it matter?

### An Adaptive Framework

- A highly abstracted development infrastructure
- Various extensibility endpoints

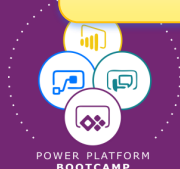
### Low-code to no-code development experience

- Development done declaratively
- Visual drag-and-drop development experience

### Sophistication with Ease

- Highly scalable
- Extremely flexible in modeling complex data relationships
- Unified interface for various devices

A rapid application development platform



#GlobalPowerPlatformBootcamp

# How has it been evolved?

## Dynamics CRM

- A CRM application at its early stage
  - Sales
  - Service
  - Marketing
- Limited extensibilities



## XRM Framework

- Extensibility added to the application
- Declarative customization framework
- Plugin
- Workflows
- SDK
- Solution Framework (since 2011)



## CDS (Common Data Service)

- The unified framework for future business application
- Integration with various Microsoft cloud services
- Unified development framework
- Support of many advanced development scenarios

Dynamics CRM 1.0, 1.2

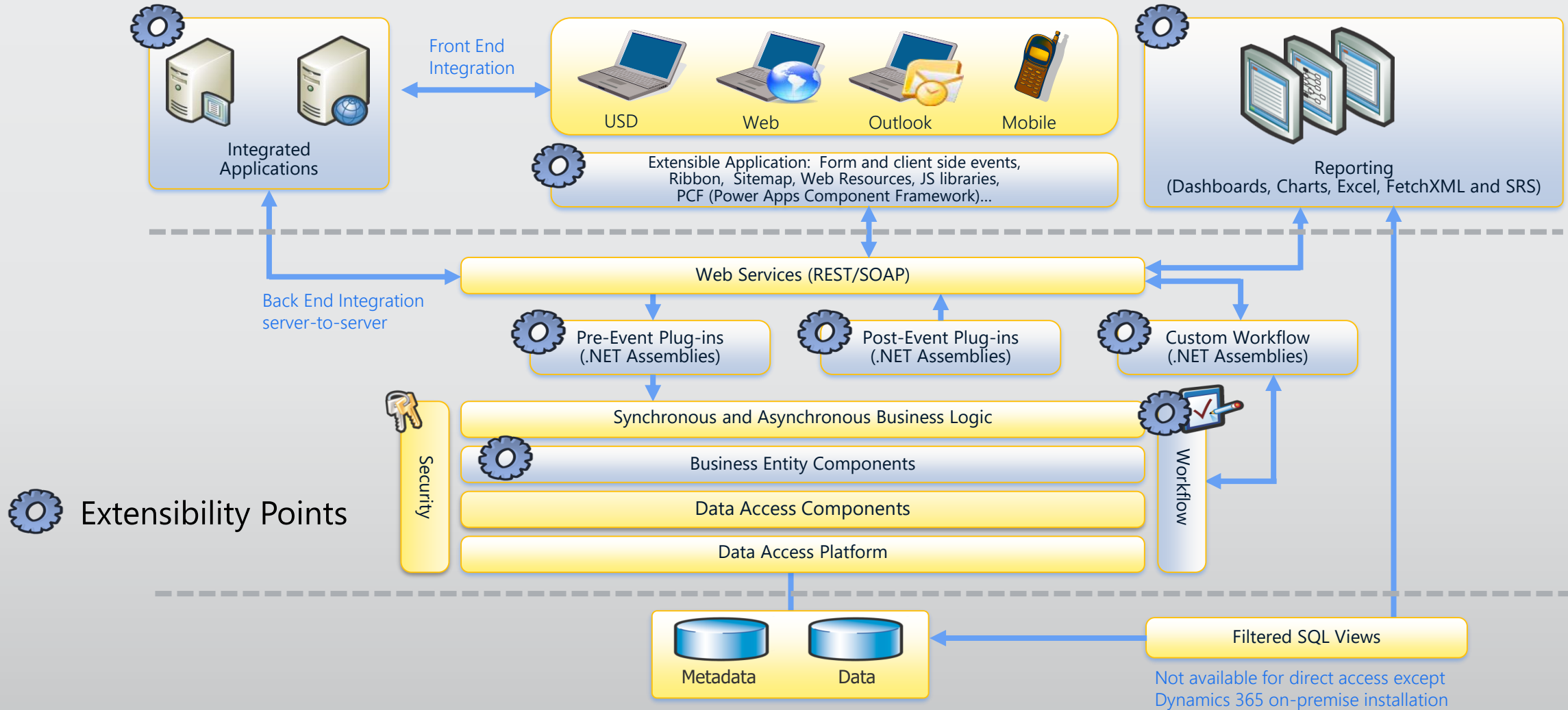
Dynamics CRM 3.0, 4.0, 2011, 2013, 2015, 2016

