

CPET 565/499 Mobile Computing Systems

Oct. 15, 2012

Lecture Note

RFID - passive / Active Sensors

1. Review of Pilot Project Proposals

• Sensors
• Fixed Locations

Project Title	Team/Students
Inventory Control with RFID Readers	Robert Tilbury Luis D. Morales
Mobile App: Sales Executive Dashboard View of complex info	James Fracica Chris Frey
Mobile Business Intelligent for Pharmaceuticals Presentation / Business Logic / Data Tier	Heidi Prussing Sayed Nayab Hassan
??	MengWei Stephen C. Obioma
Just-in-Time Inventory Tracking for raw material	Samson Amade Michael McNair
Mobile Inventory System Telecom operators Equipment tracking	Muhammad Mansur Joel Bauer

2. Project Risk Assessment/Matrix

- Funding (budget)
- Market (competition)
- Customers (buy-in)
- Economic outlook
- System integration (cost, experience)
- Team factors
- Knowledge and Experience (Technology)

Availability

* Query

* Interface to Live CRM.

3. Android Application Class,

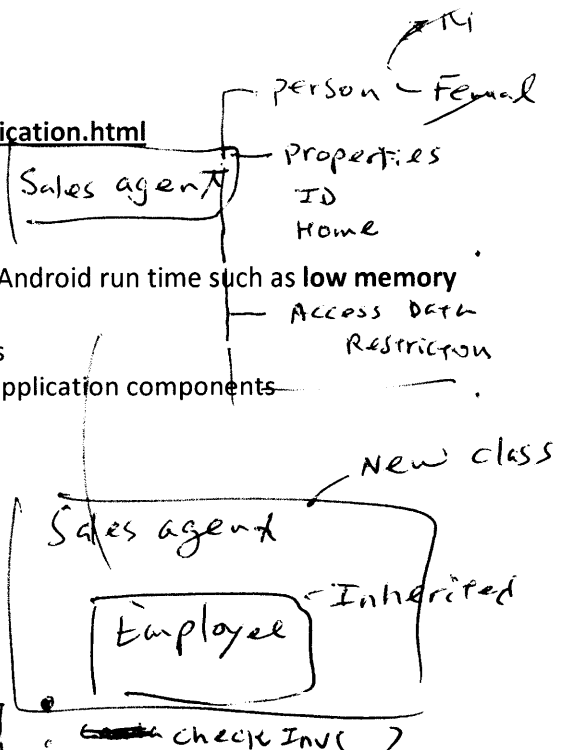
<http://developer.android.com/reference/android/app/Application.html>

Application Object

- Remains instantiated whenever your application runs
- Application class enables the program to do three things
 - Respond to application level events broadcast by Android run time such as low memory conditions
 - Transfer objects between application components
 - Manage and maintain resources used by several application components

public class Application
extends ContextWrapper
implements ComponentCallbacks2

java.lang.Object
android.content.Context



Methods
functions

android.content.ContextWrapper
android.app.Application

Public Constructors – Application()

Public Methods

- void onConfigurationChanges(Configuration newConfig)
- void onCreate()
- void onLowMemory()
- void onTerminate()
- void onTrimMemory(int level)
- void registerActivityLifecycleCallbacks(Application.ActivityLifecycleCallbacks callback)
- ...

Inherited Methods

4. Android Activities, <http://developer.android.com/reference/android/app/Activity.html>

- Each Activity represents a screen that an application can present to its users
- Extend Activity to create a new Activity class
- The Activity Lifecycle
- Activity Stacks
- Activity States
 - Active
 - Paused
 - Stopped
 - Inactive
- Monitoring State Changes
- Android Activity Classes (subclasses)
 - MapActivity
 - ListActivity
 - ExpandableListActivity

