



Participant Handbook

Customised Courses under PMKVY (210 hrs)

Sector
IT - ITeS

Sub-Sector
IT Services

Occupation
Application Development

Reference ID: **SSC/Q4602, Version 1.0**

NSQF Level: 3



**Media Content
Developer**

Published by

IT – ITeS Sector Skill Council NASSCOM

Sector Skill Council Contact Details:

Address: Plot No. – 7, 8, 9 & 10 Sector – 126, Noida, Uttar Pradesh – 201303
New Delhi – 110049

Website: www.sscnasscom.com

Phone: 0120 4990111 – 0120 4990172

All Rights Reserved ©2022

First Edition, January, 2023

IT – ITeS Sector Skill Council NASSCOM

Sector Skill Council Contact Details:

Address: Plot No. – 7, 8, 9 & 10 Sector – 126, Noida, Uttar Pradesh – 201303
New Delhi – 110049

Website: www.sscnasscom.com

Phone: 0120 4990111 – 0120 4990172

This book is sponsored by IT – ITeS Sector Skill Council NASSCOM

Under Creative Commons Licence: CC-BY-SA

Attribution-ShareAlike: CC BY-SA



This license lets others remix, tweak, and build upon your work even for commercial purposes, as long as they credit you and license their new creations under the identical terms. This license is often compared to “copyleft” free and open-source software licenses. All new works based on yours will carry the same license, so any derivatives will also allow commercial use. This is the license used by Wikipedia and is recommended for materials that would benefit from incorporating content from Wikipedia and similarly licensed projects.

Disclaimer

The information contained herein has been obtained from sources reliable to IT – ITeS Sector Skill Council NASSCOM. NASSCOM disclaims all warranties to the accuracy, completeness or adequacy of such information. NASSCOM shall have no liability for errors, omissions, or inadequacies, in the information contained herein, or for interpretations thereof. Every effort has been made to trace the owners of the copyright material included in the book. The publishers would be grateful for any omissions brought to their notice for acknowledgements in future editions of the book. No entity in NASSCOM shall be responsible for any loss whatsoever, sustained by any person who relies on this material. The material in this publication is copyrighted. No parts of this publication may be reproduced, stored or distributed in any form or by any means either on paper or electronic media, unless authorized by the NASSCOM.





“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”

Shri Narendra Modi

Prime Minister of India



Certificate

COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

IT-IteS Sector Skills Council NASSCOM

for

SKILLING CONTENT: PARTICIPANT HANDBOOK

Complying to National Occupational Standards of

Job Role/ Qualification Pack: Media Content Developer QP No SSC/Q4602 NSQF Level
3

Date of Issuance: January 19th, 2023
Valid up to*: July 19th, 2023
*Valid up to the next review date of the Qualification Pack or the
'Valid up to' date mentioned above (whichever is earlier)

Authorised Signatory
(IT-IteS Sector Skills Council NASSCOM)

A handwritten signature in blue ink.

Acknowledgements

IT-ITeS Sector Skills Council NASSCOM would like to express its gratitude to all the individuals and institutions who contributed in different ways towards the preparation of this “Participant Handbook”. Without their contribution it would not have been completed. Special thanks are extended to those who collaborated in the preparation of its different modules. Sincere appreciation is also extended to all who provided peer review for these modules. The preparation of this Handbook would not have been possible without the IT - ITeS support. Industry feedback has been extremely encouraging from inception to conclusion and it is with their input that we have tried to bridge the skill gaps existing today in the Industry.

This handbook is dedicated to the aspiring youth who desire to achieve special skills which will be a lifelong asset for their future endeavours.

About this Book

This Participant Handbook is developed to impart training for the skill and knowledge required to work as a Media Content Developer. It is designed based on the Qualification Pack SSC/Q0503 under the National Skill Qualification Framework and comprise of the following NOS/topics:

1. SSC/N0503 develop media content and graphic designs for software products and applications
2. DGT/VSQ/N0102 Employability Skills

This book is designed considering the technical demand and educational background of the participants. Thus, special effort has been made to explain the concept regard for the job mostly through graphics and illustrations.

