

Team 08

To: Dana Edberg

From: Terence Henriod, Jorge Santoyo, Raja Singh

Date: 04/28/15

Subject: Replica Toys Database Design Part 02

Modifications To Logical Model

Reference 1

We merged the Registration and purchase entities. This made it clear that this is a post-purchase data model.

Reference 2 & 4

In both of the cases, we reduced the complexity of our “Survey Pattern.” The new pattern uses four entities instead of six. We no longer try to implement “survey versioning” via storing a survey/question configuration in the two dropped tables.

Reference 3

We considered the registration survey attributes gender and age as survey questions. We considered the possibility of the gender question evolving away from one with binary responses to one with other responses than those we currently consider today (maybe this is silly, maybe not); also it just seemed fitting to treat it similarly to other questions with a finite set of responses. As for age, we also treated it similarly to the other survey questions (a question in the Questions table, possible responses in the Options table) and just put ~100 rows in the options table; this was really for uniformity and convenience more than to follow any salient design principles.

Reference 5 & 6

The ToyId was a poorly named attribute for the Model entity to refer to the ProductLine entity; it probably should have been named “ProductLineId” or something better. The logic behind this part of the design was that Replica Toys might expand beyond making just ride-ables (maybe playhouses modeled after notable buildings). Either way, it doesn’t matter since we dropped the idea of a ProductLine. We also removed the concept of a vehicle category from the Model entity once we were advised that Replica Toys does not care to categorize their toys at this time.

Reference 7

We merged the Return and Unit entities. Since we are not storing data about every unit made by Replica Toys and only storing data concerning returns, it seemed best to go about things this way. Now we use one entity called “Unit” which will store return-relevant data about returned units only.

Reference 8

We no longer relate a Unit to a Distributor since this is not a purchase tracking system. We now just relate a Unit to a Registration, and a Registration to a Distributor.

Reference 9

This issue was resolved by clarifying the design with our new/modified “Survey Pattern.” By applying this pattern, it is now more capable of handling questions/answers that might be recycled from form to form.

Revised Logical Data Model

See Attachment.

Original Logical Data Model and Markup

See Attachment.

Physical Data Model ERD

See Attachment.

Prototype Database

We stored all of our project’s data in Terence Henriod’s database for the IS675 class. For ease of use, we prefixed all of the table names for this project with ‘a_’.

