CCC211-18 ; 2BSCS-2: Marasigan, Vem Aiensi A.

Assignment 1: Usage and Difference of Transactional from Analytical Database

Nowadays, in the digital era, many companies rely upon modern technologies in handling pieces of information or data to have effective use for its advantages. By doing so, the application of databases is very prominent. Such are transactional databases and analytical databases.

Transactional databases are commonly used for storing information from the companies' daily transactions. These transactional data may include purchases, returns, invoices, payments, credits, debits, trades, dividends, asset sales, contracts, interests, contracts, payroll, lending, reservations, signups, subscriptions, contractual fees or penalties, and donations. These data are generated by various systems or programs that are being used by companies or clients while running or supporting everyday business processes or transactions. Other characteristics of this kind of database are having the capability to read and write transactional data quickly as well as maintaining its integrity. Hence, this kind of database is broadly used in retail, legal and commercial means.

However, transactional databases or systems may not be considered optimal for business intelligence. This is where analytical databases take the spotlight. Transactional databases are different from analytical databases but still, their relation to each other is significant. Information from transactional databases can serve as the basis of analysis.

From the word itself, data analysis is the primary purpose of having an analytical database. It is a read-only system that stores historical data on business metrics. This is designed to quickly analyze massive amounts of data compared to operational databases/transactional databases. Companies or analysts use this database to gain insights or knowledge about the clients' or users' patterns and behavior regarding their products and services. These pieces of knowledge are acquired from transactional data which are transformed using ETL (extract-transform-load) to become optimal business intelligence. Afterward, these pieces of data are loaded into data warehouses which will then be able to go through processes of analysis. That is why analytical databases are vital for a company as it generates insights and knowledge for them to come up with correct, wise, and effective decisions for the sake of their business' future.

