

Interaction Design
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Lecture - 13
The Framework Definition and Refinement Phase in Goal Directed Design Process-
Interaction Framework

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Quick recap

Overview of Goal directed design process

Week 3 | Lecture video 01



Welcome to week 4 of this course on Interaction Design. Till now we have gone through essentially few different steps as far as designing interactive process is concerned. If you remember in the first week we were talking about very basic definitions of what is an interface; what is an interaction and how do, we define interaction design as a process. And in particular to as an answer to the third question we had seen three different definitions.

And one of the definition was essentially talking about process of designing interactive product. And that definition had given us an idea that designing interactive product is a highly goal directed design process. So in that following week we had seen different facets of this goal directed design process. And now we are in week 4 were we are going to study framework definition part of goal directed design process.

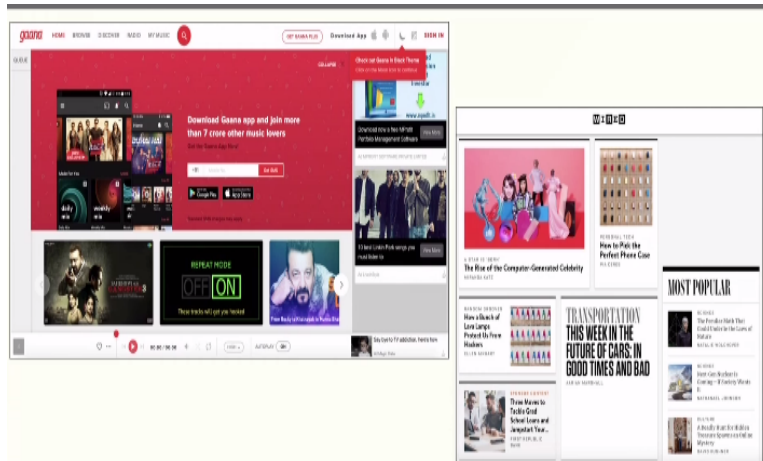
But once again let us do a quick recap of what does this goal directed design process was. So the process essentially starts with research phase and then it goes onto modelling phase. The third phase is the requirement definition; fourth one is framework; fifth one being the refinement and sixth one is the development phase, and if you remember when we were talking about overview of goal directed design process.

We had seen that from left of your screen towards the right of your screen, we are actually going from understanding the domain, the user, or application and requirements for that, and then we were obstructing that knowledge. And in the third phase we were extracting the knowledge in the form of requirements. And now the fourth stage is the representation of that knowledge of that understanding when it comes to designing interactive product.

And fifth one being the detailing part. So you can very well imagine that by the end of fourth week you would be able to do detail an interactive product because we have seen different parts of this process. Once again in week 4, as I am telling you we are in the framework and refinement process. We could have taken these two phases separately but as you may imagine that refinement is about looking at different aspects of this process and improving on your outcomes of each phase of this process.

And then refine them further; we are not taking refinement as a very specific phase to start it. We are combining it with framework definition so today's topic of discussion would be framework definition and refinement. Let me show you few different images which are going to come before you in the slide.

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You can see that we have different interfaces around us. Be it an online presents or be it an offline presents. You come across so many different interfaces in a very day-to-day routine, so the interfaces that you are seeing front of you can you imagine an underlying structures beneath them. So what you seeing is the finished product, is the final outcome of the entire process, and let me show you few more examples of these outcomes.

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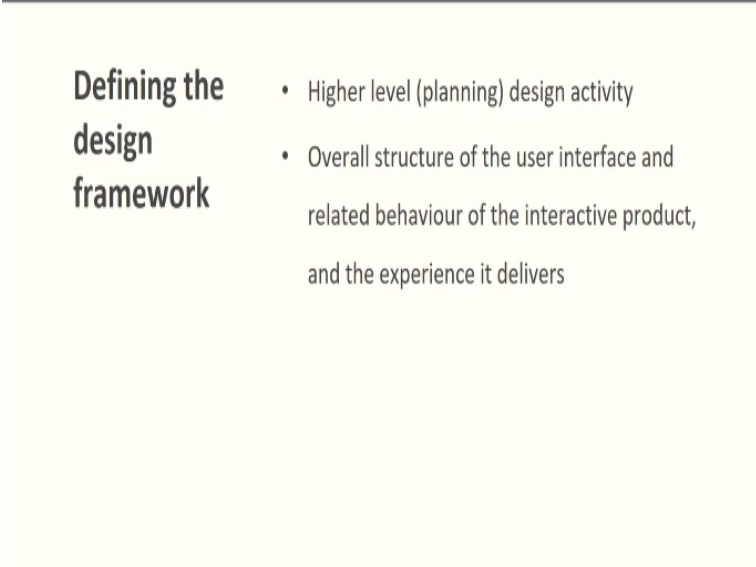


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On your screen is an interactive interface where you are trying to manipulate or you are trying to gather information about activities around financing. And then you have calendar and then you have some data visualization interface. So if you see all of these 4 or 5 different interfaces that I

am showing before you would not you imagine an underlying structure, so that underlying structure is what the framework of the design.

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Defining the design framework

- Higher level (planning) design activity
- Overall structure of the user interface and related behaviour of the interactive product, and the experience it delivers

So when it comes to framework definition phase we are essentially trying to define the designing framework. Always remember that continue from understanding to abstracting to structuring to representing and detailing we are onto the representation part. So while you are trying to represent you are trying to detail the design framework. And it is a higher-level planning activity. In that sense that we are going to plan it out such a way so that it is stays consistent across the organization,

Or across the design team, anyone who is looking at your design framework should be able to replicate your design in the manner which is intended. So it is a higher level design activity and it is focused around planning the design. And it is also about the overall structure of the user interface, behaviour of the interactive product and the overall experience that it delivers to its user.

