

## **CSE 3241/5241 Group Project**

Your group has been hired to design and implement the database portion of a major development effort for a large manufacturing company. This company, Stomper & Wombat's, currently has no database systems, all current systems are file-based. The long-time president of the company has retired and left his son in charge. As Stomper & Wombat's have experienced countless issues using the file-based systems, they have decided to switch to the database approach.

To accomplish this goal, they have retained your employer, VaporWare Consulting, to take responsibility of the database side of the new enterprise-wide suite of applications. Stomper & Wombat's has a team of application developers who will develop the web-based applications. One database will support all of the functionality of these applications. Some of these applications are internal; only accessible by Stomper & Wombat's employees. Some will be publically accessible.

What follows are narratives from different Stomper & Wombat's employees who are attempting to describe how Stomper & Wombat's is organized and how they operate. Any questions you have for any of these stakeholders are to be emailed to your instructor or grader but the content should be directed to the proper Stomper & Wombat's employee.

### **JoVanna Corleone – Office Manager**

*Ms. Corleone rules the office through fear and intimidation and it runs smoothly and efficiently. Those that have displeased her have been known to disappear suddenly. She is known as JoVanna “The Cleaner.” She understands the corporate structure.*

What Stomper & Wombat’s does is manufacture products and sells them to customers.

Stomper & Wombat’s is headquartered in central Ohio and has several locations around the United States. Each location, including the headquarters, has an office, a warehouse, and a factory.

Organizationally, Stomper & Wombat’s is divided into departments. There is no requirement that every department be represented in each location, though it is possible. Each department, at each location, will have a manager who is responsible for that department at that location. Each location also has an individual who is in charge of the entire location. Every employee at Stomper & Wombat’s has a direct supervisor, except for the president.

The departments are Executive, Accounting, Assembly, Engineering, Information Technology, Inventory, Maintenance, Marketing, Payroll, Purchasing, Sales, Security, and Strategy.

The Executive department is simply the upper echelon of Stomper & Wombat’s:

- Jefferson Polk, President
- Sara Young, CFO, EVP Finance
- Peter Gibbons, CTO, EVP Technology Services
- Ole Kirk Christiansen, EVP Manufacturing and Logistics
- Betty Draper, EVP Marketing and Strategy
- Desmond Llewelyn, EVP Engineering and Research
- William MacDougal, Director of Facilities
- Franklin Nelson, Corporate Counsel
- Jack Reacher, Director of Security
- Dr. Stephen Strange, M.D., Director of Health Services

### **Jim Halpert – Regional Sales Manager**

*Mr. Halpert is one of the most successful salesmen in the history of Stomper & Wombat's. His expertise is with Sales. He started at headquarters but has since transferred to the Tampa Bay, FL, office to lead the sales for that region.*

Sales is what drives our business. We have customers who buy products from us. A customer places an order, we fill it, and then ship it. Each and every order is reviewed after it is placed. This review has to happen within 2 business days. After the review, the order will either be approved or denied.

The United States is divided into sales regions, and each region is served by a sales department at one of our locations. Customers can place orders by phone, or through the website.

We also have a region which is responsible for all international orders, and only international orders. International orders are only placed through the website. This region is managed from company headquarters.

Our systems track each and every customer. We do not take an order from anyone who is not in our system as a customer. This includes on-line orders. Stomper & Wombat's also requires at least one contact person at each customer, but no more than three.

We do have the ability to offer a discount to a customer, or on a single order. This must be approved by a sales manager before it can be applied.

## **Haley Pritchett – Customer Relations Specialist**

*Ms. Pritchett works at headquarters in the Customer Relations group. She is responsible for checking with customers to make sure they are pleased with the service they receive at Stomper & Wombat's. This group also monitors a phone number and email address that the customers use when they have questions, complaints, or suggestions.*

Each location has a Customer Relations group. We are currently part of the Strategy department, though at different times in the past we have been in the Sales, Executive, and Marketing departments. We're important, they just know where to put us.

We contact each customer once a year to see if they are pleased with Stomper & Wombat's. We have a standard set of questions that we ask them, and a score is calculated from the responses. Well, three scores. Some of the questions are about their salesperson, some are about the quality of the products we ship them, and the others are about the accuracy and timeliness of the delivery. We do not do this with international orders because those customers do not have their own salesperson. At least not right now.

We used to do these surveys over the phone, but some customers have since asked us to send theirs by email. Makes sense to use technology.

We also handle calls and emails when the customer is complaining about something. Those we need to address quickly. We are in a competitive business and need to make sure we keep our customers happy.

We do keep track of complaints, and we can suggest a customer receive a discount on their next order.

### **Darryl Philbin – Warehouse Supervisor**

*Mr. Philbin is a long-time supervisor of the warehouse at the Durham, NC, location. His expertise is with the inventory.*

We sell what we call “products.” Each product is made up of parts. These parts are what we keep in the warehouses at each location.

When an order is placed the proper warehouse gets a notification that lists each product, and quantity, on that order. Each product has what we call a bill of materials (BoM). This BoM lists which parts are needed to make that product. For example, the BoM for our Deluxe Rotary Thingamajig contains 8 whiz-bangs, 18 inches of duct tape, a flux capacitor and 9 stainless steel screws.

All parts that are needed to make every product on an order are collected from the warehouse and placed in a container, or containers, depending on how many parts or the size of them. These containers are then sent to the factory.

When someone pulls a part from our inventory, they are to scan the tag on the shelf and enter the number taken.

## **Katie Bell – Purchasing Agent**

*Ms. Bell is a purchasing agent located in the San Diego, CA, location. Her expertise is with purchasing as well as inventory.*

It is important that Stomper & Wombat's always has enough parts available to fulfill the orders that we receive. If we do not, then the order has to wait until we get enough of those parts. That makes customers unhappy. But, since those parts cost money, we do not want to have too many of them in the warehouse, either.

What we do in purchasing is buy parts from manufacturers that are then shipped to our warehouses. Every part, in every location, has what we call a re-order point. When we use enough of a part so that the number left on-hand is less than the re-order point, then we need to order more of that part.

Some parts are only available from one manufacturer, some are available from more than one. When a part is available from more than one manufacturer, it will still have the same Stomper & Wombat's part number.

If there is an emergency where we need to get parts in more quickly than normal and it will cost more, we can do that if someone approves it. Another possibility is that parts are shipped from one location to another.

### **Rosie Riveter – Lead Assembly Specialist**

*Ms. Riveter is a supervisor in the factory at the Roswell, NM, location. Her expertise is with the assembling products from parts and shipping.*

When the warehouse sends us the parts for the products on an order, we first need to double check what they sent us. The BoM is there with the parts. We need to sign off on the BoM before we start making the first part. If there is a problem, we send everything back to the warehouse for them to correct it.

Each product has a list of steps we have to follow in order to put it together. Each product has what is called a routing sheet which has each step of the assembly process for a product. It also shows how much time each step is supposed to take. For each step we record the person who is doing the work, the start time and end time. This is done so we can evaluate the workers.

When the order is complete, we send the products to another part of the factory. This is shipping. The staff there package all of the products and place them on trucks to be delivered to the customers. Sometimes, for whatever reason, we will ship part of an order, and the other part will be shipped later.

Everything leaves the location in a Stomper & Wombat's truck, though sometimes it is taken to the airport, or to IPS of Federal Express or something like that, if that is a better option.

## **Kevin Malone – Accounting**

*Mr. Malone is an accountant at the struggling Scranton, PA, location. His knowledge is supposedly in accounting. No other accountant volunteered to talk to the development team, so here we are.*

I work with numbers. Not just some of them, but all of them. I have an adding machine.

We have the normal accounting systems here. Accounts payable, accounts receivable, general ledger. I think there are both debits and credits so it is pretty complicated. We have to keep track of a lot of things.

One thing I do know is that we do not send an invoice to a customer until the stuff on the order is put on a truck. Some people call this a bill, but we accountants call it an invoice. This bill, I mean invoice, shows everything that was shipped, and how many of them. It has how much one of each thing costs, and then is timesed by the number of those things we put on the truck. By this I mean that if someone ordered five of our Gizmos. The ~~bill~~ invoice says that we shipped 5 Gizmos, each one costs 9.85 and then all 6 of them costs, uh, some number bigger than 9.85.

Every customer has a certain number of days to pay the bill, before we start calling them, and maybe charging a late fee. We keep track of payments.

Some customers have a discount. Sometimes we just discount one order. Some locations charge sales tax, depending on where they are. Some states do not have sales tax. Some customers never pay sales tax, like churches.

We might charge them for shipping if the order is small or we have to have someone else do the shipping. Or if it goes to another country, like Hawaii.



### **April Ludgate – Payroll Specialist**

*Ms. Ludgate started as an intern in accounting but is now a full-time employee handling payroll. She is at headquarters, the location that processes payroll for all employees of Stomper and Wombat's. Her expertise is in Payroll and Human Resources.*

We process payroll ourselves, we do not have a third-party administrator do our payroll.

We pay employees in three different ways:

- The salespeople receive a monthly salary as well as commission on their sales. Different salespeople have different commission percentages. These commissions are a month in arrears. For example the commission check a salesperson gets on the last day of May is based on the sales during April.
- Some employees are paid by the hour. This is based on job title, not on each individual employee. Each hourly employee has an expected number of hours they are to work in a week. Hourly employees are eligible for overtime (if they work more than 40 hours in a week) and shift-differential (work 3<sup>rd</sup> shift).
- The rest of the employees are on salary, and get the same pay at the end of each month.

There are a lot of benefits employees can get here. Health insurance, dental, vision. Short and long term disability. Life insurance. 401k.

For taxes we need to know marital status, dependents, exemptions claimed, extra withholding.

We have to keep a lot of information for each employee.

What is expected of your VaporWare data design team?

- Milestone 1: A requirements document, which contains the business rules that will determine how this new system operates.
  - Each business rule must adhere to the guidelines for well-written business rules that was discussed in class.
  - Each business rule must be categorized as a structural assertion (is it a term or fact), derived assertion, or action assertion. If an action assertion, what type is it (i.e., timer, enabler, etc.)
  - A mock-up of data entry screens, at least one for each stakeholder who provided information above.
- Milestone 2: A conceptual design, using an ER/EER model.
  - The only attributes on this diagram are the primary key attributes.
  - All other attributes are to be on a separate document. In addition to documenting the entity/relation for each of these attributes, denote any compound and derived attributes.
- Milestone 3: A relational model based on the conceptual model.
  - This relational model must match your conceptual model.
  - This relational model must be normalized to the BCNF level. If you feel that there are entities that should not be normalized to that level, and then instead provide justification for that design decision.
- Milestone 4: A description of any additional database artifacts that you feel are needed, and why they are needed. For example:
  - Any additional indexes (all primary key and foreign keys should be denoted on the conceptual model)
  - Views
  - Check constraints
  - Default constraints
  - A list of reports that should be generated from the database. The requirements should suggest a few; but there are others that make sense. These would typically be generated by the system as a PDF or Excel file.
- Milestone 5: Final deliverables:
  - SQL script files that will create the database and its artifacts
  - SQL script files to insert data in the tables
  - A document that details any operations where transactions should be used

All documentation should be neat, complete and professional.