5. Using UML to Model Mobile Applications

References

- Introduction to OMG's Unified Modeling Language (UML),
http://www.omg.org/gettingstarted/what_is_uml.htm
- Practical UML: A Hands-on Introduction for Developer, by Randy Miller,
<http://edn.embarcadero.com/article/31863>
- Microsoft Visio 2010 (UML Model Diagrams)
 - UML Activity
 - UML Collaboration
 - UML Component
 - UML Deployment
 - UML Sequence
 - UML StateChart
 - UML Static Structure
 - UML Use Case

6. UML Diagrams

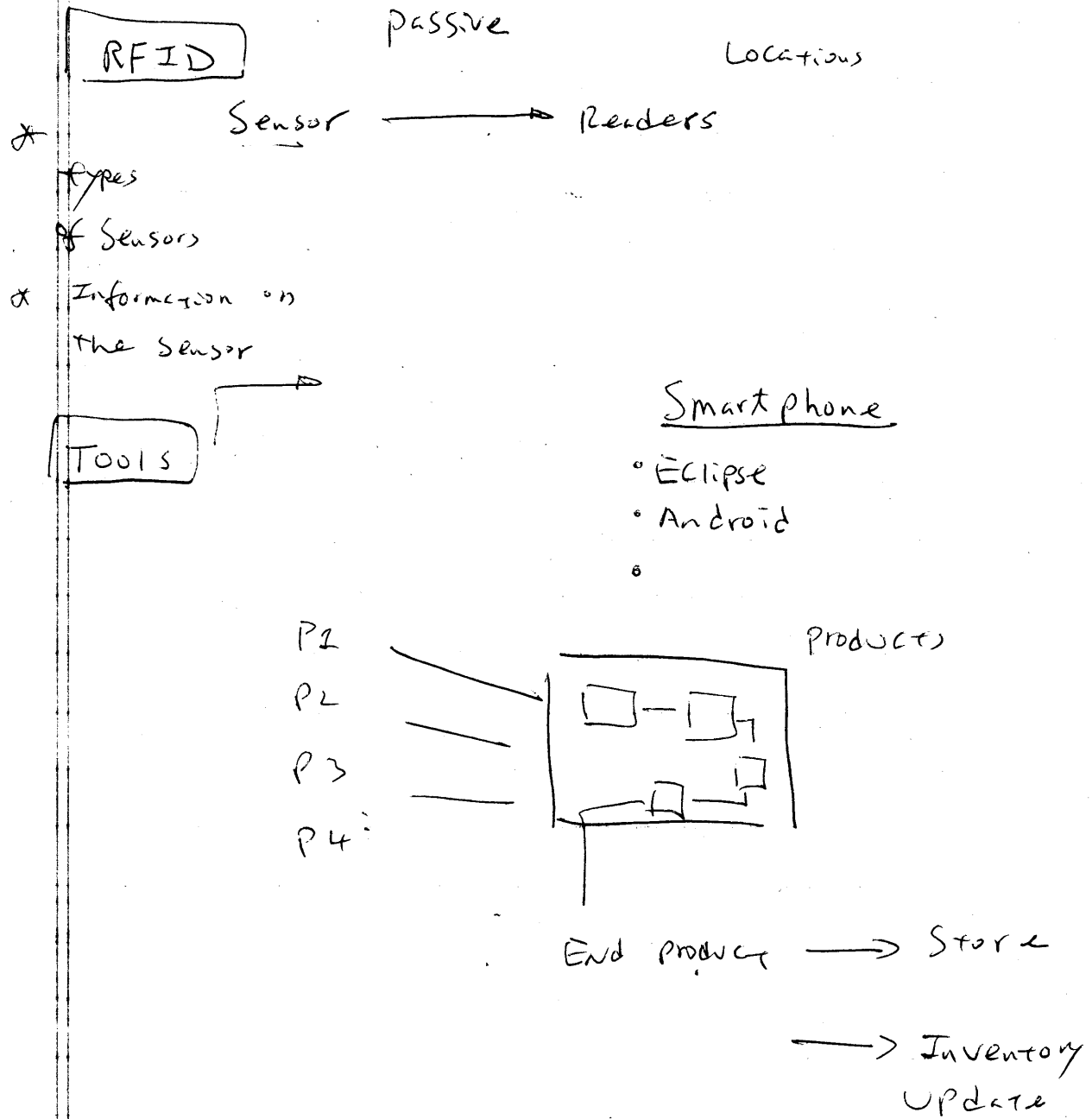
- Use Case Diagrams
- ✓ • Class Diagrams
 - Classes and relationships
- Object Diagrams
- Component Diagrams
 - Divide a large application into smaller ones
- Deployment Diagrams
- Statechart Diagrams (State Diagrams)
 - Life cycles of various objects
 - Represent effects of various Events
 - Clarifying the behavior of components as various events, driven by user interface, change the state of objects
- Sequence Diagrams (Interaction Diagrams)
 - Representing user interface
- Collaboration Diagrams (Interaction Diagrams)
- Activity Diagrams (Flow chart)