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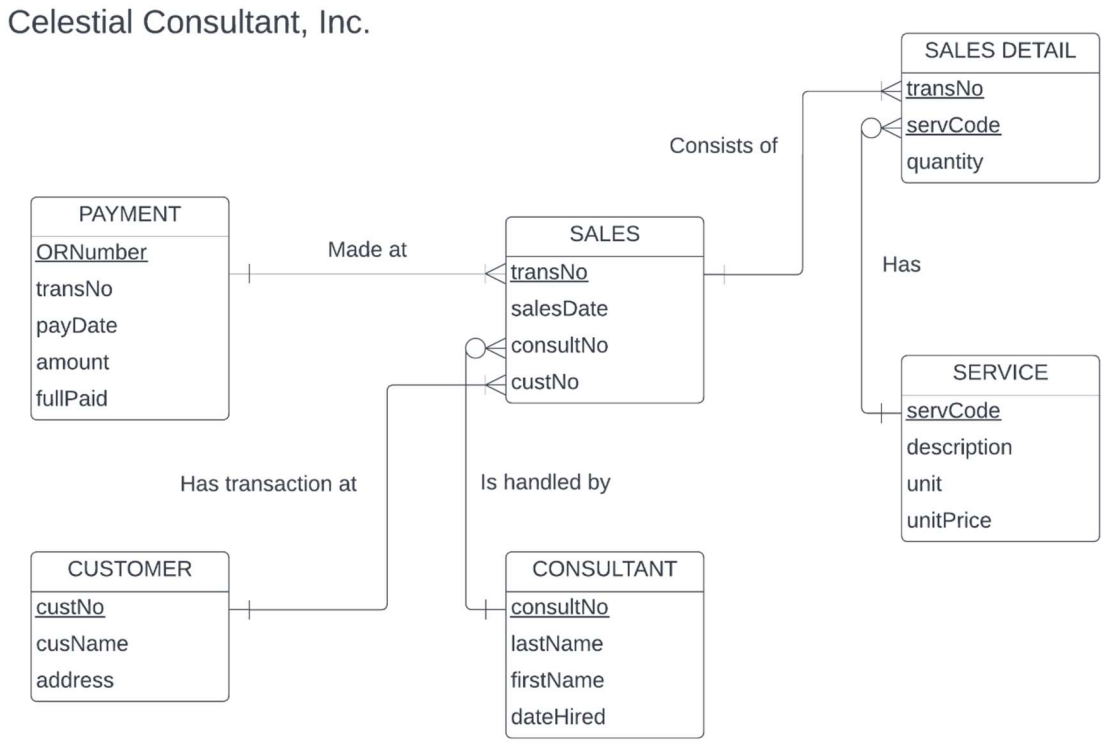
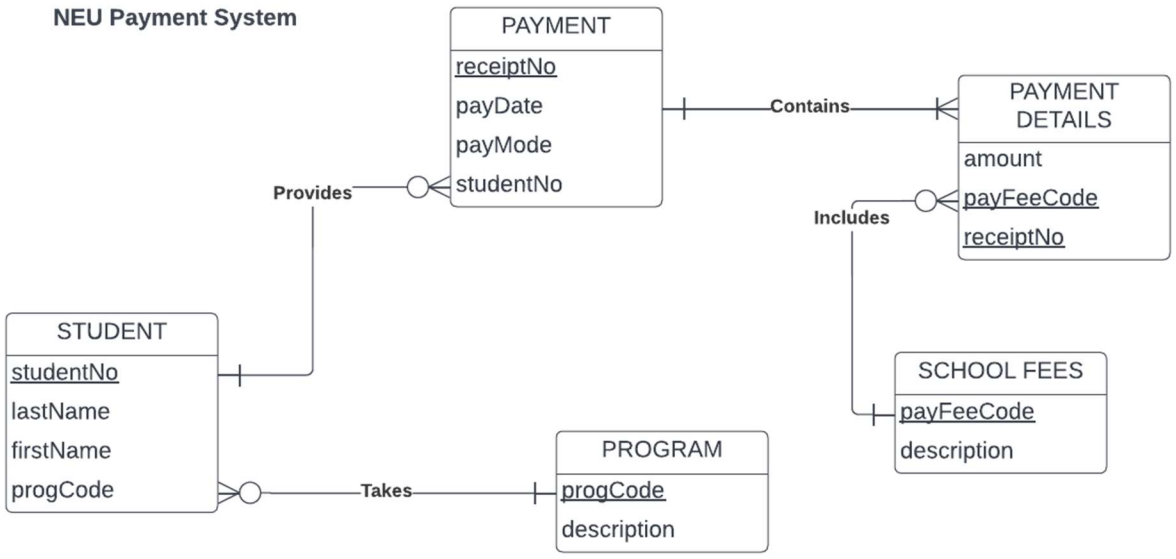
ERD 1



ERD 2



CCC211-18 *Information Management 1* : LEC ASSIGNMENT 3
2BSCS-2 : Marasigan, Vem Aiensi A.

CASE 1

BOOKTRANS

studentNo	**bookCopy**	**bookTitle**	**dateBorrowed**	**bookCode**	**publisher**
19-12345-678	BOOK1_1	Java Programming	2020-10-05	BOOK1	Wiley and Sons
19-12345-678	BOOK2_1	Database Fundamentals	2020-11-10	BOOK2	Pearson Education
19-12345-679	BOOK1_2	Java Programming	2020-10-10	BOOK1	Wiley and Sons
19-12345-680	BOOK3_1	Python Intro	2020-10-24	BOOK3	Harper Colins

BOOKTRANS: studentNo, bookCopy → bookTitle, dateBorrowed, bookCode, publisher
BOOKTRANS (studentNo, bookCopy, bookTitle, dateBorrowed, bookCode, publisher)

REVISED

a. Functional Dependencies

STUDENT: studentNo
BOOKTRANS: studentNo, bookCopy, dateBorrowed → bookCode
BOOK: bookCode → bookTitle, publisher

b. Relational Dependencies

STUDENT: (studentNo)
BOOKTRANS (studentNo, bookCopy, dateBorrowed, bookCode)
BOOK (bookCode, bookTitle, publisher)

c. Split Tables

STUDENTS

studentNo
19-12345-678
19-12345-679
19-12345-680

BOOKTRANS

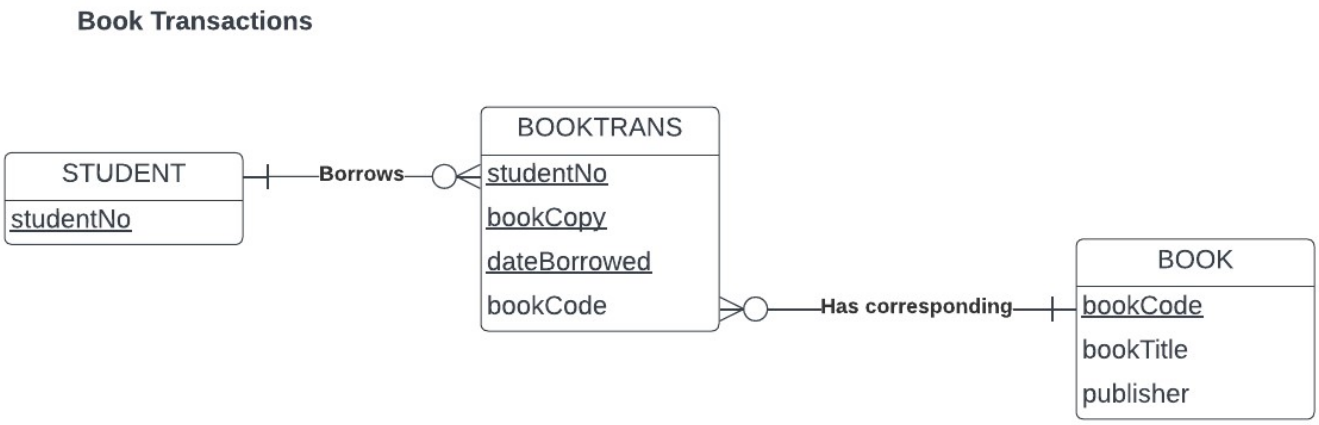
studentNo	**bookCopy**	**dateBorrowed**	**bookCode**
19-12345-678	BOOK1_1	2020-10-05	BOOK1
19-12345-678	BOOK2_1	2020-11-10	BOOK2
19-12345-679	BOOK1_2	2020-10-10	BOOK1
19-12345-680	BOOK3_1	2020-10-24	BOOK3

BOOK

bookCode	**bookTitle**	**publisher**
BOOK1	Java Programming	Wiley and Sons
BOOK2	Database Fundamentals	Pearson Education
BOOK3	Python Intro	Harper Colins

CCC211-18 *Information Management 1* : LEC ASSIGNMENT 3
2BSCS-2 : Marasigan, Vem Aiensi A.

d. ERD Diagram



CASE 2

PERSONNEL

employeeNo	lastName	firstName	gender	time-in	time-out	dateWorked	currentSalary	effectiveSalaryDate
1234	Leviste	Alex	M	8:00	17:01	2020-11-03	21,000	2020-11-01
1235	Carson	Maybeline	F	7:00	18:05	2020-11-03	22,300	2020-10-15
1234	Leviste	Alex	M	7:58	17:01	2020-10-24	19,000	2019-04-15
1236	Schmidt	Jane	F	9:05	16:30	2019-11-03	18,000	2018-12-15
1237	Morrison	Viktor	M	10:01	18:45	2020-11-05	15,000	2020-11-05
1234	Leviste	Alex	M	7:00	16:00	2020-11-05	21,000	2020-11-01
1236	Schmidt	Jane	F	8:00	17:00	2020-11-10	22,000	2020-11-01
1236	Schmidt	Jane	F	13:00	22:05	2020-11-12	22,000	2020-11-01

PERSONNEL: employeeNo, dateWorked, time-in, time-out, effectiveSalaryDate → lastName, firstName, gender, currentSalary

PERSONNEL (employeeNo, dateWorked, time-in, time-out, effectiveSalaryDate, lastName, firstName, gender, currentSalary)

