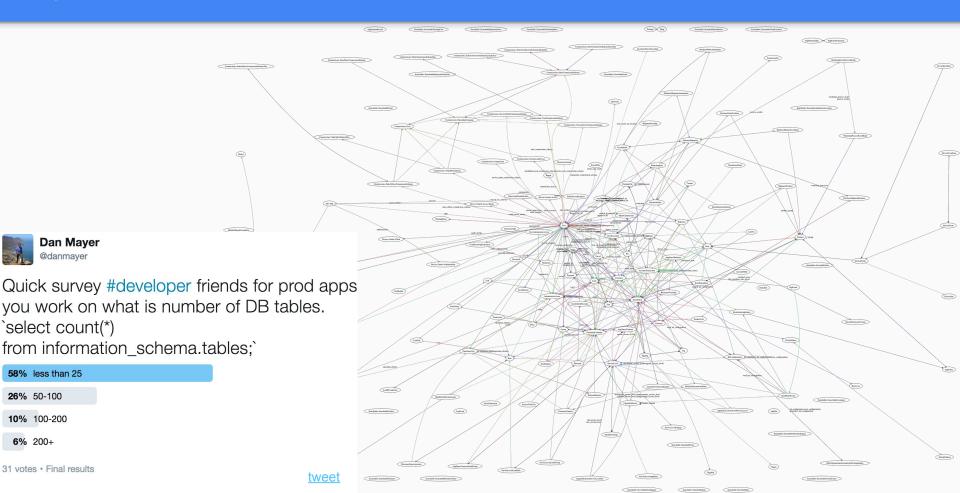
Information Architecture (IA) Change Process

How to make data changes clear

Why?



26% 50-100 10% 100-200

58% less than 25

6% 200+

À.

@danmayer

31 votes · Final results

Why?

- As DB complexity grows it's more difficult to make a correct schema.
 - Particularly taking into account multiple aspects of the business
- Many DBs have legacy tables & fields that can further confuse conversations around data
- As DBs grow teams need an easy way to focus in on only the models under discussion

- Larger changes to a DB require understanding & agreement across
 - Product Management
 - Data (BI & DI)
 - Software
 - & often Operations / Stakeholders
- Teams need communication tools to show data change & intents
- A change process that allows for incremental change during discussion

How?

- Integrated into development & PR flow
- Supports Async discussion & feedback
- Both visual & textual diffs
 - DOT <-> PNG
- Faster to express than full code change
 - DB changes don't actually need to be applied for visualization
 - \circ $\,$ Migrations don't need to be written or run
- BI & PMs can edit *DOT* files to express intents
- Fast iteration with images can be updated during live workgroup discussions

digraph models diagram { graph[overlap=false, splines=true, bgcolor="none"] "Customer" [shape=Mrecord, label="{Customer|account id :integer\l agent id :integer\l barcode :character varying(255)\l contact id :integer\l created at :timestamp without time zone\l deleted at :timestamp without time zone\l email :character varying(255)\l first name :character varying\l fixed_location_id :integer\l gender :integer\l house image content type :character varying(255)\l house image file name :character varying(255)\l house_image_file_size :integer\l house_image_fingerprint :character varying(255)\l house image processing :boolean\l house image updated at :timestamp without time zone\l house_latitude :numeric(15,10)\l age :integer best_visit_time :character varying(255) wet, vide, time character waying (25) hubblen, pey interger (does), landmark, draft character waying (25) effective, nu, school integer (does), landmark, draft character waying (25) gradient integer mage, context, pey character varying (25) integer mage, integer mage, interger (does) and interger (does) and integer (does) and intege literacy integer local_name :character varying(255) number_of_people_in_household integer agent id :integer assigned at timestamp without time zone captured_by_id integer captured_by_telesales :boolean contact_id :integer converted_at :timestamp without time zone primary_income :integer profession :character varying(255) residence image content type character varying residence, image_content_type character varying residence_image_file_nume character varying residence_image_file_nume character varying residence_image_image/miniter integer residence_image_image/miniter integer values_character varying(255) boose_lation_more(15,10) word_longtimute_rumeric(15,10) word_image/miniter integer boose_longtimute_rumeric(15,10) converted_by_id :integer created_at :timestamp without time zone custom_location_mannersharp without time zone custom_location_manner :character varying(255) deleted_at:timestamp without time zone follow_up_at:timestamp without time zone id :integer interest_level :integer issue reported at timestamp without time zone ward_id :integer issue_reported_by_id integer marked_cold_by_id integer marked_cold_by_id integer marked_cold_by_id integer national_grid_customer boolean notes stext account_id :integer agent_id :integer barcode :character varying(255) pooes text operating_company_id_integer ordered_at_timestamp without time zone place_id_integer place_id_integer presented_at_timestamp without time zone referral_code character varying burcode :character varying(255) contact_id_integer created_at_timestamp without time zone fixed_location_id_integer house_image_content_type :character varying(255) house_image_file_name :character varying(255) house image_file_name :character varying(255) referrer id :integer sight seller completed at timestamp without time zon source_detail :integer house image file size integer house image fingerprint character varying(255) house_image_inigerprint cruatecter varying(255) house_image_processing :boolean house_image_updated_at :timestamp without time zon status :integer updated_at :timestamp without time zone waived gns at timestamn without time zone id :integer last_paid_at :timestamp without time zone lead_id :integer notes :text operating_company_id :integer sold_by_id :integer updated_at :timestamp without time zone utilization_rate :double precision utilization_updated_at :timestamp without time zone

agentconverted_by captured_bymarked_cold_by

sold by

verified :boolean verified_at :timestamp without time zone visit_time_character_varving(255)

When to follow new IA change process

For large data changes, not for small schema changes!