CDS / Power Apps / Dynamics 365



#GlobalPowerPlatformBootcamp

# CDS / Power Apps Architecture Drill-Down



# What's in the zoo?



Power Apps

Canvas Apps

Model Driven  
Apps

Portal



Microsoft Dynamics 365  
for Customer Engagement

Sales

Service

Marketing

Field  
Service

Project  
Service



Microsoft  
Dynamics 365  
Human  
Resources



Common Data  
Service for Apps

Core  
Entities

Restricted  
Entities

Custom  
Entities

Business  
Rules

Workflows

Business  
Process Flows

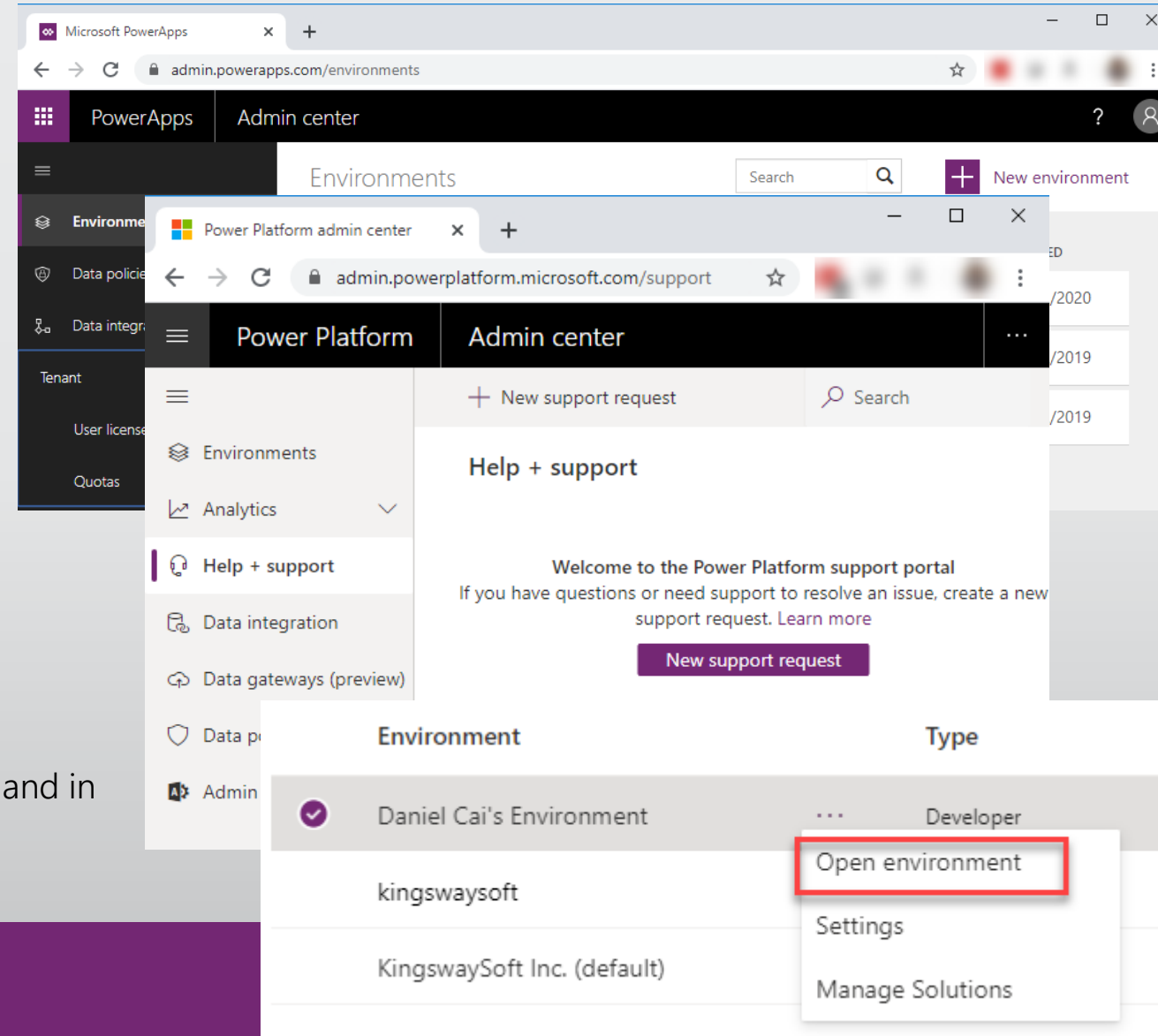
Plugins



#GlobalPowerPlatformBootcamp

# Where should I start from?

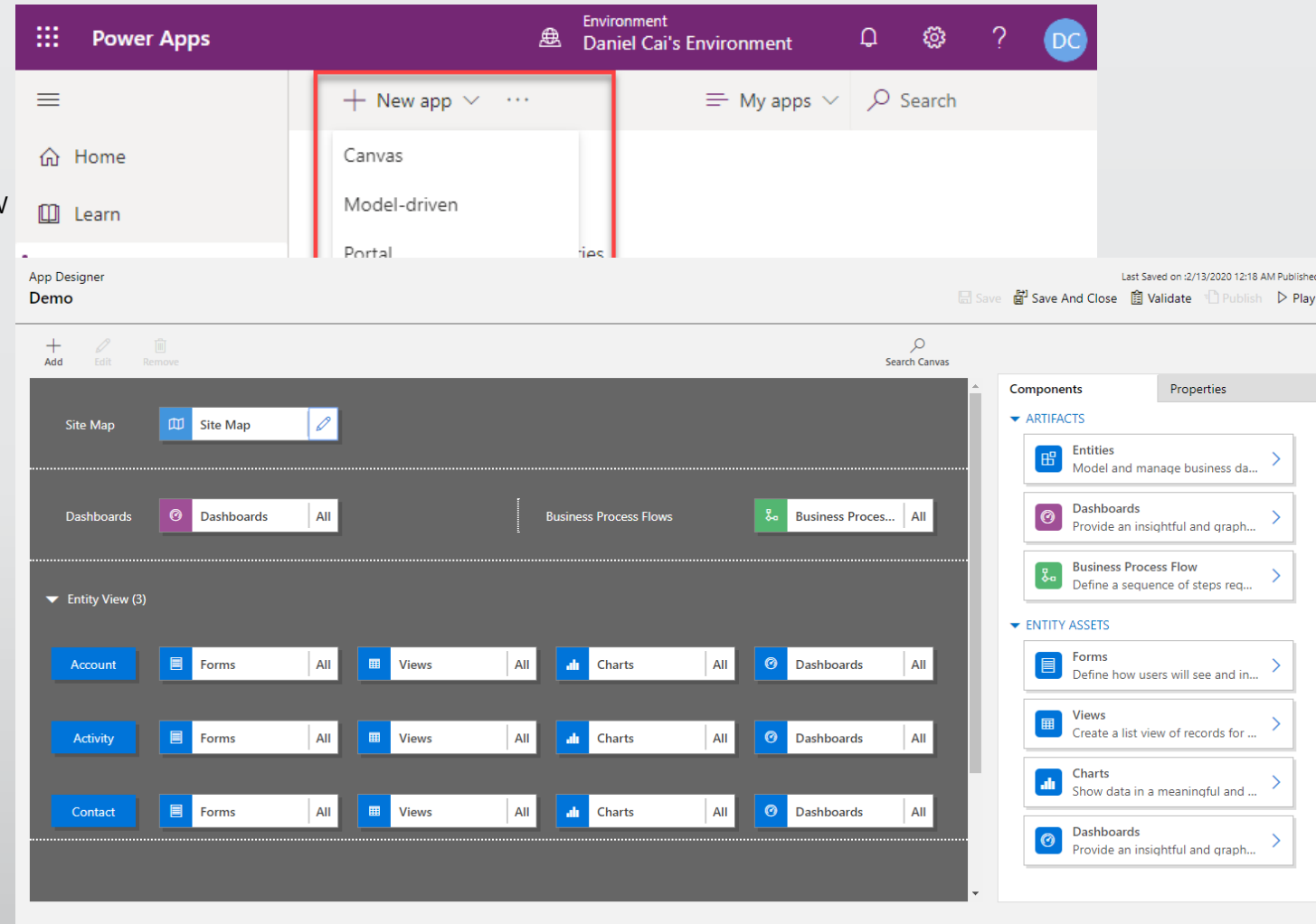
- Sign up a free individual community plan
  - <https://web.powerapps.com/community/signup>
  - Create a database after sign-up
- URL for App Creator or Maker
  - <https://make.powerapps.com/>
  - App designer, entities, relationships, option sets, etc.
- URL for Admins
  - Power Apps admin center
    - <https://admin.powerapps.com/>
  - Power Platform admin center
    - <https://admin.powerplatform.microsoft.com/>
    - Including system settings, data integration configurations, etc.
- How my users can access my app?
  - Your URL can be found using the **Open Environment** command in the platform admin center