Symbols Used



Key Learning
Outcomes



Unit
Objectives



Summary



Notes



Exercise

Table of Contents

Sl.No	Modules and Units	Page No
1.	IT-ITeS/Application development industry	1
	Unit 1.1 - IT-ITeS/Application Development Industry	3
	Unit 1.2 - Career Path of a Media Content Developer	14
2.	Analysis and Design of Web Based Applications (SSC/N0503)	27
	Unit 2.1 - Process of conversions and testing new products and applications	29
3.	Develop Media Content and Graphic Designs for Software Products and Application (SSC/N0503)	37
	Unit 3.1 - Selection of Components and Tools for Web/Media Content Development	39
	Unit 3.2 - Verification and Validation of Media and Graphics	44
4.	Interpret Design Specification (SSC/N0503)	49
	Unit 4.1 - Implementation of Web Design	51
	Unit 4.2 - Technical Validation of a Web's HTML Implementation	56
5.	Employability Skills (DGT/VSQ/N0102)	65
	https://eskillindia.org/NewEmployability	
	Scan the QR code below to access the ebook	
		
6.	Annexure	69
	Annexure : QR Code	70







**IT - ITeS SSC
NASSCOM**

1. IT-ITeS/Application development industry

Unit 1.1 - IT-ITeS/Application Development Industry

Unit 1.2 - Career Path of a Media Content Developer



Bridge Module

Key Learning Outcomes



At the end of this module, the participant will be able to:

1. Comprehend various delivery models used in the IT-Application development industry
2. Examine the current growth and development standards of web development application

Unit 1.1 - IT-ITeS/Application Development Industry

Unit Objectives



At the end of this unit, the participant will be able to:

1. Discuss the relevance of the IT-ITeS sector
2. List the various sub-sectors of the Application development industry

1.1.1 Introduction to the IT/ITeS Industry

Information Technology (IT) refers to the creation, management, retaining, and transfer of ideas. IT includes all forms of information technology, including computer hardware and software used for digital resources, storage, and transfer. The IT industry is a key driver of economic growth globally. IT is used in various sectors like education, manufacturing, hospitality services, communication, medical services, etc. IT is used in our everyday lives in the form of doing office work, performing banking operations, paying utility bills, watching movies, booking tickets, etc. It is also used in many household products with embedded software like washing machines, microwave ovens, etc.

Information Technology Enabled Services (ITeS) also known as web-enabled or remote services utilize a wide range of operations that uses IT to improve the efficiency of the business, company or organisation.

The IT industry is broadly divided into the following segments:

IT Services

- Application Development
- Application Deployment
- Application Maintenance
- Data Scientists
- Infrastructure Management Systems
- Information Security
- IT Consulting
- IT Service Management
- Project Management
- Testing and QA, etc.

Business Process Management

- Analytics
- Customer Relationship Management
- Finance and Accounting Management
- Human Resource Management
- Knowledge Management
- Legal Services
- Supply Chain Management, etc.

Continued...

