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Digital 1nn0vation

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Augmenting the Digital Customer Experience with Dynamics 365, IoT & .NET

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Digital Customer Experience

- Markets between buyers and sellers have existed for centuries, but in the digital world, customer expectations have changed dramatically. Organizations must now respond to these ever increasing expectations, often driven by an individual's personal experience using digital technology in their everyday life.

So, in an environment where instant gratification and expected satisfaction is the norm, how do organizations respond?

Digital Customer Experience

Organizations must transform their businesses and services, often in the face of digitally savvy competitors, they need to:

- Become truly customer centric.
- Satisfy customers, whilst driving operational effectiveness, efficiency and value.
- Deliver enjoyable, exciting experiences that meet high customer expectations.
- Increase loyalty, retention and value against new digitally agile competitors.
- Deliver holistic and intuitive experiences irrespective as to how, where or when individuals choose to interact.
- Address the blurring processes of marketing, sales and service.
- Build trusted relationships, whilst respecting privacy

Technology enablers

- **Technology delivers seamless cross-channel experiences**: Comprehensive, cohesive "omni-channel" technology solutions now deliver the reality of seamless experiences for customers, irrespective of how they touch an organization.
- **Creative design drives user experience**: Analytics tools are now facilitating an agile approach to user experience design, learning from how customers engage over time. This informs creative design and technical development to continually adapt user experience to maintain high levels of engagement.
- **Mobility**: The current explosion in mobile devices makes it possible for individuals to engage with businesses irrespective of location, time of day, or circumstance, whilst the user experience itself ensures continued engagement and repeat use.
- **Virtualization**: In a world of multiple-device engagement, virtualization in data management makes it possible to join data together creatively, "bring it to life", and present a true "single customer view" for organizations cost effectively, and quickly. Actionable insights can then be delivered in real-time to meet and exceed customer needs.
- **Social media integration**: With social media platforms increasingly a part of an individual's private life, businesses are now adopting and integrating these into their operations, presenting the digital consumer with opportunities to engage and interact, whilst businesses seek to monetize the content.
- **Cloud solutions as a service platform**: SaaS and cloud deployment options have further reduced the total cost of ownership for customer experience solutions—many now work on a pay-as-you-go basis, enabling businesses to scale with customer demand.

Business Drivers

- **Customers are in control**: Organizations are no longer calling the shots—customers are in charge. In their own private lives, they control both the digital technologies they use, and the information they share with friends—they like the immediate responses they receive. This feeling of control, getting "instant answers", now influences and guides their expectations and interactions with businesses as well.
- **Personalized service and customer engagement**: As customers increasingly exercise their right to choose, organizations must adapt to offer more personalized, 1:1 services— this is what the customer is increasingly expecting. A "one size fits all" approach and homogenous customer groups no longer work—everyone is different, every "customer journey" is unique.
- **Operational efficiency**: Organizations continue to streamline inefficient, often disconnected, processes. New digital technologies now make it possible for them to focus on measurement, analysis and learning, thereby enabling a continuous improvement culture to pervade all customer-facing operations. For example, an insurance company reduced certain repeat calls from 76% to 6%, achieving significant cost savings, whilst moving customer satisfaction from 73% to over 90%.
- **Integration of new complex data sources**: The increased sophistication of analytics facilitates the integration of insights from sources such as mobile, social and geo alongside more traditional transactional datasets. Organizations can now manage their customer data as a true valuable strategic asset, driving insights from real-time data to enable business process efficiency, and making customer value enhancing decisions which increase satisfaction.
- **Multi-device engagement and the changing demographic landscape**: People growing up in the digital age—the "digital natives"—switch between devices very frequently. Multiple devices now play a part in any step of a transaction or interaction. This necessitates "joined up", real-time, easy-to-use solutions to manage an engagement, irrespective of device, seamlessly managing the interaction as it moves between mobile, home or workplace. In this context, the "user experience" dimension must inform ongoing design and innovation

DCX Industry Case: Retail

- New click and collect solutions, like “drive through” grocery collection, will provide flexibility, choice and convenience.
- Geo-location and iBeacons will push personalized offers at a local level.
- Personalization, enhanced web behavior tracking, facial recognition and avatars (to try clothes) will drive engagement, loyalty, value and retention.
- Shopping will become ever more seamless, device independent and channel agnostic—buying will be easier, whether online or in person.

