

Transitions

Elements & Principles

Design Research Seminar



Indian Institute of Technology Bombay

IDC School of Design

Interaction Design (M. Des)

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Guide

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Approval

The Report Committee for Interaction Design,
Industrial Design Centre, IIT Bombay certifies
that this is the approved version of the following
report on 'Transitions' done under Design Research
Seminar (DRS) by Kiran Prasanth R, 176330008.

Project Guide :

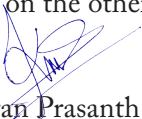
A handwritten signature in black ink, appearing to read 'R Venkatesh', is written over a light yellow rectangular background.

Acknowledgment

This project as a part of my Design research Seminar (DRS) was a great learning curve for me. From getting industry level guidance to insights into much larger fields, this helped in a personal as well as in a professional growth for me. Words cannot express how grateful I am to my guide Professor Venkatesh Rajamanickam, who has not only guided me through and through but also pushed me to venture out beyond my comfort zone and get a glimpse into what the rest of my life would look like.

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Abstract

Transitions is the process of changing from one state to another. We see transitions everywhere around us, it can be in an environment, a storybook, movies, web and mobile application. Transitions plays an important role in Web and Mobile applications because transitions are not just about changing from one state to another but also has to take care of many other things such as maintain the context while changing views, explain the user what just happened, show relation between objects, focus attention. Improve perceived performance, create illusion of virtual space etc.

The research is done mainly on the two areas of transitions. On the “Elements of transitions” and the other is “Principles of transitions”. The elements of transition has three categories which are the primary, secondary and tertiary. The primary elements are the initial or the basic features which comes while triggering an action or along with the cause. The secondary elements are the elements which starts functioning after the triggered action. The tertiary element can act as a bridge between the elements and principles of transition, because tertiary elements are elements which overlaps with the other two categories and also are very close to the principles of transition.

The principles of transitions are the output and outcomes formed by the elements which are, actions, narrative, beliefs, meanings, logics, expectations, continuity, narrative, relationship, causality etc.

Introduction

When we go from one room to another in our house, we can see the change happening to the environment around us. It is a smooth and continues change which is happening due to movement, this is transition. Transition is smooth, flowing passage from one condition to another. The change happens so continuously that there is no break point, no step, no distinct place to pinpoint the change. It is not simply a shift from one place to another, but a change so smooth, gradual and subtle that the change is barely detectable while occurring.

Today we can see transitions in Story books, Drama, Movies and in Web & Mobile platforms. This research project is focusing on the elements and the principles of transition in Web & Mobile platforms. The role of transitions had become very important in Web & Mobile applications today because transitions can help the users cut down the cognitive load, give directions, as a good guide and also helps to complete the story or the action.

Basic Transitions (Used in movies)

In movies, many experiments are happening then and now regarding editing or the transitions. Many techniques and technologies can be seen today, They provide the user with different effects and experiences for jumping from one shot to another and also to convey the meaning/logic according to the need. Some of the basic transitions used in movies are as follows:

The Cut

Is the fastest and straight forward transition which is commonly used. It's based on the principle of cutting in real time with an adherence to graphical and spatial coherence.

The Wipe

Used for jump forward in time, space and location

Fade in/Fade Out

Used for depicting lengthy passage of time, as a visual motif suggesting that something significant has happened and also as a visual pause.

The Dissolve

Is a fade to transition between two shots. It is used as a briefer passage of time than the fade in/fade out.

Used for showing two events are happening at the same time, the connection between two events.

Graphic Match Cut

Is based on the principle that the features of two shots are graphically composed in the same manner, so that when the transition happens, they appear to match.

Match Cut on action

Is when the movements or placement of objects or people match over the edit. Audience's eyes are focused on the movements and not on the spatial and graphical shift that occurs over the two shots.

Iris Effect

Is kind of a circular mask where the transition happens from black to the event or the other way by focusing on a particular element in the scene or the shot at the beginning or at the end.

