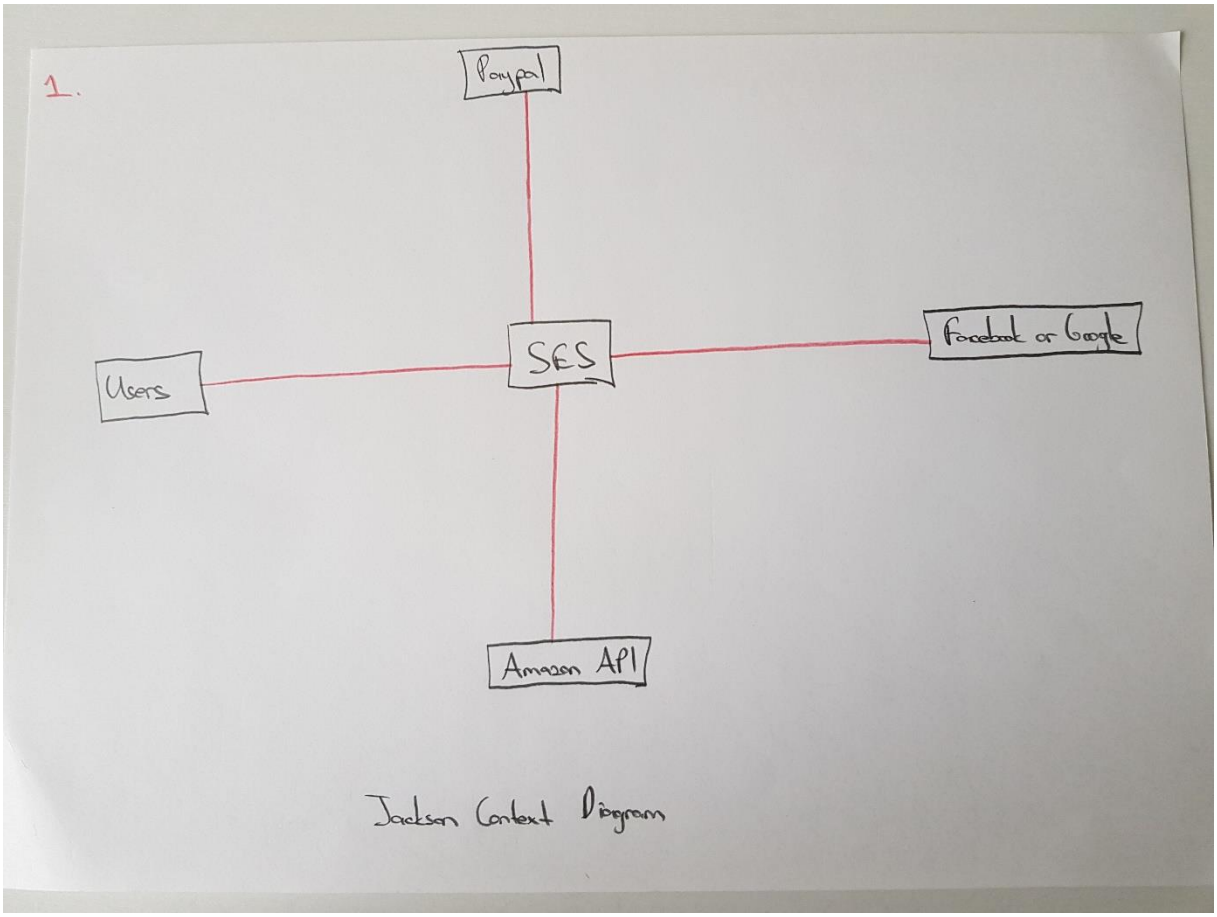
W1

1.Second-hand E-commerce System (SES) has four external entities. They all differ from SES and they get/give inputs and/or outputs from/to SES. Also, they are directly related to SES. The first one is Users. Since “Users” has direct impact on inputs of SES that means it provides inputs such as “Item info”. The second external entity is “Paypal” because it provides payment process which is related to one part of SES operations. ”Facebook or Google” is another external entity that gives register option. The last external entity is “Amazon API” since it provides tag related to corresponding item and it is directly related to SES. Moreover, The Seller can accept payment directly from the Buyer. Since this transaction is out of context regarding direct relationships of SES, Jackson Context Diagram does not include Buyer-Seller relationship. Since our assumption is that the Seller and the Buyer can be same person in different time, possible external entity the Buyer and the Seller can combine into new external entity that is “Users”.