# First thing first – Create an app

- What's included
  - Site Map
  - Components
    - Artifacts
      - Entities, Dashboards, Business Process Flow
    - Entity Assets
      - Forms, Views, Charts, Dashboards
  - Properties
    - App's name, description, tile image, etc.
- App designer
  - <https://make.powerapps.com/> -> Apps
  - Site Map designer
    - Area
    - Group
    - Sub area
      - Dashboard
      - Entity
      - Web resources
      - URL



#GlobalPowerPlatformBootcamp

# Entity Customization – where Data modeling starts

- An Entity is a type of record.
  - Examples: Account, Case, Article, Business Unit.
  - Table in the database stores data records.
  - Metadata describes how the entity is presented to users, such as Display Name.
- A Form displays a single record.
  - May contains fields, sub-grids, and other components.
  - Provides client-side scripting and features such as Business Process Flows and Business Rules.
- A View displays a list of several records.
  - Filter criteria define the records that are displayed.
  - View columns contain field values.
- A Chart provides a visualization of data.
  - Used in combination with a view that filters records.
- A Field contains one piece of data.
  - Column in the entity table.
  - Control on a form, column in a view.
  - Also known as “attribute”, especially by developers.



# Field Customizations

Field type	SQL data type
Single line of Text	nvarchar(n)
Option Set	int
Two Options	bit
Image	uniqueidentifier
Whole number	int
Floating Point Number	float
Decimal Number	decimal
Currency	money
Multiple Lines of Text	nvarchar(max)
Date and Time	datetime
Lookup	uniqueidentifier

- Advanced Field Types
  - Calculated Fields
    - Not a physical field.
    - Values are automatically calculated based on the expression defined.
  - Rollup Fields
    - Physical field.
    - Values are calculated asynchronously based on aggregation of child entities as defined.

CALCULATED FIELD

### Set Next Follow Up Date

IF...THEN

CONDITION (OPTIONAL)

If Status equals "Active"

+ Add condition

ACTION

Set Next Follow Up Date to AddDays(3, Follow Up By)

ROLLUP FIELD

### Last Appointment

SOURCE ENTITY

Source: Case

Use Hierarchy: NO

RELATED ENTITY

Related: Appointments (Regarding)

FILTERS (OPTIONAL)

+ Add condition

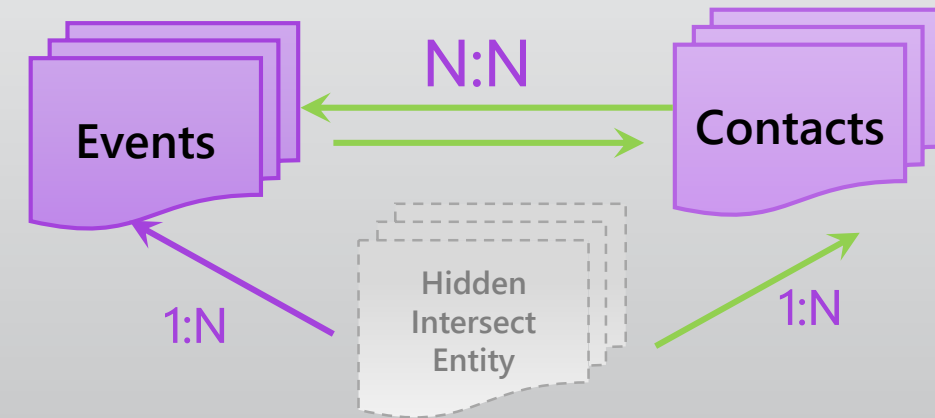
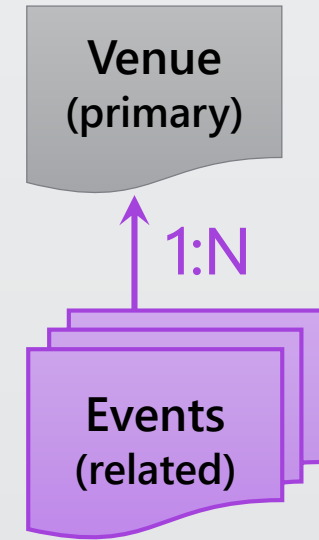
AGGREGATION