DB Change	Follow IA Change Process?
Delete a completely deprecated table	No
Removing completely deprecated fields	No
Adding small table for internal use not needed for reporting	No
Adding a few additional fields	Probably, use good judgement
Refactor: moving actively used columns to a different table	Yes
Adding complex tables that represent core business data	Yes
Refactor: renaming and replacing active used columns	Yes

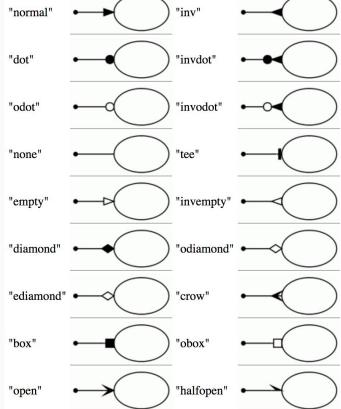
What is a dot file?

- DOT (graph description language)
 - Node, Edge and Graph Attributes
 - Basic of UML with DOT
 - Connections
 - <u>Dir</u>
 - Arrows
- Easy to generate from Rails Model files
- Easy to generate in multiple other frameworks
- Easy to build by hand
- Easy to "zoom" in on focus areas

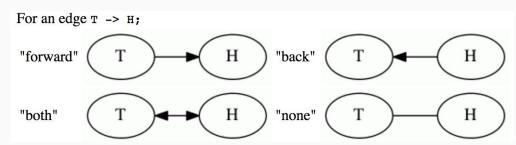
1	digraph models_diagram {
	graph[overlap=false, splines=true, bgcolor="none"]
	"Customer" [shape=Mrecord, label="{Customer account_id :integer\
	agent_id :integer\l
5	barcode :character varying(255)\l
	contact_id :integer\l
	created_at :timestamp without time zone\l
	<pre>deleted_at :timestamp without time zone\l</pre>
	email :character varying(255)\l
	first_name :character varying\l
	<pre>fixed_location_id :integer\l</pre>
	gender :integer\l
	house_image_content_type :character varying(255)\l
	house_image_file_name :character varying(255)\l
	house_image_file_size :integer\l
	house_image_fingerprint :character varying(255)\l
	house_image_processing :boolean\l
	house_image_updated_at :timestamp without time zone\l
	house latitude : numeric(15 10))]

What is a dot file?

Arrows (we need agreed on legend 1:1, 1:Many)

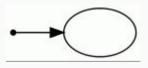


Dir



Proposed Legend

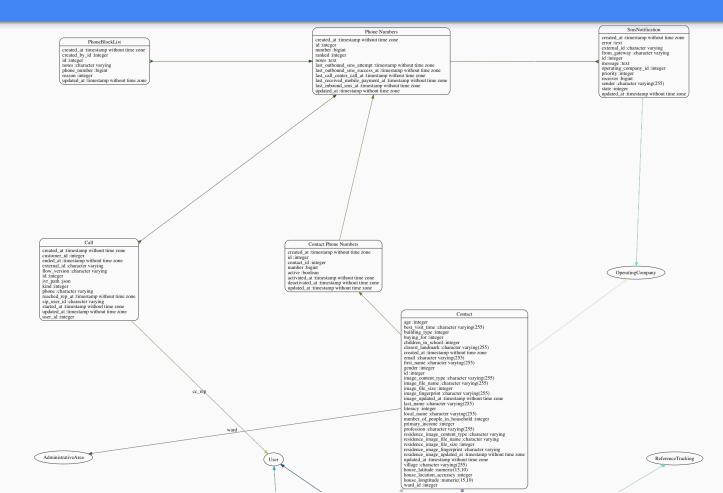
• 1:1 -> "normal"



• 1:Many -> "crow"