Connected Customer

- Every time someone comes through the door, it is an opportunity to convert and sell. Real time and near real time responsiveness is now possible through advances in data streaming and analytics.
- IoT data can suggest where the customer is headed and how to meet her there.
- **At the end of the day, success is driven by customer experience**. Did the retailer meet the customer on the customer's terms, deliver engaging interactions, and leave the customer feeling well served?
- For a connected customer, the retailer can **market more directly and personalize the experience**. Recognize and welcome the customer, anticipate the shopping intent, offer a customized promotion, suggest a complementary purchase – all can enhance the customer experience, all can create incentives to purchase, and all can be accomplished electronically or through store staff

Indoor positioning system

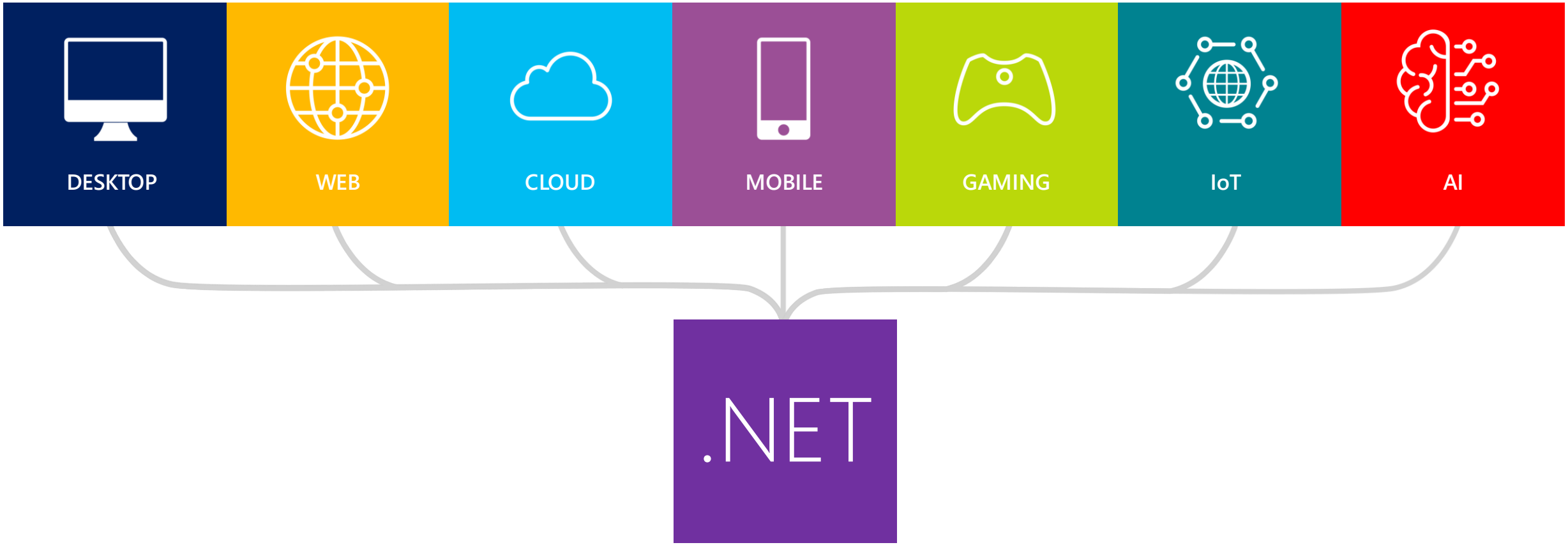
https://www.nashville.gov/News-Media/News-Article/ID/3477/Mayor-Music-City-Center-Unveil-Wayfinding-App

- An indoor positioning system (IPS) is a system used to locate objects or people inside a building using lights, radio waves, magnetic fields, acoustic signals, or other sensory information
- Any wireless technology can be used for locating. Many different systems take advantage of existing wireless infrastructure for indoor positioning.
- There are three primary system topology options for hardware and software configuration, network-based, terminal-based, and terminal-assisted.
- Positioning accuracy can be increased at the expense of wireless infrastructure equipment and installations.

IPS Math

- Once sensor data has been collected, an IPS tries to determine the location from which the received transmission was most likely collected.
- The data from a single sensor is generally ambiguous and must be resolved by a series of statistical procedures to combine several sensor input streams.
- Location will be calculated mathematically by approximating signal propagation and finding angles and / or distance.
  - Trilateration (distance from anchors) **
  - Triangulation (angle to anchors)

Your platform for building **anything**



Windows.Devices.Bluetooth.Advertisement

https://docs.microsoft.com/en-us/uwp/api/windows.devices.bluetooth.advertisement

- **BluetoothLEAdvertisementPublisher**
  - An object to send Bluetooth Low Energy (LE) advertisements.
- **BluetoothLEAdvertisementWatcher**
  - An object to receive Bluetooth Low Energy (LE) advertisements.
- **BluetoothLEManufacturerData**
  - A Bluetooth LE manufacturer-specific data section
- **BluetoothLEAdvertisementPublisherStatusChangedEventArgs**
  - Provides data for a StatusChanged event on a BluetoothLEAdvertisementPublisher.
- **BluetoothLEAdvertisementReceivedEventArgs**
  - Provides data for a Received event on a BluetoothLEAdvertisementWatcher.
- **BluetoothLEAdvertisementWatcherStoppedEventArgs**
  - Provides data for a Stopped event on a BluetoothLEAdvertisementWatcher

Demo

.NET Core 3.0 + UWP Bluetooth Low Energy IPS

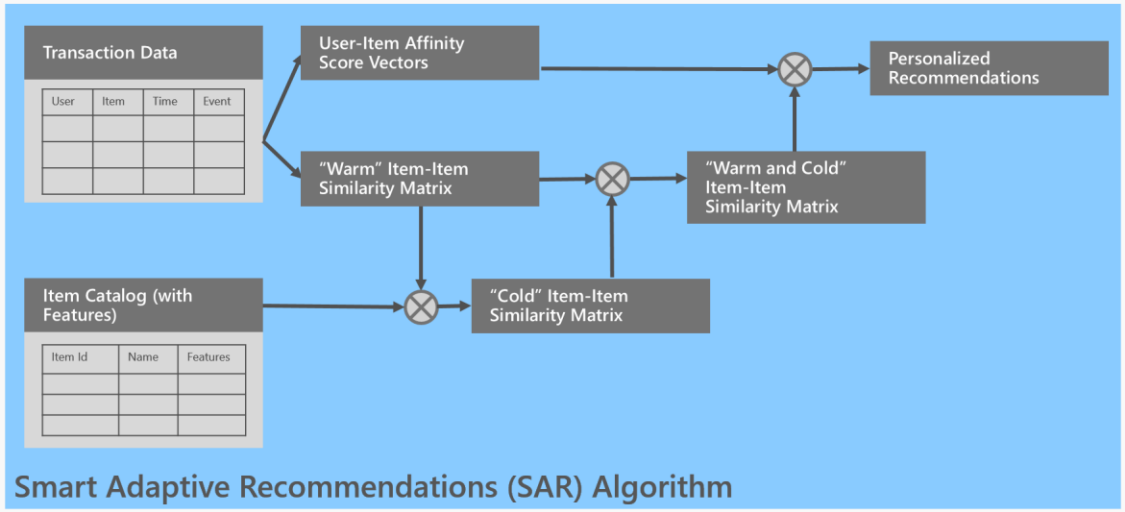
Product Recommendations Solution

https://github.com/Microsoft/Product-Recommendations

- This solution enables you to create product recommendations based on historical transaction data and information on the product catalog.
- The following scenarios are supported by the SAR algorithm:
  - Item-to-Item Recommendations. This is the "Customers who liked this product also liked these other products" scenario. Increase the discoverability of items in your catalog by showing relevant products to your customers.
  - Personalized Recommendations. By providing the recent history of transactions for a given user, the SAR algorithm can return personalized recommendations for that user.
- At a high level, The solution exposes mechanisms to:
  - Train models using the SAR (Smart Adaptive Recommendations).
  - Request a previously created model for recommendations.