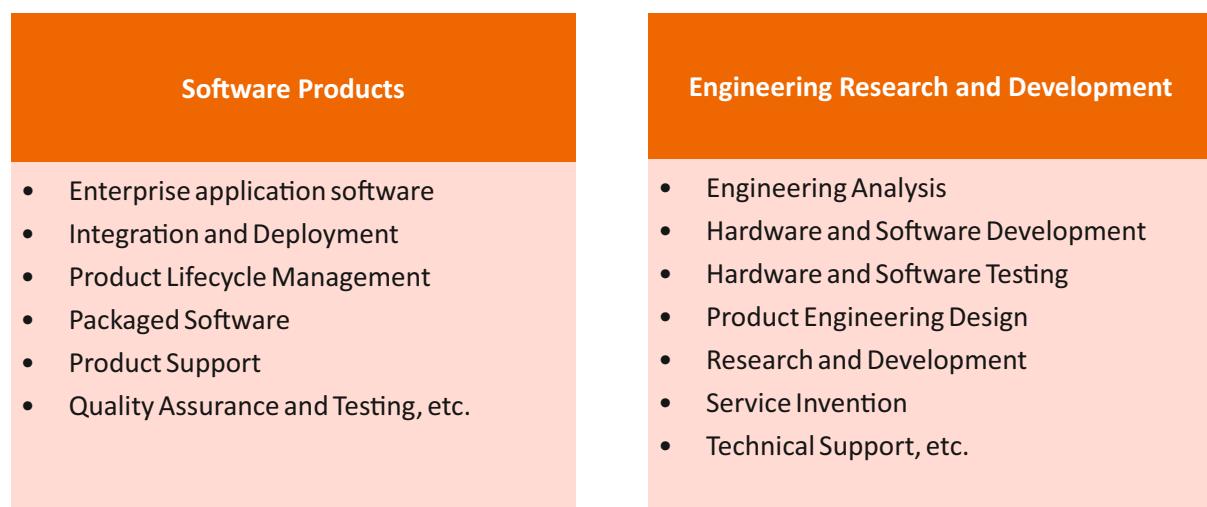


Fig. 1.1.1 Segmentation of the IT Industry
(Source: IT-ITeS Sector Skill Council NASSCOM)

1.1.2 Relevance of IT/ITeS Industry

India's IT/ITeS sector contributes enormously to the economy by creating significant employment opportunities. India is considered the knowledge powerhouse for information technology. The IT industry has greatly boosted the socio-economic parameters in addition to the Gross Domestic Product (GDP) and exports. India has become one of the largest tech-startup hubs. Indian IT companies have shown capabilities in delivering both off-shore and on-shore services to global clients. India is also the largest offshoring destination for IT enterprises across the world. According to NASSCOM, the IT/ITeS sector collected a total of US \$180 million, including export and domestic revenues. Indian IT and its allied areas are expected to grow to US \$19.93 billion by 2025. The growing demand, global presence, policy support, and India's competitive advantage in IT is a big benefit.

The Government of India has helped in the advancement of the IT industry by introducing many liberalization policies and other initiatives. The government initiatives like setting up Special Economic Zones (SEZ), Export Oriented Units (EOU), Software Technology Parks (STP) and Foreign Direct Investments (FDI) have helped the Indian IT industry to achieve a leading position in the global IT industry. The government of India has included 'Digital India' as one of the ten most important dimensions in Vision 2030. India has an advantage in the global IT industry because of the growing demand, global footprint, competitive advantage and policy support by the government.

1.1.3 IT Application Development Industry

Information Technology Application Development is the process of designing, creating, and implementing a set of computer programs to perform various tasks that a business process requires. The main steps involved in application development are planning, designing, coding, testing, deploying and maintaining. The various people involved in application development in an organisation are researchers, developers, interface designers, database administrators, analysts, etc.

The different types of application development are:

1. Desktop application development

These are developed for desktops and laptops. While developing the application, the Operating System has to be considered and the Application Programming Interfaces (APIs) and programming languages have to be chosen accordingly. The desktop applications have to be downloaded and installed on the device. These applications run offline independent of the web browser. These applications are often ‘custom-made’ or developed based on customer requirements. They provide better data security and protection from any unauthorized access.

2. Web application development

It consists of creating two apps, one running in the browser and the other on the server, known as the front-end and back-end technologies. HTML, CSS and JavaScript are required for developing the browser application and for the server application development AJAX and PHP are required. The user enters data at the front end and the server stores and processes that data at the back end. A web app is an interactive application that the user can access from the browser. Unlike desktop applications, these do not have to be downloaded and installed on the device. Therefore, making it easy for the user to access and use them instantly. Web application development is gaining popularity and is extensively used in sectors like e-commerce, banking, education, etc.