References

- [1] F. A. Kraemer, "Engineering Android Applications Based on UML Activities, "
http://research.cs.queensu.ca/~dingel/cisc836_F11/androidWithActivities.pdf
- [2] B. Yan and G. Chen, "AppJoy: Personalized Mobile Application Discovery,"
<http://www.cs.uml.edu/~glchen/papers/appjoy-mobisys-2011.pdf>
- [3] M. Kang, L. Wang, and K. Taguchi, "Modelling Mobile Agent Applications in UML 2.0 Activity Diagrams," <http://www.auml.org/auml/supplements/UML2-AD.pdf>
- [4] A. Grassi, R. Mirandola, and A. Sabetta, "A UML Profile to Model Mobile Systems," 2004,
http://www.uniroma2.it/didattica/papersvg/deposito/UML-2004_LNCS.pdf
- [5] E. A. Belloni and C. A. Marcos, "Modeling of Mobile-Agent Applications with UML,"
<ftp://jano.unicauca.edu.co/proyectos/wapcolombia/papers/MA-UML.pdf>
- [6] A. Knapp, S. Merz, and M. Wirsing, "On Refinement of Mobile UML State Machines," 2004,
http://www.pst.ifi.lmu.de/projekte/agile/papers/knapp_merz_wirsing_mtla04.pdf

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(2)

Equipment Tracking inside the warehouse

- Expensive (Hospitals)

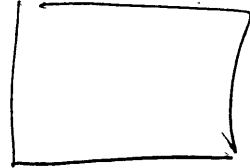
Eg-1



Eg-2



Eg-3



- Service (Calibration)