Using Sound

Mostly used before, after or while the transition happens. For giving a clue or surprise and an impact.

Elements Of Transitions

What is transition?

Transition is the process of changing from one state to another. In the area of User Interaction & Experience, transitions are a way to link actions through time. They help in communicating what is happening in the interface.

Right transitions can help in improving usability and experience of the user. They help the user in the following ways (Bill and Theresa, 2002, p. 234):

- Maintain context while changing views.
- Explain what just happened.
- Show relation between objects.
- Focus attention.
- Improve perceived performance.
- Create illusion of virtual space.

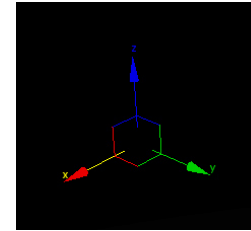
What are the elements of transition?

There are many elements which are involved with transitions. These elements can act direct or indirect in a transition. Here, all the elements are brought together and are segregated accordingly. They are categorized in to primary, secondary and tertiary elements. Some of the elements and their property overlaps or shows similarities in some cases.

Primary elements

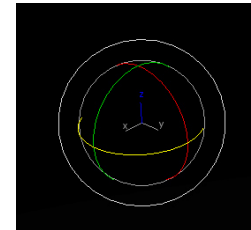
Position

Position deals with movement of an object. The object can be moved in any of the axis (X, Y and Z).



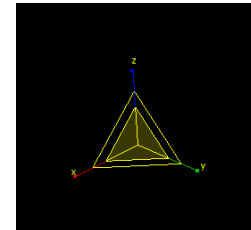
Rotation

Rotational motion is brought through this option. The action has to take place around a anchor point or pivot.

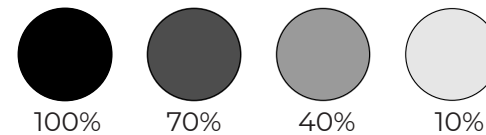


Scale

Scale deals with the size of the object. An object can be scaled in any axis or a particular axis.



Opacity



Opacity deals with the transparency of an object. Appearing and disappearing of an object is done by controlling the opacity values of an object.

Colour

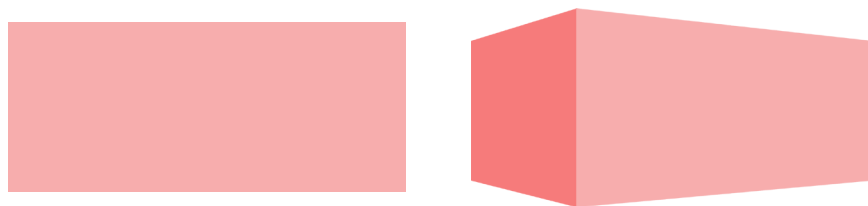
Is an important element. Colour controls and denote the user and mainly used for feedbacks and notification.



Secondary elements

Involves elements which starts functioning after a triggered action. Some of the secondary elements are :

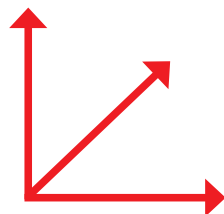
Dimension



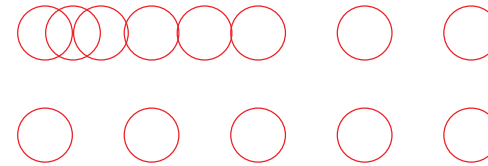
Introduces the third dimension and also converts 2D object to 3D during the action takes place. Mostly seen in dynamic positions.

Direction

Gives an orientation to the user about from where the object appeared and on the other hand where the object is disappearing.



Speed



Different speed in the transition (of a screen or an object) depicts different meanings.

Shape



Flexible, moves and transform from one form to another .

Tertiary elements

Tertiary elements acts as a bridge between the elements and the principles because the tertiary elements overlaps with the primary and secondary elements and also with some of the principles. The tertiary elements are as follows :

Animation

Animation is the illustration of motion. Many transitions used today are inspired by animation industry to enhance the UX. The most famous and widely used animation principles are that from the book 'The Illusion of Life: Disney Animation':

Squash and stretch

This action gives the illusion of weight and volume to a character as it moves.