What is a dot file? Text Input -> Image Diagram Output

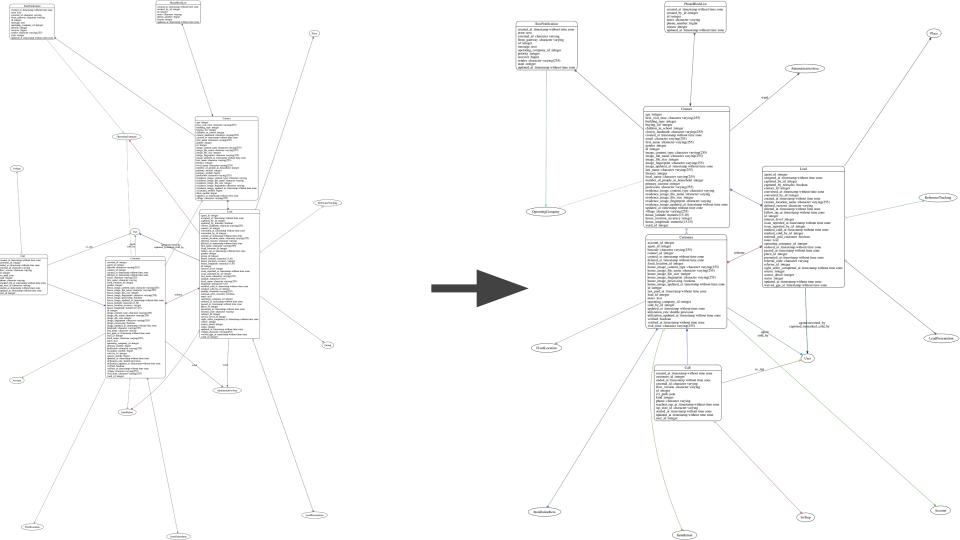


Example: Contact Cleanup

Refactoring data, attributes, & associations of Contact Models

Textual Diff

			100 -house_location_accuracy :integer\1
60 mma d	pc/customers.dot	View ~	-house_continue.com/science/com/sc
虚	00 -6,54 +6,33 00 barcode :character varying(255)\1		102 73 id :integer\l
6 6	contact_id :integer\l		103 74 interest_level :integer\l
7 7	created_at :timestamp without time zone\l		104 75 issue_reported_at :timestamp without time zone\l
8 8	deleted_at :timestamp without time zone\l		105 76 issue_reported_by_id :integer\l
9	-email :character varying(255)\l		106 —last_name :character varying(255)\l
10	-first_name :character varying\l		107 -latitude :numeric(15,10)\l
11 9	fixed location id :integer\l		<pre>108 -local_name :character varying(255)\l</pre>
12	-gender :integer\l		109 —longitude :numeric(15,10)\l
13 10	house_image_content_type :character varying(255)\l		110 77 marked_cold_at :timestamp without time zone\l
14 11	house_image_file_name :character varying(255)\l		111 78 marked_cold_by_id :integer\l
15 12	house_image_file_size :integer\l		112 -mobile :character varying(255)\l
16 13	house_image_fingerprint :character varying(255)\l		113 79 national_grid_customer :boolean\l
17 14	house_image_processing :boolean\l		114 80 notes :text\l
18 15	house_image_updated_at :timestamp without time zone\l		115 B1 operating_company_id :integer\l
19	-house_latitude :numeric(15,10)\l		19 00 -119,16 +85,12 00 place_id integer\l
20	-house_location_accuracy :integer\l		119 85 presented_at :timestamp without time zone\l
21	-house_longtitude :numeric(15,10)\l		120 86 referral_code :character varying\l
22 16	id :integer\l		121 87 referrer_id :integer\l
23 24	<pre>-image_content_type :character varying(255)\l</pre>		122 -service_level_id :integer\l
	<pre>-image_file_name :character varying(255)\l</pre>		123 88 sight_seller_completed_at :timestamp without time zone\l
	<pre>-image_file_size :integer\l -image_fingerprint :character varying(255)\l</pre>		124 89 source :integer\l
	<pre>-image_ringerprint :cnaracter varying(255)\t -image_processing :boolean\l</pre>		125 90 source_detail :integer\l
28	<pre>-image_processing rootean(t -image_updated_at :timestamp without time zone\l</pre>		126 91 status :integer\l
	-landmark :character varying(255)\l		127 92 updated_at :timestamp without time zone\l
30	-last_name :character varying\l		128village :character varying(255)\l
	last_paid_at :timestamp without time zone\l		129 -waived_gps_at timestamp without time zone\l
32 18	lead_id :integer\l		130 -ward_id :integer\l
33	-local_name :character varying(255)\l		131 -)*1
34 19	notes :text\l		93 +waiveg gs_at timestamp without time zone(1)") 122 9 "SaNotification" (shape-Mrecord, label="(SaNotification created at timestamp without time zone("
35 20	operating_company_id :integer\l		132 == "Simskotification" [shape=mrecord, ladel="(Simskotification[created_at :timestamp without time zone) 133 95 error: text]}
36	-primary mobile :bigint\l		134 96 external_id :character varying\1
	-profession :character varying(255)\l		
38	-secondary_mobile :bigint\l		
39 21	sold_by_id :integer\l		165 127 updated_at :timestamp without time zone\l
4.0	-spouse_mobile :bigint\l		166 128 user_li integer\l 167 129 191
41 22	updated_at :timestamp without time zone\l		
42 23	utilization_rate :double precision\l		
43 24	utilization_updated_at :timestamp without time zone\l		169 130 "Customer"→ "Fixediccation" [arrowtall-mone, arrowheadmormal, dir=both color="#690980"] 178 - "Customer"→ "AdministrativeAres" [label="ward", arrowtall-mone, arrowheadmormal, dir=both color
44 25	verified :boolean\l		170 - Customer -> Administrativenera (Labeir Ward, arrowtalemone, arrowtalemone), arrowtalemone, arrowtalemone, arrowtalemone, direbetrim)
45 26	verified_at :timestamp without time zone\l		172 132 "Customer" -> ACCount (afforcatienoue, afformedamional, directic color=#s20477) 172 133 "Customer"-> Micer (label:#agent", arrowstailenoue, arrowstailenoue, toolor=#s20486A")
46 47	-village :character varying(255)\l		173 133 "Customer -> User" (Laber sold, by, arrowtail-mone, arrowhead-mormal, direction color-#26AGA")
48	-visit_time :character varying(255)\l		[0] -177,15 +137,13 @0 user_id integer\
	-ward_id :integer\l		
	-)"] +visit_time :character varying(255)\l}"]		
50 28	<pre>+visit_time :character varying(255)\()"] "Contact" [shape=Mrecord, label="{Contact age :integer\l</pre>		
51 29	best_visit_time :character varying(255)\l		
52 30	building_type :integer\l		180 - "Lead" -> "OperatingCompany" (arrowtailmone, arrowheadmormal, diraboth color="#EAAKCM") 180 + "Contact" -> "OperatingCompany" (arrowtailmone, arrowheadmormal, diraboth color="#EFAKCM")
	building_type finteger(t		140 + "Contact" -> "OperatingCompany" (arrownailmone, arrownaidmoneni, girmoth coince"#retGr] 141 + "Contact" -> "AdministrativeArea" [label"#ard", arrownailmone, arrowneadmonmal, girmoth coince"
	children_in_school :integer\l		151 + "Contact" -> "AdministrativeArea" (Ladet="ware", arrowtatemone, arrowtatemon arrowtatemone, arrowtatemone, arrowtatem
	closest_landmark :character varying(255)\l		101 142 "Lead" -> "reference ifacking" [arrowtalwoots, arrowtageoot, armoto corm=#plu/Uo"] 182 143 "Lead" -> "Luoder" arrowtalmedd, arrowtalmedd, arrowtagedot, armoto corm=#B94680"]
56 34	created at :timestamp without time zone\l		102 103 CEad - Customer (artowisal=boot, artowisal=boot, direbut custer #devode) 183 - "Lead"-> "Instaliation" (arrowisal=boot, arrowisal=boot, direbut color=#devode)
35	+email :character varying(255)\l		 Lead Lead Listatication (arrowtatized), arrowtatized (introduct of the dynamic) Lead (Lead) (Le
57 36	first_name :character varying(255)\l		165 "Lead" -> 'rate [artwistatemine, artowistatemine, artowistatemine], darbour (color="AnAACC7"]
58 37			186 146 "Lead" -> 'Lead" -
59 38			187 - "Lead" -> "Gener Laborat Laborat Laborat Laborat Control and The Control of
嶽	00 -67,49 +46,36 00 literacy :integer\l		188 - "Lead" -> "AdministrativeArea" [label="ward", arrowtal=none, arrowtae=normal, dir=both color="#6)
67 46	local_name :character varying(255)\l		189 147 "Lead" -> "User" [Lebel="captured by", arrowtail=none, arrowhead=normal, dir=both color="#9398AE"]
68 47	number_of_people_in_household :integer\l		100 148 "Lead" -> "User" [Label="converted_by", arrowtail=mone, arrowheadmormal, di=both color="#86C82F"]
69 48	primary_income :integer\l		191 149 "Lead" -> "User" [label="marked_cold_by", arrowtail=mone, arrowhead=mormal, dir=both color="#07448!
10	/ · · · · · · · · · · · · · · · · · · ·		end a ser react reaction of a constrained of the service of the se