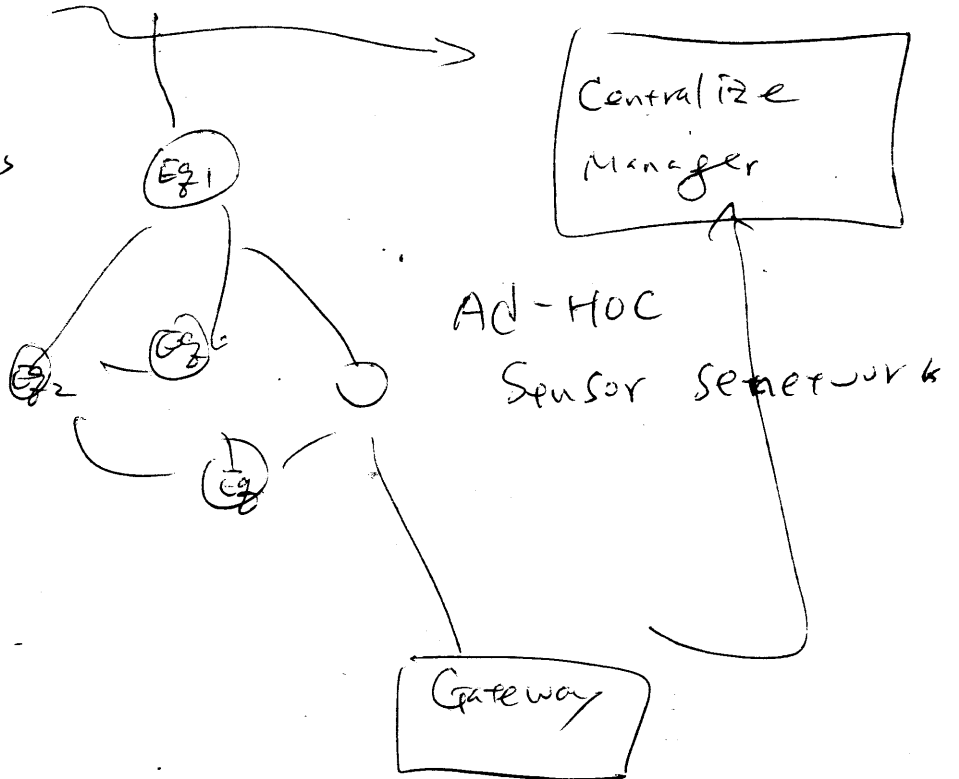
* Location

* Service (Calibration)

