



School of Information Technology
Computer Programming, F19

Database Technical Documentation Proposal

SEWphisticated Machines[®]
Make something meaningful.

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CSD-2206, Database Design & SQL

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1.0 Database Modelling: Analysis and Design

1.1 Company Name, Overview & Description

Sewphisticated Machines

Sewing Canada, International Sewing & Co., and The Sewcial Stitch, gathered together to promote innovation, technology and creativity thus forming *Sewphisticated Machines*. *Sewphisticated Machines* is a retailing company located in Sarnia that is selling top of the line, revolutionary sewing machine technology. They offer comprehensive educational seminars, service, and supports to customers internationally.

Educational seminars occur twice per month and include up to a maximum of six participants to ensure quality education and learning. The seminars purpose is to improve beginner to intermediate sewing skills, comprehension of complex sewing patterns and improvement with technical skills while learning the technological advancements of these machines.

Our technical service and supports program provide our customers with technical support issues, systematic reset processes and learning advancement to ensure each customers' needs are met. Additionally, we strive to achieve customer loyalty, longevity and relationship building. We pride ourselves on our teams' knowledge and expertise in all things sewing. Our incredible team of expert's complete comprehensive research to offer our customers the most progressive products on the market. *SEWphisticated Machines* dominates competitors by offering customers machines with revolutionary technology including cutting-edge touch screens, laser stitch precision, unbeatable power, lightweight carrier options, innovative features and economic pricing.

Our company caters to those wanting to learn a new skill and create something meaningful. We pride ourselves on our knowledge and customer service, and promise you a product that will out-live any warranty on the market.

Table 1. Company Characteristics List

Company Characteristics	
Company Name	Sewphisticated Machines
Company Slogan	Make something meaningful.
Company Mission Statement	To be a global leader in the creative industry by inspiring sewers of all levels to transform their skills by using revolutionary technology
Company Locations	Toronto (HQ), Winnipeg, Calgary, Vancouver
Company Type	Retailer
Company Product	Sewing Machines

SEWphisticated Machines is revolutionizing the creative process for people all around the globe. Our success in business and retail of sewing machines has lead to our expansion of our operations in over four locations across Canada to keep up with the demand. We have initiated our expansion and development process

by collecting data and statistics from our company employees, customers and orders. We utilize and collect related data and metadata into a structured software, **DBeaver EE Edition**, Universal Database Manager for efficient and effective database management of our company sales, customers, orders, and rentals of our products. The table below demonstrates our initial draft of our conceptual and logical data model.

Table 2. Company Attributes Draft (Table Layout)

IBM PRODUCT: SEWING MACHINES	Description
COMPANY ID	Company ID helps us distinguish which company owns the product.
MODEL NUMBER	Refers to the specific number given to the product (and establishes newer versions of the product).
PRODUCT NAME	Identification of the product.
BRAND	Brand of technology the product uses for performance.
WARRANTY (YRS)	Number of years the product is under warranty based on specific company policy.
PARTS	Physical parts that make up the sewing machine.
MACHINE CATEGORY	Type and function of machine (for e.g. embroidery, quilter etc.).
FEATURES	Product features that identify newer/updated versions (i.e. touch screen, petal, laser precision etc.).
PRICE	Price of the product in Canadian currency.
SIZE	Dimensions of the product.
COLOR	Color the product and associative parts come in and availability of those parts.
WEIGHT	Weight of the product (in lbs & kg).
SURFACE AREA	Surface area the product takes up on sewing machine-support table (in m ²).
RENTAL PRICE	Products available to be rented and associated rental price.

1.2 Product Attributes

Figure 1. Illustrates our company product attributes identified using a partial Entity Relationship Diagram (ERD). This is a draft of our conceptual and logical data model. This ER table illustrates the list of attributes of our entity, Sewing Machines. The characters in bold demonstrate attributes that are mandatory for our company database. The Primary Key (PK) demonstrates the Unique Identifier of our entity.

Figure 1. Draft ERD Listing attributes of the entity (company product) Sewing Machines.

SEWING MACHINES	
PK	product_id
	company_id
	model_num
	product_name
	brand
	warranty_years
	parts
	category
	features
	price
	size
	color
	weight
	surface area
	rental_price

The attribute and unique identifier (UID) of our product sewing machines, referred to as '**product_id**', is the attribute that uniquely identifies every single product from the other products that we carry. We utilize the product_id to help identify other details of the product that include but are not limited to corresponding product name, model ID, brand, machine category and other attributes. These additional attributes assist us with providing customers specific details on the product(s) of their interest.

Customers purchase hundreds of products from our retailing company 'Sewphisticated Machines.' We organize their purchase of our product(s) by a customer sales invoice they receive as an attachment via e-mail. Please see an example of our customer sales invoice attached below.