MAX of End Time

# Relationships

Relationships define how one entity is related to another entity.

- One-to-many (1:N) relationships
  - One record of a primary entity
  - Zero, one, or many records of a related entity
  - Related entity has a lookup field to store the GUID of the parent record
  - N:1 is a 1:N relationship viewed from the other side
- Many-to-many (N:N) relationships
  - Many-to-many relationships are symmetrical
  - A hidden intersect entity is automatically created, that has a 1:N relationship from each of the N:N entities



# Demo – Entity Customizations and relationships



#GlobalPowerPlatformBootcamp

# How do I secure my data?

- CDS Security Model
  - Dynamics platform offers a sophisticated but scalable security model which allows you to define the access control policy as granular as you want
- Entity Privileges: up to five access levels
  - Organization-owned entities:
    - None
    - Organization.
  - User or Team-owned entities:
    - None
    - User
    - Business Unit
    - Parent: Child Business Unit
    - Organization

The screenshot displays the 'Security Role: Knowledge Manager' configuration page in the PowerApps environment. The page is divided into several tabs: Details, Core Records, Service, Business Management, Customization, Missing Entities, Business Process Flows, and Custom Entities. The 'Details' tab is active, showing a table of entity privileges. The table has columns for Entity, Create, Read, Write, Delete, Append, Append To, Assign, and Share. Each cell contains a colored circle indicating the privilege level: None Selected (white), User (yellow), Business Unit (orange), Parent: Child Business Units (green), and Organization (dark green). Below the table, there is a section for 'Privacy Related Privileges' with a warning message and a list of privileges with their corresponding status icons. A key at the bottom explains the color coding for the privilege levels.

Entity	Create	Read	Write	Delete	Append	Append To	Assign	Share
Business Unit	○	●	○	○	○	○		
Channel Property Group	○	●	○	○	●	●		
Currency	○	●	○	○	●	●		
Document Template	○	●	○	○	○	○		
Email Server Profile	○	●	○	○	○	●	○	○
Field Security Profile	○	○	○	○	○	○		
Field Sharing	○	○	○	○	○	○		
Mailbox	○	●	●	○	●	○	○	○
Mailbox Auto Tracking Folder	●	●	●	●	●	○	○	○
Organization		●	○			○		
Personal Document Template	●	●	●	●	●	●	●	●
Position	○	●	○	○	○	○		
Principal Sync Attribute Map			○					
Rollup Query	○	●	○	○	○	○	○	○
Security Role	○	●	○	○	○	○	○	
Sync Attribute Mapping Profile			○			○		
Team	○	●	○	○	○	○		
User	○	●	○		●	●		
User Settings	●	●	●	●		●		

**Privacy Related Privileges**  
Enabling these privileges will allow users to extract customer data from Microsoft Dynamics 365. For more information, review the corresponding user documentation.

Document Generation	●						●
Export to Excel	●						●
Mail Merge	●						●
Sync to Outlook	●						●
Dynamics 365 for mobile							●
Go Offline in Outlook							●
Print							●
Use Dynamics 365 App for Outlook							●