Jackson Context Diagram can be shown as below:



2.Level-0 DFD Data Dictionary

-Name: Recommended Items

Description/Purpose: The application recommends a list of items that are related to the current item. It transfers from SES to Users via “Recommend Items” data.

Data structure: Item includes its price, description, address, seller, photos and tag.

-Name: Search Option

Description/Purpose: Buyer can search for an item and he/she gives option to SES. Transfer is achieved by the related data that is “Search Option”.

Data structure: Options are using keyboard, selection of category, using price interval and using published date. Categories can be electronics, automobile, sport, clothing etc. Price has some intervals that is used by buyers. For published date, buyer should provide time information.

-Name: Item Info

Description/Purpose: Seller can create an item to sell and he/she gives information about item. Transfer is achieved by the data.

Data structure: Data includes its price, description, address and photo. Item should have at least one photo.

-Name: Personal Info

Description/Purpose: In order to use application, users are required to sign up the application with their personal information. It can be applicable for buyer and seller. Since creating an account specific to the application is possible, users provide information about themselves.

Data structure: Data includes user’s name, surname, phone number, address, profile photo, email and password.

-Name: Edited Profile Info

Description/Purpose: The application allows the users to edit their profile information.

Range of values: If the users can register the system by using creating account to specific to the application, the users have password that related to profile account. Otherwise, by using Facebook or Google account, there is no other password is needed.

Data structure: Data includes name, surname, phone number, address, profile photo, email and password.

-Name: Deletion or Edited Items

Description/Purpose: The Seller can delete and edit the items he/she created before. Transfer is achieved by using the data.

Data structure: Data includes its price, description, address, photo and tag. Since the data is output of the system, it also has tag.

-Name: Items Sold and/or Unsold

Description/Purpose: The Seller can also see a list of the items that are already sold by themselves and a list of items that are not sold yet. Transfer is achieved by using the data.

Data structure: Data includes its price, description, address, photo and tag. Since the data is output of the system, it also has tag.

-Name: Seller's Profile Info

Description/Purpose: The Buyer can view the profile information of the Sellers. The transfer is achieved by the data.

Data structure: Data includes profile photo, name, surname, email address, address, and all the past items that are already sold and currently put on sale by that Seller.

-Name: Searched Items

Description/Purpose: The Buyer can view the detailed information of an item by selecting it from the list.

Data structure: Data includes item's photo(s), price, description, automatic tag, address, publish date, and how many times the item is viewed by the users.

-Name: Time Information

Description/Purpose: The buyer inputs the time information for search option that uses published date.

-Name: Buyer Receipt

Description/Purpose: After payment of item, the Buyer can get information about sold item by transfer of "Buyer Receipt" data.

Data structure: Data includes item's photo(s), price, description, automatic tag, address and seller.

-Name: Sign Up Info

Description/Purpose: To use the application, users are required to sign up the application with their personal information. This can be achieved through Facebook or Google.

Data structure: Data includes user's name, surname, phone number, address, profile photo and email address.

-Name: Photo of Item

Description/Purpose: The application sends the photo of the item to Amazon so as to get tag operation.

The data is related to Seller's activities.

Range of values: At least one photo should be provided.

Data structure: Data includes photo.

-Name: Tag

Description/Purpose: Amazon returns a tag related to the corresponding item to the application by using photo.

Data structure: Data includes tag.

-Name: Payment Info

Description/Purpose: The Seller can activate the payment system (currently we are thinking Paypal for this), if they prefer online payment. Then, the Buyer would like to get an item. Payment info is obtained by Buyer activities.

Data structure: Data includes the item's photo(s), price, description, automatic tag, address.