Anticipation

Prepares the audience for a major action the character is about to perform.

Staging

It's the presentation of an idea so that it is clear

Straight ahead and pose to pose

Straight ahead animation starts at the first drawing and works drawing to drawing to the end of the scene. Pose to pose is charted with key drawings done at intervals throughout the scene.

Follow through and overlap

When the main body of the character stops all other parts continue to catch up to the main mess nothing stops all at once

Slow in and slow out

As the action starts we have more drawings near the starting pose one or two in the middle and more drawings near the next pose fewer drawings make the action faster and more drawings make the action slower

Arcs

All actions with few exceptions follow an arc or slightly circular path.

Secondary action

It's an additional action in the scene used as a supplement of the mainland.

Timing

More drawings between poses slow and smooth the action fewer drawings make the action faster and crisp timing maintains the appearance of an object abiding by the laws of physics

Exaggeration

Remain true to reality just presenting it in a wild or more extreme form.

Solid drawings

It means taking into account forms in three-dimensional space giving them volume and weight

Appeal

It's a quality of charm able to please the viewers eyes it's the charisma of the action you.

Motion

Motion or the movement is another important factor in transition. The 12 principles of UX in Motion is as follows. These are the Principles by Issara Willenskomer which helps in creating usability of UX in motion.

Easing

Object behavior aligns with user expectations when temporal events occur.

Offset & Delay

Defines object relationships and hierarchies when introducing new elements and scenes.

Parenting

Creates spatial and temporal hierarchal relationships when interacting with multiple objects.

Transformation

Creates a continuous state of narrative flow when object utility changes.

Value Change

Creates a dynamic and continuous narrative relationship when value subject changes.

Masking

Creates continuity in an interface object or object group when utility is determined by which part of the object or group is revealed or concealed.

Overlay

Creates narrative and object spatial relationship in visual flatland when layered objects are location dependent.

Cloning

Creates continuity, relationship and narrative, when new objects originate and depart.

Obscuration

Allows users to spatially orient themselves in relationship to objects or scenes not in the primary visual hierarchy.

Parallax

Creates spatial hierarchy in visual flatland when users scroll.

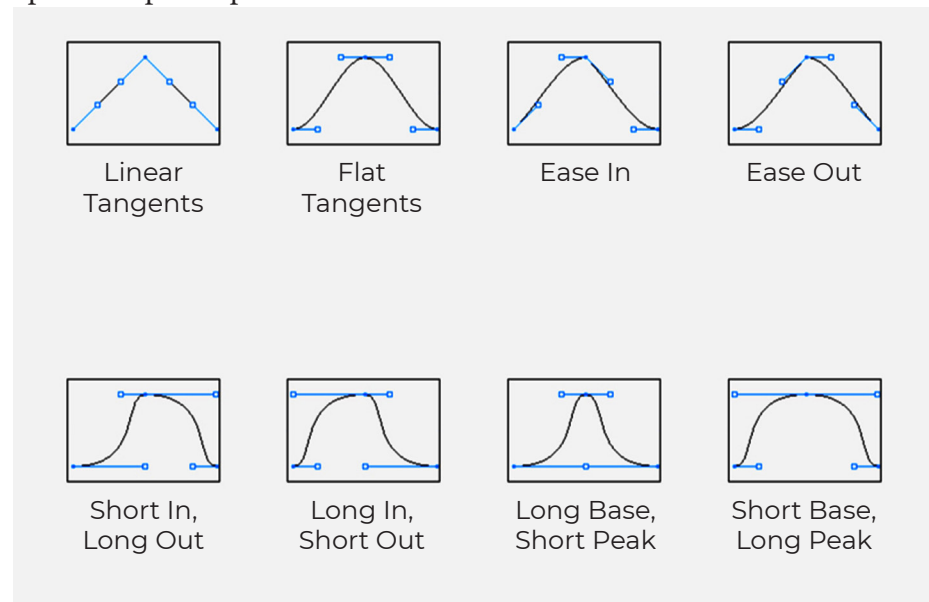
Dimensionality

Provides a spatial narrative framework when new objects originate and depart.