Once again if I showcase those examples before you, you can very well imagine that in the framework definition phase we are concerned with the overall structure of the design, interactive product and its behaviour and the experience it delivers to its user.

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Defining the design framework

- Organisation of information and its structuring
- Arrangements of interface elements on the screen
- Workflows
- Interactive behaviour
- Visual and form language

Cooper, A., Reimann, R., Cronin, D., Noessel, C. About Face: The Essentials of Interaction Design. John Wiley and Sons. 2014

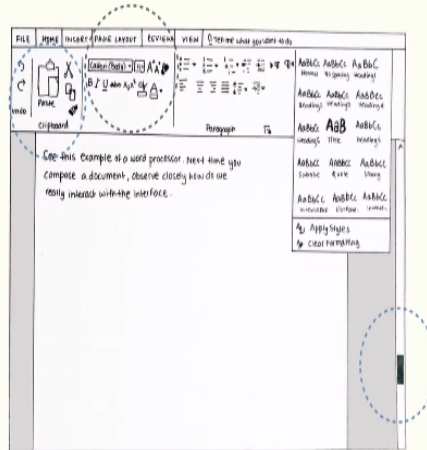
It is also about organising the information and structuring it. So you might have a lot of content which you need to be organise and structure. What do you mean by that? Imagine that there are a lot of data points which are to be represent it in an interface, we would not simply create categories of those data points but we would also be conscious of the facts, which categories have to be placed next to each other, so that is what we mean by organisation of the information, and its structuring.

It is also about arrangements of interface elements on the screen. Now as a term interface element might be little new to use, so wait until we move to the next slide because on the next slide we have an example that clearly illustrate what an interface element it. At this point of time keep this point in mind that framework definition is about arrangement of interface arrangement on the screen.

It is also about detailing workflows and interactive behaviour, and visual and form language. Now this again we have two new phases visual language and form language, wait till the next screen where we had an example to illustrate these three different phases that we are encountering. The first one is interface elements, second one is visual language and the third one is the form language.

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Defining the design framework



What you are seeing in front of your screen is a paper prototype of a word application. And if you can imagine that there are different interface elements which are marked with the circular boundaries. So these circular boundaries are trying to illustrate what do we mean by an interface elements. So all of these functions which are around editing, which are around composing, selecting the font size, manipulating different aspects of elements.

These are interfaces elements which are also about the interface tools. So all of these taken together, we call them as interface elements, even as call by if you see that is an interface elements. Now, when it comes to visual and form language that these are the two new phases that we had seen in the last slide.

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Defining the design framework



Look at the example in front of you. You have dispensing machine which dispenses cool drinks and snacks at different airports. So in this machine if you can see there is a visual language which is focused around a particular brand and also about you know how to display different items, so there is a colour composition there is an arrangement in the place, there is a layout in place; and that is what we call the visual language.

And also if you can see that circular boundary around certain parts of the picture that is about the form language. So if the interactive product has got a hardware component to it, if it in the form of physical product also then the form language comes into play which place that interaction designer not only then but also industrial designers have to contribute to the project. An industrial designers give details of the form language.

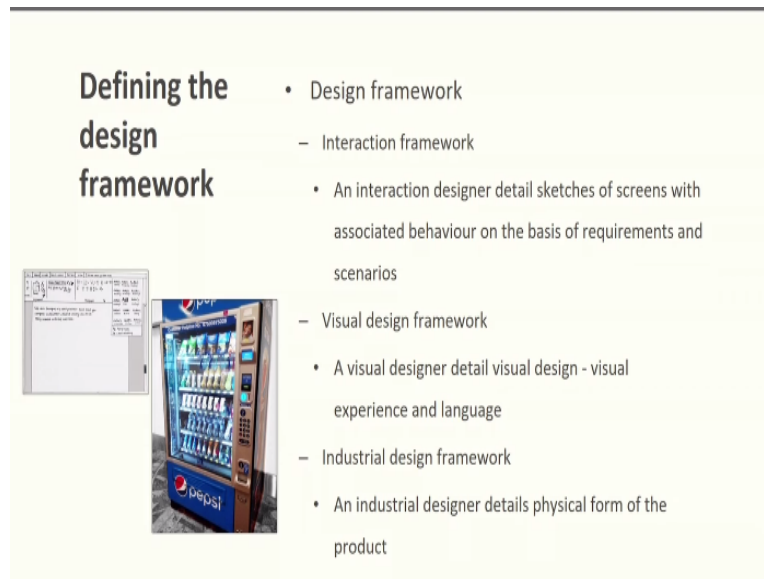
They are responsible for detailing the form language. So this is what we mean by three different phases, interface elements, visual language and form language. Let us return to defining the design framework. And now I am sure bit more clarity is there in when you look at your screen. So it is about organising the information. Once again I am repeating that. It is about organisation of information and its structure, arrangement of interfaces elements on their screen.

Workflows, interactive behaviours, visual and form language. So by now you may have understood that when it comes to designing the framework it is about three different activities.

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Defining the design framework

- Design framework
 - Interaction framework
 - An interaction designer detail sketches of screens with associated behaviour on the basis of requirements and scenarios
 - Visual design framework
 - A visual designer detail visual design - visual experience and language
 - Industrial design framework
 - An industrial designer details physical form of the product



The slide contains a list of design frameworks. To the left of the list, there are two images: a screenshot of a software interface with various panels and text, and a photograph of a blue and silver Pepsi vending machine.

The first one is called detailing the interaction framework where an interaction designer detail sketches of a screens with associated behaviour on the basis of requirements and scenarios. And then the second part of this design framework process is that you have a visual design framework where a visual designer detail visual design, and he is also detailing this visual design; keeping it in mind the visual experience and the formal language that the products needs to have.

And then we have a third framework which is the Industrial design framework where an industrial designers details physical form of the product. Let us look at the first framework within the design framework category.