3. Mobile application development

These are developed for mobile devices which have Android and iOS platforms. Android mobile apps use Java and iOS mobile apps use Objective C for development. These applications have to be downloaded and installed like in the case of desktop apps. Users can download them from the app stores.

4. Cross-platform application development

It consists of developing an application which is suitable for all three systems mentioned above. It requires a single set of API and language to develop.

5. Custom application development

It is the process of building applications as per the requirements or specifications of the customers. This type of development has challenges concerning cost and time and very often the final output may not match all the specifications of the customers.

IT Application Development Industry in India

India occupies the number one position in mobile data consumption in the world. Apart from individual users, many businesses, enterprises and government agencies are using apps. This has given significant importance to application development in the country. IT applications are used for communication, entertainment, e-commerce, education, etc. According to Statista, India’s app market revenue is expected to increase at a compounded annual growth rate (CAGR) of 9.2% by 2026. Some of the popular applications developed in India are Sandes, PhonePe, MyJio, Meesho, MX Player, etc. Some of the popular application developers in India are Tata Consultancy Services (TCS), Infosys, Tech Mahindra, etc.

1.1.4 Sub-sectors of the Application Development Industry

Today, technology is used in many areas and on multiple platforms. Application software is developed to enable the user to carry out business-related tasks, communication, online shopping, entertainment, gaming, etc. to name a few. An application is designed in such a way that it can perform a specific task like for example sending an email, creating documents, designing graphics, playing music, browsing the net, etc. Applications are developed based on the end-uses as well as the devices on which they are implemented. The requirements and constraints for each of these sectors are varied and require different skillsets and knowledge for application development.

The various subsectors of Application Development are:

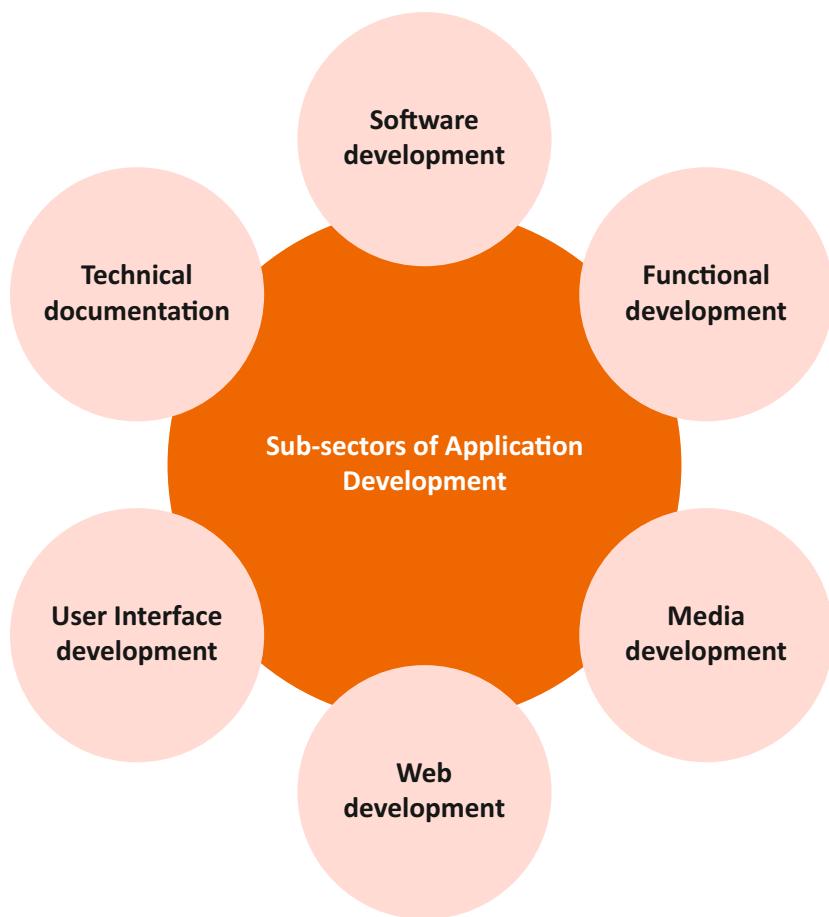


Fig. 1.1.2 Sub-sectors of Application Development

1. Software development

It involves creating, designing, deploying, implementing and maintaining software. Some of the different types of software are system software, programming software, application software and embedded software. The key people involved in software development are coders/programmers, software engineers and software developers. Software applications are created by coding with programming languages like C, C++, Java, HTML, Net, PHP, etc.

2. Functional development

IT is being used in most business processes to improve productivity and efficiency, reduce costs and time and improve quality. The backbone of all organisations is its customers, employees, resources and finance. If these are managed well, then the business is bound to succeed. Its Customer Relationship Management (CRM), Enterprise Resource Planning (ERP), Financial Management, etc.

3. Media development

It consists of developing audio/visual content, carrying out media editing and formatting for streaming, broadcasting and interactive entertainment. It involves working with functional developers to enhance the aesthetics and functionality of various applications.

4. Web development

It includes designing, coding and maintaining a website and also updating an existing website. It also involves technical functions like monitoring performance, website speed and capacity. It consists of the development of both static and dynamic sites.

5. User Interface development

It involves creating and maintaining user interfaces for databases, websites and computer programs. An efficient user interface makes the user's interaction with the website simple and aids in ease of navigation. It involves collecting data from the back-end and displaying them to the customer.

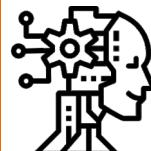
6. Technical documentation

Involves creating technical documents like manuals, troubleshooting guides, training material and other documents which helps to transfer knowledge between the application development team and user team.

Some of the emerging trends in application development are:



Internet of Things (IoT) is a network of devices and systems that have sensors and processors, software and other technologies that help in connecting and exchanging data with other devices and systems over the internet.



Artificial Intelligence (AI) is building smart computers that can perform tasks that typically require human intelligence. Some examples of AI are automation, natural language processing, smart assistants, self-driving vehicles, robotics, etc.



Machine Learning (ML) is part of AI that allows machines to learn from data and statistical models without being programmed to do so. This helps to reduce errors, automate processes, create preventive actions, etc. thus saving time.

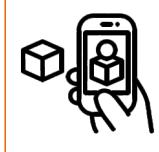
Continued...

Cloud computing deals with the on-demand delivery of various computing services like databases, servers, storage, software, etc.



Wearable devices include electronic devices like fitness trackers, smart watches, implants, etc. which are powered by microprocessors and have the ability to receive and send data using the internet.

Augmented Reality (AR) combines real-world physical elements and the digital world to create an artificial environment.



Virtual Reality (VR) is a computer-generated simulation of an environment with scenes and objects that appear to be real.

E-commerce is the backbone of online shopping as it enables commercial transactions to be carried out through the internet. It helps in sharing business information and conducting business with customers.



Entertainment includes the use of technology to create animation, special effects, graphics, etc. in movies and cartoons.

Gaming apps allow people to play games on devices like mobile phones, computers, tablets, media player, etc. Many gaming apps come preloaded on the device or can be downloaded from the app stores. Games are available for single users as well as multiple users to play at the same time.



Low-code, No-code solutions require very little coding or no coding and therefore allow people with no coding knowledge to build applications. This allows automation of repetitive work which in turn helps in improving productivity, efficiency and saving time.