Dolly & Zoom

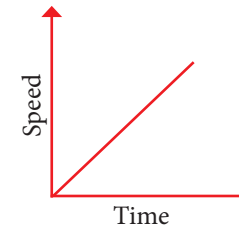
Preserves continuity and spatial narrative when navigating interface objects and spaces.

Speed Graphs / Speed Curves



Link : <https://gifvideo.net/animation-3d-blender-cgi-maya-gif>

The speed curves are curves which is formed by dividing speed by time.

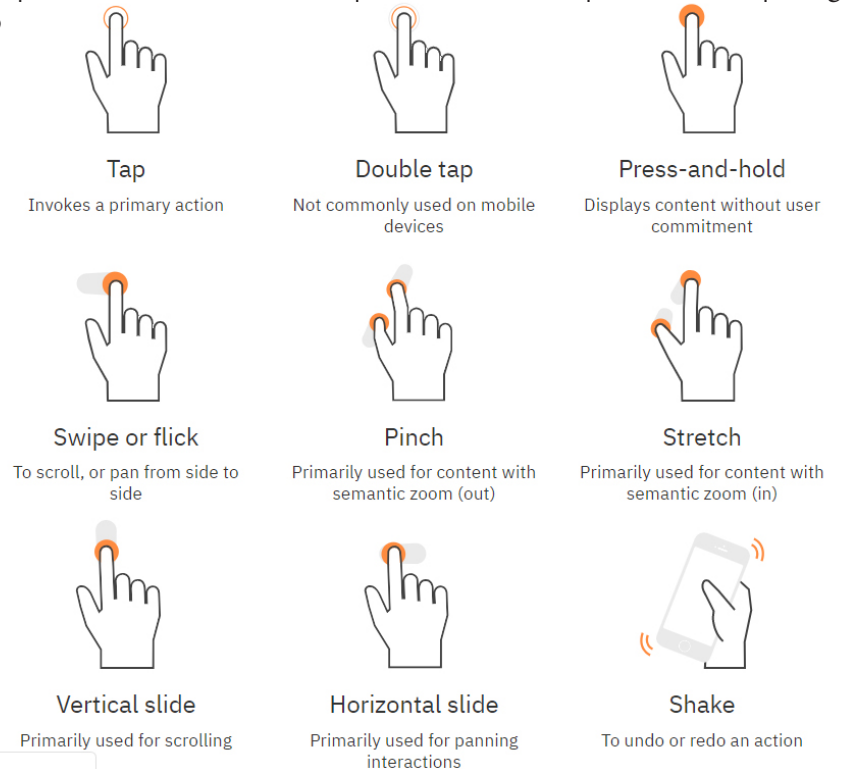


Gestures

Gestures features, done by touching or without touching the screen. Transitions works for the feedback and triggering the action for a gesture.

Smart Phones/ Tablets

Tap | Double Tap | Sweep / Swipe | Bezel Swipe | Flick | Long Press | Scroll
Pinch | Force Touch / 3D Touch | Rotate to Rotate | Slide, Shake | Drag and Drop



Link : <https://www.ibm.com/design/v1/language/experience/interaction/touch/>

PC / Laptop

Using Mouse

Right Click & Left Click | Double Click | Long Click | Drag & Drop | Scroll
| Middle Click