INVOICE

INVOICE NO. 1121

DATE: 2019-09-23



SEWphisticated Machines 222 Sewing Road Toronto, ON M5G 1L7 Phone: 416-555-2222 Fax: 416-555-2226 Email: info_sm@outlook.ca	INVOICE TO: Customer Name: Sewing CANADA Customer Address 110 9 Ave SE Calgary, AB T2G 5A6 Customer ID: 1001 Phone: 406-555-2928	SHIP TO: <input checked="" type="checkbox"/> Select <i>(If Invoice Address & Shipping Address is the same).</i> Otherwise input details below: <hr/> <hr/>
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SALES ASSOCIATE	ASSOCIATE ID	ORDER ID	ORDER DATE
Joanne McDaniels	988756	91021	2019-09-30



Product ID	Model ID	Brand	Machine Category	Description	Weight (kg))	Size (mm)	(#)	Unit Price	Extended Price
BRO	2340C V	Brother	Cover Stitch	auto height adjuster, pivot function, enhanced custom stitch	15.7 kg	W624 H320 D260	1	\$1,225.00	\$1,225.00
JAN	J-400E	Janome	Embroidery	180 embroidery designs, USB compatibility	15.9 kg	W622 H188 D290	1	\$1,349.99	\$1,349.99
Bernette	B42	Bernina	Serger	one-push air threading system, 8-piece feed-dog system,	19.9 kg	W987 300H D201	2	\$499.00	\$998.00
REL	R64	Reliable	Blind Hemmer	versatility with ability to stitch all weighted type materials	14.8 kg	W643 H339 D291	1	\$649.00	\$649.00
JA	4120Q DC-B	Juki	Quilting Machine	automatic stitch regulator, large bobbin capacity	15.2 kg	W655 H407 D252	2	\$699.00	\$1,398.00
JA	654-DE	Juki	Serger	built-in rolled hemming and overlock/flatlock variations	14.2 kg	W564 H102 D299	1	\$479.00	\$479.00

Subtotal	\$6,098.99
Sales Tax (13%)	\$792.87
Invoice Total	\$6,891.86

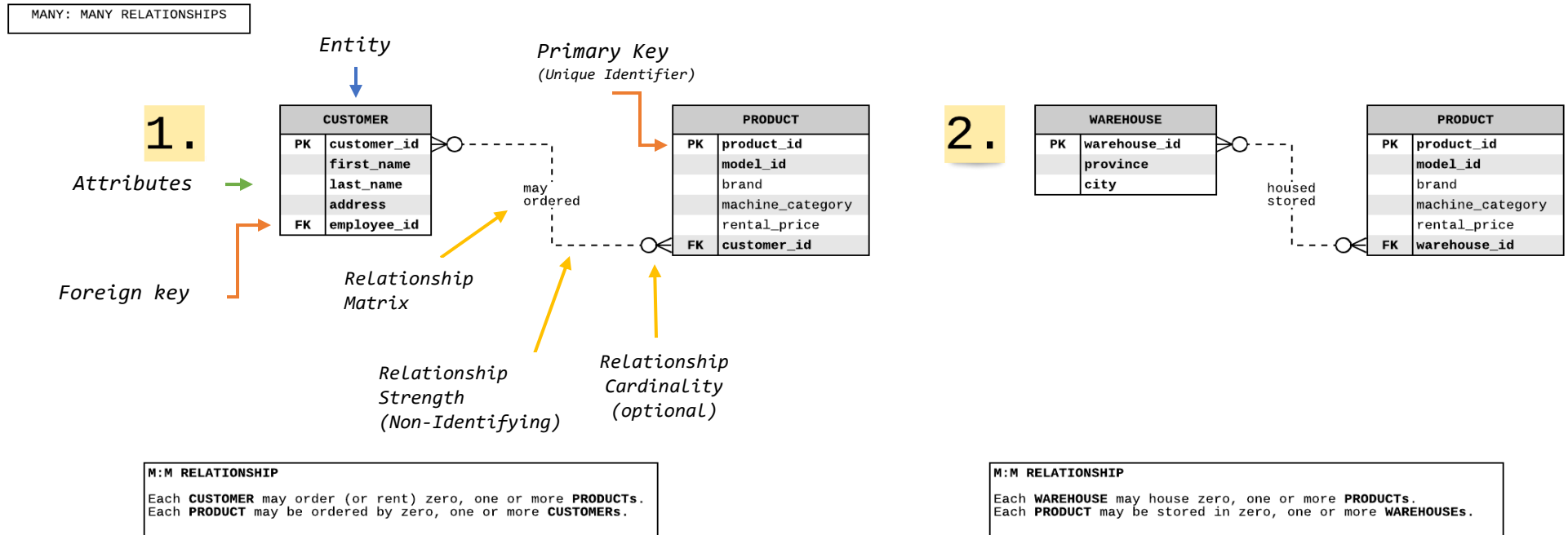
Thank you for your business!