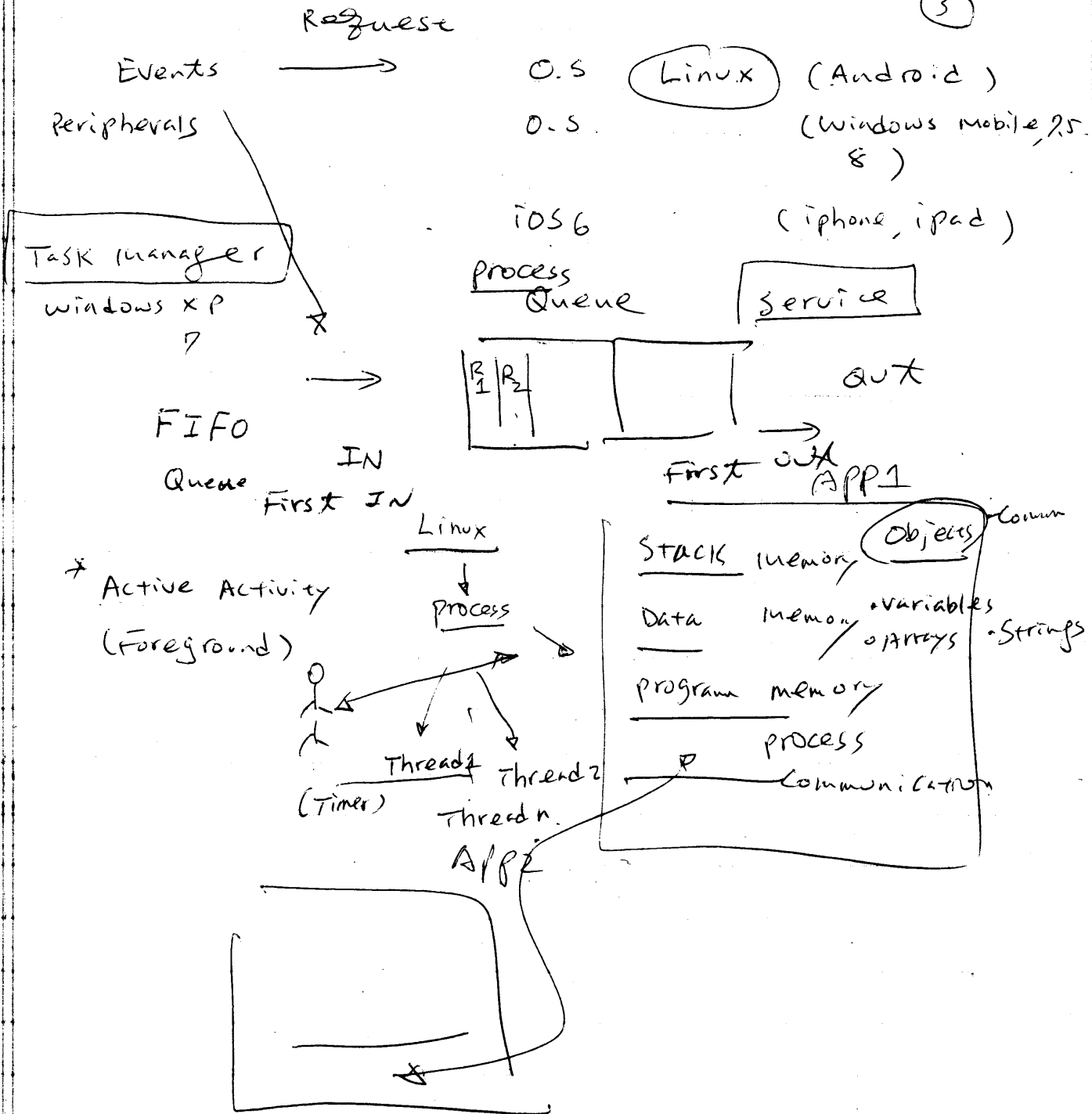
Smart Sensors

- MC
- RF
- Electronics

(Smartphone)



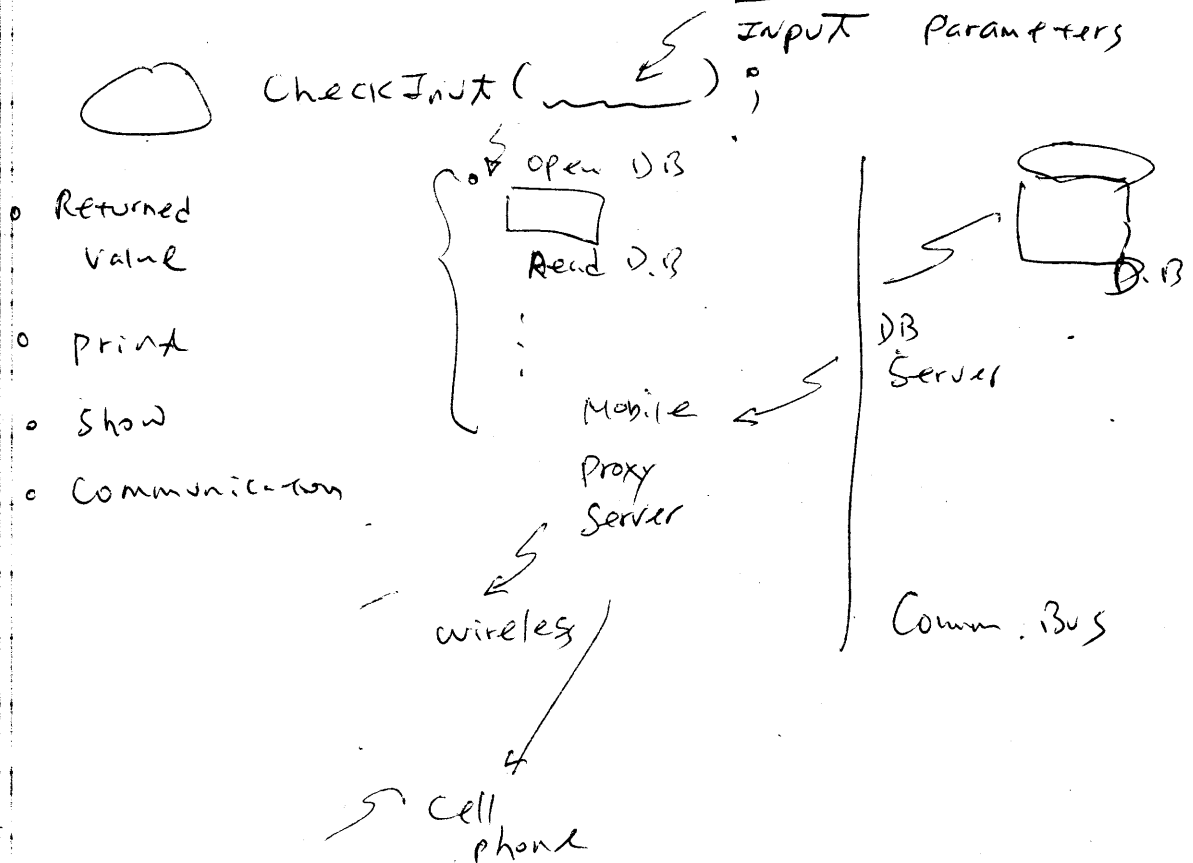
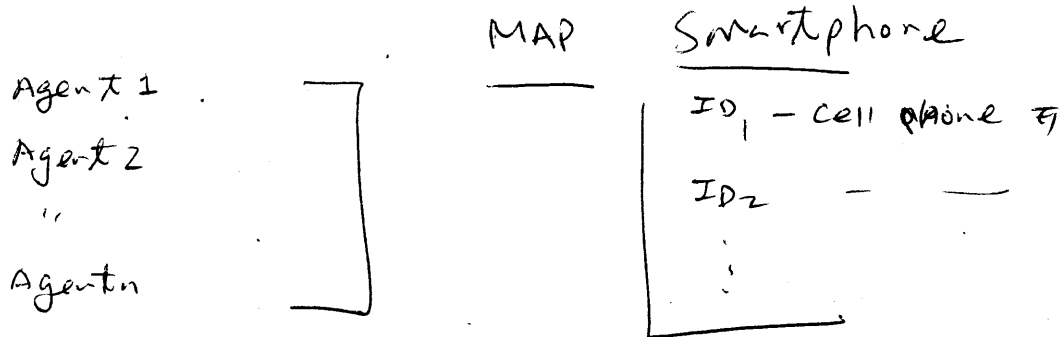
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Sales Agent — CLASS

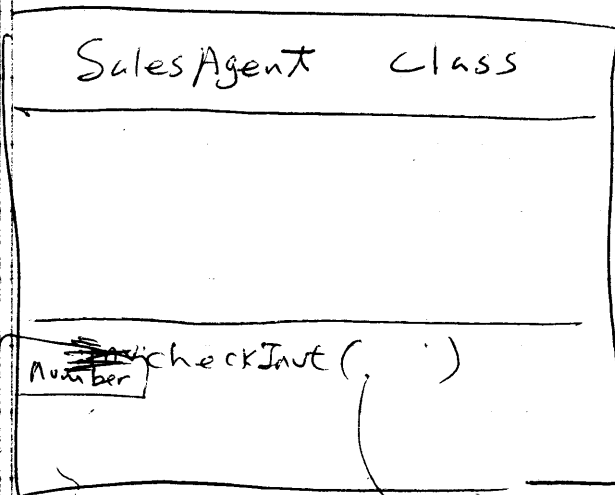
Actions (Methods)

- (1) checkInvt()
- (2) ModifyInvt() .. (Remove Hold, Add)
- (3) checkprice() --
- (4) ModifyPrice() -- (Discount based on volume)



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UML Diagram



Name

Properties/Attributes

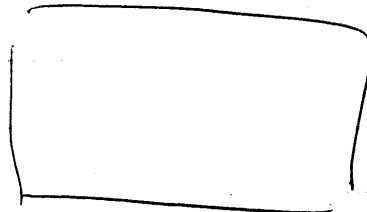
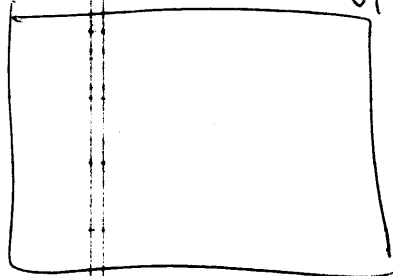
Methods

Pointer
String
Number

Product Name, Number, Region

Mobile Device View

Inventory Class



Use Cases
Know What (Intent)