Contact age :integer best visit time :character varying(255) building_type :integer buying_for :integer children_in_school :integer closest_landmark :character varying(255) created_at :timestamp without time zone email :character varving(255) first_name :character varying(255) gender :integer id :integer image_content_type :character varying(255) image_file_name :character varying(255) image file size :integer image_fingerprint :character varying(255) image updated at :timestamp without time zone last_name :character varying(255) literacy :integer local_name :character varying(255) number of people in household :integer primary_income :integer profession :character varying(255) residence_image_content_type :character varying residence_image_file_name :character varying residence_image_file_size :integer residence image fingerprint :character varving residence image updated at :timestamp without time zone updated at :timestamp without time zone village :character varying(255) house_latitude :numeric(15,10) id :integer house_location_accuracy :integer house longtitude :numeric(15,10) ward_id :integer Customer notes :text account_id :integer agent_id :integer barcode :character varying(255) referrer contact id :integer created_at :timestamp without time zone deleted at :timestamp without time zone fixed_location_id :integer house_image_content_type :character varying(255) house image file name :character varying(255) house image file size :integer house_image_fingerprint :character varying(255) status :integer house_image_processing :boolean house_image_updated_at :timestamp without time zone id :integer last paid at :timestamp without time zone lead id :integer notes :text operating_company_id :integer sold_by_id :integer updated_at :timestamp without time zone utilization rate :double precision utilization updated at timestamp without time zone verified :boolean verified at :timestamp without time zone visit_time :character varying(255) agent