Any questions or concerns please contact info_sm@outlook.ca

1.4 Entity-Relationship Diagram

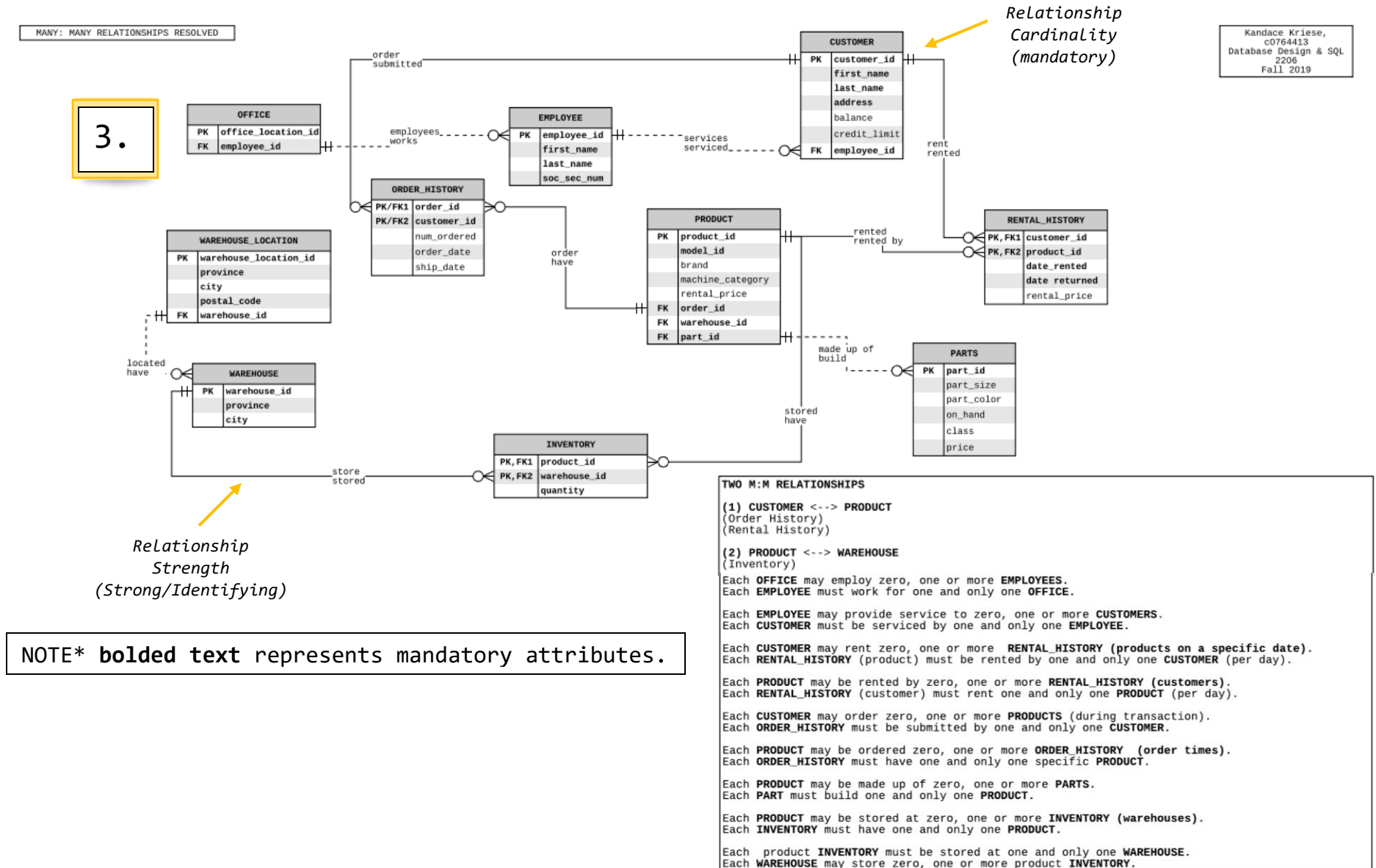
Below is a structural diagram known as an Entity Relationship Diagram (ERD) that *SEWphisticated Machines* has designed to illustrate major entities within the company's scope and the corresponding inter-relationships among those entities. In Figure 2. you will notice many-to-many (M:M) relationships that have been formed during the design process. Following Figure 2. *Sewphisticated Machines* resolved these M:M relationships and demonstrated these resolves in Figure 3. The resolves of the M:M relationships ensure data integrity within the relational database.

Figure 2. Many-to-Many Relationships (M:M)