Database Info

Database name: thenriod

Table Creation Statements

```
CREATE TABLE a_Location(
    ZipCode int NOT NULL,
    City varchar(100) NOT NULL,
    [State] varchar(2) NOT NULL
    CONSTRAINT pk_ZipCode PRIMARY KEY(ZipCode)
);
```

```
CREATE TABLE a_Customer(
    CustomerId int NOT NULL,
    ZipCode int NOT NULL,
    FirstName varchar(60) NOT NULL,
    LastName varchar(60) NOT NULL,
    [Address] varchar(60) NOT NULL,
    Email varchar(60) NOT NULL,
    PrimaryPhone varchar(60) NOT NULL,
    CONSTRAINT pk_CustomerId PRIMARY KEY(CustomerId),
    CONSTRAINT fk_ZipCodeCustomer FOREIGN KEY(ZipCode) REFERENCES
a_Location(ZipCode)
);
```

```
CREATE TABLE a_Employee(
    EmpId int NOT NULL,
    ZipCode int NOT NULL,
    FirstName varchar(60) NOT NULL,
    LastName varchar(60) NOT NULL,
    [Address] varchar(60) NOT NULL,
    Email varchar(60) NOT NULL,
    PhoneNumber varchar(60) NOT NULL,
    CONSTRAINT pk_EmployeeId PRIMARY KEY(EmpId),
    CONSTRAINT fk_ZipCodeEmp FOREIGN KEY(ZipCode) REFERENCES a_Location(ZipCode)
);
```

```
CREATE TABLE a_Distributor(
    DistributorId int NOT NULL,
    ZipCode int NOT NULL,
    Name varchar(100) NOT NULL,
    [Address] varchar(100) NOT NULL,
    Email varchar(100) NOT NULL,
    PhoneNumber varchar(60) NOT NULL,
    CONSTRAINT pk_DistributorId PRIMARY KEY(DistributorId),
    CONSTRAINT fk_ZipCodeDistributor FOREIGN KEY(ZipCode) REFERENCES
a_Location(ZipCode)
);
```

```
CREATE TABLE a_Model(
    ModelNumber int NOT NULL,
    MSRP money Not Null,
    Description varchar (1000),
    CONSTRAINT pk_modelNumber PRIMARY KEY(ModelNumber)
);
```

```
CREATE TABLE a_ReasonReturned(
    ReasonReturnID int IDENTITY (1, 1) NOT NULL,
    ReasonDescription varchar(100)
    CONSTRAINT pk_reasonReturnID PRIMARY KEY(ReasonReturnID)
```

```
);
```

```
CREATE TABLE a_Unit(
    SerialNumber int NOT NULL,
    ModelNumber int NOT NULL,
    ReturnReasonId int,
    DateReturned date,
    Comments varchar(100),
    CONSTRAINT pk_SerialNumber PRIMARY KEY(SerialNumber),
    CONSTRAINT fk_ModelNumber FOREIGN KEY (ModelNumber) REFERENCES
a_Model(ModelNumber),
    CONSTRAINT fk_ReasonReturnId FOREIGN KEY (ReturnReasonID) REFERENCES
a_ReasonReturned(ReasonReturnID)
);
```

```
CREATE TABLE a_IssueReportProblem(
    ProblemID int IDENTITY (1, 1) NOT NULL,
    [Description] varchar(100),
    CONSTRAINT pk_ProblemID PRIMARY KEY (ProblemID)
);
```

```
CREATE TABLE a_ReportMethod(
    ReportMethodId int IDENTITY (1, 1) NOT NULL,
    Method varchar(60) NOT NULL
    CONSTRAINT pk_reportMethod PRIMARY KEY (ReportMethodId)
);
```

```
CREATE TABLE a_IssueReport(
    IssueReportId int IDENTITY (1, 1) NOT NULL,
    ProductSerialNumber int NOT NULL,
    DistributorId int,
    EmployeeId int,
    CustomerId int,
    IssueReportProblemId int NOT NULL,
    ProblemDescription varchar(1000),
    ReportDate date,
    ReportMethodId int NOT NULL,
    InjuryOccurred bit NOT NULL,
    InjuryDescription varchar(1000) NOT NULL,
    CONSTRAINT pk_IssueReportId PRIMARY KEY(IssueReportId),
    CONSTRAINT fk_ReportMethodId FOREIGN KEY(ReportMethodId) REFERENCES
a_ReportMethod(ReportMethodId),
    CONSTRAINT fk_ProductSerialNumber FOREIGN KEY(ProductSerialNumber) REFERENCES
a_Unit(SerialNumber),
    CONSTRAINT fk_DistributorReportId FOREIGN KEY(DistributorId) REFERENCES
a_Distributor(DistributorId),
    CONSTRAINT fk_EmployeeReportId FOREIGN KEY(EmployeeId) REFERENCES
a_Employee(EmpId),
    CONSTRAINT fk_CustomerId FOREIGN KEY(CustomerId) REFERENCES
a_Customer(CustomerId),
    CONSTRAINT fk_TypeofProblem FOREIGN KEY(IssueReportProblemId) REFERENCES
a_IssueReportProblem(ProblemId)
);
```

```
CREATE TABLE a_TestForm(
    TestFormId int IDENTITY (1,1) NOT NULL,
    RecommendingTestFormId int,
    IssueReportId int NOT NULL,
```

```

    EmpId int NOT NULL,
    TestType varchar(100),
    TestDescription varchar(500) NOT NULL,
    TestResults varchar(1000),
    RecommendedResolution varchar(1000),
    TestCompleted bit,
    CONSTRAINT pk_TestFormId PRIMARY KEY(TestFormId),
    CONSTRAINT fk_RecommendingTestFormId FOREIGN KEY(RecommendingTestFormId)
REFERENCES a_TestForm(TestFormId),
    CONSTRAINT fk_IssueReportIdTestForm FOREIGN KEY(IssueReportId ) REFERENCES
a_IssueReport(IssueReportId),
    CONSTRAINT fk_EmpId FOREIGN KEY(EmpId) REFERENCES a_Employee(EmpId),
);

```

Table Contents

Location Entity:

	ZipCode	City	State
1	19548	Pine Forge	PA
2	21750	Hancock	MD
3	22216	Arlington	VA
4	28431	Chadbourn	NC
5	29901	Beaufort	SC
6	41083	Sanders	KY
7	43464	Vickery	OH
8	43768	Old Was...	OH

Customer Entity:

	CustomerId	ZipCode	FirstName	LastName	Address	Email	PrimaryPhone
1	1146	90842	Kameko	Jacobson	Ap #539-6954 Maecenas Rd.	eget@utcursus.edu	8609022572
2	1181	21750	Ora	Eaton	757-5852 Dui. Rd.	aliquam@tristiqueenectuset.org	8376610541
3	1188	22216	Stephen	Shepard	8716 Nec. Rd.	Cras. vehicula@cubilia.ca	9621483578
4	1216	48661	Karyn	Contreras	6658 Congue Street	imperdiet.ullamcorper.Duis@v...	3459749104
5	1251	19548	Sonia	Payne	354-6927 Ornare, Avenue	Morbi@placerategetvenenatis....	8929890179
6	1286	83465	Chelsea	Bryan	1618 Ultricies Street	auctor.velit@Curabitur.edu	2401658034
7	1349	58123	Kellie	Ferrell	730-6569 Vitae Road	eget.mollis.lectus@duinectem...	6976917357
8	1370	52302	Nolan	Bryan	356-2456 Risus. St.	Cras.convallis.convallis@sagitt...	9512965603

Employee Entity:

	EmpId	ZipCode	FirstName	LastName	Address	Email	PhoneNumber
1	1000	83465	Imani	Jolie	4903 Sit Av.	eget@velquamdignissim.co.uk	8008453750
2	1007	48661	Lane	Vaughan	4667 Eu. Rd.	tristique@erosnectellus.ca	3389470872
3	1014	88118	Erich	Halla	273-2518 E...	hendrerit@nonmagna.ca	8286247226
4	1021	88118	Thaddeus	Marvin	736-9014 A...	quis@elementum.ca	9104332432
5	1028	52302	Teegan	Bruce	Ap #710-1...	sapien@cursus.com	3101448767
6	1035	19548	Yoko	Myles	Ap #910-6...	sit.amet.metus@in.edu	2483653967
7	1042	50330	Alexandra	Rooney	P.O. Box 3...	magna.nec.quam@egestasl...	5227143968
8	1049	64668	Colby	Silas	P.O. Box 1...	blandit@dictumultricies.com	9185860918

Distributor Entity:

	DistributorId	ZipCode	Name	Address	Email	PhoneNumber
1	1231	83465	Sed Diam Institute	151-9699 Libero Rd.	Aenean.gravida.nunc@non.org	5008910949
2	1234	48661	A Dui Cras Incorporated	141-9893 Magnis Avenue	nostra.per@conubianostra.net	2231875944
3	1237	88118	Elit Company	345-417 Non St.	quam@variusNam.edu	4743438340
4	1240	52302	Arcu Imperdiet Ullamc...	Ap #281-3780 Dolor. St.	purus@Morbinonsapien.co.uk	3012221920
5	1243	19548	Velit Egestas LLP	5476 Enim Road	omare.lectus@Quisqueimper...	3446306824
6	1246	41083	Aliquam Iaculis Lacus ...	Ap #967-7284 Consect...	metus@nonleoVivamus.ca	8675100376
7	1249	55435	Ipsum Suspendisse N...	159-5774 Bibendum Rd.	erat.eget.ipsuam@maurissapie...	3575352372
8	1252	50330	Suspendisse Tristique...	P.O. Box 968, 8105 Ph...	in@ipsuamprimis.com	2403663437

Model Entity:

	ModelNumber	MSRP	Description
1	212	8818.17	Chevrolet Tahoe
2	213	3053.58	Chevrolet Impala
3	214	5577.26	Nissan Altima
4	215	9350.37	1984 Toyota Te...
5	216	7979.82	Ford Mustang
6	217	1917.81	John Deer Class...
7	218	4688.97	Cadillac Enterage
8	219	1707.63	Volkswagon Be...

ReasonReturned Entity:

	ReasonReturnID	ReasonDescription
1	1	Buyer's Remorse
2	2	Accidentally purchased wrong item/model
3	3	Distributor gave/sent wrong item/model
4	4	Product malfunctions
5	5	Quality did not meet expectations
6	6	New, desired feature released shortly a...
7	7	Product did not match description
8	8	Product too dangerous to operate safely

Unit Entity:

	SerialNumber	ModelNumber	ReturnReasonId	DateReturned	Comments
1	1234567	212	1	2015-06-06	The unit was too expensive for its quality. Poor craftsmanship. I want my money back!!!
2	1234577	220	3	2014-12-27	What were you people thinking, thanks to you my son cried on his birthday.
3	1234582	219	4	2015-08-19	The brakes went out, my kid almost died, how are you people still in business.
4	1234587	218	5	2015-03-19	Seriously was this made in China?
5	1234592	217	6	2015-10-06	Gosh I should have waited a month, sorry but want the new surroundsound in the mustang.
6	1234602	215	8	2016-02-08	Ever hear about consumer safety? The brakes went out.
7	1234607	214	9	2015-12-05	Because I can.
8	1234612	213	10	2015-02-21	Wife didn't like the product
9	1234617	212	1	2015-11-28	I should have gone with Chevy Impala to begin with, sorry.
10	1234622	221	2	2015-04-11	I thought my child wanted the this model but it was suppose to be John Deer.
11	1234627	220	3	2016-01-09	Wrong item people.
12	1234632	219	4	2014-06-23	Car doesn't work correctly
13	1234637	218	5	2014-11-25	Paint chipped on left side.
14	1234642	217	6	2014-11-06	Wanted the newer model of John Deer with the auto adjust seats and seat warmers.
15	1234647	216	7	2016-02-06	Thought it would be more realistic than it was, sorry only the best works for little Timmy.
16	1234652	215	8	2016-02-22	Goes way to fast for my little Sarah, she almost rolled her vehicle.
17	1234657	214	9	2015-01-17	
18	1234662	213	10	2016-02-28	The model sucks.
19	1234667	212	1	2016-03-12	Just got layed off, need to trim the expenses.

IssueReportProblem Entity:

	ProblemID	Description
1	1	Inadequate finish - toy does not look good
2	2	Inadequate operation - toy does not operate corr...
3	3	Poor operation - toy tips over during use
4	4	Inadequate operation quality - toy broke during use
5	5	Poor operation quality - toy hurt user
6	6	Other

ReportMethod Entity:

	ReportMethodId	Method
1	1	WebForm
2	2	Phone
3	3	Email
4	4	Twitter
5	5	Store

IssueReport Entity (Cropped To fit on page):

	IssueReportId	ProductSerialNumber	DistributorId	EmployeeId	CustomerId	IssueReportProblemId
1	1	1234567	1231	NULL	NULL	1
2	2	1234572	NULL	1035	NULL	1
3	3	1234577	NULL	NULL	1496	1
4	4	1234582	1261	NULL	NULL	1
5	5	1234587	NULL	1021	NULL	1
6	6	1234592	NULL	NULL	1496	1
7	7	1234597	1249	NULL	NULL	1
8	8	1234602	NULL	1028	NULL	1
9	9	1234607	NULL	NULL	1188	1
10	10	1234612	1252	NULL	NULL	1
11	11	1234617	NULL	1105	NULL	1

ProblemDescription	ReportDate	ReportMethodId	InjuryOccurred	InjuryDescription
Wheels seem to turn at different speeds and with...	2013-05-19	5	0	None
Wheels wobble.	2015-06-06	5	0	None
Axel snapped under child's weight.	2015-03-04	5	0	None
Paint is chipping.	2015-04-01	5	0	None
Back-up lights don't work.	2014-08-22	5	0	None
Ignition is unreliable.	2014-09-14	5	1	Minor electrocution.
Brakes slip.	2013-12-26	5	0	None
Gas pedal doesn't work very well.	2014-12-27	5	0	None
The vehicle/toy does not seem to be functional.	2014-12-28	5	0	None
There is smoke coming from the back of the vehi...	2015-01-03	5	0	None
Wheels are crooked.	2013-02-28	5	0	None

TestForm Entity (Cropped To fit on page):

	TestFormId	RecommendingTestFormId	IssueReportId	Empld	TestType	TestDescription
1	1	NULL	1	1000	Operational	Used Computer Simulation
2	2	NULL	4	1007	Operational	Physical Test
3	3	NULL	3	1014	Operational	Used Computer Simulation
4	4	NULL	5	1021	Operational	Used Computer Simulation
5	5	NULL	7	1028	Operational	Used Computer Simulation
6	6	NULL	8	1035	Operational	Used Computer Simulation
7	7	NULL	9	1042	Operational	Used Computer Simulation
8	8	NULL	2	1049	Operational	Used Computer Simulation
9	9	NULL	10	1056	Operational	Used Computer Simulation
10	10	NULL	11	1056	Operational	Used Computer Simulation
11	11	2	4	1063	Non Operational	Used Computer Simulation

TestResults	RecommendedResolution	TestCompleted
Operatioanl Axel Broken	Replace Axel	1
Need further Testing, seems to be cosmetic and n...	Open another test query	1
Operatioanl Axel Broken	Replace Axel	1
back up light does not work	Replace light	1
brake fails on water	Fix brakes	0
acceleration does not occur, pedal issues	Replace pedal	1
Customer did not explain problem	Tell customer no problem	1
Left wheel wobbles	Replace 'wheel	1
too much smog	Issue refund to customer, unit cant be fixed	1
alignment seems off	Re-align the vehicle	1
Everything works but the axel just seems bent	Either replace the axcel or give the customer a ...	1