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Interaction framework

- Act of detailing high level structure of the interactive product in terms of
 - Layout of interface screens
 - Behaviour of interface elements
 - Information organisation
 - Overall interaction with the user

The first one is the Interaction framework. So as we had seen that interaction designers are responsible for detailing this framework. And it is an active detailing, high level structure of the interactive product in terms of few different aspects. The first one is layout of interface screens. Second one is behaviour of interface elements; information organisation is the third one and the fourth one is overall interaction with the user.

So these are the four broad aspects which have to be taken into account when it comes to detailing the interaction framework. Let us look at other parts of interaction framework as well.

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Interaction framework

- Decide form factor details- Platforms
 - Web application to be viewed mostly on high resolution screens (desktop platform)
 - Or, a smart phone based application which has to be accessed on the move in varying light conditions (mobile platform)

So when it comes to designing interaction framework apart from keeping in mind those four essential aspects you have also to consider the form factor that details about the platforms over which your interactive product is going to be hosted. So there might be instances when you have to design an interactive web application, so in that sense platform is the web. Or you might have to design an interactive application for desktop based environment.

Even a smart phone based application which has to be accessed on the move in varying conditions of light, so it is a mobile platform.

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Interaction framework

- Decide form factor details- Platforms
 - Or, a kiosk based application viz. atm, ticketing and reservation, information and inquiries. Such applications are meant for use by users with different experience with the interface (kiosk platform)
 - In-vehicle systems like GPS, and entertainment systems
 - Home entertainment platforms involving games
 - Interconnected smart device environments

Even at times you might have to design interactive applications for kiosk based applications. For example, your ATM machines, different commodity dispensing machines, a lot of the like reservation and ticketing machines, enquiry machines kept in public locations they all fall within the category where the platform is a kiosk platform. Then you might have interactive applications which are meant to be hosted In-vehicle condition.

So your GPS which is a part of car dashboard these days is one such application which is meant for In-vehicle systems. And then you might have interactive applications which are focused around home entertainment, platforms. For example, lot of gaming applications are of that nature. And then there is an emerging trend around connecting different device environments

which are talking to each other. When it comes to deciding form factor details which is also about platforms as we had seen.

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Interaction framework

- Decide form factor details- Platforms
 - When in confusion, take decisions based on knowledge gathered in the earlier phase of 'goal directed design process' involving personas, scenarios and requirements

If at times as an interaction designer or if a team of interaction designer is confused about which platform to choose then the best way to decide on it to look back in your stakeholder interviews, their preferences and their needs. You might also require to imagine and think about personas scenarios and goals of the user groups. So these are your guiding principles when it comes to deciding on the platform.

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Interaction framework

- Decide form factor details- Platforms
 - When in confusion, take decisions based on knowledge gathered in the earlier phase of 'goal directed design process' involving personas, scenarios and requirements

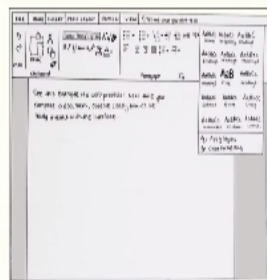
The next part about interaction framework is that you also have to decide about the posture of the application and the system inputs methods. Now the concept of posture is a bit difficult concepts, so I need your attention in understanding that. So it means, when we are talking about the posture of an interactive product it means that the area concerned about how the product present itself before that user, that is the, what is the stance that the product takes.

And presentation affects how users make sense of interactive products behaviour. And the interactive product also may present itself differently in different context. Now these three lines are little difficult to understand, so let us look at the example following this slide.

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Interaction framework

- Define posture (stance) and system inputs methods
- By defining posture, designers estimate the **attention** that the interactive product requires from its users



- Word processor needs an undivided attention
- Users often experience being engrossed completely when interacting with such applications
- Other examples- Spreadsheets, schedulers etc.

Again, once again the example of word processor is a very relevant example because if you imagine and if you recall your experience of using any word processor your continual attention required by the application. So word processor as an application is one such application which requires a lot of attention from the user in fact undivided attention from the user. While their might be other applications like reminders and notification applications.

Applications which are showing you updates around a stocks that you might have invested your money in, all of these different kind of application does not need so much attention from the user, so that is what we mean by posture of the interactive application, the way it presents the

amount of attention it demands from the user that is what we mean by the posture of the interactive application.

Once again let me reiterate this concept because it is a little complicated concept. Again, consider the example of the word processor. Imagine when you are engrossed in creating a document at that time it is require that you invest your entire attention onto creating the document. So word processor once again as an application is one such application where users undivided attention is in high demand, okay.

While there might be other applications which might not need that much of attention; that is what we mean by posture of the interactive product. So by defining posture designers estimate the attention that the interactive product requires from his user. When comes to systems input methods it is comparatively an easier concept to understand. It is about the input modalities with the interface. How as a user you are going to provide your inputs to the interface?

Is it through text, is it through voice, so many speeches based systems are already there or is it through different other ways; maybe gesture based inputs. So you have to understand and detail these systems input methods as well. So keyboard, mouse, thumb board, touch screen, speech, game controllers with tactic feedback, remote controls dedicated hardware buttons etcetera., so many of these are all examples of system input methods.

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Interaction framework

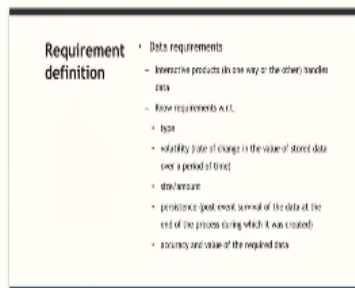
- Define posture (stance) and system inputs methods
 - System input method (a.k.a. input modality)
 - Keyboard, mouse, thumb-board, touch screen, speech, game controllers with tactile feedback, remote controls, dedicated hardware buttons, etc.
 - Basis of decision: Users' attitudes, capabilities, and preferences

And the basis of decision once again when it comes to deciding on factors in interaction framework definition always decided on the basis of the previous knowledge which is a knowledge that you have gathered about user goals, user preferences and needs. So basis of decision if in confusion is always about users' attitude capabilities and preference, so that is how you come to decide system input methods.

