



## WHY DFDS? *When Swim Lanes are Not Enough* A Comparison of Process Modeling Techniques

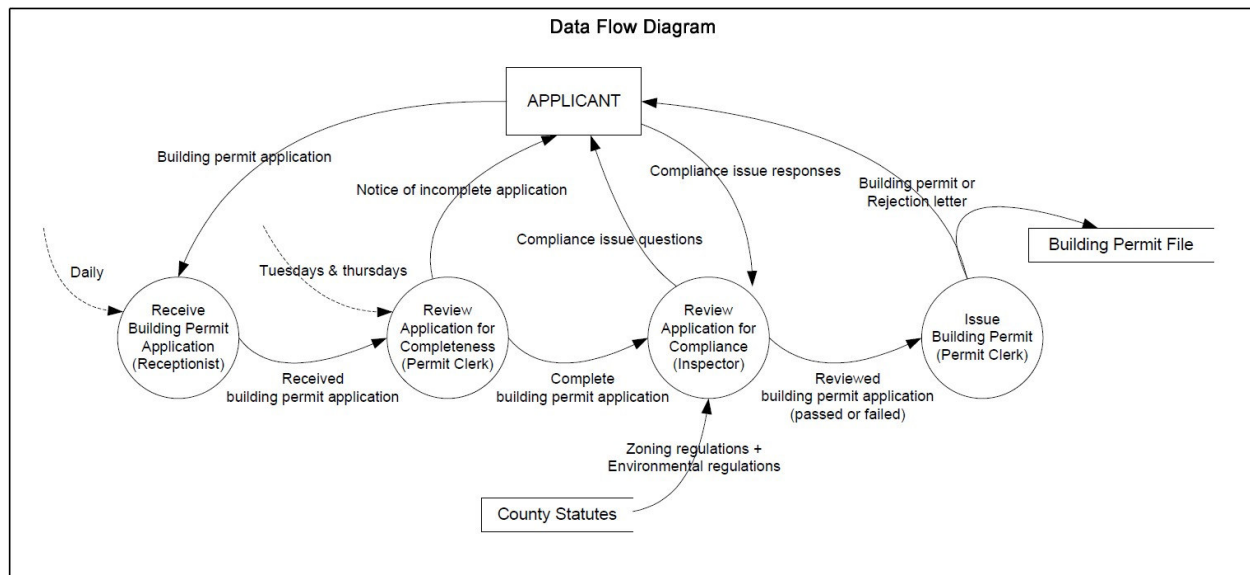
Data Flow Diagrams have been around for about thirty years. There are a number of newer techniques available, and it might seem that one of these would be a better alternative to the DFD. In our experience, even though technology has changed dramatically, what you are looking for when modeling business processes hasn't changed much at all.

If you are developing requirements for an information system, you need to discover and document:

- overall process flow
- activities being performed
- inputs & outputs to the activities
- events that trigger the activities
- who performs the activities
- where the activities are performed
- where information is stored
- who supplies information
- who needs to receive information.

Once documented, all of these aspects need to be specified in a set of new business process requirements. This was true thirty years ago and it is still true.

A Data Flow Diagram shows all of these aspects extremely well. We find that about 80% of the time we are modeling business processes, the DFD best meets the needs.



How does the DFD compare with other diagramming techniques?

- Process Maps (also called Workflow Diagrams)
- Use Cases
- Activity Diagrams



- Functional Decomposition Diagrams

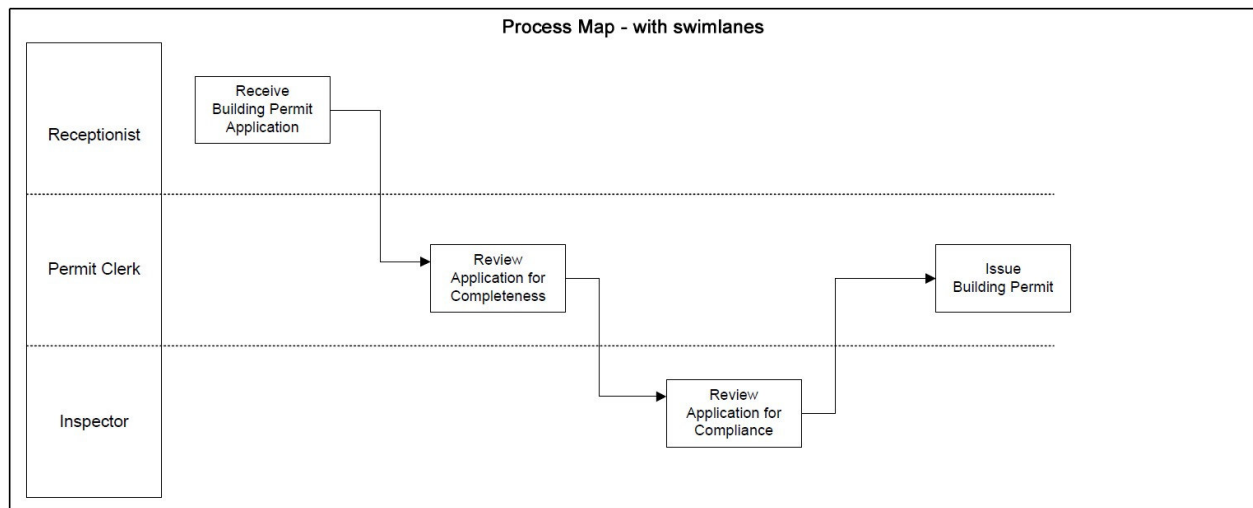
They all have their places and they satisfy the rest of the needs. We will present each one of them and follow the narrative with sample illustrations. All show the same process, but each highlights different aspects. (Note: These are very simple examples & not all of the capabilities of each type of diagram are shown.)