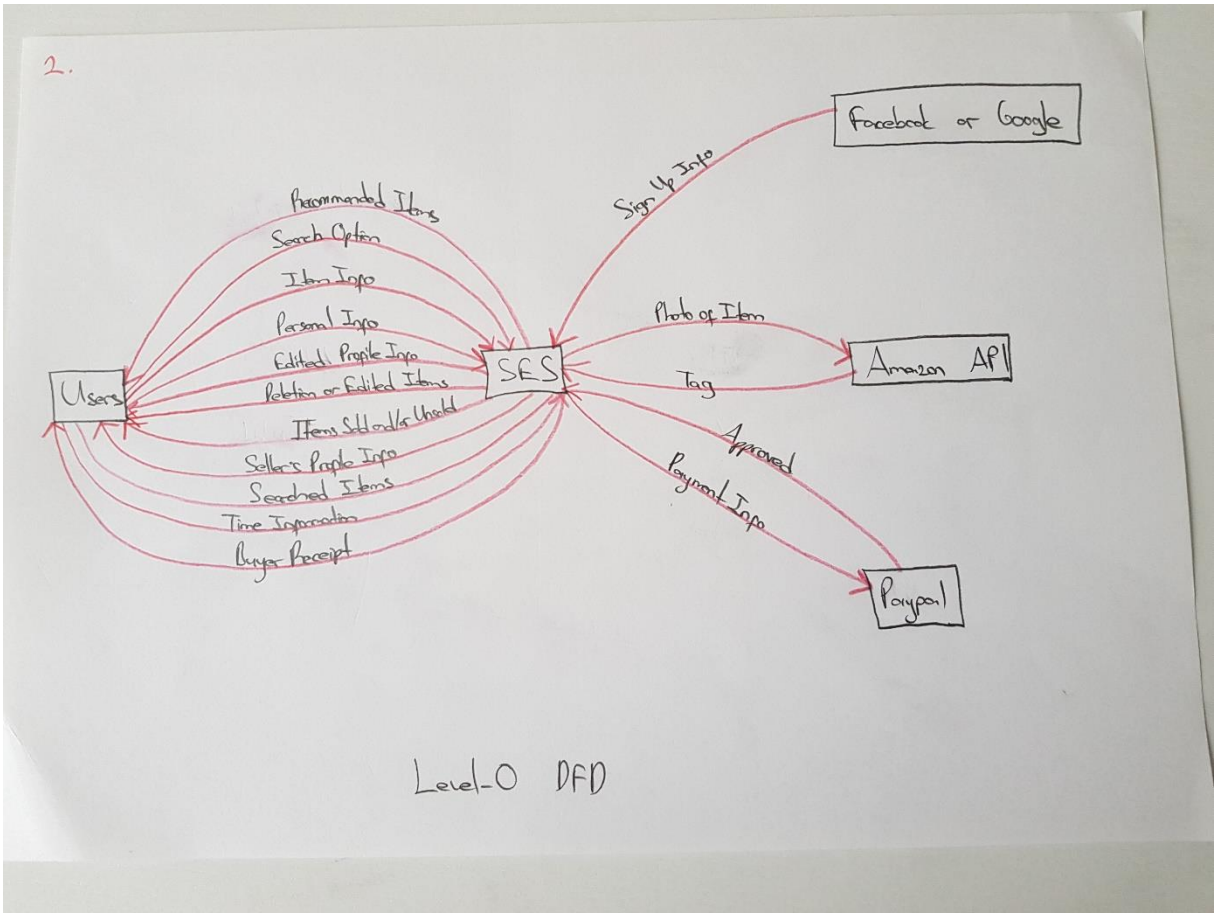
-Name: Approved

Description/Purpose: Paypal provides paying the price. Then, Paypal give confirmation message. This message is carried by "Approved" data. It is obtained by Buyer.

Data structure: Data includes approve message.

In this case, our assumption is that Paypal can pay the price and does not give error message or nonapproved message to the application.

The Level-0 DFD can be shown as below:



3.Level-1 DFD

Our assumption is that the Seller and the Buyer can be same person in different time, but they have different account for seller and buyer roles. To keep track of the buyer and seller's transaction differently, SES can give sign up and login operations and other operations by using two main transformations. These are "Operate Seller Activities" and "Operate Buyer Activities". Question says:" For the third question, you are not required to draw every function separately. Instead, you can group similar functions together. Two main transformations explained above can group similar functions together. "Operate Seller Activities" and "Operate Buyer Activities" have own sign up and log in activities due to tracking of different roles. The common data flow is defined in Part 2 that is Level-o DFD. These data are Recommended Items, Search Option, Item Info, Personal Info, Edited Profile Info, Deletion or Edited Items, Items Sold and/or Unsold, Seller's Profile Info, Searched Items, Time Information, Sign Up Info, Photo of Item, Tag, Approved and Payment Info. Since they are defined in previous section, they do not define in this section. However, noncommon data such as Activation of

Payment System between “Operate Seller Activities” and “Operate Buyer Activities” should be defined. The number of inputs and outputs are compatible with Level-0 DFD.