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Interaction framework

- Detail data and functional elements
 - Based on functional and data requirements gathered earlier



Requirement definition

- Data requirements
 - interactive products (in one way or the other) handle data
 - those requirements w.r.t.
 - type
 - stability (rate of change in the value of stored data over a period of time)
 - data/measure
 - persistence (post event, survival of the data at the end of the process during which it was created)
 - accuracy and value of the required data

Now the next set of activity that you have to do when it comes to this defining an interaction framework is about detailing data and functional elements and that is where I encourage you to revisit in earlier session on requirements. When we are talking about the requirements we were

clearly mentioning that there are requirements which are focus around the data. And then there is another set of requirements which is focus around the functions.

So there are interface elements which are catering to these two kinds of requirements. Data requirements and functional requirements; element interface element which are catering to data requirements are data elements while interface elements which are catering to functional requirements are functional elements. So what is why I have use one of the slide from an earlier session.

You can see that we were talking about the requirement definition part where we will be clearly mentioning what is the data requirement. And similarly, we had in the same session on requirements we had mentioned very clearly what is a functional requirement.

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Interaction framework

- Detail data and functional elements
 - Basic data elements - Photos, videos, text (as in messages, reminders, documents and records), sounds
 - Interactive product operates on these basic data elements

Once again let us understand what data is. Data elements are basically photos, videos and text. And you know, as in text basically as in messages, reminders, documents and records and also sometimes sounds. And then interactive product operates essentially operates on the basic data elements. So it is very important while you are defining the interaction framework that you detail data and functional elements as well.

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Interaction framework

- Detail data and functional elements
 - Becomes a basis to define product functionality
 - e.g. a photo organising and editing application, document editing application, photo collage application, format conversion applications etc.
 - Consider relationships between data elements
 - e.g. a photo within a photo album; a photo, sound or video object in a slide presentation application

Now why it is important because when you are detailing data and functional elements it becomes your, it becomes a basics to define the product functionality. What does the product accomplish in terms of different functions that are what the product functionality is. So while you are detailing data and functional interface elements you are defining product functionality. So for example, a photo organising an editing application acts or operates on photos as data element, so what it operates on define the nature of the application.

If it operates on photos essentially as data element, then it is a photo organising and editing application. Similarly, we have document editing applications, photo collage applications, format conversion application etcetera, etcetera. So there are applications which are just focused around converting formats from one file format to another file format. Essentially, if you are using an E-book reader there are times when you are required to convert a PDF file into an E-book, E-book reader format file.

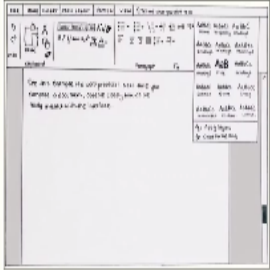
So there is application which caters to this kind of requirements. So that is where we are saying that detailing data and functional elements is about detailing the functionality of the product interactive product. And consider relationship between data elements when you are trying to detail. So there might be times when a photo resides in as photo album, all sound or a video object resides in a slide presentation.

So these are the different examples. So there might be relationship between the data elements which you have to consider when you are detailing the interaction framework.

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Interaction framework

- Detail data and functional elements
 - Functional elements: Operations or manipulations (via tools) to be performed on data elements



- Copy format tool - Use to copy styles from one text group to another

Functional elements. So these are operations or manipulations that you are performing on the data elements. So essentially the interactive product operates on data elements, but there are functions that you perform on the data elements. So that is what we are calling the functional elements. So for example, the copy format tool, have you ever done an activity like you have a paragraph in a different format and then you have another paragraph in a different format.

What you do, you put your cursor on one paragraph and then go to the copy format tool and then use that tool throughout the next paragraph, the format of the first paragraph gets copied on the second paragraph. So you are essentially acting on text as data elements but the function that you are performing is copying the format, so that is a functional element in the interface or interaction, okay.

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Interaction framework

- Detail data and functional elements
 - Base your design on context, user goals and mental models
 - Ensure that it stays relevant for the users
 - Use design principles
 - e.g. Provide user control
 - Use interaction patterns (known solutions to frequently occurring problems)
 - e.g. Multilevel undo list

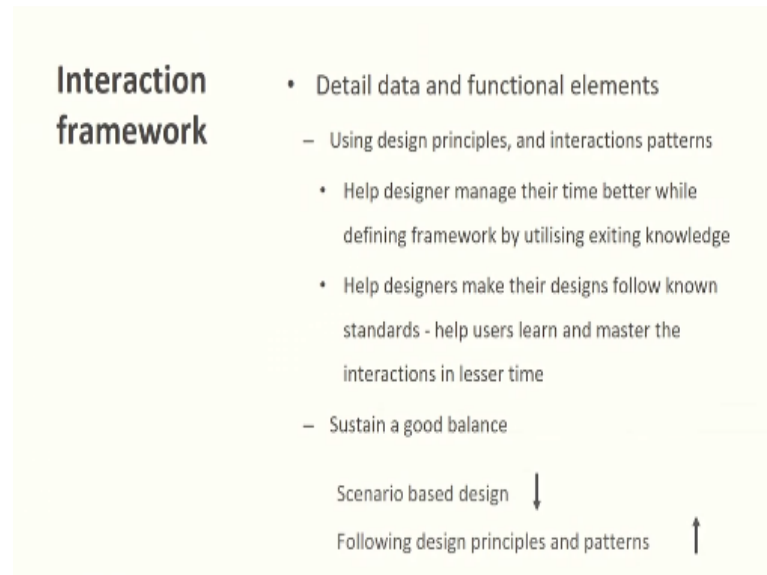
Now we are moving further into detailing data and functional elements. So base your design on context, user goals and mental models when you are designing the functional elements. Especially when you are thinking about the operations that you are performing on the data elements it becomes imperative for you to think about the mental models of the users. Imagine the recall the time when we are talking about the mental models.