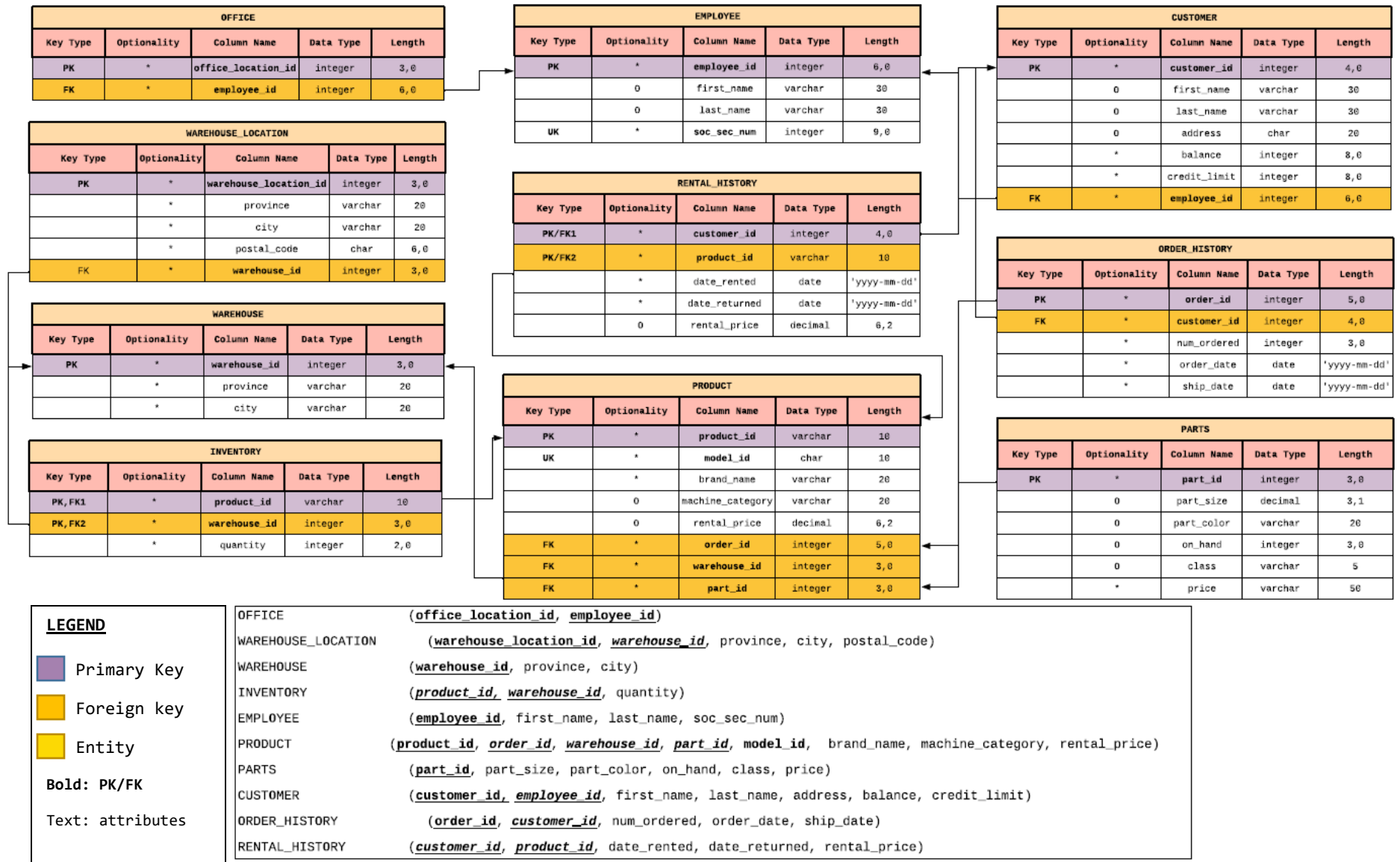


NOTE* **bolded text** represents mandatory attributes.

Figure 3. M:M Relationships resolved. Final ERD.



1.5 Relational Physical Model (Physical ERD)



2.0 Database Build & Constraints Implementation Project

2.1 The Construct of Create & Alter DDL Statements

In the data implementation project (the construction phase of our database), we utilized Data Definition Language (DDL) that consisted of SQL commands to create and modify our database structure. We included the following DDL commands within our SQL: CREATE, ALTER and DROP statements. Additionally, we used SELECT and INSERT statements to populate each table with the test data of our company attributes with their corresponding entities. Please see the SQL QUERY attachment to review our DDL statements.

2.2 Database Constraints

Sewphisticated Machines successfully implemented DDL statements in the SQL database management system as shown in the attachment. To ensure data integrity within our entity tables, Sewphisticated machines built restrictions based on several business rules and/or policies. The integrity constraints define the possible values of each column. Additionally, the constraints will help to maintain data integrity by restricting inappropriate values entered in those same columns. Database constraints (business rules) have been included for the following: NOT NULL, DEFAULT, Primary Keys, Foreign Keys, Unique Keys and Check constraints. Constraints were included in the SQL using *Alter Table* statements.

2.3 Constraint Testing

Below identifies each constraint unit tested and documentation outlining the potential outcome when A) A constraint is violated and B) When the constraint is successful.

(1) EMPLOYEE TABLE

EMPLOYEE TABLE	CONSTRAINT TESTING - Primary Key
Testing Num.	1
Date	October 16, 2019
Description	Confirm primary key constraint employee_id is inputted once and value uniquely identifies each row in table sm_employees.
Expected Results	Insert fails with SQL_SM_IBM7918 duplicate key error.

Action	INSERT INTO sm_employees VALUES (988801, 'Sean', 'Sanders', 512345673);
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

EMPLOYEE TABLE	CONSTRAINT TESTING - Unique Key
Testing Num.	2
Date	October 18, 2019
Description	Confirm unique key constraint on soc_sec_num to ensure no duplicate numeric data entries in table sm_employees.
Expected Results	Insert fails with SQL_SM_IBM7918 duplicate key error.
Action	INSERT INTO sm_employees VALUES (988801, 'Sean', 'Sanders', 512345673);
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

EMPLOYEE TABLE	CONSTRAINT TESTING - Mandatory
Testing Num.	3
Date	October 19, 2019
Description	Confirm accurate numeric input is satisfactory to specific condition of social security number in table sm_employees.
Expected Results	Insert fails with SQL_SM_IBM7918 duplicate key error.
Action	INSERT INTO sm_employees VALUES (988801, 'Sean', 'Sanders', 512345673);
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

(2) OFFICE TABLE

OFFICE TABLE	CONSTRAINT TESTING - Primary Key
Testing Num.	1
Date	October 15, 2019
Description	Confirm primary key constraint office_location_id is inputted once and value uniquely identifies each row in table sm_office.
Expected Results	Insert fails with SQL_SM_IBM7918 duplicate key error.
Action	INSERT INTO sm_office VALUES (106, 988801);

Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.
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OFFICE TABLE	CONSTRAINT TESTING - Foreign Key
Testing Num.	2
Date	October 15, 2019
Description	Confirm foreign key constraint on employee_id to ensure data relates to parent table sm_employees.
Expected Results	Insert fails with SQL_SM_IBM7918 insufficient numeric error.
Action	INSERT INTO sm_office VALUES (106, 988801);
Message	SQL Error [23505]: [SQL0803] , incorrect parent key value specified

(3) CUSTOMERS TABLE

CUSTOMERS TABLE	CONSTRAINT TESTING - Primary Key
Testing Num.	1
Date	October 11, 2019
Description	Confirm primary key constraint on customer_id to ensure value uniquely identifies each row in table sm_customers. Input data should meet specified condition as outlined in CHECK constraint, else ERROR.
Expected Results	Insert fails with SQL_SM_IBM7918 duplicate key error.
Action	INSERT INTO sm_customers VALUES (1007, 'SewingLife', 'North America', '16 Grey Road, Calgary', 988801);
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

(4) ORDER_HISTORY TABLE

ORDER_HISTORY TABLE	CONSTRAINT TESTING - Primary Key
Testing Num.	1
Date	October 11, 2019
Description	Confirm primary key constraint on order_id to ensure value uniquely identifies each row in table sm_order_history. Input data should meet

	specified condition as outlined in CHECK constraint, else ERROR.
Expected Results	Insert fails with SQL_SM_IBM7918 duplicate key error.
Action	INSERT INTO sm_order_history VALUES (20210, 1007, '2019-08-29', '2019-08-30');
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

ORDER_HISTORY TABLE	CONSTRAINT TESTING - Mandatory
Testing Num.	2
Date	October 23, 2019
Description	Confirm inputted value of shipping date to be AFTER or the same as ORDER DATE.
Expected Results	Insert fails when shipping date falls prior to order date.
Action	INSERT INTO sm_order_history VALUES (20210, 1007, '2019-08-29', '2019-08-30');
Message	SQL Error [23513]: [SQL0545] INSERT, UPDATE, or MERGE not allowed by CHECK constraint.

(5) PARTS TABLE

PARTS TABLE	CONSTRAINT TESTING - Primary Key
Testing Num.	1
Date	October 22, 2019
Description	Confirm primary key constraint on part_id to ensure value uniquely identifies each row in table sm_parts. Input data should meet specified condition as outlined in CHECK constraint, else ERROR.
Expected Results	Insert fails with SQL_SM_IBM7918 duplicate key error.
Action	INSERT INTO sm_parts VALUES (005, 22.3, 'maroon');
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

(6) WAREHOUSE

WAREHOUSE TABLE	CONSTRAINT TESTING - Primary Key
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Testing Num.	1
Date	October 20, 2019
Description	Confirm primary key constraint on warehouse_id to ensure value uniquely identifies each row in table sm_warehouse. Input data should meet specified condition as outlined in CHECK constraint, else ERROR.
Expected Results	Insert fails with SQL_SM_IBM7918 duplicate key error.
Action	Action: INSERT INTO sm_warehouse VALUES (905, 'AL', 'CA');
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

WAREHOUSE TABLE	CONSTRAINT TESTING - Primary Key
Testing Num.	2
Date	October 20, 2019
Description	confirm constraint on mandatory CITY and PROVINCE input in table sm_warehouse to ensure input data satisfies the specified condition (specific locations of warehouse indicated) else ERROR.
Expected Results	Insert fails with SQL_SM_IBM7918 incorrect data entry.
Action	Action: INSERT INTO sm_warehouse VALUES (905, 'AL', 'CA');
Message	SQL Error [23513]: [SQL0545] INSERT, UPDATE, or MERGE not allowed by CHECK constraint.

(7) PRODUCTS TABLE

PRODUCTS TABLE	CONSTRAINT TESTING - Primary Key
Testing Num.	1
Date	October 26, 2019
Description	Confirm primary key constraint on product_id to ensure value uniquely identifies each row in table sm_products. Input data should meet specified condition as outlined in CHECK constraint, else ERROR.locations of warehouse indicated) else ERROR.
Expected Results	Insert fails with SQL_SM_IBM7918 duplicate key error.

Action	INSERT INTO sm_product VALUES ('SIG', 'SGR908', 'Singer', 'Blind Hemmer', 150.00, 20210, 904, 004);
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

PRODUCTS TABLE	CONSTRAINT TESTING - Unique Key
Testing Num.	2
Date	October 26, 2019
Description	Confirm unique key constraint on model_id to ensure no duplicate numeric data entries in table sm_products.
Expected Results	Insert fails with SQL_SM_IBM7918 duplicate key error.
Action	IN INSERT INTO sm_products VALUES ('SIG', 'SGR908', 'Singer', 'Blind Hemmer', 150.00, 20210, 904, 004);
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

PRODUCTS TABLE	CONSTRAINT TESTING - Mandatory Key
Testing Num.	3
Date	October 26, 2019
Description	Confirm brand_name IS NOT NULL by ensuring data entry is successfully completed in this specific row.
Expected Results	Upload fails with SQL_SM_IBM7918 when data has not been entered along with primary key.
Action	INSERT INTO sm_products VALUES ('SIG', 'SGR908', 'Singer', 'Blind Hemmer', 150.00, 20210, 904, 004);
Message	SQL Error [23503]: [SQL0530] Operation not allowed by referential constraint SM_PRODUCTS_PART_ID_FK in IBM7918.