Name: Activation of Payment System

Description/Purpose: For payment, the Seller can activate the payment system. By using this information thanks to the data, the Buyer can take information about whether payment system is active or not.

Data structure: Data includes activation message.

Name: Seller Info

Description/Purpose: The Buyer can view the profile information of the Sellers. To do achieve this, “Operate Buyer Activities” should take information from “Operate Seller Activities”.

Data structure: Data includes profile photo, name, surname, email address, address, and all the past items that are already sold and currently put on sale by that Seller.

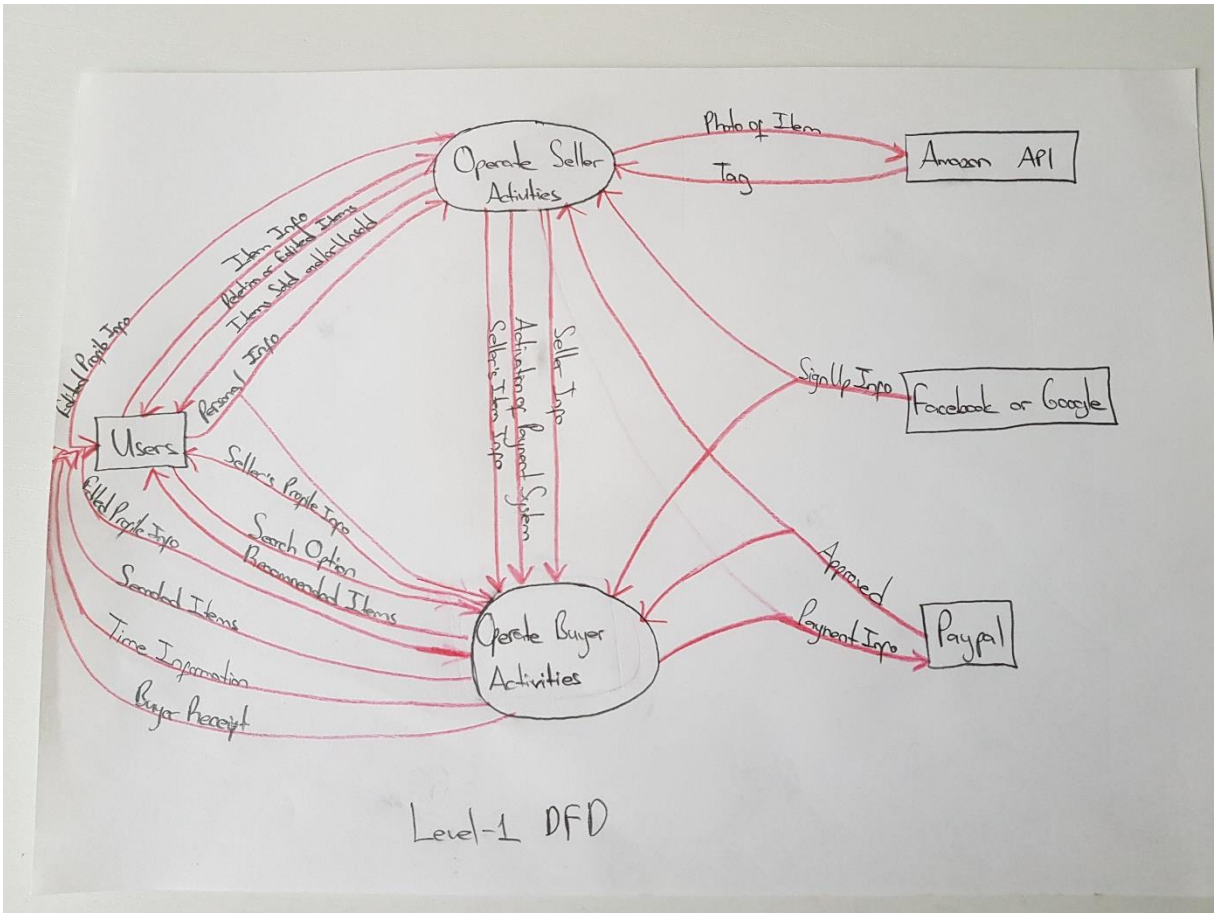
The Level-1 DFD can be shown as below:

Name: Seller’s Item Info

Description/Purpose: Item information created by the Seller is used by the Buyer. The transfer is achieved by using “Seller’s Item Info” data.