And we were saying that there is the system model and there is a mental model. And the model that are there in between are different represented model which are created by the designers and it is a designer's mandate that he brings represented model as close as possible to the mental model of the user, that kind of activity that kind of approach has to be followed when you are doing an interaction design framework detail.

So when you are thinking about the functional elements always think about the context, user goals and the mental models that your users have. So this ensures that your design is stays relevant for the users. And use design principles, like providing user control and also there is an existing knowledge about different interaction patterns which are known which are solution to known problem. So you need not reinvent the wheel at times when a problem surfaces up.

And if there is an interaction part pattern which is applicable to your problem please do use that. So for example one of the interaction pattern is Multilevel undo list which we had discussed in one our earlier sessions.

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So when you are using design principles and interaction patterns as a designer it helps you manage your time, you need not to reinvent the wheel ones again as we have said the interaction patterns are about solution to known problem, so if at all it is possible for you to use these solutions do use them. They are; do use them they are very important; it saves your time. And help designers make their designs follow certain known standards which in turn lessens the time of learning for your users.

And users take less time mastering your interface. Because there are solutions to known problems, so users have also been interacting through different interfaces using those patterns, so the time to learn those patterns is very less time. So the users would take less time to learn any interactions which is based on existing interaction patterns, and they would master the interface in lesser time possible.

Now it is important to sustain a good balance between these two different ways of designing. So you see that when you are moving from understanding users to detailing the interaction framework were moving from very basic understanding of users and then abstracting it out

structuring it, representing it into an interaction framework that is one way of doing it. And when you are using the already established designed principles and patterns it is a bit different process.

It is like you are using already given set of principles and pattern, so you have to keep a balance between it, these are two different kind of approaches. But if you can strike a balance across these approaches it makes your product much, much better. So it is important to certain a good balance between moving your designs from understanding users to interaction framework and using already existing designed principles and patterns.

Because if you can see the scenario based design is a bit top down approach while following designed patterns and principles is a bottom up approach, so you have to strike a right balance in these 2 approaches.

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Interaction framework

- Detail data and functional elements
 - While you imagine and detail these elements, think of your interface as it is pretending to be a considerate human
- Sustain a polite and 'eager to help' tone of interactions
- Humanise the interactions
- e.g. Seems you couldn't save your last document!
Would you like to recover it?

While you are imagining and detailing elements and functional elements think of your interface as it is pretending to be a considerate human being. So sustain a polite and eager to help tone of interactions. Humanise the interactions. So you might have seen that there are times as when you commit an error as a user and the interface actually does not scold you it rather says, seems that you have done something not appropriate, would you like to amend it?

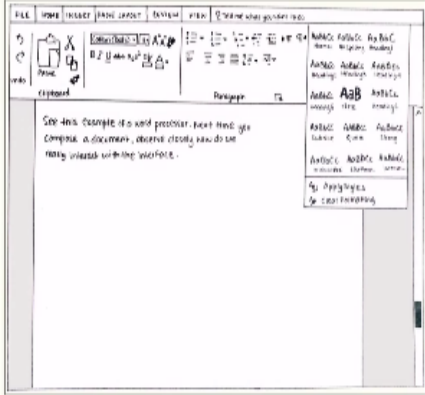
So it gives you an opportunity to improve on your error, that is like interface pretending to be a human being. So seems you could not save your last document, would you like to recover it? It is a humanised tone of the interaction. So it is important that you imagine your interface as it is pretending to be a considerate human being. And once again when you are detailing the interaction framework the next step to encounter is detail functional groups and their hierarchies.

So you are essentially doing three things right. Data elements, Functional elements which are operation on data elements and then you are moving further saying that what are the group of these functional elements and what is the hierarchy within these functional elements.

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Interaction framework

- Detail functional groups and their hierarchies



The image shows a screenshot of a Microsoft Word application window. The title bar reads 'Microsoft Word - [document name]'. The ribbon is visible at the top, with tabs for 'FILE', 'HOME', 'INSERT', 'PAGE LAYOUT', 'REFERENCES', 'SEND TO MOBILE', and 'VIEW'. The 'HOME' tab is active, showing various font and paragraph settings. Below the ribbon, there is a text area containing the following text: 'Get this example if you need to present your ideas. Complete a document, observe closely how do the really interact with the interface.' To the right of the text area, there is a vertical sidebar with several icons and labels, including 'HOME', 'INSERT', 'PAGE LAYOUT', 'REFERENCES', 'SEND TO MOBILE', and 'VIEW'. The overall layout is clean and organized, illustrating the functional groups and their hierarchies in a user interface.

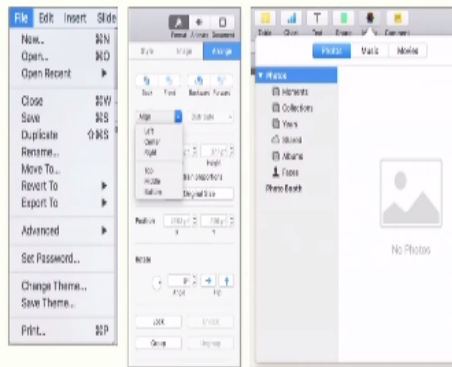
So on your screen if you see the example of the word processor you can clearly see that their existed hierarchy as a different functional elements. The first set of hierarchy is at the header. Okay so you have File, Home, Insert, Page Layout, Review and View. And then the next hierarchy comes into picture which is about doing operations and undoing them and then pasting, copy and cut and then you can manipulate the fonts and their prosperities and then you can manipulate the paragraph layout.