### Process Maps (or Workflow Diagrams)

Process maps are a type of flow chart that has been adjusted to clearly show a business process from beginning to end. They may look a lot like DFDs, but they have a significant difference. They show the flow of activities within a process (i.e. their sequence) but they don't show any information flow.

We find that we almost always need to understand the flow of information and therefore need to develop DFDs. If the need arises to highlight the order of the activities instead of the information flow, a Process Map can always be derived from a DFD. But it is not as easy to go the other way.

Regarding swim-lane notation used in Process Maps, we have found that in some cases DFDs can adapt quite well. However, if the information flow is complex, this doesn't work very well.

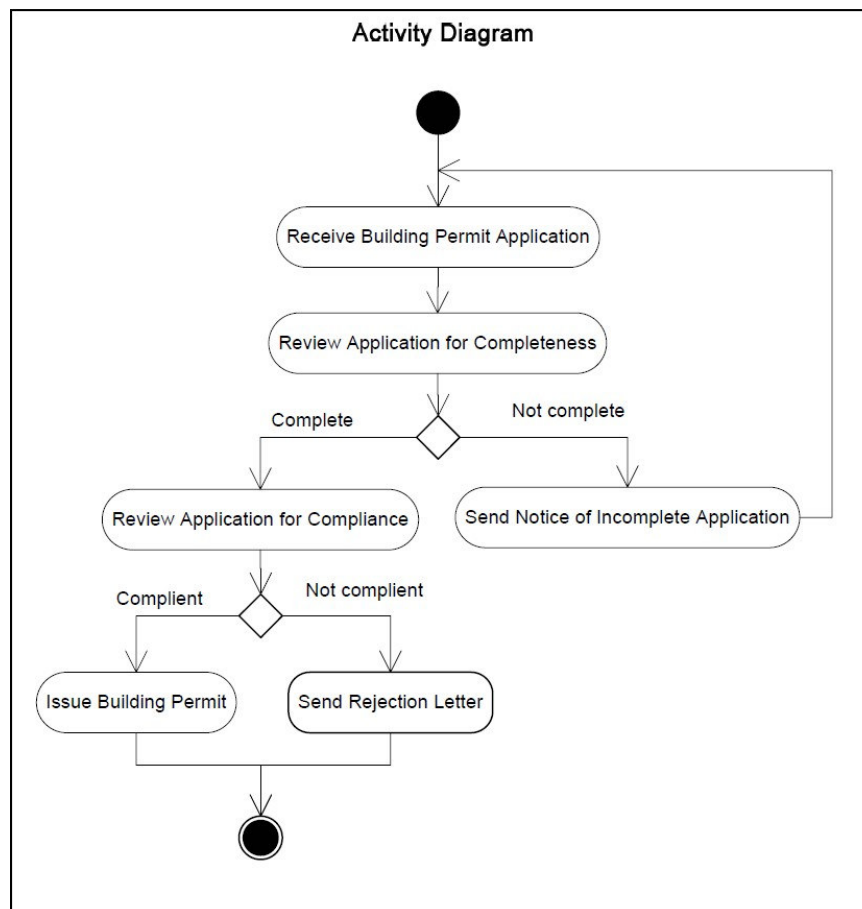




## Activity Diagrams

An Activity Diagram is a UML diagram that is not too different from a traditional flow chart. Whenever you need to show the logic in a business process, this is a good choice. However, we would not begin process modeling with an Activity Diagram for two reasons: 1) it does not show the crucial information flow and 2) a lot of business logic is “designed” which means the business activities follow a particular pattern, not because they must, but because someone (or many people over the years) decided what order would be the best. By using DFDs, and analyzing the information flow, we can see the essential information dependencies. This will allow the business to adjust the logical flow of activities, if they want to achieve a more streamlined process flow.

