

Data Flow Diagram (DFD) for FTMK Final Year Students: Overcoming the Common Mistakes

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1. DFD? ERD? Which one to use?

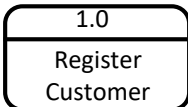
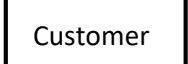
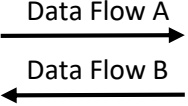
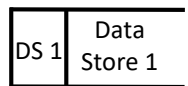
Data flow diagram (DFD) and entity relationship diagram (ERD) are two common diagrams used to graphically represent elements at certain stages in a system development lifecycle. While DFDs are used in the analysis stage to represent the flow of data, ERDs are used in the design stage to reflect the relationships among the entities.

These two diagrams are used extensively by FTMK final year students in their final year reports. Over the years, the students may have overlooked the importance of DFDs in conveying WHAT data moves in and out, HOW data is transformed and WHERE data is stored within the system. Perhaps the low motivation and the perception that creating such diagrams are burdensome tasks, students kept on making mistakes when creating DFDs. This paper highlights the common mistakes when creating DFDs and provides graphical tips on how to correctly create DFDs.

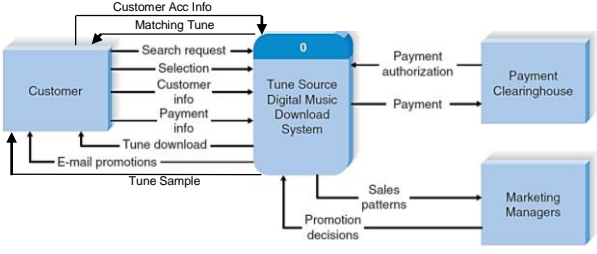
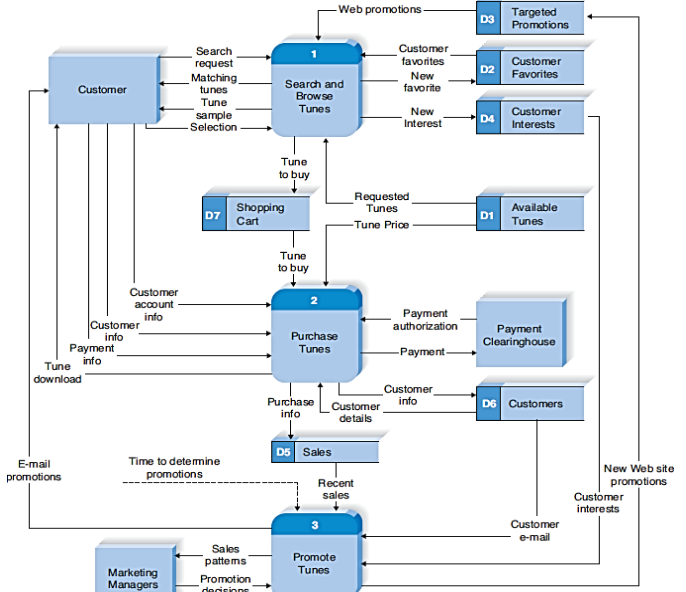
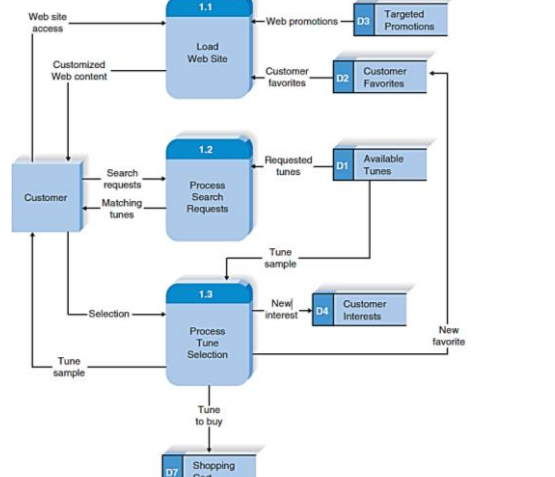
2. Getting Your DFD Right From the Beginning