Lead agent_id :integer assigned at :timestamp without time zone captured_by_id :integer captured_by_telesales :boolean contact_id :integer converted at :timestamp without time zone converted by id integer created at :timestamp without time zone custom_location_name :character varying(255) deferral reasons :character varving deleted_at :timestamp without time zone follow up at :timestamp without time zone interest level :integer issue_reported_at :timestamp without time zone issue_reported_by_id :integer marked_cold_at :timestamp without time zone marked cold by id :integer national grid customer :boolean operating_company_id :integer ordered at :timestamp without time zone passed_at :timestamp without time zone place id :integer presented_at :timestamp without time zone referral code :character varying referrer_id :integer sight seller completed at timestamp without time zone source :integer source detail :integer updated_at :timestamp without time zone waived_gps_at :timestamp without time zone

> agentconverted_by captured_bymarked_cold_by

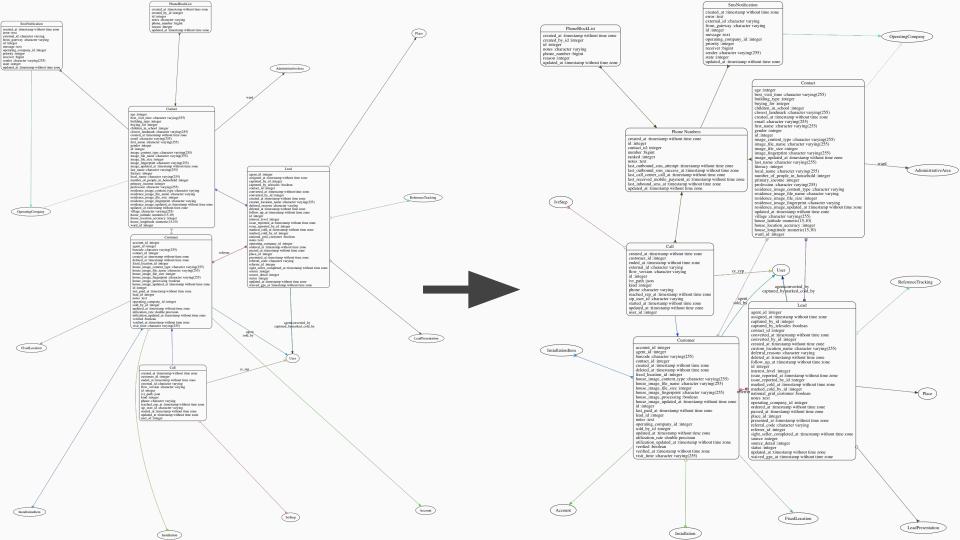
ZOOMED IN!

sold_by

ward /

Refactoring out Phone Numbers

21	do	c/customers.dot View V	_
	00		
串		00 -46,15 +46,12 00 literacy :integer\l	
46	46	local_name :character varying(255)\l	
	47	number_of_people_in_household :integer\l	
	48	primary_income :integer\l	
49		-primary_mobile :bigint\l	
	49	profession :character varying(255)\l	
	50	residence_image_content_type :character varying\l	
	51	residence_image_file_name :character varying\l	
	52	residence_image_file_size :integer\l	
	53	residence_image_fingerprint :character varying\l	
56		residence_image_updated_at :timestamp without time zone\l -secondary_mobile :bigint\l	
		-third_mobile :bigint\l	
		updated at :timestamp without time zone\l	
		village :character varying(255)\l	
	57		
\$		00 -94,6 +91,18 00 source_detail :integer\l	
	91	status :integer\l	
	92		
	93		
	94	+ "PhoneNumber" [shape=Mrecord, label="{Phone Numbers created_at :timestamp without time zone\l	
		+id :integer\l	
	96	+contact_id: integer\l	
		+number :bigint\l	
		+ranked :integer\l	
		+notes :text\l	
		+last_outbound_sms_attempt :timestamp without time zone\l	
		+last_outbound_sms_success_at :timestamp without time zone\l	
		+last_call_center_call_at :timestamp without time zone\l	
		+last_received_mobile_payment_at :timestamp without time zone\l +last_inbound_sms_at :timestamp without time zone\l	
		+updated_at :timestamp without time zone\l)"]	
		"SmsNotification" (shape=Mrecord, label="{SmsNotification created_at :timestamp without time zone	eVI
98 1	07	error :text\l	
99 1	80	external_id :character varying\l	
牵		00 -142,6 +151,7 00 user_id :integer\l	
	51	"Contact" -> "Customer" (arrowtail=odot, arrowhead=dot, dir=both color="#DAA9E3")	
143 1	52	"Contact" -> "OperatingCompany" [arrowtail=none, arrowhead=normal, dir=both color="#EFF6C3"]	
144 1	53	"Contact" -> "AdministrativeArea" [label="ward", arrowtail=none, arrowhead=normal, dir=both colo	/r='
	54	+ "Contact" -> "PhoneNumber" [arrowtail=crow, arrowhead=none, dir=both color="#24580C"]	
	55	"Lead" -> "ReferenceTracking" [arrowtail=odot, arrowhead=dot, dir=both color="#61D7D6"]	
	56	"Lead" -> "Customer" [arrowtail=odot, arrowhead=dot, dir=both color="#B84680"]	
	57	"Lead" -> "Place" [arrowtail=none, arrowhead=normal, dir=both color="#4C356C"]	
墩		00 -153,9 +163,10 00 user_id :integer\l	
	63	"Lead" -> "Customer" [label="referrer", arrowtail=none, arrowhead=normal, dir=both color="#EF7CA:	1"]
	64	"Lead" -> "LeadPresentation" [arrowtail=odot, arrowhead=crow, dir=both color="#24580C"]	
	65	"SmsNotification" -> "OperatingCompany" [arrowtail=none, arrowhead=normal, dir=both color="#49FC	AE'
156		- "SmsNotification" -> "Contact" [arrowtail=crow, arrowhead=none, dir=both color="#245B0C"]	
157		 "PhoneBlockList" -> "Contact" (arrowtail=crow, arrowhead=normal, dir=both color="#245880C") "Sacharification" -> "PhoneBlockList" (arrowtail=crow, arrowhead=normal, dir=both color="#245880C") 	
		* "SmsNotification" -> "PhoneNumber" (arrowtail=crow, arrowhead=none, dir=both color="#24588C") * "PhoneBlockList" -> "PhoneNumber" (arrowtail=crow, arrowhead=normal, dir=both color="#24588C")	
		<pre>* "PhoneBlockList" -> "PhoneBudger" [arrowtall=Crow, arrownead=normal, dir=both color="#24580L"] "Call" -> "Customer" [arrowtail=none, arrowhead=normal, dir=both color="#1B4EE8"]</pre>	
	69		
	70	"Call" -> "User" [arrowtail=none, arrowhead=normal, dir=both color="#3438E0"]	
	71	"Call" -> "User" [label="cc_rep", arrowtail=none, arrowhead=normal, dir=both color="#DCCB34"]	
161 1	72	"Call" -> "IvrStep" [arrowtail=odot, arrowhead=crow, dir=both color="#DC6371"]	



