l, Sukhmanjeet Singh, student number 000838215, certify that this material is my original work. No other person's work has been used without due acknowledgment and I have not made my work available to anyone else.

Vintage Console Nation (VCN) – A Database Design Case Study

# Introduction

This assignment focuses on designing an Entity Relationship Diagrom (ERD) for VCN, a company that deals with vintage and clone consoles. We’ll normalize the relevant data and create an ERD.

# Case Study Overview

* **Vintage Console Nation (VCN)** imports and distributes vintage and clone consoles.
* Product range includes consoles for Playstation 1 and 2, Nintendo 64, SNES, and Dreamcast, along with controllers, memory packs, and rumble packs.
* VCN sells to established retailers, not directly to individuals.
* Sales reps (field and inside) handle orders from electronic stores and department stores.
* A business-to-business web application manages incoming orders.

# ERD Creation Steps

In this section, we will outline the steps for creating the Entity Relationship Diagram (ERD). The normalization process involves progressing through various normal forms, including the zeroth (0NF), first (1NF), second (2NF), and third (3NF).

# Sales Order:

0NF: SALES\_ORDER\_ID + ITEM\_ID -> ORDER\_DATE, CUSTOMER\_ID, NAME, ADDRESS, CITY, PROV, POSTAL, DESCRIPTION, QUANTITY, PRICE, AMOUNT, TOTAL

1NF: SALES\_ORDER\_ID + ITEM\_ID -> ORDER\_DATE, CUSTOMER\_ID, NAME, ADDRESS, CITY, PROV, POSTAL, DESCRIPTION, QUANTITY, PRICE

2NF: SALES\_ORDER\_ID + ITEM\_ID -> QUANTITY

2NF: SALES\_ORDER\_ID -> ORDER\_DATE, CUSTOMER\_ID, NAME, ADDRESS, CITY, PROV, POSTAL

2NF: ITEM\_ID -> DESCRIPTION, PRICE

3NF: SALES\_ORDER\_ID + ITEM\_ID -> QUANTITY

3NF: SALES\_ORDER\_ID -> ORDER\_DATE, CUSTOMER\_ID

3NF: CUSTOMER\_ID -> NAME, ADDRESS, CITY, PROV, POSTAL

3NF: ITEM\_ID -> DESCRIPTION, PRICE

# Invoice:

0NF: INVOICE\_ID + ITEM\_ID + SALES\_ORDER\_ID -> INVOICE\_DATE, CUSTOMER\_ID, NAME, ADDRESS, CITY, PROV, POSTAL, DESCRIPTION, QUANTITY, PRICE, AMOUNT

1NF: INVOICE\_ID + ITEM\_ID + SALES\_ORDER\_ID -> INVOICE\_DATE, CUSTOMER\_ID, NAME, ADDRESS, CITY, PROV, POSTAL, DESCRIPTION, QUANTITY, PRICE

2NF: INVOICE\_ID + ITEM\_ID + SALES\_ORDER\_ID -> QUANTITY

2NF: INVOICE\_ID + SALES\_ORDER\_ID -> INVOICE\_DATE, CUSTOMER\_ID, NAME, ADDRESS, CITY, PROV, POSTAL

2NF: ITEM\_ID -> DESCRIPTION, PRICE

3NF: INVOICE\_ID + ITEM\_ID + SALES\_ORDER\_ID -> QUANTITY

3NF: INVOICE\_ID + SALES\_ORDER\_ID -> INVOICE\_DATE, CUSTOMER\_ID

3NF: CUSTOMER\_ID -> NAME, ADDRESS, CITY, PROV, POSTAL

3NF: ITEM\_ID -> DESCRIPTION, PRICE

# Inventory Status:

0NF: ITEM\_ID -> DESCRIPTION, ON\_HAND, ALLOCATED, ON\_ORDER, AVAILABLE

1NF: ITEM\_ID -> DESCRIPTION, ON\_HAND, ALLOCATED, ON\_ORDER

2NF: ITEM\_ID -> DESCRIPTION, ON\_HAND, ALLOCATED, ON\_ORDER

3NF: ITEM\_ID -> DESCRIPTION, ON\_HAND, ALLOCATED, ON\_ORDER

# Purchase Order:

0NF: PURCHASE\_ORDER\_ID + ITEM\_ID -> ORDER\_DATE, VENDOR\_ID, NAME, ADDRESS, CITY, COUNTRY, DESCRIPTION, QUANTITY, COST, AMOUNT, TOTAL

1NF: PURCHASE\_ORDER\_ID + ITEM\_ID -> ORDER\_DATE, VENDOR\_ID, NAME, ADDRESS, CITY, COUNTRY, DESCRIPTION, QUANTITY, COST