Data Structure: Data includes price, description, address and photo.

The Level-1 DFD can be shown as below:



4.Detailed DFD

The selected one of major group of functionalities is “Operate Buyer Activities”. The below data, detailed transformations and the related explanations is about Buyer activities. The common data explained before such as Edited does not define in this section again. Total number of inputs and outputs are compatible with Level-1 “Operate Buyer Activities”.

-Name: Sign Up Info

Description/Purpose: Facebook or Google account give information about person to SES regarding the Buyer. “User Table” database stores that information to use for another function.

Data Structure: Data includes user’s name, surname, phone number, address, profile photo and email address.

-Name: User Info

Description/Purpose: To provide edited profile information, User Table give information to “Edit Profile” transformation by using “User Info” data.

Data Structure: Data includes name, surname, phone number, address, profile photo, email and password.

-Name: Edited Profile Info

Description/Purpose: The application allows the users to edit their profile information. “Edit Profile” transformation enables to the user to edit profile information.

Data structure: Data includes edited or not name, edited or not surname, edited or not phone number, edited or not address, edited or not profile photo, edited or not email and edited or not password.

-Name: Personal Info

Description/Purpose: In order to use application, users are required to sign up the application with their personal information. In this case, it can be applicable for buyer. Since creating an account specific to the application is possible, the buyer provides information about themselves. Buyer give personal info to “Create Account via Application” transformation. This transformation enables the buyer to sign up.

Data structure: Data includes buyer’s name, surname, phone number, address, profile photo, email and password.

-Name: Sign Up Info1

Description/Purpose: To use the application, users are required to sign up the application with their personal information. This can be achieved through creating account via application. Due to different approach is needed for sign up, “Sign Up Info” and “Sign Up Info1” is required because Facebook or Google account provides password but creating account via application needs new password. SES is willing to differentiate those.

Data structure: Data includes user’s name, surname, phone number, address, profile photo and email address and password.

Name: Seller’s Profile Details

Description/Purpose: “Seller Info” database stores seller’s information. To view Seller’s profile by the Buyer, “Seller’s Profile Details” data transfer from the database to “View Seller’s Profile” transformation.

Data structure: Data includes profile photo, name, surname, email address, address, and all the past items that are already sold and currently put on sale by that Seller.

Name: Seller Info

Description/Purpose: The Buyer can view the profile information of the Sellers. To do achieve this, “Operate Buyer Activities” should take information from “Operate Seller Activities”. “Seller Info” transfer information from Seller to Buyer. “Insert Buyer Activities” provides usable information by transferring “Seller Info” to “Inserted Info” data.

Data structure: Data includes profile photo, name, surname, email address, address, and all the past items that are already sold and currently put on sale by that Seller.

-Name: Inserted Info

Description/Purpose: To insert Seller information into the “Seller Info” table.

Data structure: Data includes profile photo, name, surname, email address, address, and all the past items that are already sold and currently put on sale by that Seller.

-Name: User Info

Description/Purpose: Before log operation, “User Table” database give information to “Log In” transformation. The data is “User Info.”

Data structure: Data includes user’s name, surname and password.

-Name: Approve

Description/Purpose: “Log In” transformation enables to get approve from “Detailed User Table” database and give login information to the database. “Approve” is a kind of positive message to log in.

Data structure: Data includes positive acknowledgement.

-Name: Login Info

Description/Purpose: Detailed User” table stores log in information thanks to “Login Info” data transfer.

-Name: User Activation

Description/Purpose: After logging in, system send message to “Use Search Option”. The message is transfer by using “User Activation” data.

Data structure: Data includes activation of profile message.