The Previous Iteration is Wrong

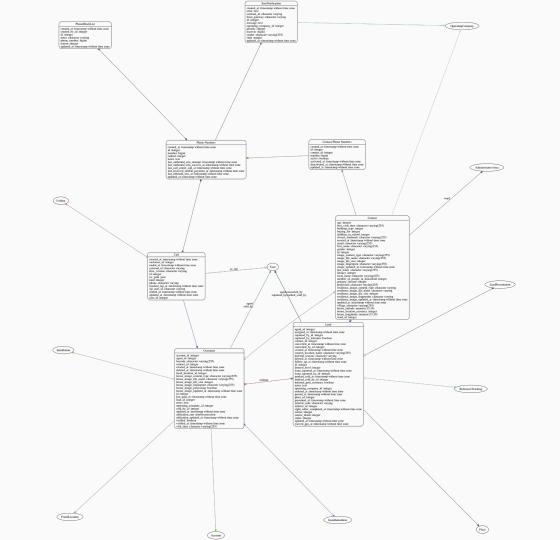
Issues:

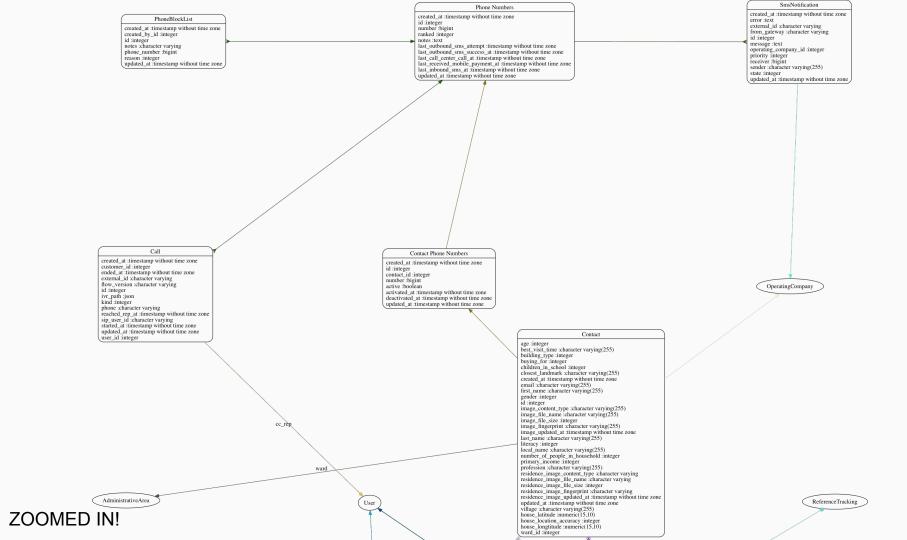
- DB currently has multiple users with the same primary number
 - shouldn't be allowed, but exists
- DB intends to have many accounts with secondary numbers that are other's primary numbers.
 - this can & should happen for friends / family accounts
- Previous design would have duplicate phone number records per unique number.
- Therefor we couldn't appropriately link *SMSs* and Calls to *PhoneNumbers* without creating multiple records