**Key**

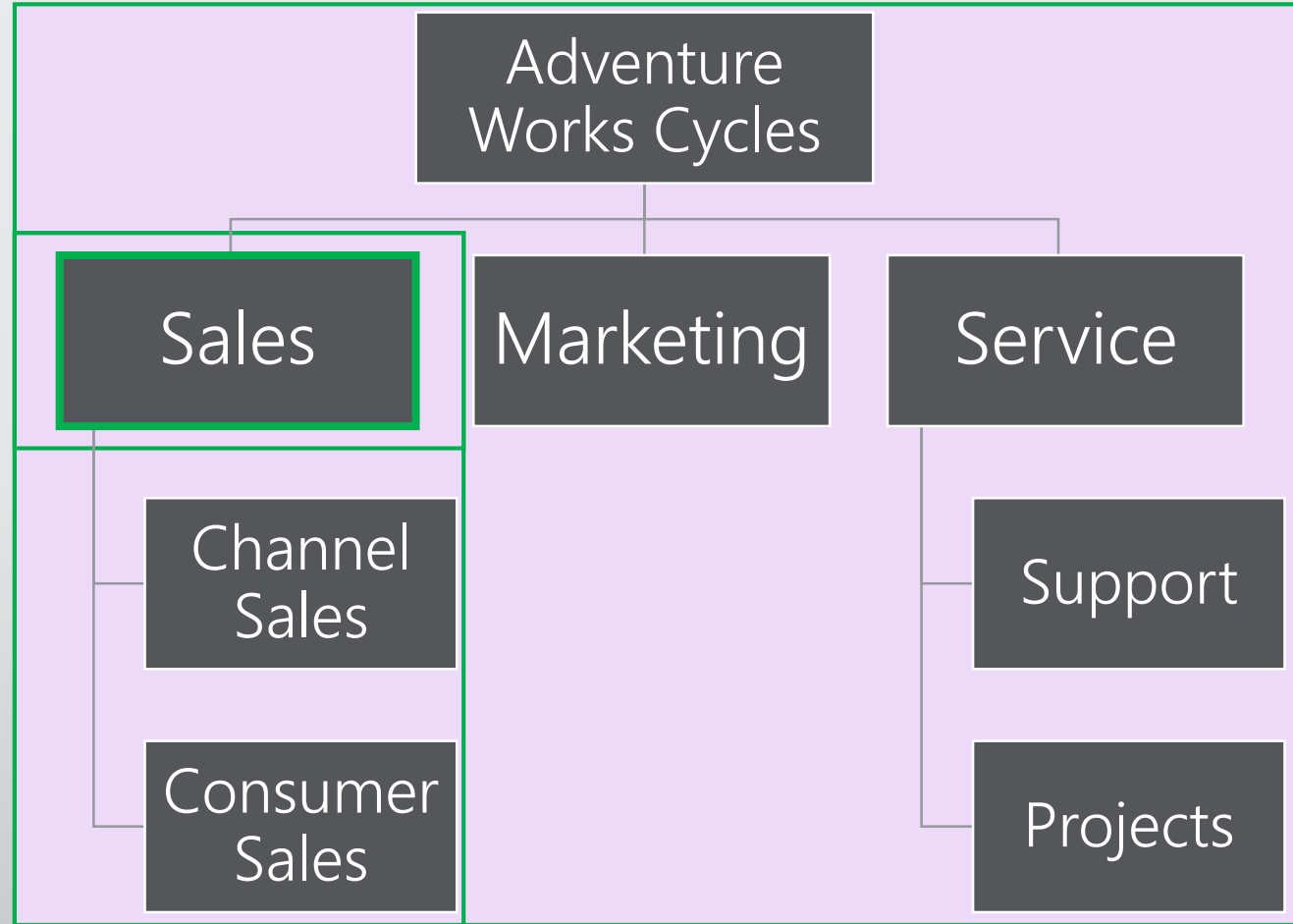
- None Selected
- User
- Business Unit
- Parent: Child Business Units
- Organization

# Security Role Access Levels Explained

Organization

Business Unit

Parent: Child  
Business Unit



# Demo – CDS Security Model



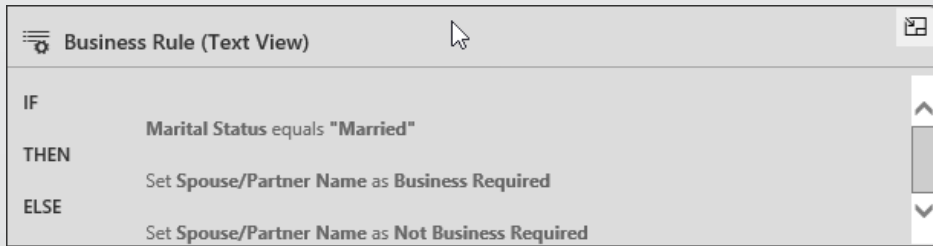
#GlobalPowerPlatformBootcamp



# All is good, until the boss says...

## Business Logics and Argumentation in CDS

There are many different ways to implement business logics in CDS and Dynamics 365