(8) RENTAL_HISTORY

RENTAL_HISTORY TABLE	CONSTRAINT TESTING - Primary Key
Testing Num.	1
Date	October 29, 2019

Description	Confirm primary key constraint on customer_id and product_id to ensure value(s) uniquely identifies each row in table sm_rental_history. Input data should meet specified condition as outlined in CHECK constraint, else ERROR.
Expected Results	Insert fails with SQL_SM_IBM7918 unidentifiable value.
Action	INSERT INTO sm_rental_history VALUES (1005, 'JA', '2019-11-29', '2019-11-30');
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

RENTAL_HISTORY TABLE	CONSTRAINT TESTING -Mandatory
Testing Num.	2
Date	October 29, 2019
Description	confirm inputted value of date_rented to be BEFORE or SAME as date_returned
Expected Results	Insert fails when date_rented falls latter to date_returned.
Action	INSERT INTO sm_rental_history VALUES (1005, 'JA', '2019-11-29', '2019-11-30');
Message	SQL Error [23513]: [SQL0545] INSERT, UPDATE, or MERGE not allowed by CHECK constraint.

(9) INVENTORY TABLE

INVENTORY TABLE	CONSTRAINT TESTING - PRIMARY KEY
Testing Num.	1
Date	October 31, 2019
Description	Confirm primary key constraint on product_id and warehouse_id value(s) uniquely identifies each row in table sm_inventory. Input data should meet specified condition as outlined in CHECK constraint, else ERROR.
Expected Results	Insert fails with SQL_SM_IBM7918 unidentifiable value.
Action	INSERT INTO sm_inventory VALUES ('JA', 901, 18);
Message	SQL Error [23505]: [SQL0803] Duplicate key value specified.

INVENTORY TABLE	CONSTRAINT TESTING - Mandatory
Testing Num.	2
Date	October 31, 2019
Description	Confirm inputted value of quantity IS NOT NULL.
Expected Results	Insert fails when quantity value returns a 0.
Action	INSERT INTO sm_inventory VALUES ('JA', 901, 18);
Message	SQL Error [23513]: [SQL0545] INSERT, UPDATE, or MERGE not allowed by CHECK constraint.

Constraint Unit Testing completed.

3.0 Database SQL Query Project

3.1 SQL Query 1: SMPRODV1

SMPRODV1 view that is a result set based upon two tables.

PRODUCT_ID	MACHINE_CATEGORY	ON_HAND	PRICE
BRO	CoverStitch	7	1225.00
B8	Miniature	7	1225.00
JAN	Embroidery	16	1139.99
REG	Embroidery	16	1139.99
SIG	Serger	16	1139.99
REGG	CoverStitch	16	1139.99
BRO90	Embroidery	16	1139.99
BERM	Embroidery	16	1139.99
RE12	Embroidery	16	1139.99
BERNETTE	Serger	43	1450.00
PF	Serger	43	1450.00
SHARP	Miniature	43	1450.00
SHPP	Blind Hemmer	43	1450.00
bro69	Serger	43	1450.00
shrP66	Serger	43	1450.00
REL	Blind Hemmer	20	1115.25
SHRP	Blind Hemmer	20	1115.25
Bro1	Blind Hemmer	20	1115.25
BRO100	CoverStitch	20	1115.25
OM	CoverStitch	20	1115.25
JA	Quilter	4	2001.99
KI	Quilter	4	2001.99
SP	Quilter	4	2001.99
REG16	Serger	4	2001.99
BB97	Blind Hemmer	4	2001.99

```
-----SMPRODV1 PRODUCTS SQL
CREATE OR REPLACE VIEW smprodv1 AS
  SELECT product_id, machine_category, on_hand, price
  FROM SM_PRODUCTS
  JOIN sm_parts USING(part_id);

SELECT * FROM smprodv1;
```

Note* machine_category is the product 'description.'

3.2 SQL Query 2: SMPRODV2

SMPRODV2 view is a result set based upon multiple-table joins (four).