-Name: Search Option

Description/Purpose: Buyer can search for an item and he/she gives option to SES. Transfer is achieved by the related data that is “Search Option”.

Data structure: Options are using keyboard, selection of category, using price interval and using published date. Categories can be electronics, automobile, sport, clothing etc. Price has some intervals that is used by buyers. For published date, buyer should provide time information. “Use Search Option” transformation enables buyer to select one option.

-Name: Determined Search Option

Description/Purpose: Selected one of the options.

Range of values: This could be using keyboard, selection of category, using price interval or using published date.

Determined Search Option can be used by “Enter Keyboard”, “Select Category”, “Use Price Interval” and “Use Published Date” transformations. In order to do their tasks, these transformations uses “Item Name Table”, “Category Table”, “Price Range Table” and “Published Date Table” databases respectively.

-Name: Time Information

Description/Purpose: The buyer inputs the time information for search option that uses published date. “Use Published Date” transformation uses “Time Information” to do its task.

-Name: Selected Item

Description/Purpose: After all options perform correctly, the output of those options groups into “Selected Item” data. The data is obtained by “Group Items” that enables SES to combine those options in one list. The list is basically searched list.

-Name: Searched Items

Description/Purpose: The Buyer can view the detailed information of an item by selecting it from the list.

Data structure: Data includes item’s photo(s), price, description, automatic tag, address, publish date, and how many times the item is viewed by the users.

“Group Items” transformation enables the Buyer to view searched item’s details.

-Name: Clicked Item

Description/Purpose: The Buyer can click the item from searched list.

Data structure: Data includes item's photo(s), price, description, automatic tag, address, publish date, and how many times the item is viewed by the users.

To view the item's details, the Buyer can get item information from SES. The related item information is inserted via Seller activities. Therefore, the Buyer should use item information created by the Seller.

"Seller's Item Info", Inserted Item Info and "Item Details" data are used for that purpose. All data includes same ingredients. These are price, description, address and photo. "Item Details" can extract from "Items" database in the Buyer side.

-Name: Related Items

Description/Purpose: The application recommends a list of items that are related to the current item. To identify general information about related items of current item "Group Item" transformation is used. After determination of which items are roughly related to current item, "Related Items" data is used for transfer between "Recommend Items" and "Group Items". The exact determination can obtain by "Recommended Items" transformation. Thanks to this transformation, the Buyer can get recommended items when he/she look at the current item.

Data structure: Data includes item's photo(s), price, description, automatic tag, address, publish date.

-Name: Recommended Items

Description/Purpose: After performing of "Recommended Items" transformation, the desirable information that is list of recommendations transfer by using "Recommended Items" data.

-Name: Purchasing Item

Description/Purpose: After selection of specific item to buy, purchasing operation is generated by "Pay for Item" transformation. Its flow occurs by using "Purchasing Item" data.

Data structure: Data includes item's photo(s), price, description, automatic tag, address, publish date.

-Name: Payment Info

Description/Purpose: If the Seller actives payment system, then "Pay for Item" transformation send "Payment Info" to Paypal to pay the price of item.

Data structure: Data includes the item's photo(s), price, description, automatic tag, address.

-Name: Approved

Description/Purpose: Paypal provides paying the price. Then, information about that is transferred to SES. It is obtained by both Seller and Buyer.

Data structure: Data includes confirmation message.

-Name: Purchasing Transaction

Description/Purpose: After finishing of purchasing item, the whole purchasing and other related activities is willing to combine in order to inform the Buyer. To do achieve this goal, “Generate Buyer Receipt” transformation is used to generate Buyer receipt. Input of this transformation is “Purchasing Transaction”.

Data structure: Data includes the item’s photo(s), price, description, automatic tag, address, seller.

-Name: Buyer Receipt

Description/Purpose: The buyer wants to get summary of purchase of item. “Buyer Receipt” enables the Buyer to see purchasing information.

Data structure: Data includes the item’s photo(s), price, description, automatic tag, address, seller.

-Name: Receipt Data

Description/Purpose: In order to use further transactions, “Generate Buyer Receipt” transformation give “Receipt Data” data to “Detailed User Table” database. The Buyer can see previous shopping activities after a while by using the database.

The Detailed DFD can be shown as below: