

Domain Model

(functional) process modeling \rightarrow الـ قـدـةـ الـ فـعـلـيـاتـ

(system behaviour) activities \rightarrow الـ فـعـلـيـاتـ الـ سـيـسـتـمـيـاتـ

domain model using process modeling \rightarrow المـحـنـجـيـنـ

لـهـيـنـاـ تـرـكـيـبـاـنـاـ الـ سـيـسـتـمـيـاتـ الـ فـعـلـيـاتـ

الـ فـعـلـيـاتـ يـمـثـلـونـاـ الـ مـوـادـ

ERD (structured) Glass diagram (object-oriented)
Entity relationship diagram domain model

\rightarrow يـمـكـنـاـ تـرـكـيـبـاـنـاـ الـ فـعـلـيـاتـ

: ، الـ مـنـاطـقـ الـ فـعـلـيـاتـ الـ مـوـادـ

Specific area represent the work scope

2 Techniques to identify Jcs

1. Brainstorming

لـهـيـنـاـ الـ مـوـادـ الـ مـنـاطـقـ الـ فـعـلـيـاتـ الـ مـوـادـ

\rightarrow user, system, roles, functional areas

-: Things to identify \rightarrow Checklist

- Tangible: \rightarrow physical objects

- Roles played: \rightarrow system or software roles

- Organizational units: \rightarrow functional areas / work group / الأقسام

- Devices: \rightarrow store machine

- Sites / Locations: \rightarrow domain to track locations

- Incident / events: \rightarrow registration, data to be tracked

Steps:

١. عرف كل user وابدأ ال usecase بتائفهم واقعًا مع الناس.
 ٢. دع وللهم brainstroming.
 ٣. نستخدم ال Things checklist.
 ٤. استرشد على ال user واعمل الخطوات التي وقق تأثيري.
 ٥. جمع ال results وأعمل eliminate لـ حذف مترددة.

2. Noun Technique

بيانات النصوص (NLP) Natural language P. 11

فی الـ Document

POSIT : part of speech tagging in IR systems

- الـ Nouns تكون عبارة عن :-

- class or attribute in class
 - Entity or attribute in entity
 - less track lost glitz into cursive

Our system will describe how text is given & received.

* بىر كىلدە امىسلىكىن noun شۇف تېرىكۈن معاناوا لاخ و
* لەم دەوراڭدا دە وۇنىڭ اس ئەلەت او احابىتىغا yes ە

3.3 Nouns II

one instance و يكون Faculty II Class في كل جدول one instance و يكون مثلاً كذا، وبه
دو لفة كلها لازم تكون مختلفة كلها، وبه
لأن كل طاولة تكون مثلاً في كل database

Water rate limit & slab fee by Ogranma

About Project

متادفات أو كلمات نفس المعنى مترادفات synonym *
واحد دينم noun ٥

(exclude) إزالة من حاجة ذاتي في normalization *
ليس أو قات نسخة ورد رقم في normalization
الإر ظهور احذف duplicate في database
لهمسة لغزنة trade-off بين الجودة والدقة

further research جو الـ further research تأثير فيها قرار noun *

أي فاعل noun أو المطلوب requirement الـ further research *
أي شرط static requirement هو الـ further research
أي قرار dynamic

Details about domain Model

وأمثلة على things الـ domain model

Structured data model : FRD diagram required

Object-oriented data model : class [domain model]
الـ domain على كل عنوان

Class : → attributes

→ Identifier or key (unique يكون يجده)

→ Compound attribute

Class → Type of thing

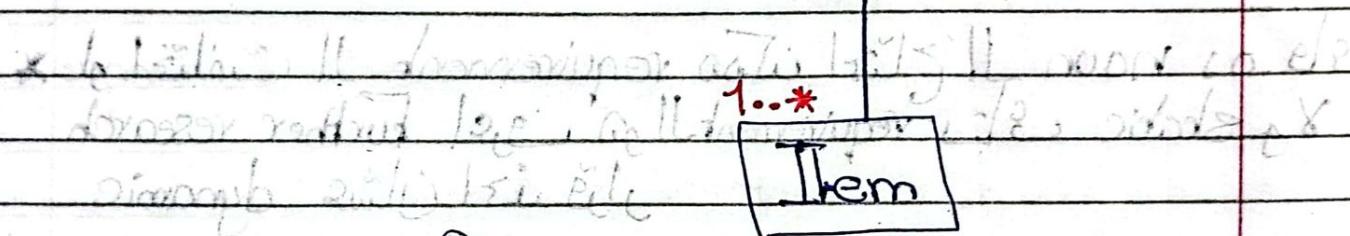
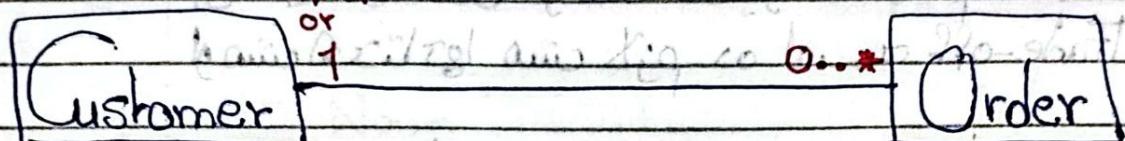
Object → instance of class

attribute كل خاصية value كل instance

* Associations

Domain لفظ لغاتي و في المقابل class بمعنى

Multiplicity يحدد عددي المرة التي تظهر فيها class



Types of Associations

* Binary : بين اثنين من classes

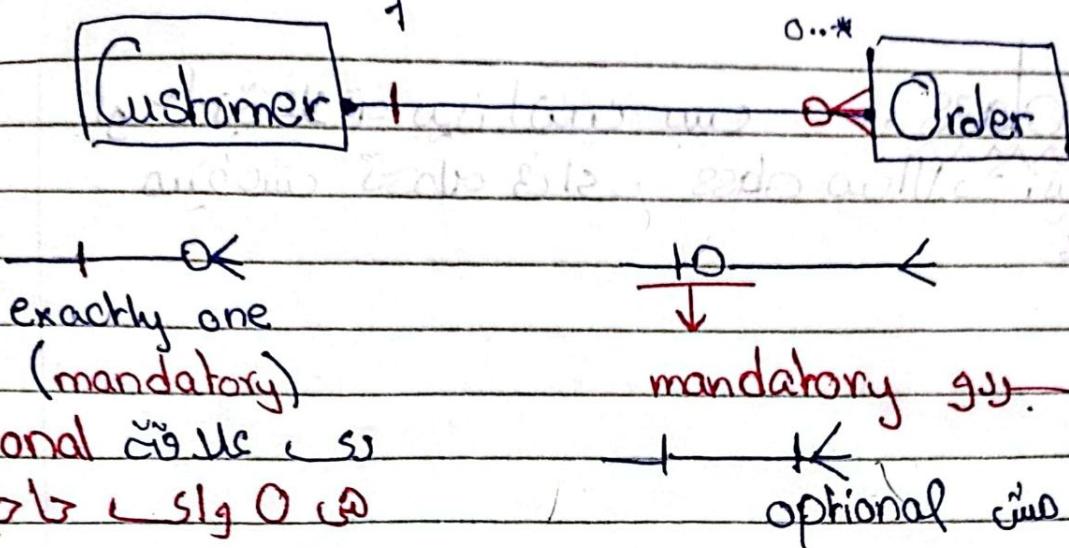
* Unary : بين نفس class (Self relationship)

* Ternary : بين ثلاثة classes

* N-ary : بين أربع classes

الآن نأتي إلى Class of E.RD

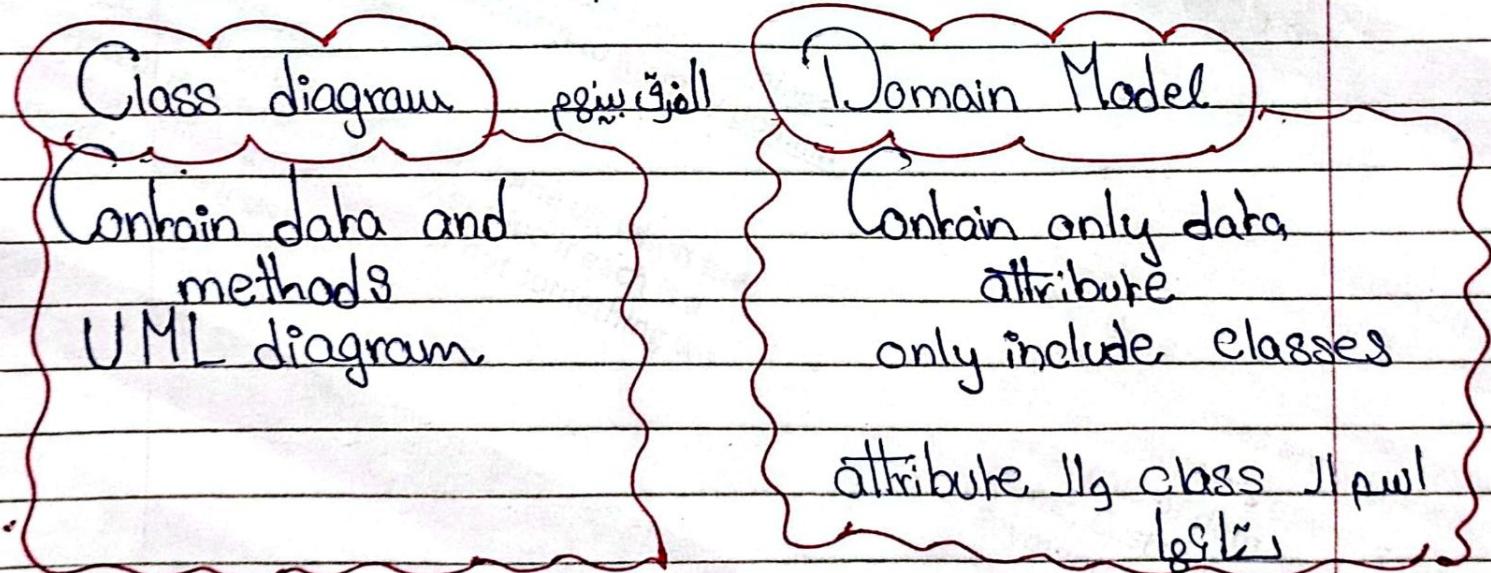
About Project



* Semantic net : identifying class relation with itself or with other classes

Things like ينبع من Function like user بين المفهومين
association ينبع من relationship like ينبع من

Slide 28 Example on a Bank

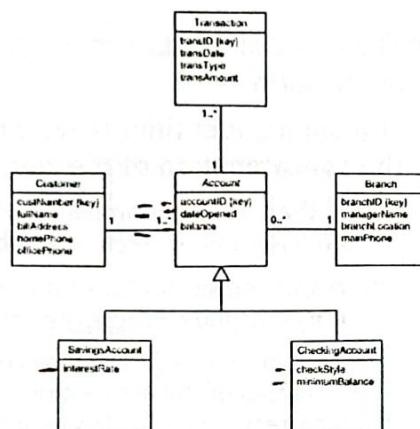


* Class name → Capital كائن
Attributes → camelCase

Generalization/Specialization: Inheritance for the Bank with Special Types of Accounts

- A SavingsAccount has 4 attributes
- A CheckingAccount has 5 attributes
- Note: the subclasses inherit the associations too

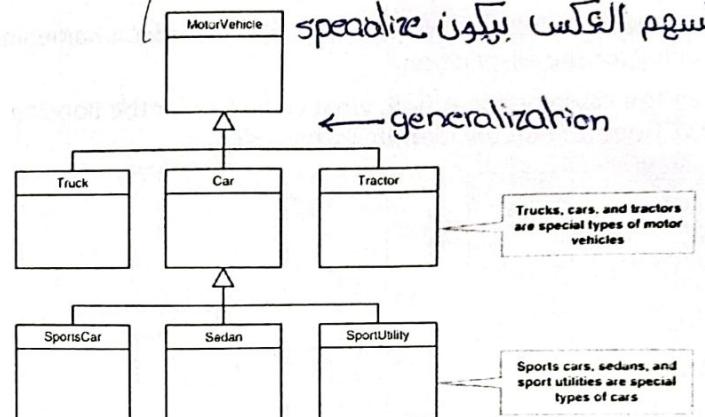
Subclass inherit:
 → attributes
 → methods
 → relationships (associations of superclass)



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42

Generalization/Specialization



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40

More Complex Issues about Classes: Whole Part Relationships

- Types:**
- Aggregation— a whole part relationship where the component part **exists separately and can be removed and replaced** (UML diamond symbol on next slide) **weak dependency (associate)**
 - Computer has disk storage devices (storage devices exist apart from computer)
 - Car has wheels (wheels can be removed and still be wheels)
 - Composition— a whole part relationship where the parts **cannot be removed** (filled in diamond symbol) **strong dependency (associate)**
 - OrderItem on an Order (without the Order, there are no OrderItems)
 - Chip has circuits (without the chip, there are no circuits)

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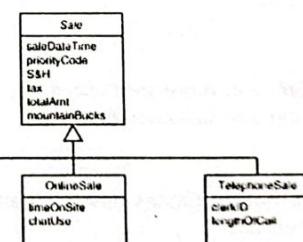
43

whole **dependency** من بعض في الـ part يتأثر على الـ LifeCycle

Generalization/Specialization: Inheritance for RMO Three Types of Sales

has at least one abstract method

- Abstract class— a class that allow subclasses to inherit characteristics **but never gets instantiated**. In Italics (*Sale*)
- sub**class** of abstract class
- Concrete class— a class that can have instances → object and **object class**
- Inheritance – Attributes of OnlineSale are:
- timeOnSite, chatUse, saleDateTime, priorityCode, S&H, tax, totalAmt...
- under class objects



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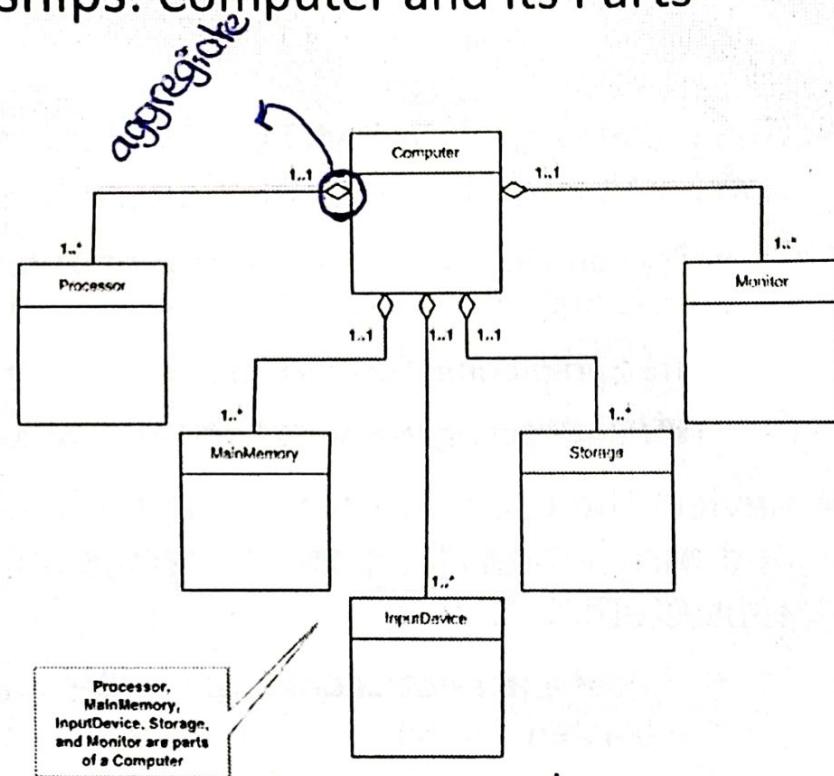
41

abstract method : has no implementation

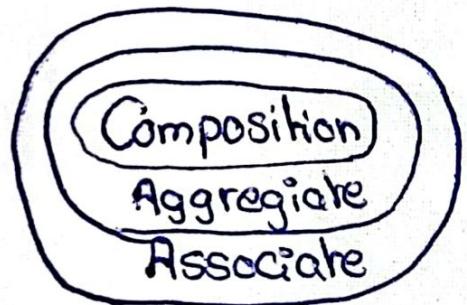
aggregation is strong association

Whole Part Relationships: Computer and its Parts

- Note: this is composition, with diamond symbol.
- Whole part can have multiplicity symbols, too (not shown)\



to
main
ate.



Composition is special type of aggregation

More on UML Relationships

weak & simple because

RMO CSMS Project: Domain Model Class Diagrams (2 of 2)

- Given the complete RMO CSMS Domain Model Class Diagram and Sales and Customer Account subsystem examples:
 - Try completing the Order Fulfilment Subsystem Domain Model Class Diagram
 - Try Completing the Marketing Subsystem Domain Model Class Diagram
 - Try Completing the Reporting Subsystem Domain Model Class Diagram
 - Review the use cases from Chapter 3 and decide what classes and associations from the complete model are required for each subsystem
 - Classes and associations might be duplicated in more than one subsystem model

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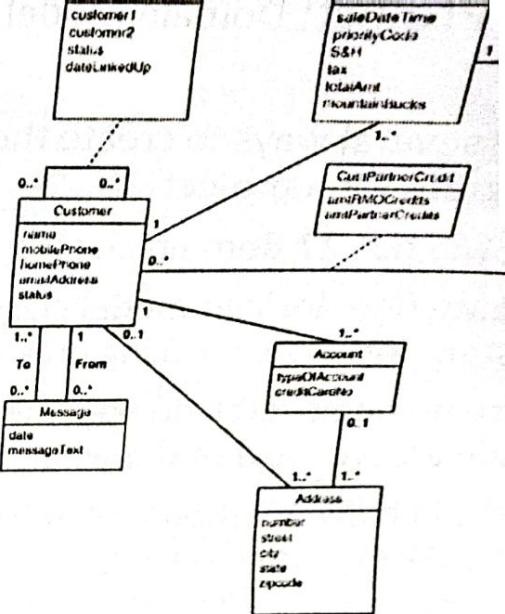
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Object Behavior – State Machine Diagram