Whenever discovering and documenting logic is needed, either for a process flow or for the internal work of a single activity, we never hesitate to use a logic flow diagram. And, of course, in the design phase of a project when algorithms are being developed, the logic flow diagrams take on a much larger role.

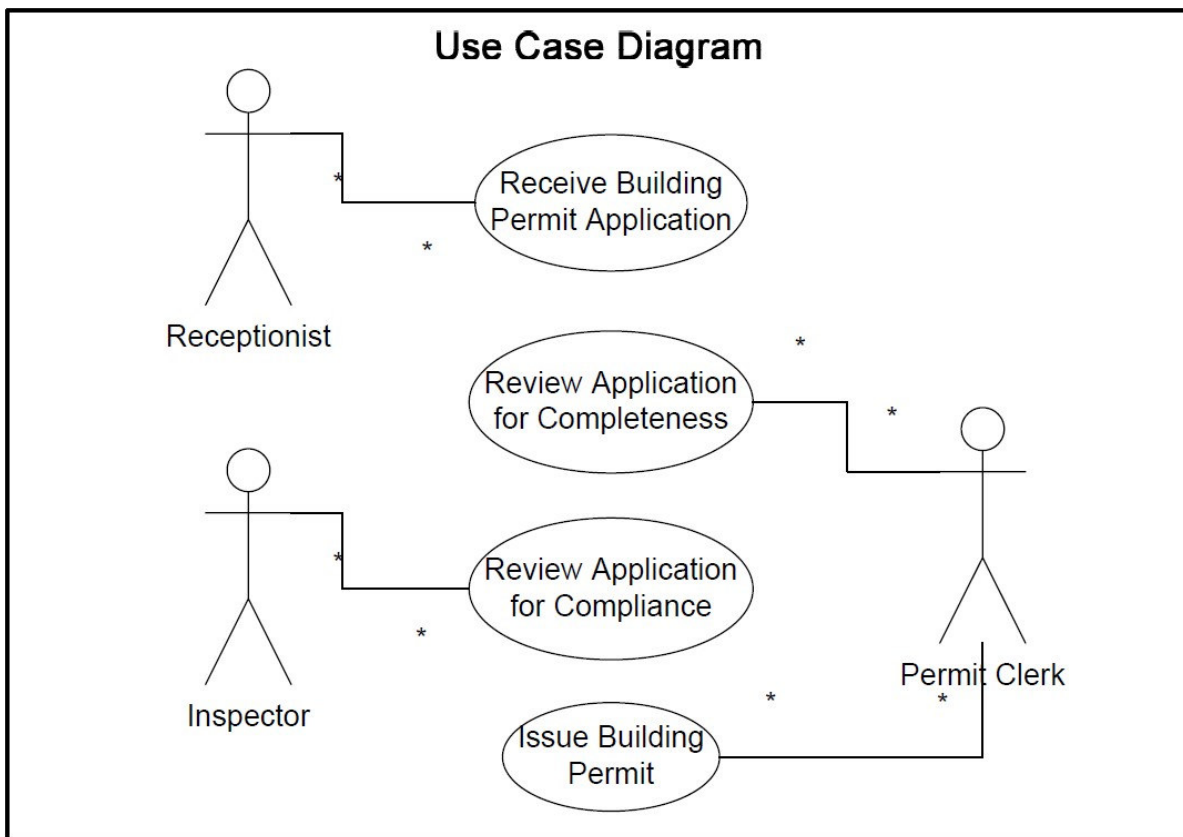




## Use Cases

Use Cases are also a UML instrument. As the name implies they show how a system is used. They do this very well, and because of this success, many are trying to use them as the primary way to discover and document business process requirements. However, we believe this is a misuse of the instrument. A Use Case diagram shows a single activity, but doesn't show an entire process flow or any information flow. You cannot do justice to business process analysis without graphically seeing how the information flows into, within, and out of the business. A Use Case Diagram does have a nice notation (stick figure) to show who performs the process. However, the real value of the Use Case is the text scenario structure, which is a good way to describe an activity.

We suggest using the DFD during business **analysis** to discover and document the business process requirements. Then, in the first step of **design**, cluster the activities into designed business transactions. A business transaction is a singular piece of work, triggered by an event, done by one person, at one location. Now, each business transaction can be called a Business Use Case. The Use Case text scenario is then a very good way to describe the business transaction. Next, technology can be applied to the Business Use Case to transform it into a System Use Case, which is a nice design document.