SAR Algorithm: Smart Adaptive Recommendations

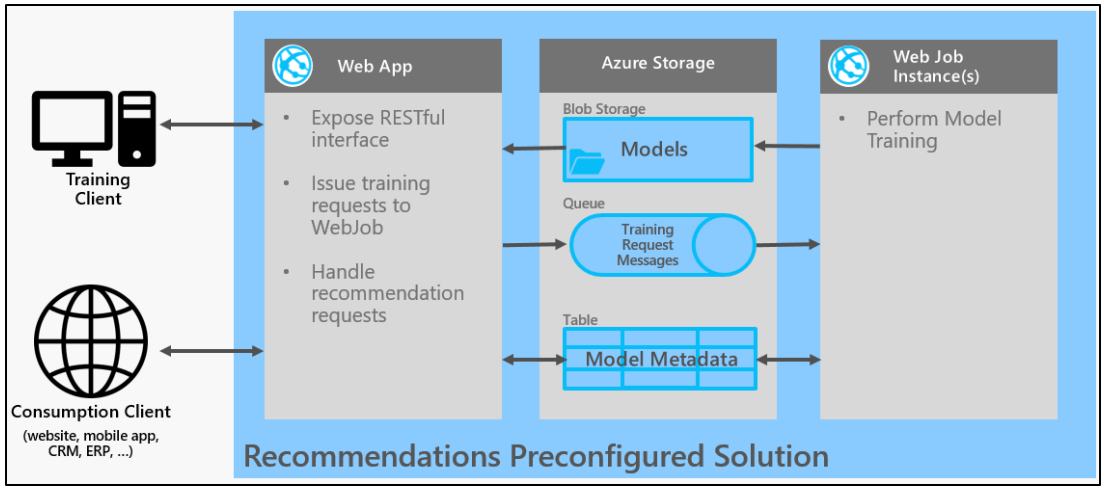
- **SAR** is a fast scalable adaptive algorithm for personalized recommendations based on user transactions history and items description.
- It produces easily explainable / interpretable recommendations.
- The input to SAR consists of:
  - Transaction (usage) data:
    - <User Id>,<Item Id>,<Time>,[<Event>]
  - Catalog data:
    - <Item Id>,<Item Name>,<Item Category>[,<Description>]



Smart Adaptive Recommendations (SAR) Algorithm

High level architecture

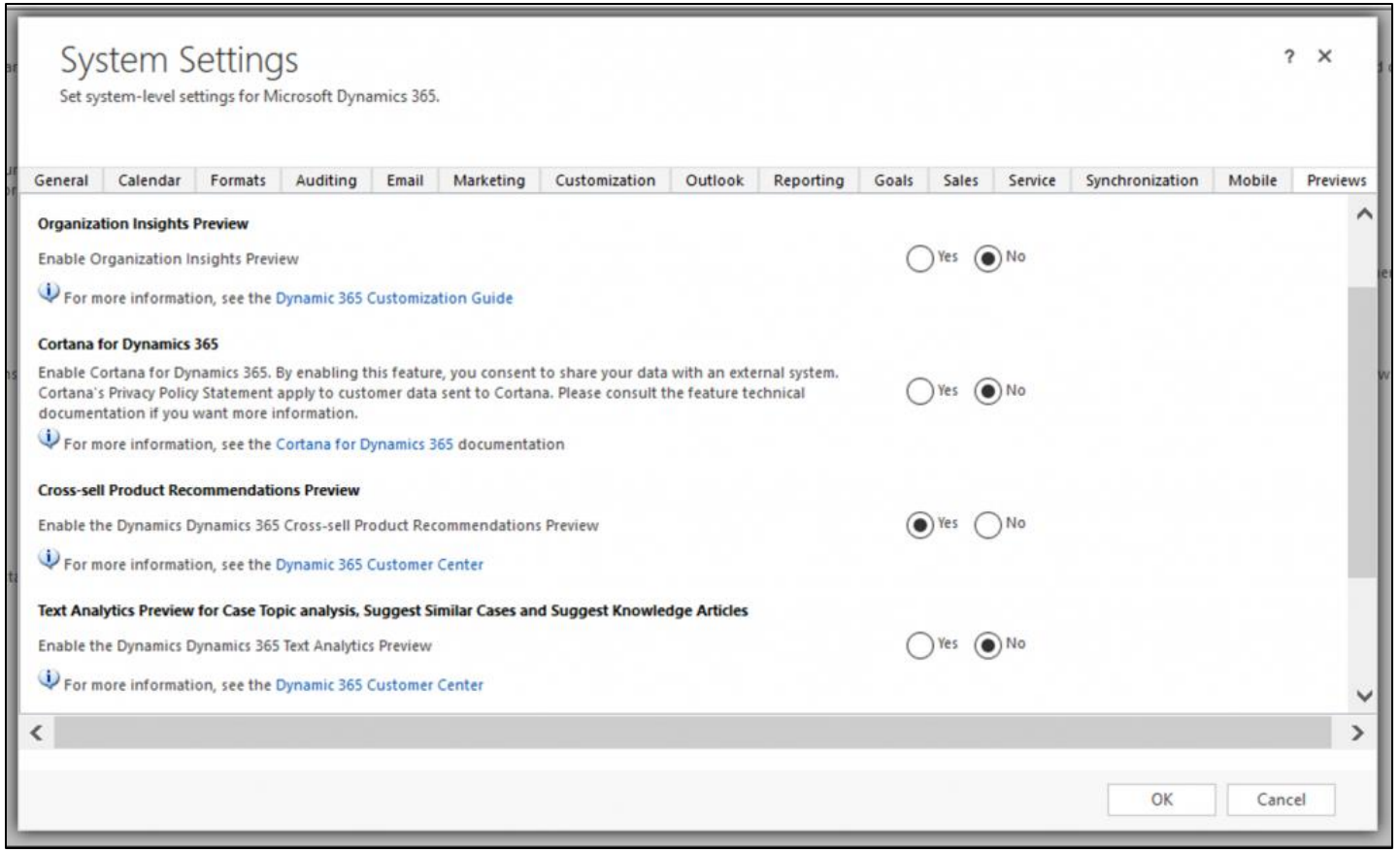
- An Azure WebApp (and a respective Web Job) The Azure Web-Application exposes a RESTful interface that allows you to train recommendations models, and then query those models for product recommendations. The Azure Web-Application also delegates training jobs to an Azure WebJob.
- An Azure Storage subscription that is used for storing models, model metadata as well as for WebApp to WebJob communication.



