

Max's Distinctive, Impressive BizTech Student Blog

Thursday, November 3, 2016

Data Fright II: Like Deja Vu All Over Again

So you know in scary movies, how at the end, the monster/bad guy/whatever finally gets killed in some heinous fashion and everything's all good and everyone's all relieved but then, magically, he pops up & starts terrorizing again one last time? And you can kind of tell, just before it happens b/c things seem a little too ok? (*And the credits didn't start rolling yet?*)



So yeah, welcome to my reality. After my last post, I *knew* my app was way better, more logical, but I had this sneaking suspicion that something still wasn't quite right...something heinous was still lurking in the shadows. Something...clone-y. *Hate* that thing. Ok. So.

It was a dark & stormy night...(not really, but...)...I was all alone in the house (ok, my dorm room, actually) and something made me open up SF. Slowly I typed. Tap...tap...tap. Follow along if you dare. Those with heart conditions may wish to refrain.

First, to truly see how the data monster rose again, we need to fill in the rest of your **Meeting** data. Don't worry. I did all the typing so you don't have to. (After making you type stuff in & then delete it last time, hey, I owed you.)

So I made an import file of data that was sitting in **Pitch** before we knew it didn't belong there—**Contact Name**, **Email Address**, **Comments**, etc. so you can just import it straight into that new **Meeting** object you added last time. (Oh, and I also added data values for your **Enthusiasm** field, to be super-complete.)

Now, this import's a little trickier than the one you did before back in the Slicer/Dicer post b/c you have to connect the **Meeting** records to the **Pitch** records they go with, so be safe—don't text & type! Just follow closely & no one gets hurt:

1. First, click the link below to download the **Meeting** data file. (If you're using Windows and certain browsers, you might need to option-click the link and select **Download**. If it opens in Excel—just save it out as a file with the .csv extension. You just want to place it on your desktop or somewhere you can find it a few steps from now to bring the data into SF.)

<http://tiny.cc/MaxsMeetingData>

2. Then, in SF, go to **Setup > Administer > Data Management > Data Import Wizard**
3. Click on the green **Launch Wizard** button
4. Under “**What kind of data are you importing?**” click the **Custom Objects** tab. That should show **Meetings** and **Pitches** below.
5. Click on **Meetings** this time. That will open a middle box labelled **What do you want to do?**
6. Click on **Add new records**
7. *****NOW***** the slight twist—near the bottom of the center panel, where it says **Which Pitch field in your file do you want to match against to set the Pitch lookup field?**, pop open the menu labelled **--None--** and select **Pitch Name**
8. Then in the right hand column of the page, you'll see where you can drag that .csv file onto the panel labeled **Drag CSV file here to upload** so drag and drop it there now
9. Once you have the file selected properly, the green **Next** button that was dimmed before should be bright, inviting you to click it, so go ahead and click **Next**
10. The next page that appears, **Edit Field Mapping: Meetings**, should show a perfect match between the SF **Meeting** object's field names and the column headers in the .csv file and it even shows you samples of the data that will be going in
11. Click the green **Next** button
12. The next page that appears should say you have 7 mapped fields (and 0 unmapped ones) and then you can just click the green **Start Import** button
13. A popup window should appear with a congratulations and you can just click **OK**
14. You'll get an email saying your import is complete
15. Then you should see a page of stats you can ignore about the import

Now, to make sure that all worked, you need to make a **Meetings** tab:

16. Go to **Setup > Create > Tabs**
17. Under **Custom Object Tabs** click **New**
18. Pull down the **Object** menu & select **Meeting**
19. Click the magnifying glass next to **Tab Style** & click on the cute little red **Presenter** dude
20. Click **Next, Next & Save**

Now create a view that'll show everything in the **Meeting** records:

21. Click your new **Meetings** tab, up there next to the **Pitches** one & click **Create New View**
22. For **View Name** enter “All Meeting Data”
23. Tab to autofill **View Unique Name**
24. Scroll down to the **Step 3. Select Fields to Display** section
25. In the **Available Fields** list, click **Meeting Date** to highlight it and then click the right arrow button under **Add** to move it into the **Selected Fields** list
26. Repeat the last step for **Contact Name, Email, Mobile, Enthusiasm & Comments**
27. Scroll down and click **Save**

Now you should see all the **Meeting** data with the three records you created last time for the meetings with Julia Chavez at the top. Below that—ten new records of meeting data taken from fields that weren't supposed to be in **Pitch** records, eg. the contact info, comments, etc. Ok. They're all there but are they really each connected to the right **Pitch** records? Let's see:

28. Click on **Edit** for the 9/15/16 meeting with Maria Valducci
29. The meeting details page shows this meeting is connected to **Pitch P-007**—click the little magnifying glass just to the right of the **Pitch** slot so you can see if that's the right one
30. In the popup window that appears, you can see that **Pitch P-007** was made to Valducci Amalgam—yep, that's her angel firm, alright. Amazing, eh?
31. In the **Search...** textbox at the upper left of the popup window, replace the highlighted “P-007” with “P” and click **Go!** (matches all **Pitch** IDs that start with “P”)
32. Now you'll see a list of all the **Pitch** records and you could click one of those **Pitch** IDs to reassign this meeting to a new **Pitch**—go ahead! Pick a wrong one if you want—it'll be ok!
33. Now you're back on the edit page so just click **Cancel** so you don't save your change

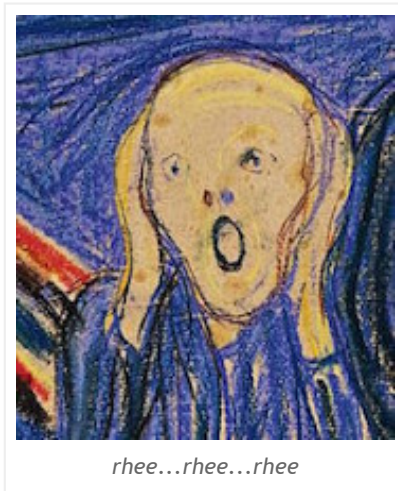
Just to be sure, check that **Pitch** records are connected to the right **Meeting** records too:

34. Click on any one of the **Meeting** ID's in the list
35. On the **Meeting** Detail page, click on the **Pitch** ID for that meeting to open that **Pitch** Detail page and find the related list of **Meetings** section you added to that layout last time

Slick, eh? Seems like life is all good. We killed the dupe monster at the end of the last episode, right? But wait...the credits aren't rolling yet <sigh>:

36. Click on your **Meetings** tab, make sure the **View** menu says “All Meeting Data” & click **Go!**
37. Click on the **Contact Name** header to sort the records alphabetically by **Contact Name**

Now take a closer look at the Julia Chavez records. Notice anything...uh...dupe-y looking?



Remember, at the end of last time, you were pretending to be Riley. You had three meetings with Julia Chavez so you created the first meeting record and then cloned it twice to save time, right? (My bad—I told you to.) But you were duplicating her phone number and email address each time. See?

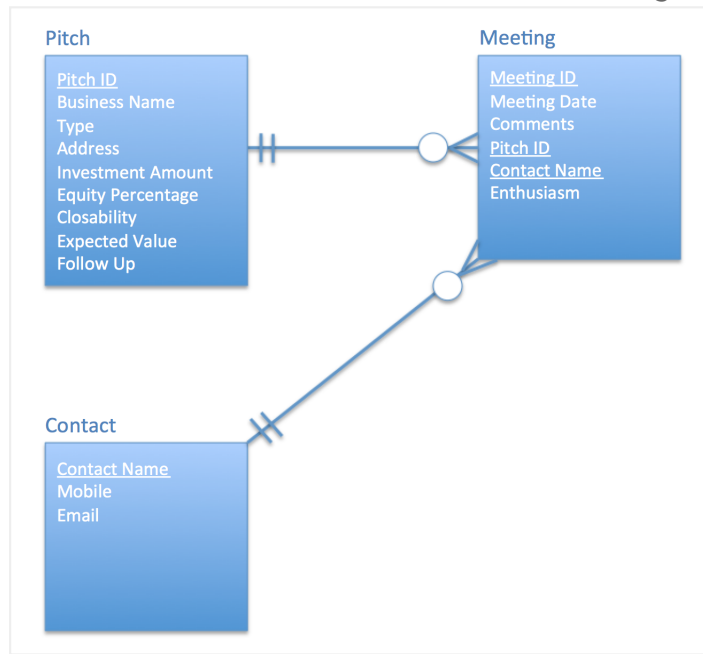
What if I tell you she just changed her phone number to (408) 812-1223 or has a new email address? You would have to make sure you change it in all three of her meeting records or...yup, lost integrity again. That's what happened with my app for Riley. Major :(

Breaking Up, New Relationships & Becoming Normal(-ized): A Database Therapy Session

Last time, getting the meeting fields out of the **Pitch** object got rid of duplicated street address data for the businesses—one address for one pitched firm record, connected to all its meeting records—the famed “one to many relationship,” right?