Improvements

- Contact -> ContactPhoneNumbers -> Phonenumber <- [SMSs, PhoneBlockList, Calls]
- Remove Contact_Id and now PhoneNumbers is correct can map directly to tables with a number *SMSs*, *Calls*, & *PhoneBlockList*.
- We can now see messages that went to individual users after a phone number changes as we can query between activate_at / deactivated_at.
- We can also show when one message now goes to many contacts who all are sharing a number (hopefully as secondary numbers)

	do	View View
243	1	@@ -93,7 +93,6 @@ updated_at :timestamp without time zone\l
.93	93	waived_gps_at :timestamp without time zone\l}"}
94	94	"PhoneNumber" [shape=Mrecord, label="{Phone Numbers created_at :timestamp without time zone\l
95	95	id :integer\l
96		-contact_id: integer\l
.97	96	number :bigint\l
98	97	ranked :integer\l
99	98	notes :text\l
243	1	@0 -139,6 +138,14 @0 started_at :timestamp without time zone\1
139	138	updated_at :timestamp without time zone\l
140	139	user_id :integer\l
141	140	}"]
	141	+"ContactPhoneNumber" [shape=Mrecord, label="{Contact Phone Numbers created_at :timestamp without time zone\l
	142	+id :integer\l
	143	+contact_id :integer\l
	144	+number :bigint\l
	145	+active :boolean\l
	146	+activated_at :timestamp without time zone\l
	147	+deactivated_at :timestamp without time zone\l
	148	<pre>+updated_at :timestamp without time zone\l}"]</pre>
142	149	"Customer" -> "FixedLocation" (arrowtail=none, arrowhead=normal, dir=both color="#698080")
143	150	"Customer" -> "Account" [arrowtail=none, arrowhead=normal, dir=both color="#37DF17"]
144	151	"Customer" -> "User" [label="agent", arrowtail=none, arrowhead=normal, dir=both color="#82A8CA"]
幸	1	@@ -151,7 +158,8 @@ user_id :integer\l
151	158	"Contact" -> "Customer" [arrowtail=odot, arrowhead=dot, dir=both color="#DAA9E3"]
152	159	"Contact" -> "OperatingCompany" [arrowtail=none, arrowhead=normal, dir=both color="#EFF6C3"]
153	160	"Contact" -> "AdministrativeArea" [label="ward", arrowtail=none, arrowhead=normal, dir=both color="#6A4341"]
154		- "Contact" -> "PhoneNumber" [arrowtail=crow, arrowhead=none, dir=both color="#245B0C"]
	161	+ "Contact" -> "ContactPhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"]
	162	+ "ContactPhoneNumber" -> "PhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"]
155	163	<pre>"Lead" -> "ReferenceTracking" (arrowtail=odot, arrowhead=dot, dir=both color="#61D7D6")</pre>
156	164	<pre>"Lead" -> "Customer" [arrowtail=odot, arrowhead=dot, dir=both color="#BB4680"]</pre>
157	165	"Lead" -> "Place" [arrowtail=none, arrowhead=normal, dir=both color="#4C356C"]





Workflow

1. Generate or update initial model on dev branch

* generate dot file: `FOCUS=true VERBOSE=true OUTPUT=doc/customers.dot rake diagram:models:customers`

- * generate image: `neato -Tpng doc/customers.dot > doc/customers.png`
- * check in the un-edited DOT & image files
- * commit to dev branch
- * this will serve as your before to diff against later
- 2. Create a feature branch to work on your changes
 - * new branch: `git checkout -b feature/db_phone_change`
 - * edit to reflect your changes: `open doc/customer.dot`

* convert updated DOT file to updated image: `neato -Tpng doc/customer.dot > doc/customers.png`

* view PNG & Refactor until happy

* create a PR and upload the before and after images, diff will be automatically created for the DOT file changes.

Workflow: Initial Model

 If there is a suitable DOT file use it, if not modify `dev.rake` to create one

```
desc 'Generates an class diagram for all customer models.'
task : customers do
  output = ENV['OUTPUT'] || 'tmp/customers.png'
  customer ignores = if ENV['FOCUS']
                       %w(Tagging AppliancePurchase Tag Ticket InstallationItems Task).join(',')
                     else
                       1.1
                     end
  ENV['EXCLUDE_MODELS'] = ENV['EXCLUDE_MODELS'].to_s + customer_ignores
  files = %w(
  app/models/customer.rb
  app/models/contact.rb
  app/models/lead.rb
  app/models/sms_notification.rb
  app/models/phone_block_list.rb
  app/models/call.rb
  generate_for_files(files, output)
end
```