2.1 The Symbols

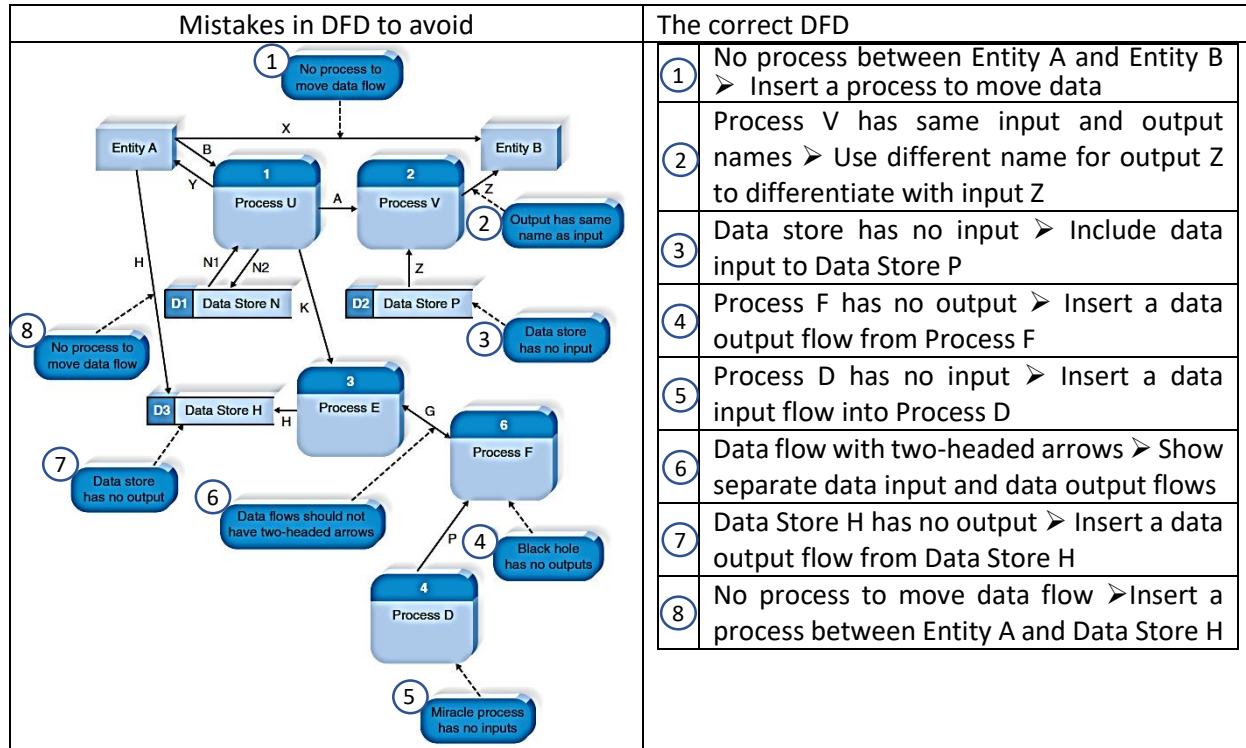
The four basic symbols in DFD represent process, external entity, data flow and data store.

DFD Symbol	DFD rules to follow
Process 	<ul style="list-style-type: none">+ begins with a verb+ context diagram process is labelled 0. Subsequent processes are numbered with respect to its parent process+ must have at least one input data flow and one output data flow+ must be connected to a process, external entity or data store
External Entity 	<ul style="list-style-type: none">+ labelled as a noun+ must be connected to a process+ must have at least one input data flow or output data flow
Data flow 	<ul style="list-style-type: none">+ labelled as a noun (no verb); input data flow label should be different from output data flow (since data has been processed)+ can appear between:<ul style="list-style-type: none">i. process and processii. process and external entityiii. process and data store+ input data flow should be sufficient to produce output data flow+ cannot use two arrow heads \longleftrightarrow; instead use \rightleftarrows
Data Store 	<ul style="list-style-type: none">+ labelled as a noun (no verb)+ must have at least one input and one output+ can be mapped to an entity in the entity relationship diagram (ERD)

2.2 The Diagrams

Diagram Type	Diagram Example
<p>Context diagram</p> <ul style="list-style-type: none"> + must show only one process (normally labelled as the proposed system). No detailed processes + consists of at least two external entities + must have at least one input data flow and one output data flow + cannot have data store + the number of input data flows and output data flows must equal (balanced) to that of subsequent diagrams 	
<p>DFD Level 0</p> <ul style="list-style-type: none"> + must show all major processes + numbered as 1.0, 2.0, ..., n.0 + can show data store + the number of input data flows and output data flows must equal (balanced) to that of preceding diagram 	
<p>DFD Level 1</p> <ul style="list-style-type: none"> + must show sub-processes of preceding DFD Level 0 + numbered (for process 1.0) as 1.1, 1.2, ..., 1.n + the number of input data flows and output data flows must equal (balanced) to that of preceding diagram + DFD Level 2 and above is not recommended for Final Year Project (unless necessary) 	

3. Common Mistakes in DFD



4. In A Nutshell

DFD is NOT a flow chart that show the sequence of processes. DFD shows WHAT data moves in and out, HOW data is transformed and WHERE data is stored within the system. One simple rule to remember whenever creating or checking a DFD: A process must be present at either end of a data flow.

5. Bibliography

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4. Using Data Flow Diagrams (DFDs). <https://www.w3computing.com/systemsanalysis/using-data-flow-diagrams/> (last accessed: 15 March 2021)
5. What is a Context Diagram and what are the benefits of creating one? <https://www.modernanalyst.com/Careers/InterviewQuestions/tabid/128/ID/1433/What-is-a-Context-Diagram-and-what-are-the-benefits-of-creating-one.aspx> (last accessed: 30 March 2021)