So why was there still duping happening? Finally lightning hit me (not literally, thank god)—*One contact has one phone number, one email, etc. but can attend many meetings. The “many meetings” part is what’s causing the duping, just like with Pitch before.*

Solution? Another breakout—**Contact** needs to be its own entity (object) too! One name, email and phone number for each contact, stored once and connected to that contact’s meeting records by a relationship so you can still find the contact info for who was at a meeting when you need to.



In SF, you’ll just replace all the contact info fields in the **Meeting** object with a single lookup field for **Contact**, where you can “look up” the contact info for a **Meeting** record when you need to.

Oh, and there’s one nice surprise to save you time. Turns out the **Contact** object is already there. It’s a built-in (“standard”) object in SF, so you don’t have to create one. And it’s already got most every field you could ever want. Since you can keep the contact info in **Contact** from now on, just delete those fields from **Meeting**:

38. Go to **Setup > Create > Objects > Meeting**
39. Scroll down to **Custom Fields & Relationships** and click **Del** next to **Contact Name**
40. Click the checkbox for **Yes, I want to delete the custom field.** & then click **Delete**
41. Do the same thing to get **Mobile** and **Email** out of the **Meeting** object

Yay, duplicate data destroyed by arranging the data model to reflect the underlying relationships among the fields—“normalization,” Prof says. But you will still need to be able to find the contact info for the people at meetings when you need it, so you have to connect up the **Meeting** records to their corresponding **Contact** records. Easy—just add a **Lookup Relationship** field to **Meeting**:

42. Still on the **Meeting** object page, under **Custom Fields & Relationships**, click **New**
43. Select **Lookup Relationship** & click **Next**

44. On the **Related To** drop-down menu, select **Contact** (NOT ContRact!) and click **Next**
45. **Field Label** shows “Contact” but change it to “Contact Name”
46. Tab to autofill **Field Name**
47. Check the checkbox for **Always require a value in this field in order to save a record** b/c, honestly, a meeting really needs to have someone for you to meet with otherwise it would be woefully pointless, right? (That little bar on the E/R diagram, the 2nd nearest one to **Contact**, says there has to be a **Contact** record associated with every **Meeting** record.)
48. Click **Next**, **Next**, **Next** & **Save**

Now that **Meeting** records can connect to **Contact** records, you can find one of Julia’s meetings and, using that, you can create her **Contact** record & connect it to that meeting at the same time:

49. Click on your **Meetings** tab
50. Select the **All Meeting Data** view and click **Go!**
51. Under **Action**, click **Edit** for the 10/7/2016 record (that was the 1st meeting with Julia)
52. On the edit page, find the new **Contact Name** field you just added—the one that connects to the **Contact** object record—and click the magnifying glass to popup a **Lookup** window
53. There are a bunch of fake contacts in there—SF comes with some for practice—but not Julia Chavez yet so you need to add her by clicking **New**
54. Now fill in the **First Name** and **Last Name** slots with...“Julia” and “Chavez” of course
55. Enter “julia.chavez1981@gmail.com” for **Email**
56. Enter “(510) 403-8995” for **Phone**
57. Skip the other fields & just click **Save** at the bottom to create Julia’s new **Contact** record
58. Back on the 10/7/2016 **Meeting** page, Julia’s name is there now so click **Save** for that record

Now that Julia’s got a record in the **Contact** object you can easily connect her other meeting records to it. First, connect up the 10/21/16 meeting:

59. Click **Edit** for the 10/21/16 Julia Chavez **Meeting** record
60. Click the magnifying glass next to **Contact Name**
61. In the **Lookup** window that pops up, “Julia Chavez” should appear (if not, you could easily look her up by typing “Chavez” into the **Search...** slot) & just click on her to fill in the slot
62. Now you’re back on the meeting record edit page and just click **Save**

Now you’re back on the list of **Meeting** records and you need to connect the last Julia Chavez meeting record, the 10/31/16 meeting record, to her **Contact** record:

63. Click **Edit** for the 10/31/16 Julia Chavez **Meeting** record
64. Click the magnifying glass next to **Contact Name**
65. In the **Lookup** window that pops up click on “Julia Chavez”
66. Now you’re back on the edit page and just click **Save**

Cool. Now to be complete, you’d still need to create **Contact** records for the rest of the contacts & connect the meeting records to them, but let’s not take the time. You get the point, right?

See, by eliminating the fields that had been duped for contacts with multiple meetings like Julia, we got rid of the duped contact data (eg multiple copies of her email address & phone). Now, those things appear just once on her one **Contact** record. Yay. The good ole one-to-many relationship saves the day, right? Wrong (sorry). I thought so too but...credits still aren’t rolling quite yet, sorry.

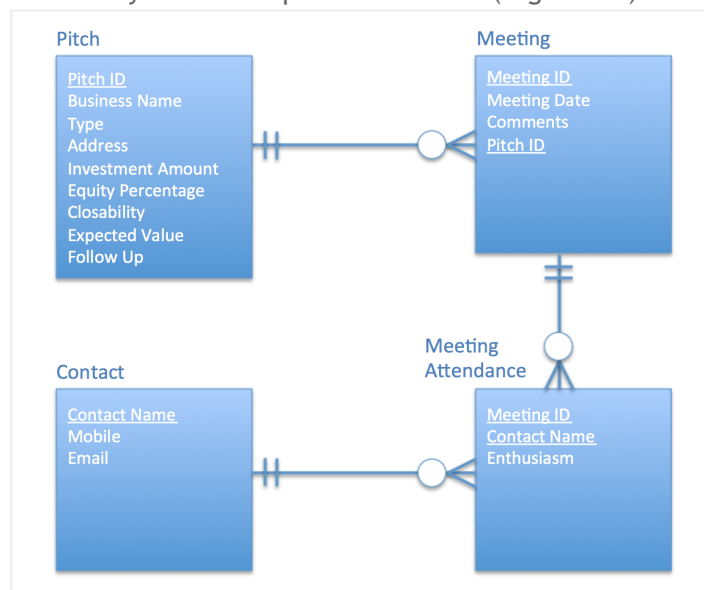
Let's say you're Riley again, like last time, and after your 3rd meeting with Julia at Spray & Pray, she emailed you—says she invited two of her colleagues at the firm to join you & her at the next meeting, on 11/15. Hmm...now you have *three* contacts for this *one* meeting. Which one's **Contact Name** would go in the lookup field for the 11/15 **Meeting** record?

One Many-to-Many is One Too Many

So now the sad truth comes out! One contact can be at many meetings (got that covered) AND one meeting can have many contacts attending (not covered—ouch)! Not a “one-to-many” after all—it's the dreaded <dum-da-da-dum> “many-to-many,” scourge of the database universe. Oh, sure, you can draw it on paper in your E/R diagram. But can you build a many-to-many in SF or in any other database system? Uh-uh.

And even if you could, where would you put the **Enthusiasm** field? It's supposed to tell how enthusiastic one specific contact was at one particular meeting. It can't stay with **Meeting** (every contact at that meeting gets their own value). And it can't go with **Contact** (each one gets multiple **Enthusiasm** ratings, one for every meeting they attended, like Julia Chavez did). Soooooo? Two words: “junction entity.”

Prof told us many-to-many relationships between two entities can be replaced by two (2) one-to-many relationships that link *both* entities to a “junction” entity, inserted in-between. We'll call our junction entity **Meeting Attendance**. Then **Contact** and **Meeting** would each have a one-to-many relationship to it, instead of a many-to-many relationship directly to each other. A **Meeting Attendance** record could show that this one **Contact** (say “Julia Chavez”) attended this one **Meeting** (on 10/21) and that day she was super enthusiastic (e.g. a “5”). Here's the new pic:



In case you don't know the markings, they go like this:

- a crow's feet symbol means “there might be many of these for one of those (at the other end of the relationship),”
- a circle means “there might be none of these for one of those,”
- a bar closest to the entity means “there can be no more than one of these for one of those,” and
- a bar farther from the entity means “there has to be one of these for every one of those.”

So yeah, a **Pitch** might not have any meetings set up yet or it might have several. But, going the other direction, one particular **Meeting** had better be for exactly one **Pitch**. No more, no less.

A **Meeting** might have a bunch of **Meeting Attendances**, one for each of the contacts that you met with at that meeting. But there better be *at least* one.

A **Meeting Attendance** record definitely needs a **Meeting** to connect to AND a **Contact** to connect to, too. Makes no sense to record a **Enthusiasm** rating without *both* of those, right?

Now, to make the E/R diagram happen in SF, you're going to need to create a junction—a custom object called **Meeting Attendance** with just an **Enthusiasm** field and two lookup fields—one for **Contact** and one for **Meeting**, to make the connections (relationships). So one **Enthusiasm** rating goes with one combination of one **Contact** and one **Meeting**. Piece-a-cake.