REVISED

a. Functional Dependencies

PERSONNEL: employeeNo → lastName, firstName, gender
WORK HISTORY: employeeNo, dateWorked, time-in, time-out
SALARY: employeeNo, effectiveSalaryDate → currentSalary

b. Relational Dependencies

PERSONNEL (employeeNo, lastName, firstName, gender)
WORK HISTORY (employeeNo, dateWorked, time-in, time-out)
SALARY: (employeeNo, effectiveSalaryDate, currentSalary)

CCC211-18 *Information Management 1* : LEC ASSIGNMENT 3
2BSCS-2 : Marasigan, Vem Aiensi A.

c. Split Tables

PERSONNEL

employeeNo	lastName	firstName	gender
1234	Leviste	Alex	M
1235	Carson	Maybeline	F
1236	Schmidt	Jane	F
1237	Morrison	Viktor	M

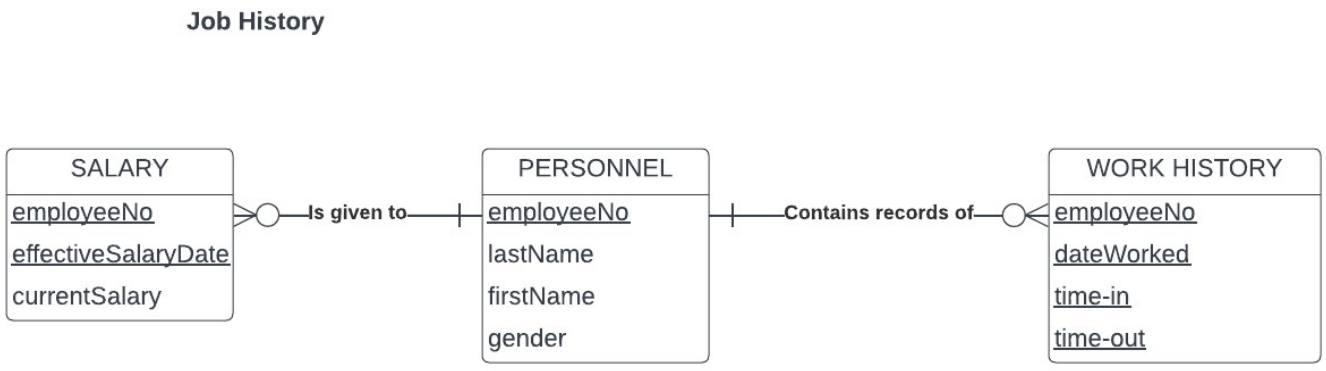
SALARY

employeeNo	effectiveSalaryDate	currentSalary
1234	2020-11-01	21,000
1235	2020-10-15	22,300
1234	2019-04-15	19,000
1236	2018-12-15	18,000
1237	2020-11-05	15,000
1236	2020-11-01	22,000

WORK HISTORY

dateWorked	time-in	time-out	employeeNo
2020-11-03	8:00	17:01	1234
2020-11-03	7:00	18:05	1235
2020-10-24	7:58	17:01	1234
2019-11-03	9:05	16:30	1236
2020-11-05	10:01	18:45	1237
2020-11-05	7:00	16:00	1234
2020-11-10	8:00	17:00	1236
2020-11-12	13:00	22:05	1236

d. ERD Diagram



CCC211-18 *Information Management 1* : LEC ASSIGNMENT 4
2BSCS-2 : Marasigan, Vem Aiensi A.

-First Normal Form-

-Functional Dependency-
PURCHASE RECORDS: pONumber, supplierCode, prodCode → pODate, supplierName, address, description, unit, unitPrice, quantity

-Relational Notation-
PURCHASE RECORDS (pONumber, supplierCode, prodCode, pODate, supplierName, address, description, unit, unitPrice, quantity)