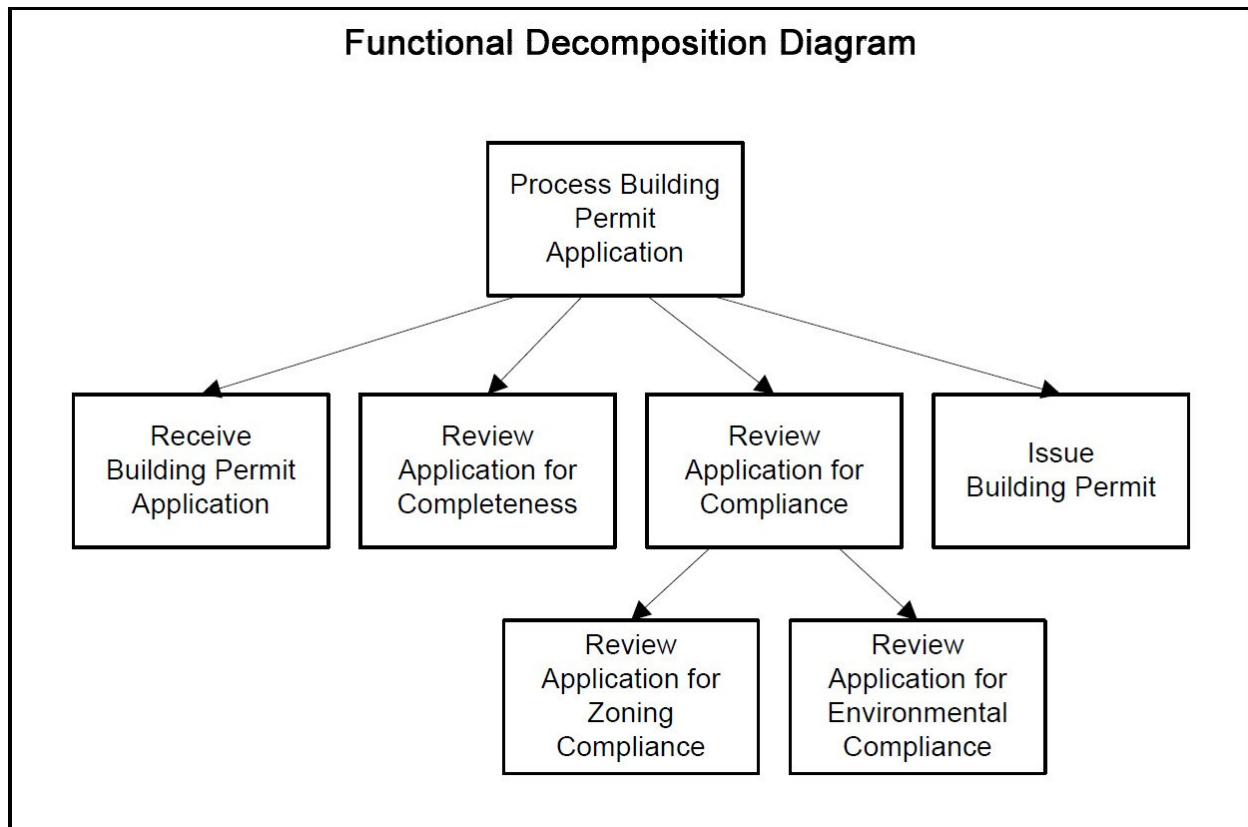


## Functional Decomposition Diagrams

Functional Decomposition is a technique of taking a business function and breaking it down into sub-functions. A Functional Decomposition Diagram is a structure chart that shows the functions and sub-functions all in a single view. It normally does not show process flow, information flow, logic flow, or anything else – just the decomposition.

It is important to note that DFDs also effectively allow you to decompose processes. DFDs have an advantage in that the information flow is seen at each level of decomposition. The Functional Decomposition Diagrams have an advantage in that you can see all the levels of decomposition in a single view.

We use these diagrams in two ways: 1) at the very start of a business process modeling effort, it is sometimes useful to simply (and quickly) decompose a large process into smaller ones. It helps determine the scope of the effort and can be a way to partition the modeling effort into smaller pieces. 2) After completing a leveled set of DFDs, it is often useful to create a structure chart to show all of the processes and sub-processes. It doesn't take long, and you can then see the whole picture in single view.





## **Are There Any Disadvantages of DFDs?**

Every modeling instrument has its strengths and weaknesses. Process modeling with DFDs probably requires more skill and rigor on the part of the modeler. Information flow can be very complex. It takes practice to learn how to use the data flow diagramming technique and it takes discipline to successfully use it on a project. However, business process modeling is not a trivial job. Even though we don't want to create unnecessary complications by using a more complex instrument, we do need to use whatever it takes to get the job done. As Einstein said "Make everything as simple as possible, but not simpler."

## **Conclusion**

In short, to successfully discover, assess, and specify the process requirements of a business requires the inclusion of the information flow. The Data Flow Diagram remains one of the best instruments for that purpose.