K, so first create your junction object, **Meeting Attendance**:

67. Go to **Setup > Create > Objects > New Custom Object**
68. For **Label** enter “Meeting Attendance”
69. For **Plural Label** enter “Meeting Attendances”
70. **Object Name** should be autofilled already as “Meeting_Attendance”
71. Edit **Record Name** to be “Meeting Attendance ID”
72. For **Data Type**: Auto Number
73. **Display Format**: {0000}
74. **Starting Number**: 1
75. Just in case, check the **Optional Features** boxes to **Allow Reports** and **Allow Activities**
76. Click **Save**

Now, add the relationship-making fields to **Meeting Attendance**—one connecting it to **Meeting**, and another connecting it to **Contact**, like in the E/R diagram above. Like before, you make a one-to-many relationship by adding a custom field at the “many” end so each record there will contain the ID number of the linked record at the “one” end. So first, add a field to **Meeting Attendance** for connecting it to **Meeting**:

77. Under **Custom Fields and Relationships**, click **New**, then select the data type **Lookup Relationship**, click **Next**, and then, on the **Related To >** menu, select **Meeting** to add a field (**Field Label** = “Meeting ID”) that will be used to connect each **Meeting Attendance** record to the right **Meeting** record (check the **Required** checkbox, the **Nexts** & then **Save & New**)

Now in the next step you're going to almost repeat the last step but this time connecting **Meeting Attendance** to **Contact** (careful! - do NOT choose ContRact by mistake!):

78. Use the data type **Lookup Relationship** again but then, on the **Related To >** menu, select **Contact** to add a field (**Field Label** = “Contact Name”) that will connect these **Meeting Attendance** records to the right **Contact** records (check the **Required** checkbox again, the **Nexts** and then **Save & New** again)
79. Note: For both of those fields, SF automatically checked **Don't allow deletion of the lookup record that's part of a lookup relationship**. That's good. It prevents someone deleting a **Meeting** record that a **Meeting Attendance** record is connected to. Can't have a meeting attendance with no meeting—bad “referential integrity,” Prof calls it. To delete a **Meeting** record, just delete all it's **Meeting Attendance** records first. (Same w/**Contact** records.)

Finally, **Enthusiasm**. We already have an **Enthusiasm** field in the **Meeting** object, but now we know it belongs here in **Meeting Attendances** instead b/c it's unique to each *combination* of a **Meeting** and a **Contact** at that meeting. We'll delete it from **Meeting** in a sec, but first add it here:

- 80. For data type pick **Number**, for **Field Label** enter "Enthusiasm" and set **Length** = 1, **Decimal Places** = 0 & then click the **Nexts** & then **Save**

Now, back to the **Meeting** object. It's still connected directly to **Contact** and we now know that's wrong. To disconnect it, just delete the **Lookup Relationship** field you added there before. And then delete the **Enthusiasm** field (b/c it's in **Meeting Attendance** now), so:

- 81. Go to **Setup > Create > Objects > Meeting**
- 82. Scroll down to **Custom Fields & Relationships** and click **Del** under **Action** next to the **Contact Name** field and finish off the deletion
- 83. Now go back to **Custom Fields & Relationships** and click **Del** under **Action** next to the **Enthusiasm** field and finish off that deletion

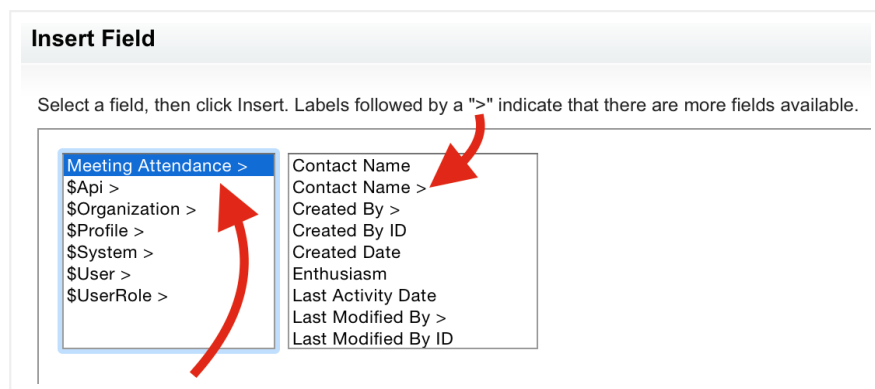
Now the database structure in SF (the "schema") matches the E/R diagram & Riley can add all four contacts for the next meeting with Spray, each with their own enthusiasm ratings, & no duping!

Cool. But...uhm...the data's all broken up. Is that ok? What if you wanted to get email addresses for all contacts for pitched firms in Mountain View, for example, to invite them to a demo reception you're holding downtown next week? Could you?

