


A combination of SharePoint and CRM to ensure atomic transactions (Travel Agency example)



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CTO of CRM Department @ Delegate A/S

Office 365 Saturday Copenhagen

March 12, 2016

Agenda

- Matching of expectations
- Introduction: Speaker and Delegate A/S
- SharePoint and CRM
 - SharePoint Online + CRM Online = Match made in heaven
- Travel Agency
 - DDD/TDD approach
 - Demo (+code)
- Why TypeScript is a better choice (+code)
- Summary
- Q&A

Matching of expectations



Matching of expectations

- Our expectations are to show that it is possible to develop in the Cloud what you were able to do On-Premise. It might require that SharePoint development involve CRM since as it has the possibility to upload assembly files.
- The goal for this talk is to showcase that you can still code in the same way once you move to the Cloud. Code will be shown, because it is a technical talk, but the focus should be on the implemented business logic and less on the used tools.

Introduction: Speaker and Delegate A/S



Intro – Ramón Soto Mathiesen

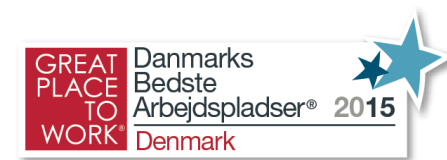
- Delegate A/S: 2013 -
 - Position: CTO of CRM Department
 - I am responsible for the department's technical vision and solutions, as well as the implementation of these visions and solutions to our customer projects.
 - CRM Projects: Schultz Information, William Demant Holding, Konica Minolta, Danske Fragtmænd, Radiometer, Jyske Bank, BRFkredit, Brüel & Kjær, ISS, ...
- Education: 2005 - 2010
 - M.Sc. in Computer Science, with minors in Mathematics (DIKU/HCØ/Pisa)
 - Microsoft certified: MCP + MCSA + MCSE + MCDBA + MCTS
- Founder and organizer of F#unctional Copenhageners Meetup Group
 - <http://www.meetup.com/MoedegruppeFunktionelleKoebenhavnere/>
- Blog
 - <http://blog.stermon.com/>



Intro – Delegate A/S



- IT-Consultancy known for their SharePoint solutions and established in 2006
- The CRM department was established in February 1, 2013 when I arrived. The head of our Department is Kaspar Bøgh Christensen, former Dynamics CRM director at Avanade, and we are a total of 13 consultants working at our two locations: Aarhus and Copenhagen
- The company's motto: "We must be the best, not necessarily the biggest"



Intro – Delegate A/S



@ GitHub



DAXIF#

Delegate Automated Xrm Installation Framework



Delegate.SPOcopy

SharePoint Online copy.



TS

XrmDefinitelyTyped

TypeScript Declaration File Generator for MS CRM



LotusNotesDumper

Lotus Notes to MS CRM + SP
(Coming soon)



C#

XrmContext

Tool to generate early-bound .NET classes for
server-side CRM coding.



f(x)RM

Functional Relationship Management
(Coming soon)