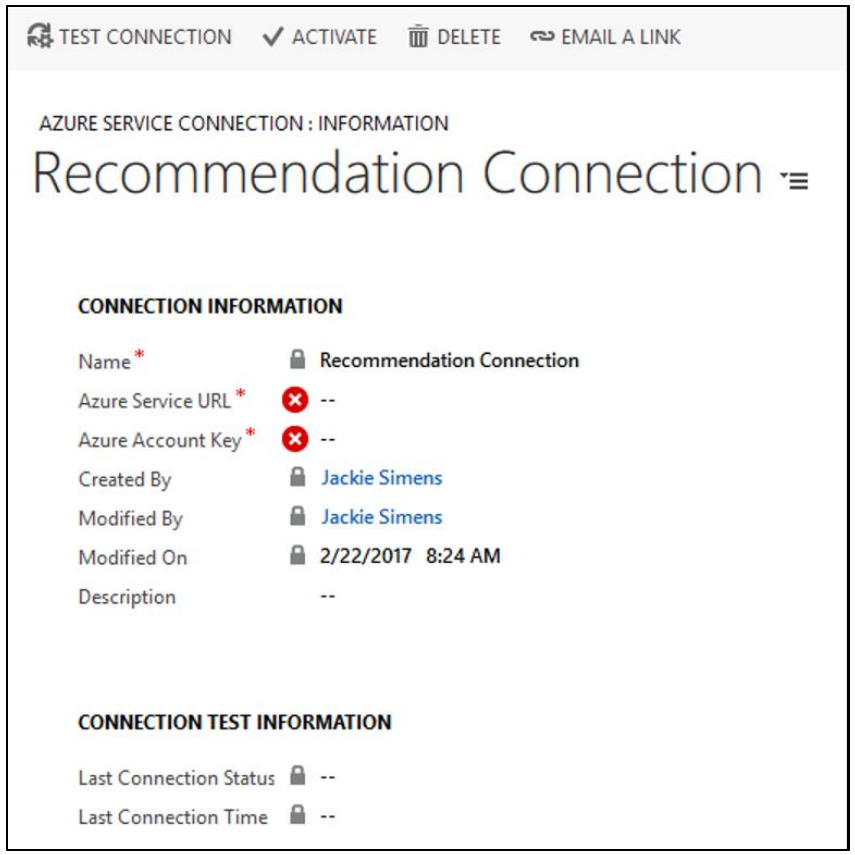
Demo

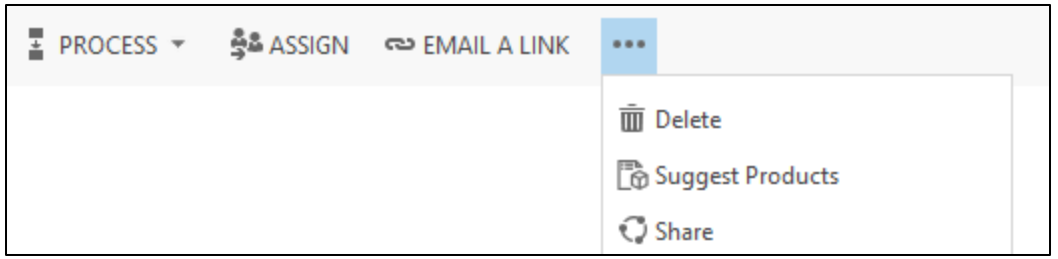
Microsoft Product Recommendation Solution

Dynamics 365 Product Recommendations preview

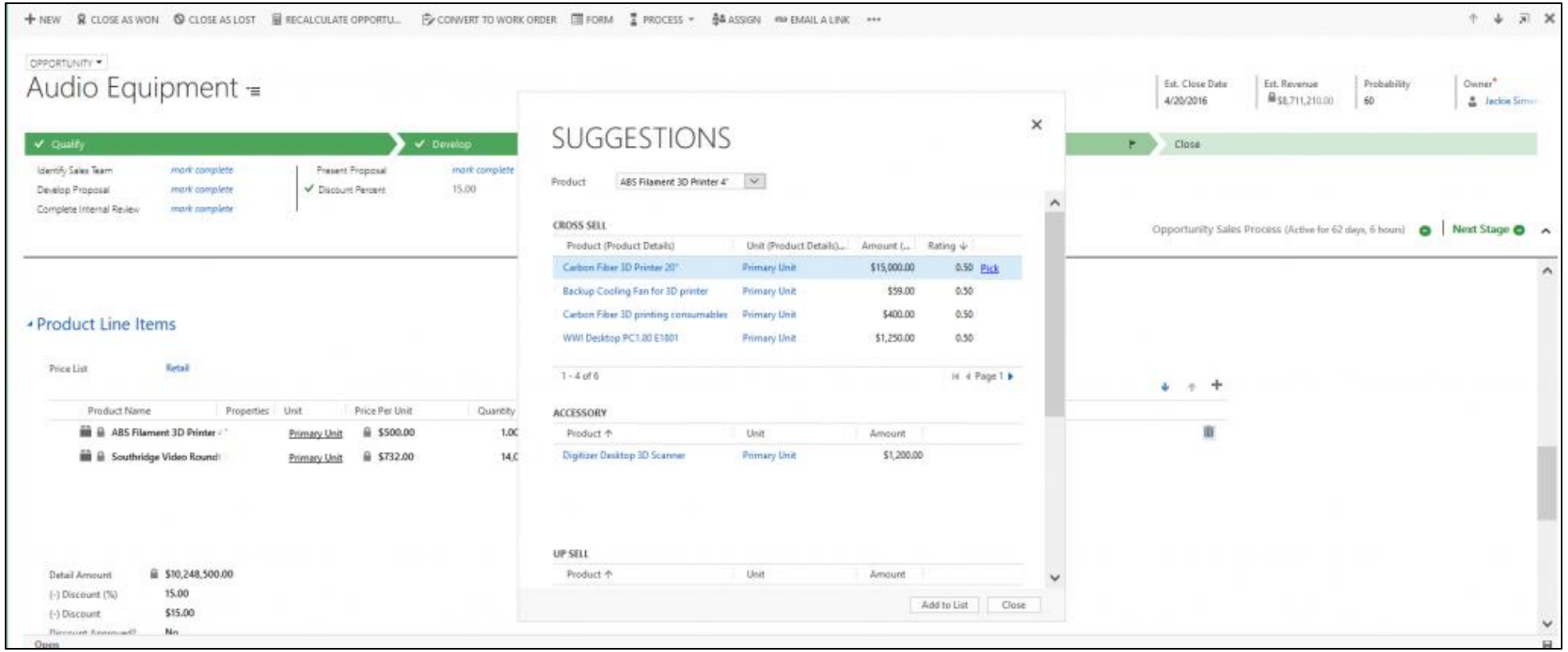


Dynamics 365 Product Recommendations preview





Dynamics 365 Product Recommendations preview



IPS + Dynamics 365

- IPS can be sent in (near) real near time to Dynamics 365
  - As a concrete entity
  - Inside a data lake and consumed via Virtual Entities
- Given a threshold you can, for each customer walk in, track his path inside the store
- Of course, the BLE Devices position in the store is fixed and the threshold must be very high
- Studying the customer's routes can help identify patterns
- IPS Geofencing

Demo

IPS Sample Data into Dynamics 365

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Recap + Grazie ☺

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