2NF: PURCHASE\_ORDER\_ID + ITEM\_ID -> QUANTITY

2NF: PURCHASE\_ORDER\_ID -> ORDER\_DATE, VENDOR\_ID, NAME, ADDRESS, CITY, COUNTRY

2NF: ITEM\_ID -> DESCRIPTION, COST

3NF: PURCHASE\_ORDER\_ID + ITEM\_ID -> QUANTITY

3NF: PURCHASE\_ORDER\_ID -> ORDER\_DATE, VENDOR\_ID

3NF: VENDOR\_ID -> NAME, ADDRESS, CITY, COUNTRY

3NF: ITEM\_ID -> DESCRIPTION, COST

# Items On Order:

0NF: ITEM\_ID + PURCHASE\_ORDER\_ID -> DESCRIPTION, VENDOR\_ID, QUANTITY

1NF: ITEM\_ID + PURCHASE\_ORDER\_ID -> DESCRIPTION, VENDOR\_ID, QUANTITY

2NF: ITEM\_ID + PURCHASE\_ORDER\_ID -> QUANTITY

2NF: ITEM\_ID -> DESCRIPTION

2NF: PURCHASE\_ORDER\_ID -> VENDOR\_ID

3NF: ITEM\_ID + PURCHASE\_ORDER\_ID -> QUANTITY

3NF: ITEM\_ID -> DESCRIPTION

3NF: PURCHASE\_ORDER\_ID -> VENDOR\_ID

# A/P Cheque:

0NF: VENDOR\_ID -> DATE, CHEQUE\_NUMBER, NAME, AMOUNT

1NF: VENDOR\_ID -> DATE, CHEQUE\_NUMBER, NAME, AMOUNT

2NF: VENDOR\_ID -> DATE, CHEQUE\_NUMBER, NAME, AMOUNT

3NF: VENDOR\_ID -> DATE, CHEQUE\_NUMBER, NAME, AMOUNT

# A/P Inquiry:

0NF: VENDOR\_ID -> NAME, VENDOR\_INVOICE\_ID, AMOUNT

1NF: VENDOR\_ID -> NAME, VENDOR\_INVOICE\_ID, AMOUNT

2NF: VENDOR\_ID -> NAME, VENDOR\_INVOICE\_ID, AMOUNT

3NF: VENDOR\_ID -> NAME, VENDOR\_INVOICE\_ID

3NF: VENDOR\_INVOICE\_ID -> AMOUNT

# Open Purchase Order Inquiry:

0NF: PURCHASE\_ORDER\_ID + VENDOR\_ID + ITEM\_ID -> QUANTITY, PURCHASE\_ORDER\_DATE

1NF: PURCHASE\_ORDER\_ID + VENDOR\_ID + ITEM\_ID -> QUANTITY, PURCHASE\_ORDER\_DATE

2NF: PURCHASE\_ORDER\_ID + VENDOR\_ID + ITEM\_ID -> QUANTITY

2NF: PURCHASE\_ORDER\_ID -> PURCHASE\_ORDER\_DATE

3NF: PURCHASE\_ORDER\_ID + VENDOR\_ID + ITEM\_ID -> QUANTITY

3NF: PURCHASE\_ORDER\_ID -> PURCHASE\_ORDER\_DATE

# Entity Relationship Diagram (ERD)

3NF: SALES\_ORDER\_ID + ITEM\_ID -> QUANTITY = ***SalesOrder***

3NF: SALES\_ORDER\_ID -> ORDER\_DATE, CUSTOMER\_ID = ***SalesOrderInformation***

3NF: CUSTOMER\_ID -> NAME, ADDRESS, CITY, PROV, POSTAL = ***Customer***

3NF: ITEM\_ID -> DESCRIPTION, PRICE = ***Item***

3NF: INVOICE\_ID + ITEM\_ID + SALES\_ORDER\_ID -> QUANTITY = ***Invoice***

3NF: INVOICE\_ID + SALES\_ORDER\_ID -> INVOICE\_DATE, CUSTOMER\_ID

3NF: CUSTOMER\_ID -> NAME, ADDRESS, CITY, PROV, POSTAL

3NF: ITEM\_ID -> DESCRIPTION, PRICE

3NF: ITEM\_ID -> DESCRIPTION, ON\_HAND, ALLOCATED, ON\_ORDER = ***InventoryStatus***

3NF: PURCHASE\_ORDER\_ID + ITEM\_ID -> QUANTITY = ***PurchaseOrder***

3NF: PURCHASE\_ORDER\_ID -> ORDER\_DATE, VENDOR\_ID = ***PurchaseOrderDetails***

3NF: VENDOR\_ID -> NAME, ADDRESS, CITY, COUNTRY

3NF: ITEM\_ID -> DESCRIPTION, COST

3NF: ITEM\_ID + PURCHASE\_ORDER\_ID -> QUANTITY

3NF: ITEM\_ID -> DESCRIPTION

3NF: PURCHASE\_ORDER\_ID -> VENDOR\_ID

3NF: VENDOR\_ID -> DATE, CHEQUE\_NUMBER, NAME, AMOUNT = ***APCheque***

3NF: VENDOR\_ID -> NAME, VENDOR\_INVOICE\_ID = ***APInquiry***

3NF: VENDOR\_INVOICE\_ID -> AMOUNT

3NF: PURCHASE\_ORDER\_ID + VENDOR\_ID + ITEM\_ID -> QUANTITY = ***OverDuePurchaseOrder***

3NF: PURCHASE\_ORDER\_ID -> PURCHASE\_ORDER\_DATE