PURCHASE RECORDS **1NF**

pONumber	pODate	supplierName	supplierCode	address	prodCode	description	unit	unitPrice	quantity
PO567	2020-11-29	Merez Philippines, Inc.	SUP001	11 Kenley Road North Paranaque City	PC3424	Pole Concrete, 9.14m	Ea	10,000.00	20
PO567	2020-11-29	Merez Philippines, Inc.	SUP001	11 Kenley Road North Paranaque City	PW3461	Pole Creosoted, 9.14m	Ea	12,500.00	10
PO567	2020-11-29	Merez Philippines, Inc.	SUP001	11 Kenley Road North Paranaque City	PW3462	Pole Creosoted, 7.0m	Ea	9,500.00	5
PO568	2020-11-29	PACWOOD	SUP002	4 McCarthur Highway Novaliches Quezon	PW3461	Pole Creosoted, 9.14m	Ea	11,500.00	8
PO568	2020-11-29	PACWOOD	SUP002	4 McCarthur Highway Novaliches Quezon	PW3462	Pole Creosoted, 7.0m	Ea	9,000.00	5
PO569	2020-11-28	3M Philippines, Inc.	SUP003	27 JMT Bldg. EDSA Makati City	FM0045	12-Fiber Pigtail	Ea	3,000.00	24
PO569	2020-11-28	3M Philippines, Inc.	SUP003	27 JMT Bldg. EDSA Makati City	FM0061	UCN 12	Ea	22,314.00	10
PO570	2020-11-04	3M Philippines, Inc.	SUP003	27 JMT Bldg. EDSA Makati City	FM0045	12-Fiber Pigtail	Ea	3,000.00	12
PO570	2020-11-04	3M Philippines, Inc.	SUP003	27 JMT Bldg. EDSA Makati City	MT2421	Insulating Tape	M	2.5	200

-Second Normal Form-

Remove partial dependencies and split into new relations:

-Functional Dependencies-
PURCHASE ORDER: pONumber, prodCode → pODate, supplierCode, quantity
SUPPLIER: supplierCode → supplierName, address
PRODUCT PRICE: supplierCode, prodCode → description, unit, unitPrice

-Relation Notation-
PURCHASE ORDER (pONumber, prodCode, pODate, supplierCode, quantity)
SUPPLIER (supplierCode, supplierName, address)
PRODUCT PRICE (supplierCode, prodCode, description, unit, unitPrice)

PURCHASE ORDER **2NF**

pONumber	prodCode	pODate	supplierCode	quantity
PO567	PC3424	2020-11-29	SUP001	20
PO567	PW3461	2020-11-29	SUP001	10
PO567	PW3462	2020-11-29	SUP001	5
PO568	PW3461	2020-11-29	SUP002	8
PO568	PW3462	2020-11-29	SUP002	5
PO569	FM0045	2020-11-28	SUP003	24
PO569	FM0061	2020-11-28	SUP003	10
PO570	FM0045	2020-11-04	SUP003	12
PO570	MT2421	2020-11-04	SUP003	200

SUPPLIER **2NF**

supplierCode	supplierName	address
SUP001	Merez Philippines, Inc.	11 Kenley Road North Paranaque City
SUP002	PACWOOD	4 McCarthur Highway Novaliches Quezon
SUP003	3M Philippines, Inc.	27 JMT Bldg. EDSA Makati City

PRODUCT PRICE **2NF**

supplierCode	prodCode	description	unit	unitPrice
SUP001	PC3424	Pole Concrete, 9.14m	Ea	10,000.00
SUP001	PW3461	Pole Creosoted, 9.14m	Ea	12,500.00
SUP001	PW3462	Pole Creosoted, 7.0m	Ea	9,500.00
SUP002	PW3461	Pole Creosoted, 9.14m	Ea	11,500.00
SUP002	PW3462	Pole Creosoted, 7.0m	Ea	9,000.00
SUP003	FM0045	12-Fiber Pigtail	Ea	3,000.00
SUP003	FM0061	UCN 12	Ea	22,314.00
SUP003	FM0045	12-Fiber Pigtail	Ea	3,000.00
SUP003	MT2421	Insulating Tape	M	2.5

-Third/Final Normal Form-

Remove other partial dependencies from **PURCHASE ORDER & PRODUCT PRICE** table and split into new relations:

-Functional Dependencies-
PURCHASE DETAILS: pONumber → pODate, supplierCode
PRODUCT QUANTITY: pONumber, prodCode → quantity
SUPPLIER: supplierCode → supplierName, address
SUPPLIER PRICE: supplierCode, prodCode → unitPrice
PRODUCT DETAILS: prodCode → description, unit

-Functional Dependencies-
PURCHASE DETAILS (pONumber, pODate, supplierCode)
PRODUCT QUANTITY (pONumber, prodCode, quantity)
SUPPLIER (supplierCode, supplierName, address)
SUPPLIER PRICE (supplierCode, prodCode, unitPrice)
PRODUCT DETAILS (prodCode, description, unit)

SUPPLIER **2NF**

supplierCode	supplierName	address
SUP001	Merez Philippines, Inc.	11 Kenley Road North Paranaque City
SUP002	PACWOOD	4 McCarthur Highway Novaliches Quezon
SUP003	3M Philippines, Inc.	27 JMT Bldg. EDSA Makati City

PURCHASE DETAILS **3NF**

pONumber	pODate	supplierCode
PO567	2020-11-29	SUP001
PO568	2020-11-29	SUP002
PO569	2020-11-28	SUP003
PO570	2020-11-04	SUP003

PRODUCT QUANTITY **3NF**

pONumber	prodCode	quantity
PO567	PC3424	20
PO567	PW3461	10
PO567	PW3462	5
PO568	PW3461	8
PO568	PW3462	5
PO569	FM0045	24
PO569	FM0061	10
PO570	FM0045	12
PO570	MT2421	200

SUPPLIER PRICE **3NF**

supplierCode	prodCode	unitPrice
SUP001	PC3424	10,000.00
SUP001	PW3461	12,500.00
SUP001	PW3462	9,500.00
SUP002	PW3461	11,500.00
SUP002	PW3462	9,000.00
SUP003	FM0045	3,000.00
SUP003	FM0061	22,314.00
SUP003	FM0045	3,000.00
SUP003	MT2421	2.5

PRODUCT DETAILS **3NF**

prodCode	description	unit
PC3424	Pole Concrete, 9.14m	Ea
PW3461	Pole Creosoted, 9.14m	Ea
PW3462	Pole Creosoted, 7.0m	Ea
FM0045	12-Fiber Pigtail	Ea
FM0061	UCN 12	Ea
MT2421	Insulating Tape	M

-FINAL TABLE AND ENTITY RELATIONSHIP DIAGRAM-

SUPPLIER

supplierCode	supplierName	address
SUP001	Merez Philippines, Inc.	11 Kenley Road North Paranaque City
SUP002	PACWOOD	4 McCarthur Highway Novaliches Quezon
SUP003	3M Philippines, Inc.	27 JMT Bldg. EDSA Makati City

PURCHASE DETAILS

pONumber	pODate	supplierCode
PO567	2020-11-29	SUP001
PO568	2020-11-29	SUP002
PO569	2020-11-28	SUP003
PO570	2020-11-04	SUP003

PRODUCT QUANTITY

pONumber	prodCode	quantity
PO567	PC3424	20
PO567	PW3461	10
PO567	PW3462	5
PO568	PW3461	8
PO568	PW3462	5
PO569	FM0045	24
PO569	FM0061	10
PO570	FM0045	12
PO570	MT2421	200

SUPPLIER PRICE

supplierCode	prodCode	unitPrice
SUP001	PC3424	10,000.00
SUP001	PW3461	12,500.00
SUP001	PW3462	9,500.00
SUP002	PW3461	11,500.00
SUP002	PW3462	9,000.00
SUP003	FM0045	3,000.00
SUP003	FM0061	22,314.00
SUP003	MT2421	2.5

PRODUCT DETAILS

prodCode	description	unit
PC3424	Pole Concrete, 9.14m	Ea
PW3461	Pole Creosoted, 9.14m	Ea
PW3462	Pole Creosoted, 7.0m	Ea
FM0045	12-Fiber Pigtail	Ea
FM0061	UCN 12	Ea
MT2421	Insulating Tape	M

ABC Telecoms, Purchase System