Using Keyboard

Press Enter | Back Space | Space Bar | Page Up/ Page Down | The Arrow Keys

Principles of transition

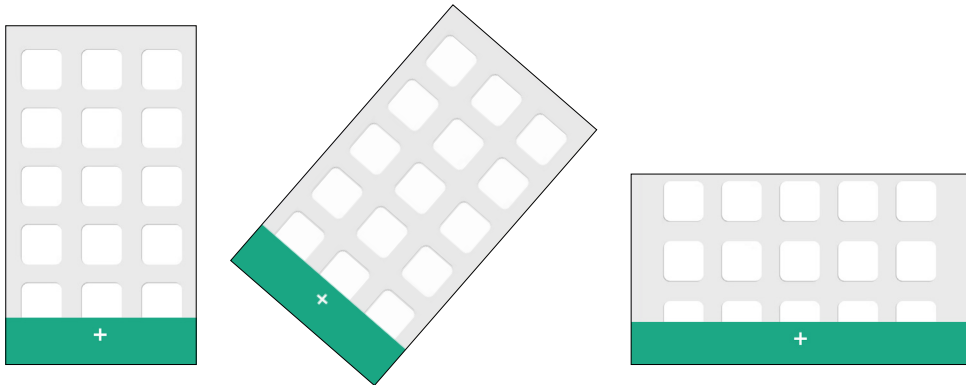
The principles of transitions are the output and outcomes formed by the elements which are, expectation, continuity, narrative, relationship, causality, focus, creating virtual space, system status.

Expectation:

Expectation are our believes that a phenomenon will conform to our estimation.

Continuity:

User flow and consistency of the experience.



How the smoothness and continuity is maintained while screen rotation in all smart phones, tablets etc.

Narrative:

Series of different events which together forms a complete experience.

Relationship:

Spatial, temporal and hierarchical representations between interface objects that guide user understanding and decision making.

Causality

Cause + Effect = Causality

The three features in causality are as follows :

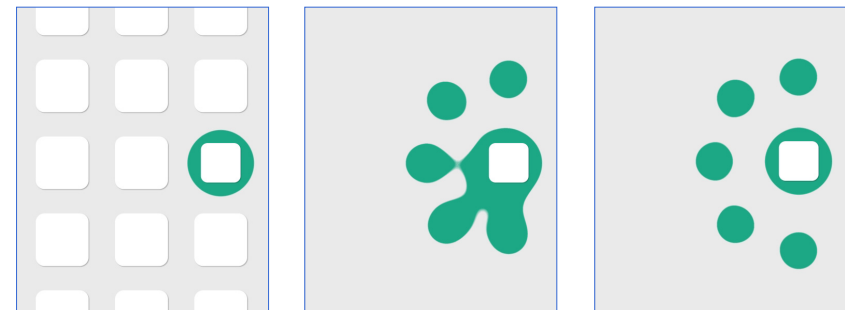
Feedback



Google tab plus sign giving feedback when the cursor is placed above it.

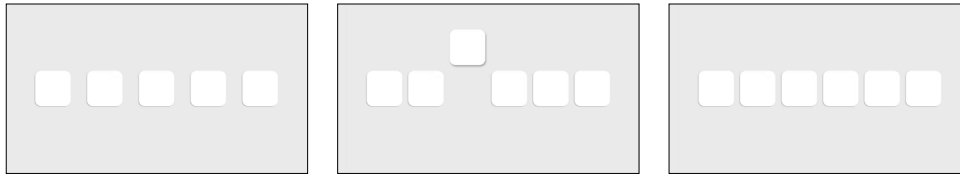
Cloning

is used when more than one options are formed from a single action



The 3d touch effect in iphone which happens while pressing an app icon and also give multiple options.

Relationship between the elements



Demonstration showing moving an application and how the other applications behaving, showing the relation with movement and the spacing.

Focus

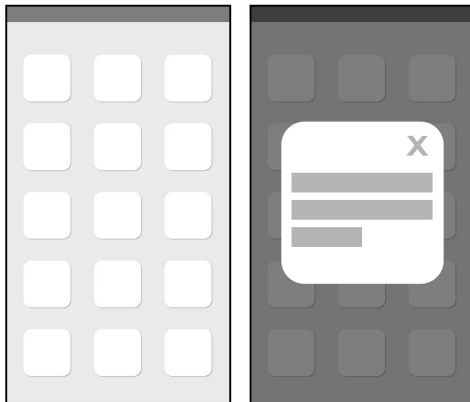
Helps the user to focus only on the elements he/she requires to interact with at a given time. This can be done in a number of ways, some of them are as follows:

- **Bright & Dim**

Brightening the area of interest in the screen. Since it is not possible to increase the brightness of the screen that is available, the remaining elements can be dimmed while keeping the area of interest at normal brightness.