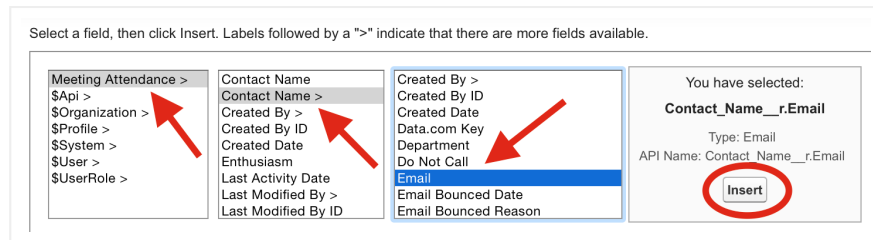
After a Breakup, Can Fields Still Be Friends? (& Hang Out Together?)

Totally. The formula data type lets you add "virtual" fields that trace across relationships to bring in values from other objects! Let's create some virtual fields in the **Meeting Attendance** object so, when it's displaying a record, it pulls in the values we need from the **Contact** object (**Email**) and from the **Meeting** object (**Pitch ID**) which then pulls in the corresponding values of **Address** from the **Pitch** object. Then we can use a view to extract just the ones with Mountain View addresses:

- 84. Go to **Setup > Create > Objects > Meeting Attendance**
- 85. Under **Custom Fields & Relationships** click **New**
- 86. For **Data Type** select **Formula** and click **Next**
- 87. For **Field Label** enter "Email" and then tab to autofill **Field Name**
- 88. For **Formula Return Type** select **Text** and click **Next**
- 89. Make sure the **Advanced Formula** tab is selected
- 90. Click the **Insert Field** button to open a popup window with **Meeting Attendance >** highlighted in the listbox on the left (the > means "this one connects to more fields")



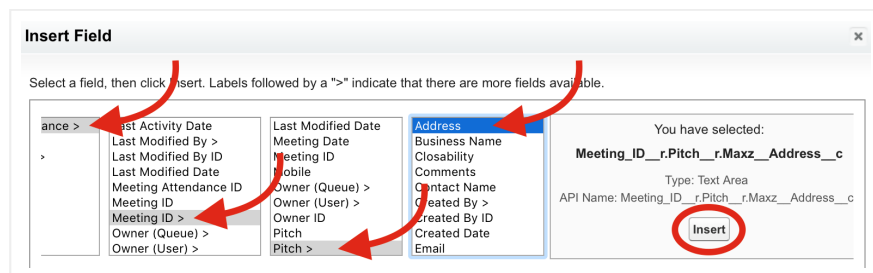
91. In the listbox on the right, you see the list of **Meeting Attendance** fields, including lookup fields you can follow to select fields from the objects at the other end of those relationships
92. Click **Contact Name >** (here the ">" means *the relationship to Contact*) to open a third listbox of fields at the other end of that relationship which can now be brought in virtually, so corresponding values from **Contact** will appear when a **Meeting Attendance** record is being viewed
93. Scroll down in that third listbox to find **Email** and click to highlight it
94. A fourth box will appear saying you have selected **Contact_Name__r.Email** which, to SF, means "follow along the **Contact Name** relationship to **Contact** and get the **Email** value"



95. Click the **Insert Button**
96. Click **Next, Next, Save & New**

Now add another virtual field using the formula approach, this time for the **Address** of the pitched firm, pulled all the way from the **Pitch** object by following the relationship to **Meeting** and then from **Meeting** to **Pitch**:

97. Select **Formula** and click **Next**
98. Enter "Address" for **Field Label**
99. Tab to autofill **Field Name**
100. Click the **Text** option for **Formula Return Type** and click **Next**
101. The **Advanced Formula** tab should still be selected but if not, click it
102. Click the **Insert Field** button
103. Again, **Meeting Attendance >** should be highlighted already but if not then click on it
104. In the listbox on the right, scroll down to find **Meeting ID >** and click to highlight it
105. In the new listbox that opened up, scroll down to find **Pitch >** and click it
106. Then, in the new (4th) listbox that opened up, click **Address**
107. The next box that opens says you've selected **Meeting_ID__r.Pitch__r.Address__c** meaning from **Meeting Attendance**, trace across the **Meeting_ID** relationship to the corresponding **Meeting** record and then trace from there, across the **Pitch** relationship, to the corresponding **Pitch** record, and retrieve the value of **Address** from there



108. Click the **Insert** button
109. Click **Next, Next** and **Save**

Now create a tab for **Meeting Attendances** so you can see them & create a view:

110. Go to **Setup > Create > Tabs**
111. Under **Custom Object Tabs** click **New**
112. For **Object**, select **Meeting Attendance**
113. For **Tab Style**, click the magnifying glass and select **Bridge** (appro for a junction object)
114. Click **Next**, **Next** and **Save**

Let's get a few records in there to see if it works:

115. Click on the **Meeting Attendances** tab
116. Click **New** and SF will show you an edit page with just the three fields that are really stored as part of a **Meeting Attendance** record: **Meeting ID**, **Contact Name** and **Enthusiasm**
117. Click the magnifying glass next to **Meeting ID** and when you see the **Lookup** window pop up, enter "M" in the **Search...** textbox & click the **Go!** button to see all the **Meeting** records listed out (b/c they all have **Meeting IDs** that start with "M")
118. Click on **Mtg-01**, that's the 10/7/16 meeting, the first one with Julia Chavez
119. Now you're back on the edit page with the **Meeting ID** filled in, so you can click on the magnifying glass next to **Contact Name** so you can connect this record to Julia's record in **Contacts**
120. In the **Lookup** window that pops up, if you don't see her name already, just type "Julia" into the **Search...** textbox and when you see it, click on it
121. Back on the edit page, you can see her name is filled in now so just enter her **Enthusiasm** rating for that meeting which was "2" and click **Save**

Back on the record details page for your new record and (hah!) SF is showing the data you just entered for the three fields that are actually stored in the **Meeting Attendance** object. Ok. Cool.

But *amazingly(!)*, it's *also* pulled in Julia's **Email** from her **Contact** record!

And...even more amazingly, it's pulled in Spray & Pray's street **Address** by first connecting to the **Mtg-00 Meeting** record and then using the **Pitch ID** it found there to connect to **Pitch** and find the right record there. The little Oompa-Loompas working their magic inside the SF cloud!

Notice, as expected, you can't double-click to edit those two "virtual" fields—a little lock icon appears, telling you those aren't really "here," they're just appearing here, *virtually*.

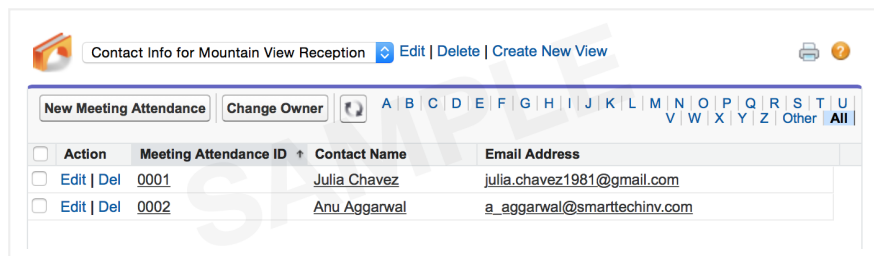
Now add one more **Meeting Attendance** record so your reception list will look more realistic:

122. Click on your **Meeting Attendances** tab & click **New**
123. Click the magnifying glass by **Meeting ID** and then, in the popup window, enter "M" for the **Search...** field and click **Go!** to see all the **Meeting** records
124. Select the **Mtg-08** record for the 9/30/16 meeting (it was with a firm in Mountain View)
125. Click the magnifying glass by **Contact Name** to pop up the **Lookup** window for **Contact**
126. Click **New** to add back the **Contact** info you deleted earlier for that meeting (Anu Aggarwal)
127. Fill in her **First Name**, **Last Name** and enter "a_aggarwal@smarttechinv.com" for her **Email**
128. Click **Save** and you'll be back on the record edit page with her **Contact Name** filled in
129. Fill in her **Enthusiasm** as "2" and click **Save**

Now let's see that list of invitees for your reception:

- 130. Click on your **Meeting Attendances** tab and then click **Create New View**
- 131. For **View Name** enter "Contact Info for Mountain View Reception"
- 132. Tab to autofill **View Unique Name**
- 133. Under **Filter Criteria**, pull down the **Field** menu and select **Address**
- 134. Next to that, under **Operator**, pull down the menu and select **Contains**
- 135. Next to that, under **Value**, enter "Mountain View"
- 136. Scroll down to the **Available Fields** list and move **Contact Name** and **Email** over to **Selected Fields** and click **Save**

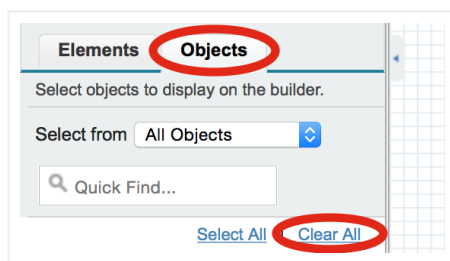
Now you've got your emailing list. (You can even click on one of the addresses to bring up an empty message if you have an email client running on your computer!)



Seems like a lot of work connecting everything up, but SF does most of that for you behind the scenes. And the upside is that the model, with the stuff separated out across entities, gets rid of your data dupe/integrity nightmares. Totally normal(-ized).

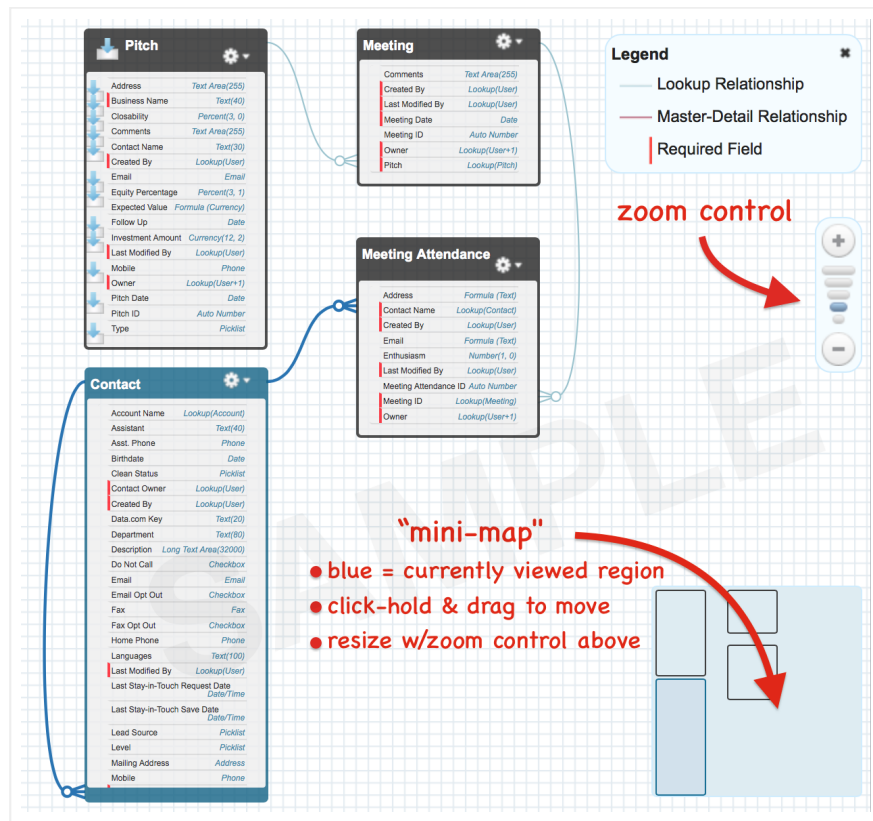
Now database management systems like SF have a name for the computer-defined version of the model—the "schema" and you can see SF's own pic of it, to make sure it looks like yours, using the great and powerful **Schema Builder**:

- 137. Click on **Setup** and then, under **Build** on the left vertical menu, find **Develop** and just under that, click on **Schema Builder** to launch SF's schema building/viewing tool
- 138. In the left hand column, make sure you're on the **Objects** tab and click **Clear All** to hide all the objects for now—SF comes with a zillion built in objects (overwhelming!)



- 139. Now check the boxes for your **Contact** (careful! - NOT ContRact), **Pitch**, **Meeting** and **Meeting_Attendance** objects to unhide them but you may have to zoom and drag them around, etc to see them like below
- 140. On the lower right, there's a mini-map of the currently viewed area and the +/- on the right let's you zoom in and out. You can click-hold and drag the schema map around or click-hold on objects to drag them around and the connectors will adjust automatically (see pic below)

141. A bit of tweaking & you can match that last E/R diagram above pretty darn close except 1) it's showing those **Pitch** fields that we hid from the layout but never bothered to delete—no way to hide them here, unfortunately, and 2) **Contact** has a ton of other built-in fields and also a relationship to itself that wasn't in the diagram—SF is just set up that way!



2

Nice way to visualize your objects & relationships, eh? You can even build your data model this way, dragging & dropping objects onto the schema, adding fields & connecting them up right here instead of all that **Next-ing**. (When you're done playing, click **Close** on the upper left, just below the **Schema Builder** label to get back to the regular interface you're used to.)

<credits roll...*finally*>

They say it ain't over it's over. Well, this one's over. You've got an awesomely normalized data model that still connects everything up but no more duplicate data. Ever. The Dupe-Monster is truly dead at last. Integrity reigns. Life is good again.

fin

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