And then you can choose different styles. So there is a definite sense of hierarchy across different functional elements.

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Interaction framework

- Detail functional groups and their hierarchies



Again a more explicit example is in front of your screen. So you see that File is at category and the content of the categories are New, Open, Open Recent, Close, Save, Duplicate, Rename, Move, Revert, Export so these are all contents of the category, they are at a low priority then the category itself. Other category which is kept at the same priority as the File is Edit and then Insert and the Slide.

In the same way look at this grouping where the content categories format and different functional elements which are around formatting are grouped together. So the first grouping is the Format, the second grouping is the Arrange. So all the format element which will help you arrange data elements on your screen are grouped together. There is a further grouping in terms of arrange elements.

So you have elements which of all about aligning different data elements on your screen they are cap together under the category of Align. So these are different functional groups and the hierarchy. And similarly, in example third, you have functional group which is photos and then the; another functional group which is music and movies. So photos, music and movies are data elements and the operations that you perform on those are function elements and they are grouped together and are presented as a particular form of hierarchy to the users.

So it is important to detail functional groups and their hierarchies.

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Interaction framework

- Detail functional groups and their hierarchies
 - Decide on
 - Priorities w.r.t. elements needing larger screen space than others
 - Arrangements leading to an optimised flow
 - Elements which stays before the user for longer times than others
 - Draw correspondence with task flows mentioned by persona and mental model

And there it is important that when you are doing you decide on the priorities with respect to different elements, so there might be elements which need a larger screen space than others, okay. And there might be arrangements which are important to lead to an optimized flow, okay. And elements also there would be a set of elements which stays before the user for longer time than other. Okay.

So you might have seen that in today's time there are interface there are very explicit interaction pattern that you hide elements which are to be used in frequently by the users while you present elements which are to be used infrequently by the user while you present elements which are to be used frequently by the users. So this is a way of decluttering the screen, you only keep the elements interface elements functional elements which are to be used frequently by the users

While you fade out that element which are to be used in frequently by the users, so this is how you decide on functional elements and their hierarchies, because ones again their might be elements which need larger screen space than other elements. There might be a set of arrangement of these elements which is the most optimized workflow and then there might be elements which are to be used at different frequencies by the users.

And then you have to draw correspondence with task flows mentioned by persona and mental models. Because when you are doing these functional groups and hierarchies you have to keep in mind the workflows and information flows which you have gathered at the modelling phase and the requirement phase. Once you have detailed functional groups and hierarchies within them you are set out to more tangible activity, to more hands-on activity which is about sketching the interface framework itself. So start sketching the design.

This is the time when you design sketching the design. You focus on higher level structured details and flow across different views or screens. So screen are synonymously called views here, so you need not to get confuse across these two terms they mean the same views or screen they mean the same. So when you are doing sketching these screens you need to focus on higher level structured details and flows across different screens.

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Interaction framework

- Sketch the interaction framework
 - Start sketching the design
 - Focus on higher level structural details and flows across different views or screens
 - Bring coherence, iterate severally to arrive at an appropriate arrangement of elements (data and functional)
 - Detach yourself from your design, discard your sketches if needed

Now it is important that you focus on higher level details because if you start focusing on visit level details which means that if you are detailing something like a dropdown menu and detailing it too much and while you are not really focusing on how the entire screen looks like and how does it relate to next screen then you are compromising on the cohesive structure of the application on the coherence across different application, okay.

So if you are focusing on a higher level details and flows across different views and screens you are close to bring in coherence and you have to iterate severally to arrive at an appropriate arrangement of elements. Those elements data and functional elements, and you have to detach yourself from your design, discard your sketches if needed. Once you have designed the interface there is no personal preference that you are bringing as a designer.

You are all doing it for a particular user group for a particular persona in a particular scenario with respect their goals, needs and wants. So if at times while iteration if you think you need to discard some of your sketches please do that, detach yourself as a designer from your sketches, iterate severally if needed. Let me show you some of some example of sketching the interaction framework.

And if you want to look at more of these examples please follow the reference given below the image.

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Interaction framework

- Sketch the interaction framework

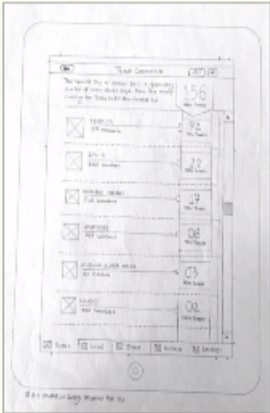


Image courtesy of Kulkarni, T. R. (July 2018). Paper prototypes for everyday design. Retrieved from <https://paperprotos.com>

So in this framework you can see that the designer is trying to sketch a very higher level interaction flow and structure, okay. So he is trying to create, he is trying to design the interaction framework with respect to a twitter community focus around the subject of cricket. So this is one example of sketching the interaction framework.

What are the advantages of doing that? So it promotes collaboration and discussion, and faster cycles of feedback involving team members, and other stakeholders. So if you design your interaction framework if you sketch your interaction framework on a piece of paper you can communicate with your peers with your stakeholders and other people onboard far, far more efficient than you do it if you do it in some other way.

So it promotes collaboration and discussion. It promotes faster cycles of feedback involving different team members and other stakeholders. And no doubt it is very cheap to iterate. There are times, in very professional setups when people end up doing high fidelity prototype that we are calling very high detailed prototyping and then when they are discussing it with their stakeholders and other members of the team there are times when they have to discard their prototypes.

At that time the prototypes cost very high, because you have invested so much of time and resources in creating higher level structures and flows across different screens. That is why it is highly recommended that you use papers to sketch your interaction flow so that you can pass it on quickly to your team members and different people onboard such as stakeholders for their feedback and discussion.