- **Obscuration**

Enabling user to focus on certain elements by obscuring remaining elements. This help designers to compensate creating single view for an interaction.



Notification, adds or guides mainly appears on screens obscuring the other elements.

- **Highlight**

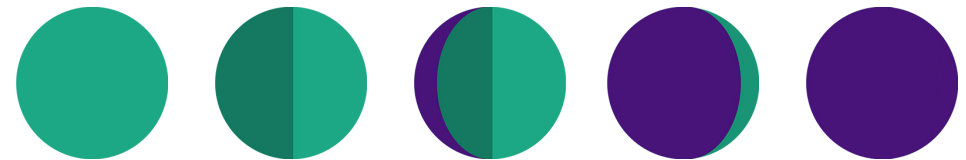
Motion has the highest level of prominence in a user interface. By using transitions, important events can be brought to the users' attention.

Creating Virtual Space

Features for creating a virtual space are mostly three dimensional. Following are some of the features provided.

Dimensionality

Brings a third dimension in different ways. It can be using a 3D object, floating element with drop shadow, folding etc. Mostly applicable in screen transitions than in objects or elements.



Active button changing the option using fold.

Maintain context while changing views

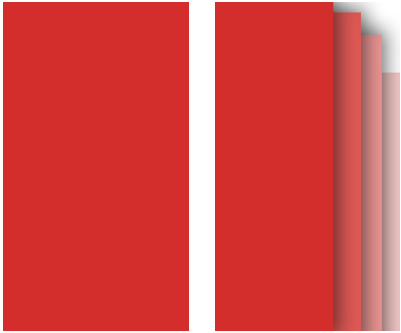
- **Slide in / Slide out**



Masking used for VFX after and before demonstration (source from bright side)

- Face Plate

The faceplate pattern ties two panes together and gives an indication that the other pane is always hidden just below the currently visible pane.



Face Plate effect used for back button option.

- Flip

Another way to have two panels use the same space is a flip transition. The option is used to show two different dimensions or two different options of the same event. Example the navigating from the front camera to the back camera and also back and forth is an area the flip is used.

- Carousel

Carousels help in extending virtual spaces. If the carousels are not animated, the user gets confused whether the content is moving left or right. Adding transitions creates the illusion that the content is being pulled into the page through carousel.

Accordion

Camera Motion

- Parallax
- Expand and Collapse of Inlays
- Expand and Collapse of Overlays

System Status

- Improve perceived performance

When a long process is running, it is better to divert the users' attention towards something else. Transitions make time to be perceived faster because the user remains engaged throughout the process.

Example : while watching a movie in youtube the advertisements comes in between.

- Same Location new action

This mostly is applicable to icons, menu, button etc. Volume button, slider etc changes according to the triggered action.

- Spot Light

The user can be notified the change in the interface by subtly highlighting an object.

- Visual Hint

Assist the user on how to interact with the interface. This can be done by hinting hidden functionalities.

Example : Tinder Application

- Self-healing Fade

Seen in temporary information such as notification, task manager, advertisements etc. Indicating the completion of a drop operation in which the dropped object was moved from one place to another.

- Animation

Reference

Basic Transitions

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Elements of Transitions

- <http://www.uvm.edu/~pmardeus/theat/designprinciples.pdf>
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Gestures

- <https://www.ibm.com/design/language/experience/interaction/touch/>

12 Basic Principle of Animation

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The UX in Motion Manifesto

- <https://medium.com/ux-in-motion/creating-usability-with-motion-the-ux-in-motion-manifesto-a87a4584ddc>

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