DB Refactoring

> objects lugicfg.dev customers.dot customers_old.do* connections.py yamllint gsheet_to_redshift.p) sources.py > refs 100 CUSTOMET -> Instattationitem failowitat=crow, arrownead=crow, dir=both cotor= #21/9C1 sources.py > refs 100 CUSTOMET -> Instattationitem fairowitat=crow, arrownead=crow, dir=both cotor= #21/9C1 sources.py > COMMIT_EDITMSG 157 "Contact" -> "Lead" [arrowtail=odot, arrowhead=dot, dir=both color="#DAA9E3"] sources.py > config 158 "Contact" -> "Customer" [arrowtail=odot, arrowhead=dot, dir=both color="#EFF6C3"] sources.py > description 160 "Contact" -> "AdministrativeArea" [label="ward", arrowtail=none, arrowhead=normal, dir=both color="#6A4341"] > FETCH_HEAD 161 "ContactPhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"] > HEAD 162 "ContactPhoneNumber" -> "PhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"]
Terms 157 "Contact" -> "Lead" [arrowtail=odot, arrowhead=dot, dir=both color="#526D9B"] COMMIT_EDITMSG 158 "Contact" -> "Customer" [arrowtail=odot, arrowhead=dot, dir=both color="#DAA9E3"] config "Contact" -> "OperatingCompany" [arrowtail=none, arrowhead=normal, dir=both color="#EFF6C3"] description 160 "Contact" -> "AdministrativeArea" [Label="ward", arrowtail=none, arrowhead=normal, dir=both color="#6A4341"] FETCH_HEAD 161 "Contact" -> "ContactPhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"] HEAD 162 "ContactPhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"]
<pre>COMMIT_EDITMSG Commit_EDITMSG Config Config Config Contact" -> "Customer" [arrowtail=odot, arrowhead=dot, dir=both color="#DAA9E3"] Contact" -> "OperatingCompany" [arrowtail=none, arrowhead=normal, dir=both color="#EFF6C3"] Contact" -> "AdministrativeArea" [label="ward", arrowtail=none, arrowhead=normal, dir=both color="#6A4341"] FFTCH_HEAD FFTC</pre>
config 159 "Contact" -> "OperatingCompany" [arrowtail=none, arrowhead=normal, dir=both color="#EFF6C3"] description 160 "Contact" -> "AdministrativeArea" [label="ward", arrowtail=none, arrowhead=normal, dir=both color="#6A4341"] FETCH_HEAD 161 "Contact" -> "ContactPhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"] HEAD 162 "ContactPhoneNumber" -> "PhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"]
description 160 "Contact" → "AdministrativeArea" [label="ward", arrowtail=none, arrowhead=normal, dir=both color="#6A4341"] FETCH_HEAD 161 "Contact" → "ContactPhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"] HEAD 162 "ContactPhoneNumber" -> "PhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"]
HEAD 162 "ContactPhoneNumber" -> "PhoneNumber" [arrowtail=none, arrowhead=normal, dir=both color="#85730B"]
Index In
ORIG_HEAD 164 "Lead" -> "Customer" [arrowtail=odot, arrowhead=dot, dir=both color="#B84680"]
packed-refs 165 "Lead" -> "Place" [arrowtail=none, arrowhead=normal, dir=both color="#4C356C"]
<pre>166 "Lead" -> "Contact" [arrowtail=none, arrowhead=normal, dir=both color="#AA4CC7"] </pre>
Sourcenteecoming 167 "Lead" -> "User" [label="agent", arrowtail=none, arrowhead=normal, dir=both color="#025AE9"] > ■ archives 168 "Lead" -> "User" [label="captured by", arrowtail=none, arrowhead=normal, dir=both color="#9398AE"]
> ■ archives 168 "Lead" -> "User" [label="captured_by", arrowtail=none, arrowhead=normal, dir=both color="#9398AE"] > ■ config 169 "Lead" -> "User" [label="converted by", arrowtail=none, arrowhead=normal, dir=both color="#96CB2F"]
> ■ data 170 "Lead" -> "User" [label="marked cold by", arrowtail=none, arrowhead=normal, dir=both color="#074489"]
> deploy 171 "Lead" -> "Customer" [label="referrer", arrowtail=none, arrowhead=normal, dir=both color="#EF7CA1"]
<pre>> Teploy 172 "Lead" -> "LeadPresentation" [arrowtail=odot, arrowhead=crow, dir=both color="#245B0C"]</pre>
<pre>> dashboard 173 "SmsNotification" -> "OperatingCompany" [arrowtail=none, arrowhead=normal, dir=both color="#49FCAE"]</pre>
"SmsNotification" -> "PhoneNumber" [arrowtail=crow, arrowhead=none, dir=both color="#245B0C"]
> dimensions_sql 175 "PhoneBlockList" -> "PhoneNumber" [arrowtail=crow, arrowhead=normal, dir=both color="#245B0C"]
> free_sql 176 "Call" -> "Customer" [arrowtail=none, arrowhead=normal, dir=both color="#1B4EE8"]
> in free_sql_surge 177 "Call" -> "PhoneNumber" [arrowtail=crow, arrowhead=normal, dir=both color="#245B0C"]
> Iuigi_warehouse 178 "Call" -> "User" [arrowtail±none, arrowhead=normal, dir=both color="#343BE0"]
> queue_metrics_load_scripts 179 "Call" -> "User" [label="cc_rep", arrowtail=none, arrowhead=normal, dir=both color="#DCCB34"]
> scripts [allow catt -> ivisted [allow catt-ouder, allow lead-clow, dif-both cotol = #bcds/i]
> 🖿 sql
> Tutis
📄 _initpy 8 results found for 'phonenum' Finding with Options: Case Insensitive 📪 🛄
III
☐ config.py
config.pyc Replace in current buffer Replace All