So it prepares a firm ground for rendering using computer based tools. Once you have a sketch on the paper you can anytime scan it and then you can put a many more details with the use of computers. So it helps detailing key path scenarios that is a new phase that we are going to understand in the next slide. So if you have sketched the interaction remember ones again this is a very critical exercise.

We are going to have a repeat discussion on this, just a very essential few points. The interaction framework, this sketch is about higher level structured details and flow across different screens. And then it promotes collaboration and discussion. It is cheap to iterate. It can be adopted for a computer based detailing later on. And it helps developing key path scenarios. Let us move onto understanding what is key path scenarios are.

Sketching the interaction framework is about detailing key path scenarios. Scenarios which involve a persona using the interactive product. Key path scenarios, it is one of the critical scenario, it is one of the everyday a typical this scenario. So for example imagine that all of us use our digital watch on a very day-to-day basis and there would be a certain few very essential set of task;

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Interaction framework

- Detail key path scenarios
 - Scenarios involving a 'persona' using the interactive product
 - Typical day scenario
 - Frequent use scenario
 - Screens depicting complete end-to-end workflows of most frequently used functional and data elements
 - Storyboarding
 - Analyse alternate workflows and iterate

That we accomplish using our digital watch. So those set of task are called the key path scenarios, okay. So scenario which involve using which involve a persona using the interactive product in a very typical day setting or in a very frequent use setting are called the key path scenario. And screens depicting complete end-to-end workflows of most frequently used functional and data elements.

So when you are doing details around the key path scenario you want to detail it completely from one end to other end. Once again sketching the interaction framework is about detailing the higher level structure and the flows across different screens. When it comes to flow across different screens it means end-to-end flow across a typical task that a persona performs using the interactive product on a very day-to-day basis on a frequent basis.

So that is why we are saying that while you are detailing the key path scenarios you would need to create all sketches screen rather we should now be saying sketch screens, depicting complete

end-to-end workflows of most frequently used functional and data elements, and storyboards. Storyboard is a technique which you use to detail these complete end-to-end workflows. And/or when you are detailing this workflow.

See it becomes important for you to also imagine the alternate workflows which are deviations from the workflow that you are imagining as an interaction designer. So creating workflow, creating storyboards is a very important activity, because then you can imagine the alternate path or alternate ways of accomplishing the task, alternate workflows, okay.

So it becomes important for you as an interaction designer to detail key path scenarios which are complete end-to-end details of different data and functional elements across different screens or views. Let me show you an example of this.

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Interaction framework

- Detail key path scenario

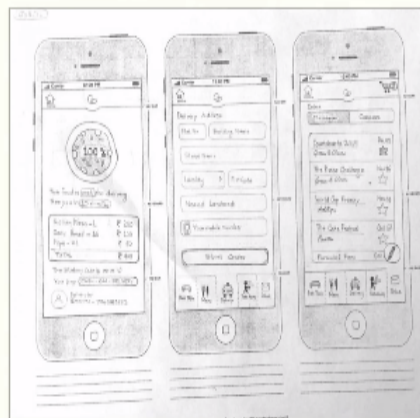


Image courtesy of Kulkarni, T. R. (July 2018). Paper prototypes for everyday design. Retrieved from <http://paperprotos.com>

So what you are seeing in front of your screen is a key path scenario where the interaction designer is trying to design key path scenario for a Pizza counter for a Pizza restaurant in a particular city. So you see that the in the key path scenario you can do couple of things, in screen 1 then you move onto screen 2 then subsequently screen 3; you are moving further into screen 4, 5 and 6. And from 1st screen to 6th screen you are accomplishing a key path scenario.

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Interaction framework

- Detail key path scenario

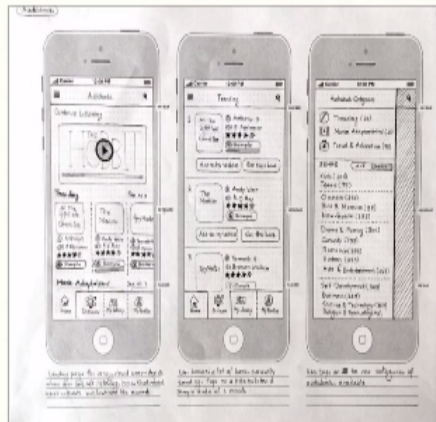


Image courtesy of Kulkarni, T. R. (July 2010). Paper prototypes for everyday design. Retrieved from <https://paperprotos.com>

Another example of a similar kind is shown in front of you. Now this is again an interesting example because it is also illustrative of what a storyboard is. If you are seeing this sketches and comments written below the sketches this is one storyboard and then you have the next storyboard. So storyboard creates Euler state, a key path scenario. And to end not only are these key path scenarios are these interaction frameworks sketched before.

It is also written what is happening in each interaction framework. Once you have created the key path scenarios and you have detailed completely from one end to other end and these are complete end-to-end scenarios then it is a time to validate these scenarios. By validation what we mean that you already have a design in place, you already have sketched your design on a paper and you have detailed it for that you have said what are the different screens.

And what is happening in each screen and then you have moved onto one screen to the other screen. You have done a great part of your work but it is the time to validate, you still have to validate, you have to poke needles into you designs and see where does it fail.

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Interaction framework

- Validating interaction framework
 - We already know - Key path scenarios consider the most essential scenario of usage and interaction
 - Post designing key path scenarios
 - Try discovering possible shortcomings in the interaction framework resulting from non-critical scenario
 - Ask several “What if ... ?” questions

So validation happens after you create key path scenarios. You try discovering possible shortcoming in the interaction framework resulting from non-critical scenarios, okay. Once again key path scenarios were about the most critical scenarios, and now you are using non-critical scenarios to validate those, because you already have a design in place; you want to see where does it fails. So for example, ask several what if question, that is one approach to validate your key path scenarios.