Delegate.Sandbox

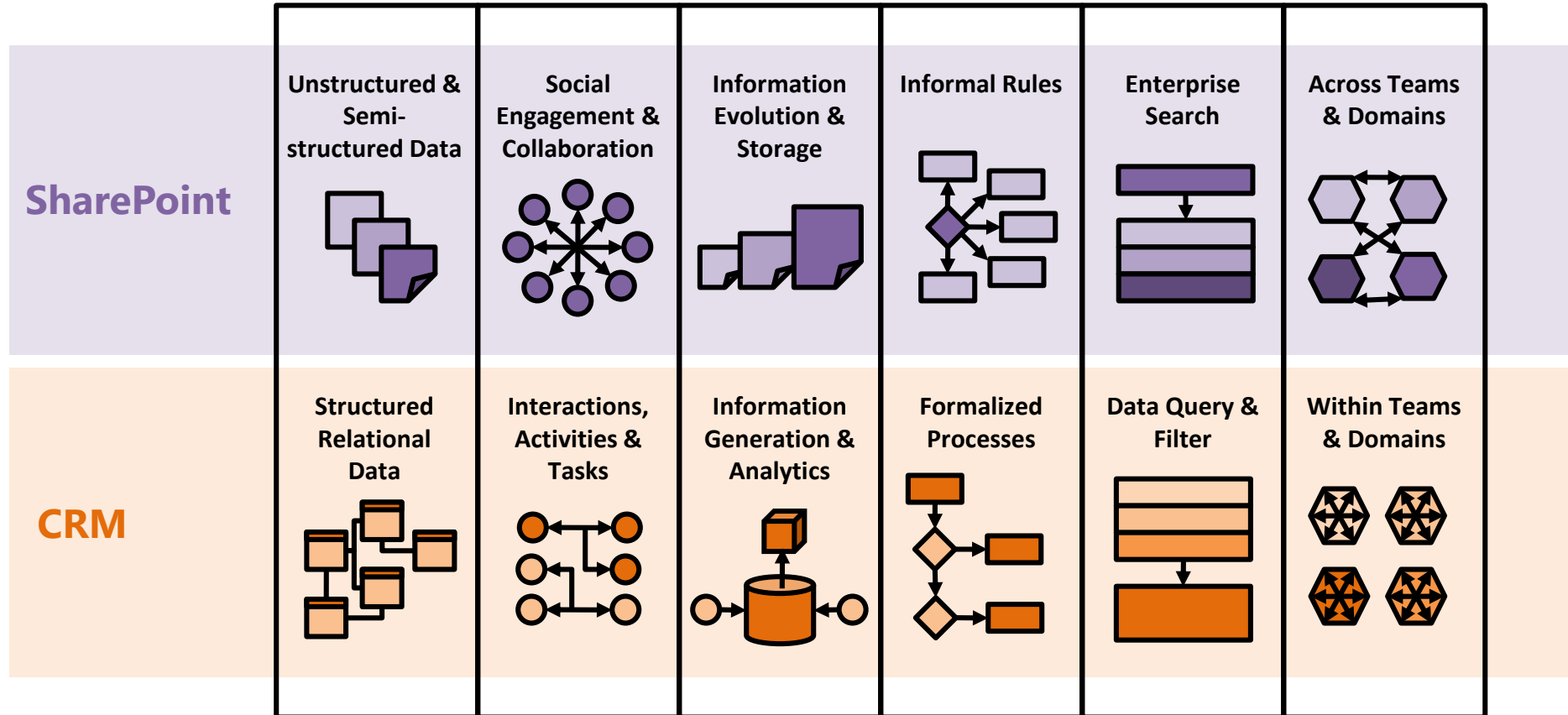
I/O side-effects safe code by using a sandbox
computation expression.

- Open Source Tools @ GitHub: <http://delegateas.github.io/> (I blog about Daxif, Twitter #HowToDaxif)

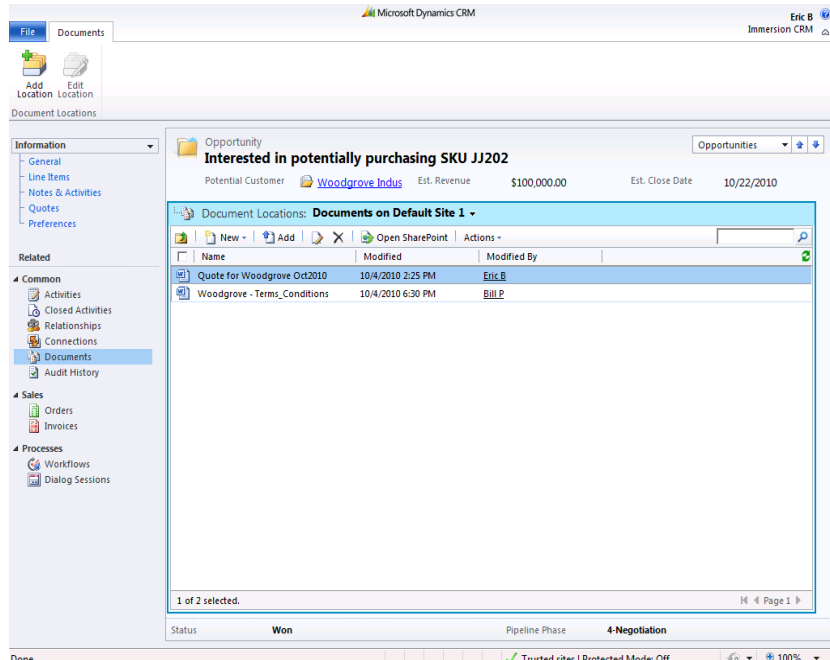
SharePoint and CRM



SharePoint and CRM



SharePoint and CRM



The screenshot shows the Microsoft Dynamics CRM interface. The main window displays an opportunity record for 'Interested in potentially purchasing SKU JJ202' with an estimated revenue of \$100,000.00 and a close date of 10/22/2010. Below the record, a 'Document Locations' pane shows a table of documents:

Name	Modified	Modified By
Quote for Woodgrove Od2010	10/4/2010 2:25 PM	Eric B
Woodgrove - Terms_Conditions	10/4/2010 6:30 PM	Bill P

The status bar at the bottom indicates the pipeline phase is '4-Negotiation' and the status is 'Won'. Below the screenshot, the text 'Out of the Box Experience' is displayed on an orange background.

Document Library
per CRM entity

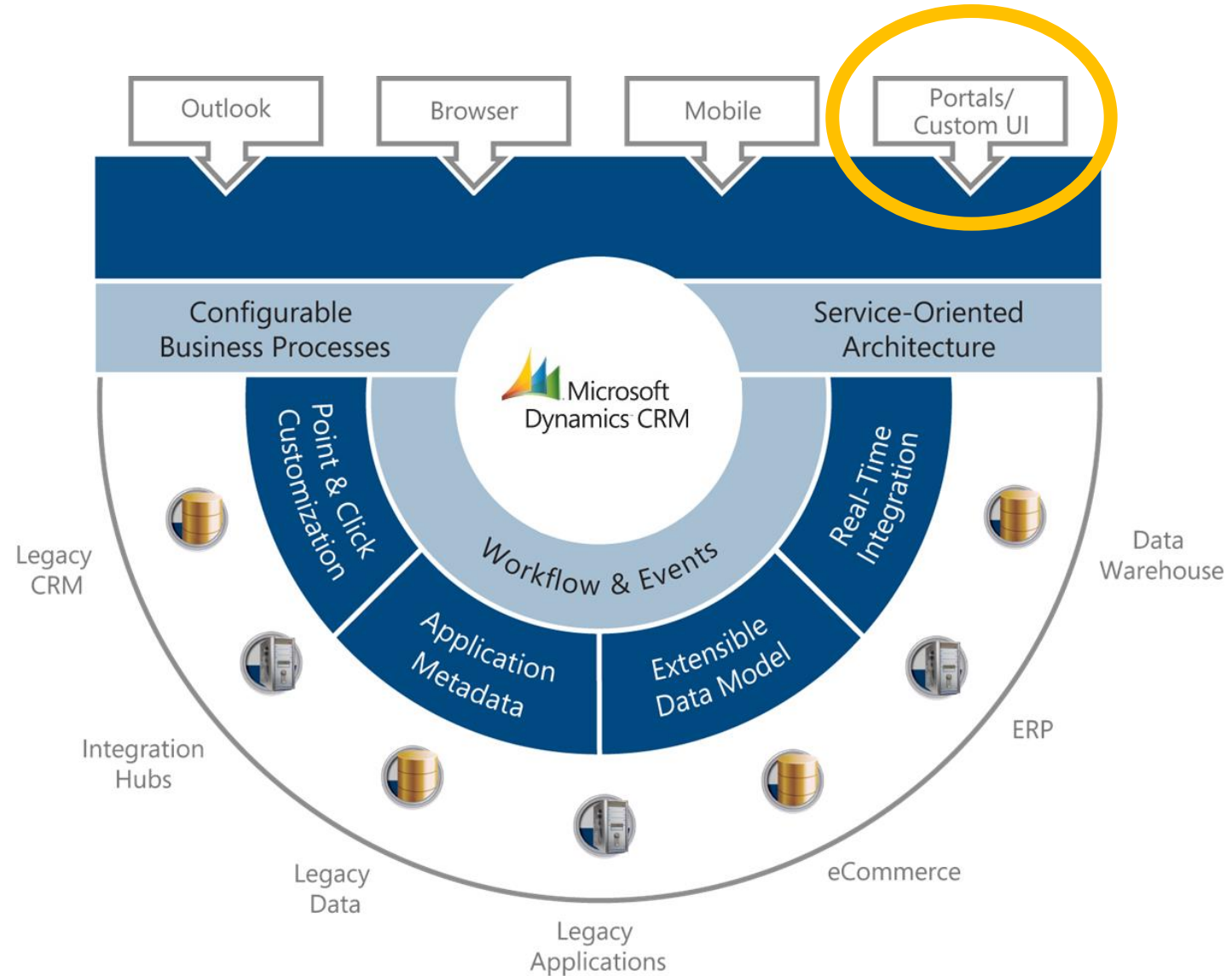
Folder per CRM
record

Mainly: Visual
Application
Integration

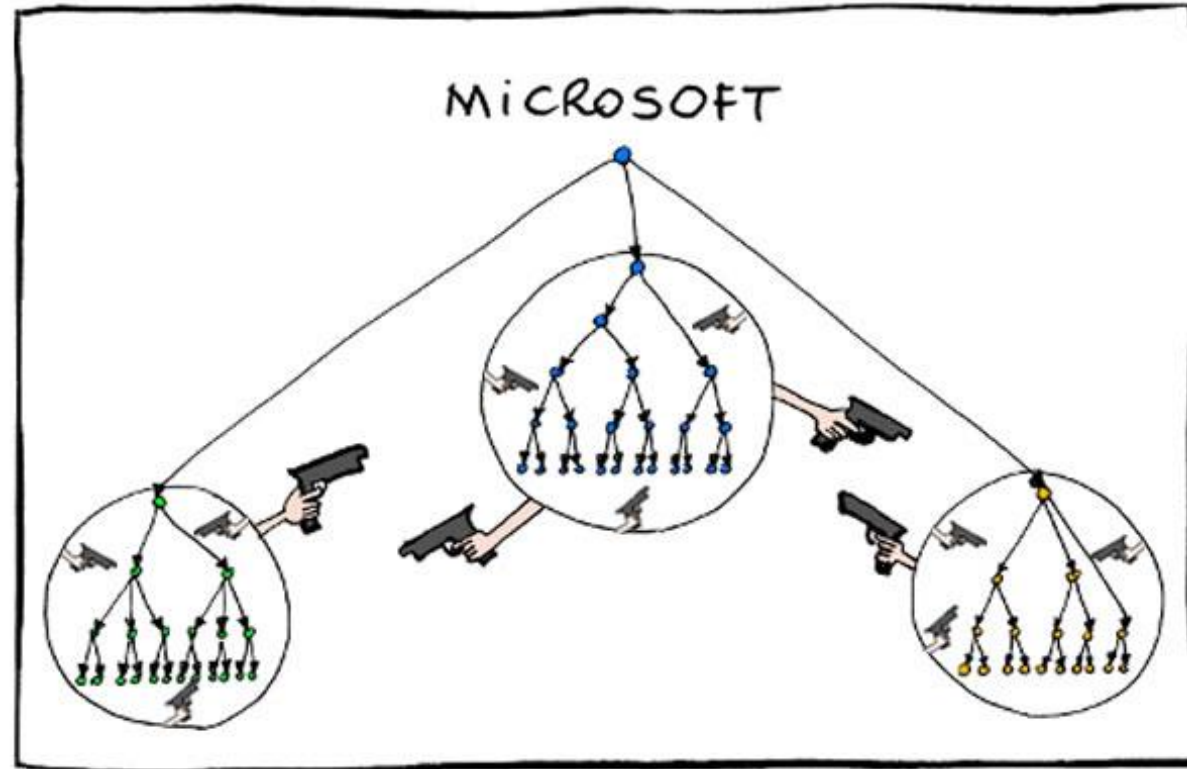
No Metadata /
Attribute
Synchronization

- Out-of-the-box (OOB):
 - SharePoint Document Management in CRM. Two Step Setup:
 - Install SharePoint WSP
 - Configure CRM Locations & Entities

SharePoint and CRM



SharePoint and CRM



But as the "good old Microsoft" we are not very prone to collaborate ... until now

SharePoint Online and CRM Online

- Match made in heaven
 - As SharePoint Online can't upload assemblies we can fallback on MS CRM Online, which does
 - MS CRM is built-in on top of a relational database and we can expand it's kernel by hooking into pre- or post- events. This allows us to perform atomic transactions (either all succeed or we rollback):

```
begin trans
  begin trans
    // our pre events
  commit/rollback trans
  begin trans
    // Microsoft events
  commit/rollback trans
  begin trans
    // our post events
  commit/rollback trans
commit/rollback trans
```

- Lightweight communication between the systems is done by using MS CRM new WebAPI and Single Page Applications (SPA) combined with **adal.js** and Cross-origin Resource Sharing (CORS) support
- We would love to show this with TypeScript but ... (more on this, later on)

Travel Agency



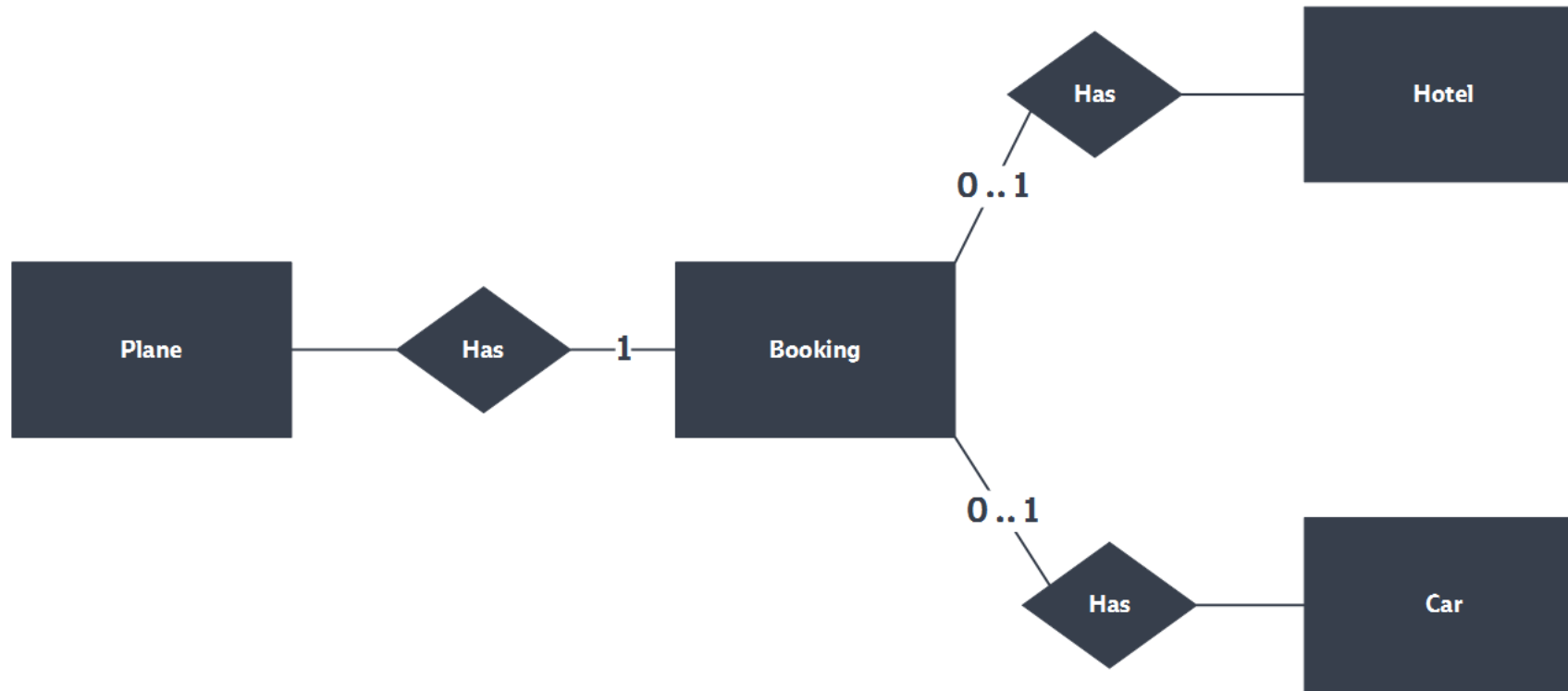
Travel Agency

- DDD/TDD approach
- Demo
 - SharePoint Online for known UI
 - CRM Online for backend consistency

Domain/Type-driven design (DDD/TDD)



Domain represented as an ER diagram



Domain represented as types

```
type Booking =  
  | Basic of Plane  
  | Combo of Combo  
  | FullPack of Plane * Hotel * Car  
and Plane = { Outbound: DateTime; Return: DateTime; Destination: Country }  
and Combo =  
  | ``With Hotel`` of Plane * Hotel  
  | ``With Car`` of Plane * Car  
and Hotel = { Arrival: DateTime; Departure: DateTime; Location: Country }  
and Car = { From: DateTime; To: DateTime; Location: Country }  
and Country = { Name: String; ``ISO 3166-1``: char * char }
```

Demo (+code)



SharePoint Online for known UI

The screenshot shows a web browser window displaying a SharePoint Online page for a travel agency. The browser's address bar shows the URL `https://spbgoffice365travel...` and the page title is "Travel Agency - Home". The browser's menu bar includes "File", "Edit", "View", "Favorites", "Tools", and "Help". The browser's toolbar shows various navigation and utility icons, including a star for favorites, a gear for settings, and a smiley face for extensions. The page's navigation bar includes "BROWSE" and "PAGE" tabs, along with "SHARE", "FOLLOW", and "EDIT" options. The main content area features a large image of world landmarks (Shard, Taj Mahal, Leaning Tower of Pisa, Big Ben, Colosseum, Eiffel Tower, Statue of Liberty, Pyramids) and an airplane flying over a cloud. Below the image is a table with four buttons: "Get Planes", "Get Hotels", "Get Cars", and "Book". The footer of the page contains a JavaScript console error: `javascript:WebForm_DoPostBackWithOptions(new WebForm_PostBackOptions("ctl00$site_follow_button", "", true, "", "", false, true))`. The browser's status bar shows a zoom level of 155%.

Get Planes	Get Hotels	Get Cars
Book		

CRM Online for backend consistency

The screenshot displays a CRM Online interface for managing travel agency data. The browser window shows the URL `https://spbgoffice365travel...` and the page title "Planes Active Planes - Micros...". The navigation bar includes "Travel Agency" and "Planes". The toolbar contains actions: NEW, EDIT, ACTIVATE, DEACTIVATE, DELETE, ASSIGN, SHARE, EMAIL A LINK, and RUN WORKFLOW. The main content area shows a list of "Active Planes" with a search bar and a table of records.

Name	Outbound	Return	Country
SAS SK-1234 Madrid	3/13/2016 8:00 AM	3/19/2016 4:00 PM	Spain
SAS SK-4321 Milano	3/13/2016 8:00 AM	3/19/2016 4:00 PM	Italy

1 - 2 of 2 (1 selected) Page 1

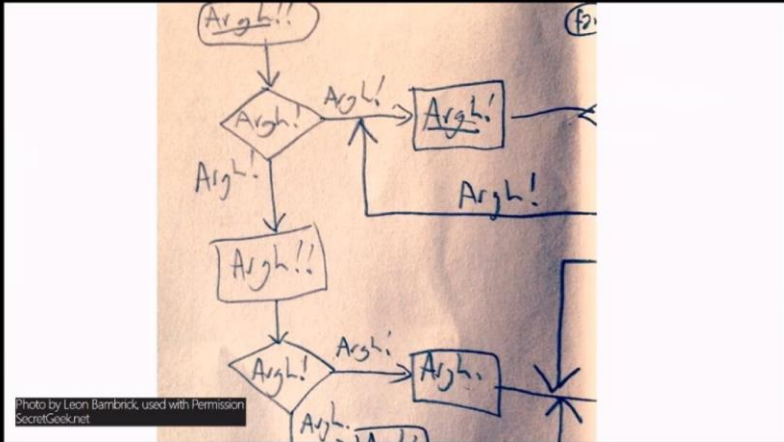
All # A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

155%

Why TypeScript is a better choice



Working with JavaScript



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Experiencing a lot of pain ...



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Expectations ...

Working with JavaScript



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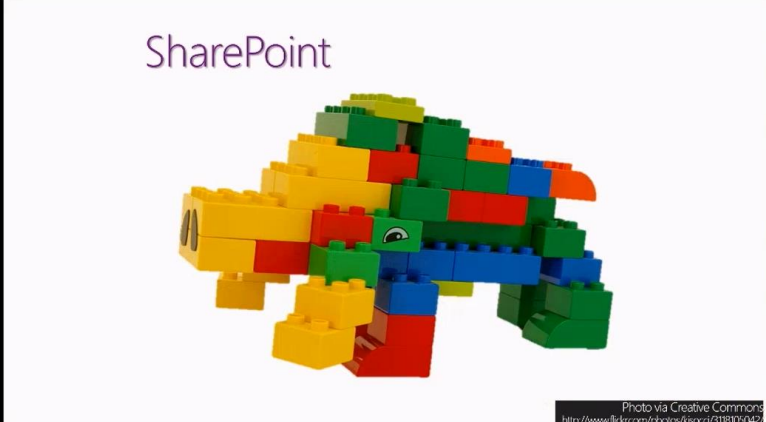
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since 2008



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... what is being delivered

SharePoint



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since 2008




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And whom to blame

Working with JavaScript

- Very funny NDC London 2016 Keynote by Scott Hanselman (go watch, but not now 😊):
 - Vimeo: <https://vimeo.com/153120762>

Working with TypeScript

- To the more serious part, Scott Hanselman defines TypeScript as: “How JavaScript should have been done, from a C# perspective”
- Since most of us work with C# on a daily basis and we love to find our errors at compile time (happy customers) and not runtime (less happy customers)
- So what is TypeScript? TypeScript is an open-source, typed superset of JavaScript that compiles to plain JavaScript. It provides static typing, classes and interfaces. One of the big benefits is to enable IDEs to provide a richer environment for spotting common errors as you type the code by generating TypeScript declaration files (.d.ts) based on a specific domain. As it will not add any additional JavaScript code, therefore, the new TypeScript code will be just as efficient as your old JavaScript code

Working with TypeScript

- We have a tool (OS) to generate declaration files based on MS CRM OData v3 interface:
 - Delegate.XrmDefinitelyTyped: <http://delegateas.github.io/Delegate.XrmDefinitelyTyped/>
- But the new OData v4 it's a bit more complex to work with. One of our co-workers have made a tools that is in pre-alpha (use it at your own risk) :
 - SJKP.ODataToTypeScript: <https://github.com/sjkp/SJKP.ODataToTypeScript>
- We might have to wait until Microsoft provides "something" to get inspired ☺

Working with TypeScript

```
dg.booking.ts  X
WebResources  {} DG.Booking  Form
1  /// <reference path="../../typings/xrm/base.d.ts" />
2  /// <reference path="../../typings/xrm/dg.xrmquery.d.ts" />
3
4  /**
5   * Replace the following reference with the corresponding form this javascript should be used for
6   */
7  /// <reference path="../../typings/xrm/form/dg_booking/main/information.d.ts" />
8  module DG.Booking {
9     var Form = <Form.dg_booking.Main.Information>Xrm.Page;
10    export function onLoad() {
11        // Attach onSave
12        Form.data.entity.addOnSave(onSave);
13
14        // Attach onChange
15        Form.getAttribute("dg_plane").addOnChange(fooChange);
16    }
17    export function onSave() { /* Do something .. */ }
18    export function fooChange() { /* Do something .. */ }
19
20    /**
21     * Big showcase of what XrmQuery is capable of
22     */
23    function bigQueryExample() {
24        XrmQuery.retrieveMultipleRecords(x => x.dg_hotel)
25            .select(x => [x.dg_name, x.dg_Arrival, x.dg_Departure])
26            .expand(x => x.dg_dg_country_dg_hotel_Country, x => [x.dg_ISO3166Code])
27            .filter(x =>
28                Filter.and(
29                    Filter.or(
30                        Filter.equals(x.statecode.Value, dg_hotel_statecode.Active),
31                        Filter.equals(x.statuscode.Value, dg_hotel_statuscode.Active)),
32                    Filter.equals(x.dg_Booking.Id, Filter.makeGuid("0000-SOME-GUID")))
33                )
34            .orderDesc(x => x.dg_Arrival)
35            .top(5)
36            .execute(accounts => {
37                // Do something here with the retrieved accounts
38            },
39            error => {
40                // Note: The error and onComplete callbacks are optional arguments to the .execute function
41                Form.ui.setFormNotification(error.message, "ERROR", "someUniqueId");
42            }); } }
```



Working with TypeScript

Note: TypeScript is designed by Anders Hejlsberg who is a Technical Fellow at Microsoft. Anders, fellow Dane, also designed C#, but most of you probably already know this 😊



Summary



Summary

- We wanted to show that it is possible to develop in the Cloud what you were able to do On-Premise.
- By following MSDN articles it's very easy to get a simple Single Page Applications (SPA) up and running in no time
 - Note: An Azure subscription must be used to bind the SP SPA to CRM
- Complexity of the new WebAPI made us not show TypeScript in code, but I hope we have convinced you to begin to use it.
 - Note: We are working on tools that will auto generate declaration files for OData v4 as we have done for OData v3
- Code available @Github: <https://github.com/delegateas>

Q&A – Questions and Answers



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