Business Rule (Text View)

IF

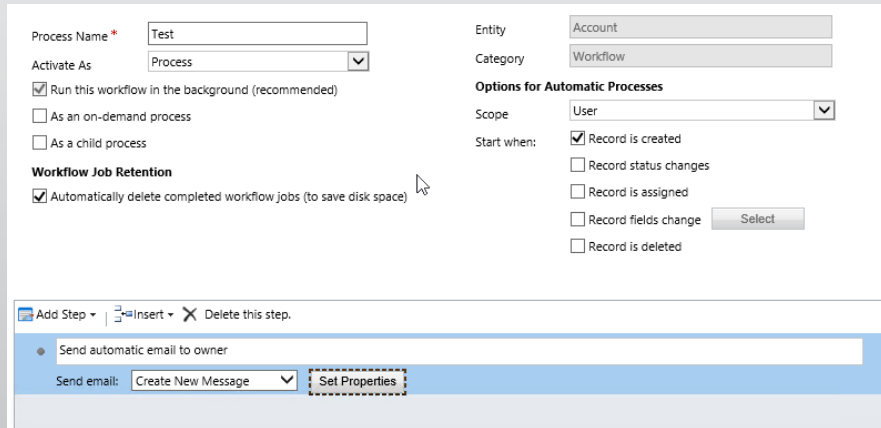
Marital Status equals "Married"

THEN

Set Spouse/Partner Name as Business Required

ELSE

Set Spouse/Partner Name as Not Business Required



Process Name\* Test

Entity Account

Category Workflow

Activate As Process

☒ Run this workflow in the background (recommended)

☐ As an on-demand process

☐ As a child process

Workflow Job Retention

☒ Automatically delete completed workflow jobs (to save disk space)

Options for Automatic Processes

Scope User

Start when:

☒ Record is created

☐ Record status changes

☐ Record is assigned

☐ Record fields change

☐ Record is deleted

Add Step | Insert | Delete this step.

Send automatic email to owner

Send email: Create New Message | Set Properties

- Business Rules
  - Build client-side logic without the need of programming skills
  - Triggered when a record is opened or when a field is changed that is in the rule conditions
- Workflows (only available if Dynamics 365)
  - Declarative approach to implement custom business logic using the workflow designer
  - Can be triggered on demand, or on various record events
  - Can be fired synchronously or asynchronously
- Plugins
  - Programmatic approach to implement custom business logic through custom code
  - Can be registered to listen to a particular event
  - Can be triggered synchronously or asynchronously



# Demo – Business Rules and Augmentation



#GlobalPowerPlatformBootcamp

# Let's put them all together

## CDS Solution System

- Key Concepts
  - Managed Solution vs. Unmanaged Solution
  - Solution Publisher
  - Solution Layering
- Solution Management
  - Solution Export
  - Solution Import
  - Publish

### Templates

- Email
- Contract
- KB Article
- Mail merge

### Schema

- Entities
- Fields
- Relationship
- Option Sets

### User Interface

- Forms
- Views
- Charts
- Dashboards
- SiteMap
- Ribbons

### Processes / Steps / Code

- Workflows
- Dialogs
- Business Process Flows
- Business Rules
- Actions
- Web Resources
- Plug-in

### Miscellaneous

- Security Roles
- Field Security Profiles
- Connection Roles
- Reports
- Solution Publisher



# There is more

## Power BI

Make informed, confident business decisions by putting data-driven insights into everyone's hands.



## Power Apps

Turn ideas into organizational solutions by enabling everyone to build custom apps that solve business challenges.

- Canvas App
- Model-driven app
- Portal



## Power Automate

Boost business productivity to get more done by giving everyone the ability to automate organizational processes.



## Power Virtual Agents

Easily build chatbots to engage conversationally with your customers and employees—no coding required.



## The Power Platform

Azure

Office 365



#GlobalPowerPlatformBootcamp

# Any Questions?



#GlobalPowerPlatformBootcamp

**Please fill  
out the  
survey!  
& Win  
Swags!!**



<https://www.powerplatformbootcamp.com/survey>



**#GlobalPowerPlatformBootcamp**

# Thank You For Attending



[#GlobalPowerPlatformBootcamp](https://twitter.com/GlobalPowerPlatformBootcamp)