- Each class has objects that may have status conditions or “states” **during runtime**
 - Object behavior consists of the various states and the movement between these states
 - **State** – a **condition during an object’s life** when it satisfies some criterion, performs an action, or waits for an event
 - **Transition** – the **movement of an object** from **one state to another**

Project: Customer Account Subsystem

Domain Model Class Diagram



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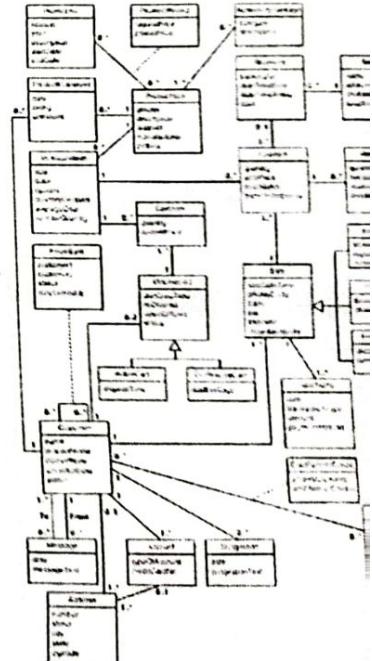
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RMO CSMS Project: Complete Domain Model Class Diagram

usecase → high level Functions
activity → workflow

Sequence → تفاصيلها هي use case لـ

State diagram لے کر classes کا لکھنے کا سچا سیکھنا

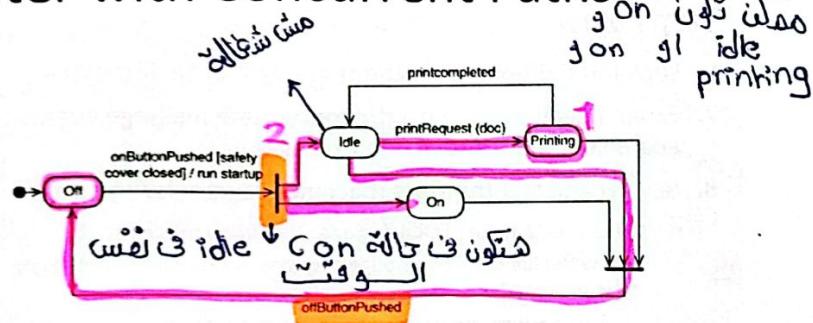


Concurrency in a State Machine Diagram

- Concurrent states – when an object is in one or more states at the same time
- Path – a sequential set of connected states and transitions
- Concurrent paths – when multiple paths are being followed concurrently, i.e. when one or more states in one path are parallel to states in another path object in more than one state at the same time

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Printer with Concurrent Paths



- Concurrent paths often shown by synchronization bars (same as Activity Diagram)

- Multiple exits from a state is an "OR" condition. ex. idle خرجان (exit)
- Multiple exits from a synchronization bar is an "AND" condition.

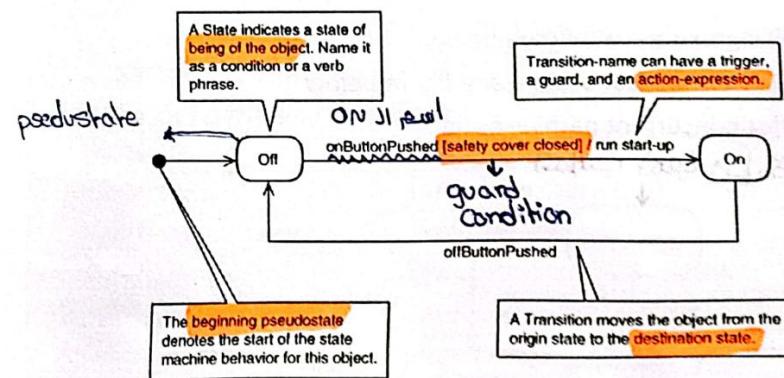
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State Machine Diagram

- State Machine Diagram – a diagram which shows the life of an object in states and transitions
- Origin state – the original state of an object before it begins a transition
- Destination state – the state to which an object moves after completing a transition
- pseudostate – the starting point in a state machine diagram. Noted by a black circle. *Lifecycle JI ایڈ*
- action-expression – some activity that must be completed as part of a transition occur
- guard-condition – a true/false test to see whether a transition can fire *check has to be true so movement happens*

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State Machine for a Printer



Syntax of transition statement

transition-name (parameters, ...) [guard-condition] / action-expression

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