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Interaction framework

- Validating interaction framework
 - 3 possible cases
 - [First] Users deviating from key path scenario and choosing an alternate path
 - e.g. User initially intends to print hardcopies using a printer but realises that she has run out of pages. She then chooses to print PDF copy instead of a hard copy.

So there will be 3 possible cases. The first one is that users deviating from key path scenarios and choosing an alternate path. An example of this kind would be, let us say that a user initially intends to print hard copies using a printer, but realises that she has run out of pages, she then

chooses to print PDF copy instead of a hard copy. So the key path scenario is about printing a hard copy of a document.

Now this is the key path scenario, the deviation from the key path scenario is the situation when the user decides to print not the hard copy but the PDF version of that copy because she has run out of paper. There might be some situation which has surface up and has forced our user to take up a alternate path to deviate from the key path scenario. So this is one case where there is a key path scenario and the user deviates from that key path scenario due to some reason.

Let us read the example ones again to gain a better clarity User initially intends to print hard copies using a printer but realises that she has run out of pages; she then chooses to print PDF copy instead of a hard copy. Clearly an indication of a deviation from the key path scenario that is the first possible case. Let us look at the second possible case.

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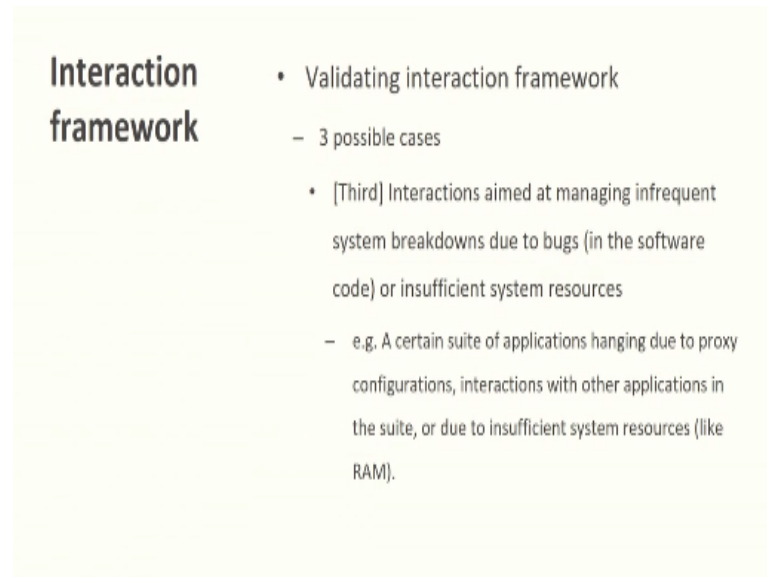
Interaction framework

- Validating interaction framework
 - 3 possible cases
 - [Second] Actions (although infrequent) which needs to be performed by the users
 - e.g. Installing, learning to use different features, upgrading software or its configuration, selling one's personal device like a laptop

The second possible case highlights actions which maybe infrequent but which needs to be essentially taken by the user. So for example, when you are installing it is a very infrequent operation that you perform. Or when you are updating your software or firmware it is again a very infrequent operation which has to be performed, okay. Or when you are selling like say one of your personal devices like a mobile phone you have to delete all the data.

You have to initialize or reset to the factory settings that is also functional element, okay. So here in the second possible case you have to imagine all the actions which maybe infrequent in nature but which have to be essentially performed by the users at some point of time.

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Interaction framework

- Validating interaction framework
 - 3 possible cases
 - [Third] Interactions aimed at managing infrequent system breakdowns due to bugs (in the software code) or insufficient system resources
 - e.g. A certain suite of applications hanging due to proxy configurations, interactions with other applications in the suite, or due to insufficient system resources (like RAM).

The third possible case here would be of interactions which are aimed at managing infrequent system breakdowns due to let us say bugs in the software code or insufficient system resources, okay. So these are all different breakdowns situations which are occurring for one reason or the other reason. Examples of these situation would be, let us say that a certain suite of applications they are hanging because there is a proxy configuration mismatch.

Or interaction with other application is happening. Or due to insufficient system resources like Random Access Memory like insufficient RAM, okay. So these are the interactions which are aimed at managing infrequent system breakdowns due to bugs in the software code or insufficient system resources. And you might have experience these cases multiple times in your interactions with interactive devices.

So I am sure that these cases are not so difficult to understand. Once again the first case is when users deviate from a key path scenario and choose an alternate scenario. The second case is when there are actions which maybe infrequent but which have to be essentially performed by the user

at some point of time. And the third one is about interactions aimed at managing infrequent system breakdowns due to bugs or insufficient system resources or for some other reason.

So this is the time when we need to summarize our understanding of interaction framework. Things we have learned in today's session include;

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Interaction framework

- Things we've learnt till now
 - Defining design framework
 - Interaction framework
 - Define form factor details (platform)
 - Define posture and system input methods
 - Detail data and functional elements
 - Detail functional groups and their hierarchies
 - Sketch the interaction framework
 - Detail key path scenario
 - Validating interaction framework
 - Visual design framework
 - Industrial design framework

We have learned how do we define the design framework. We have defined it in three different framework types. The first one is the interaction framework; the second one is the visual design framework and the third one is the industrial design framework. In today's session we are not touching on visual design framework and industrial design framework, but we have seen details of the interaction design framework.

The first one was about defining form factor details which was about thinking all different platforms which are to be utilized for your interactive application. Then the second one was about defining posture and system input methods. Third one being detailing data and functional elements then we moved onto the forth logical step which was detail the group of these functional elements and the hierarchies within them.

Then we moved onto sketching the interaction framework, detailing key path scenarios and validating them and very recently we had seen three cases which need to be use while you are

validating your key path scenarios. Let me leave you with this understanding of framework definition phase in today's session. Thank you.