CUSTOMER_NAME	ORDER_DATE	ORDER_ID	NUM_ORDERED	PRODUCT_ID	MACHINE_CATEGORY	PRICE
Long ,Debra	2019-04-22	20,201	2	BRO	CoverStitch	1225.00
Lever ,Stephanie	2019-06-17	20,214	2	B8	Miniature	1225.00
Sloan ,Chance	2019-04-25	20,202	1	JAN	Embroidery	1139.99
Long ,Debra	2019-01-19	20,207	2	REG	Embroidery	1139.99
Canada ,Sewing	2019-08-29	20,210	7	SIG	Serger	1139.99
Sloane ,Jessica	2019-09-18	20,212	6	REGG	CoverStitch	1139.99
Canada ,Michaels Retailer	2019-03-21	20,216	1	BRO90	Embroidery	1139.99
International ,Sewing Co.	2019-05-13	20,219	3	BERM	Embroidery	1139.99
Read ,Donna	2019-09-29	20,225	3	RE12	Embroidery	1139.99
Canada ,Sewing	2019-04-26	20,203	1	BERNETTE	Serger	1450.00
Lawrence ,Levi	2019-01-16	20,208	2	PF	Serger	1450.00
Thompson ,Susanna	2019-04-15	20,213	1	SHARP	Miniature	1450.00
Long ,George	2019-04-10	20,220	1	SHPP	Blind Hemmer	1450.00
Sloane ,Jessica	2019-04-11	20,222	1	bro69	Serger	1450.00
Bordal ,Claire	2019-06-14	20,223	2	shrP66	Serger	1450.00
Dance ,Claire	2019-04-27	20,204	3	REL	Blind Hemmer	1115.25
North America ,SewingLife	2019-09-15	20,209	1	SHRP	Blind Hemmer	1115.25
Bordal ,Claire	2019-09-15	20,211	1	Bro1	Blind Hemmer	1115.25
McDwane ,Simon	2019-07-08	20,217	1	BRO100	CoverStitch	1115.25
Kriese ,Kandace	2019-10-27	20,221	4	OM	CoverStitch	1115.25
Brown ,Dan	2019-02-11	20,205	2	JA	Quilter	2001.99
Dance ,Claire	2019-05-03	20,206	1	KI	Quilter	2001.99
Hutchinson ,Becky	2019-01-15	20,215	2	SP	Quilter	2001.99
Thompson ,Susanna	2019-01-02	20,218	1	REG16	Serger	2001.99
Hough ,Julianne	2019-09-15	20,224	1	BB97	Blind Hemmer	2001.99

```
-----SMPRODV2 CUSTOMERS SQL
CREATE OR REPLACE VIEW smprodv2 AS
  SELECT last_name || ', ' || first_name AS customer_name,
         order_date,
         order_id,
         num_ordered,
         product_id,
         machine_category,
         price
  FROM SM_CUSTOMERS
  INNER JOIN sm_order_history USING(customer_id)
  INNER JOIN sm_products USING(order_id)
  INNER JOIN sm_parts USING(part_id);

SELECT * FROM smprodv2;
```

3.3 Additional Entity Tables

EMPLOYEE TABLE

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	SOC_SEC_NUM
988,756	Joanne	McDaniels	212,345,678
988,757	Lori	Jane	912,345,679
988,758	Donald	Jackson	612,345,670
988,759	Sara	Ferguson	412,345,671
988,800	Allison	McCormick	512,345,672
988,801	Sean	Sanders	512,345,673

OFFICE TABLE

OFFICE_LOCATION_ID	EMPLOYEE_ID
101	988,756
102	988,757
103	988,758
104	988,759
105	988,800
106	988,801

CUSTOMER TABLE

CUSTOMER_ID	FIRST_NAME	LAST_NAME	ADDRESS
1,001	Debra	Long	28 Crane Boulevard, Toronto
1,002	Chance	Sloan	52 Red Deer St, Alberta
1,003	Sewing	Canada	110 Main St, Toronto
1,004	Claire	Dance	10 Bell St, Quebec
1,005	Dan	Brown	9 Circle Crescent, Barrie
1,006	Levi	Lawrence	2 Green St, Montreal
1,007	SewingLife	North America	16 Grey Road, Alberta
1,008	George	Long	280 Bore Street, Montreal
1,009	Tyler	McDonald	109 Clever Crescent, Toronto
1,010	Benjamin	Blane	8 Nile Road, Toronto
1,011	Michaels Retailer	Canada	99 St. Clair Blvd., Calgary
1,012	Becky	Hutchinson	6024 Mckean Street, Toronto
1,013	Amanda	Shorter	150 Claire Road, Alberta
1,014	Donna	Read	410 Robinson Street, Vancouver
1,015	Lawrence	Smith	36 Chelsea Road, Toronto
1,016	Simon	McDwane	2710 Wedding Boulevard, Quebec
1,017	Tammy	Lorde	2A Clarence Crescent, Quebec
1,018	Susanna	Thompson	340 Mutchin Road, Barrie
1,019	Stephanie	Lever	66 Chandler Boulevard, Toronto
1,020	Sewing Co.	International	79 Sam Boulevard, Barrie
1,021	Julianne	Hough	18 Stella Crescent, Montreal
1,022	Jessica	Sloane	20 Key Street, Toronto
1,023	Shawn	Greeves	120 Lawrence Boulevard, Calgary
1,024	Kandace	Kriese	150 Champagne Boulevard, Winnipeg
1,025	Claire	Bordal	94 Cake Street, Toronto

ORDER HISTORY TABLE

ORDER_ID	CUSTOMER_ID	NUM_ORDERED	ORDER_DATE	SHIP_DATE
20,201	1,001	2	2019-04-22	2019-04-24
20,202	1,002	1	2019-04-25	2019-05-01
20,203	1,003	1	2019-04-26	2019-05-22
20,204	1,004	3	2019-04-27	2019-04-29
20,205	1,005	2	2019-02-11	2019-02-15
20,206	1,004	1	2019-05-03	2019-05-05
20,207	1,001	2	2019-01-19	2019-01-22
20,208	1,006	2	2019-01-16	2019-01-17
20,209	1,007	1	2019-09-15	2019-09-20
20,210	1,003	7	2019-08-29	2019-08-30
20,211	1,025	1	2019-09-15	2019-09-20
20,212	1,022	6	2019-09-18	2019-09-20
20,213	1,018	1	2019-04-15	2019-04-20
20,214	1,019	2	2019-06-17	2019-06-26
20,215	1,012	2	2019-01-15	2019-01-16
20,216	1,011	1	2019-03-21	2019-03-22
20,217	1,016	1	2019-07-08	2019-07-20
20,218	1,018	1	2019-01-02	2019-01-03
20,219	1,020	3	2019-05-13	2019-05-25
20,220	1,008	1	2019-04-10	2019-04-12
20,221	1,024	4	2019-10-27	2019-11-03
20,222	1,022	1	2019-04-11	2019-04-19
20,223	1,025	2	2019-06-14	2019-06-20
20,224	1,021	1	2019-09-15	2019-09-25
20,225	1,014	3	2019-09-29	2019-09-30

PART TABLE

PART_ID	PART_SIZE	PART_COLOR	ON_HAND	CLASS	PRICE
1	23.1	red	7	CS	1225.00
2	27.1	yellow	16	EM	1139.99
3	59.2	brown	43	SG	1450.00
4	18.3	blue	20	BH	1115.25
5	22.3	maroon	4	QL	2001.99
6	23.1	red	3	SG	1200.99
7	30.1	yellow	8	EM	1305.99
8	59.2	brown	12	SG	1189.99
9	18.3	blue	21	BH	1217.99
10	27.3	maroon	6	QL	1111.99

WAREHOUSE TABLE

WAREHOUSE_ID	PROVINCE	CITY
901	ON	TO
902	MA	WI
903	AL	CA
904	ON	TO
905	AL	CA

PRODUCT TABLE

PRODUCT_ID	MODEL_ID	BRAND_NAME	MACHINE_CATEGORY	RENTAL_PRICE	ORDER_ID	WAREHOUSE_ID	PART_ID
BRO	2340CV	Brother	CoverStitch	129.99	20,201	901	1
JAN	J-400E	Janome	Embroidery	139.99	20,202	902	2
BERNETTE	B42V	Bermina	Serger	125.25	20,203	903	3
REL	R64	Reliable	Blind Hemmer	149.99	20,204	904	4
JA	4120QDC-B	Juki	Quilter	119.99	20,205	905	5
KI	98KIR8	Kirby	Quilter	119.99	20,206	905	5
REG	K-L907	Regina	Embroidery	139.99	20,207	902	2
PF	PFA44	PFAFF	Serger	125.25	20,208	903	3
SHRP	S398	Sharp	Blind Hemmer	149.99	20,209	904	4
SIG	SGR908	Singer	Serger	150.00	20,210	905	2
Bro1	29924	Brother	Blind Hemmer	149.99	20,211	904	4
REGG	66-90	Regina	CoverStitch	149.99	20,212	905	2
SHARP	S0000	Sharp	Miniature	160.99	20,213	905	3
B8	CV800	Brother	Miniature	149.25	20,214	902	1
SP	S39811	Sharp	Quilter	150.00	20,215	903	5
BRO90	CV65	Brother	Embroidery	169.00	20,216	904	2
BRO100	1200CV	Brother	CoverStitch	110.99	20,217	902	4
REG16	L-90	Regina	Serger	149.99	20,218	902	5
BERM	BB-100	Bermina	Embroidery	126.99	20,219	904	2
SHPP	Z-10A	Sharp	Blind Hemmer	165.35	20,220	905	3
OM	JJ-600A	Janome	CoverStitch	199.99	20,221	904	4
bro69	DS-90	Brother	Serger	120.25	20,222	903	3
shrP66	SHRP009	Sharp	Serger	143.55	20,223	902	3
BB97	29090D	Brother	Blind Hemmer	150.00	20,224	902	5
RE12	R-G68	Regina	Embroidery	149.99	20,225	905	2

INVENTORY TABLE

PRODUCT_ID	WAREHOUSE_ID	QUANTITY
BRO	901	10
JAN	902	22
BERNETTE	903	12
REL	904	15
KI	905	14
REG	905	10
PF	902	12
SHRP	903	12
SIG	903	15
JA	901	18
Bro1	902	10
REGG	903	18
SHARP	905	10
B8	901	12
SP	902	10
BRO90	903	11
BRO100	901	18
REG16	902	20
BERM	902	15
SHPP	901	11
OM	903	10
bro69	905	15
shrP66	901	38
BB97	901	54
RE12	904	10

RENTAL HISTORY TABLE

CUSTOMER_ID	PRODUCT_ID	DATE_RENTED	DATE_RETURNED	RENTAL_PRICE
1,001	BRO	2019-05-16	2019-05-17	129.99
1,002	JAN	2019-06-16	2019-06-17	139.99
1,003	REL	2019-06-22	2019-06-23	149.99
1,004	REL	2019-09-08	2019-09-09	119.99
1,005	JA	2019-11-29	2019-11-30	130.99

3.4 Conclusion

The development of the new database management system (DBMS) was an integrative approach that alleviated any inconsistent data input and ensured data, entity and referential integrity. The purpose of this design was to standardize the company's view of data. The DBMS ensures security of user information, organization of complex data and current statistics on inventory of product(s) across all warehouses. The semantic representation of data builds fuller and more meaningful descriptions which makes this system very user-friendly. The DBMS's ability to securely handle complex data make it extremely reliable. Additionally, the ability to provide extra authentication steps to the accessibility of data by users ensures safe and secure data handling. Therefore, there is no risk of data management at any level during the project development phase. Thank you for taking the time to review our DBMS proposal. We hope you select our DBMS/Database design to be implemented within your company. Thank-you.

Works Cited

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