Fig. 1.1.3 Emerging Trends in Application Development

1.1.5 Delivery Models used in the IT Application Development Industry

After the software or application is developed, it has to be deployed or delivered to the user. The application undergoes several rounds of quality tests after programming to ensure that all the specifications are met and then delivered. The entire process starting from planning to the delivery of the application to the user is known as the application or software development life cycle (SDLC). SDLC is used for designing, developing, testing and delivering high-quality software. There are various models used in SDLC and can be broadly classified as:

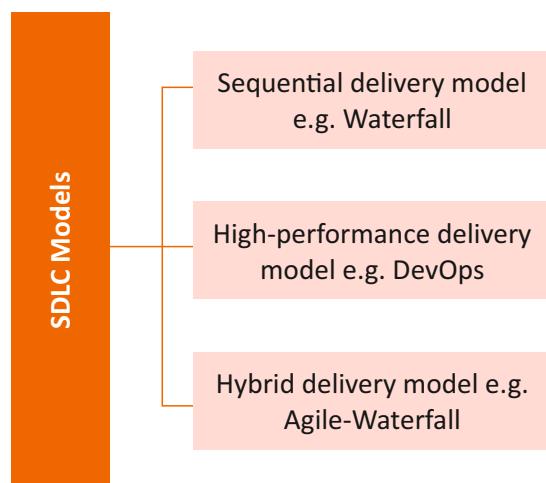


Fig. 1.1.4 SLDC Models

Waterfall model

This is the oldest, simplest, and most structured model of SDLC. It is also known as the linear-sequential life cycle model. All the phases run sequentially and each phase depends on the outcome of the previous phase. It gives a tangible outcome at the end of each phase. In this model, each phase has to be completed before starting the next phase. Hence there is no chance of overlapping the phases. The drawback of this model is that it does not offer flexibility once a phase is considered complete. Any changes after completion can affect the quality, cost and delivery time.

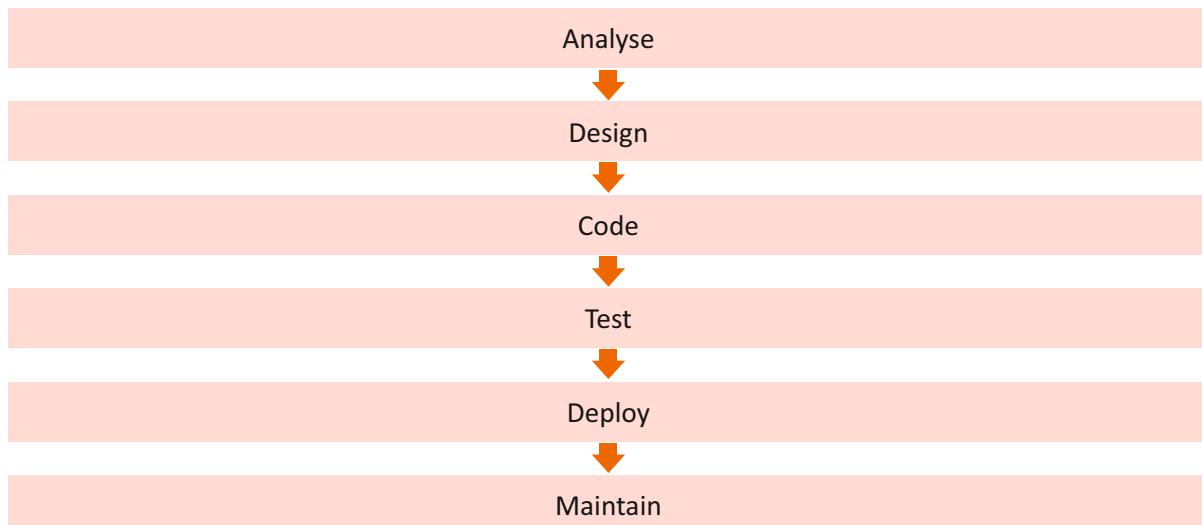


Fig. 1.1.5 Waterfall Model

Iterative model

In this model, the software requirements are broken down into smaller parts and each cycle produces a partial but deployable version of the software. The first iteration contains a small set of software requirements and every subsequent version adds more requirements to it and the final iteration contains the complete set of requirements. This helps the developers to catch potential errors in each phase and constantly improve the end product by the time it is deployed in the market.

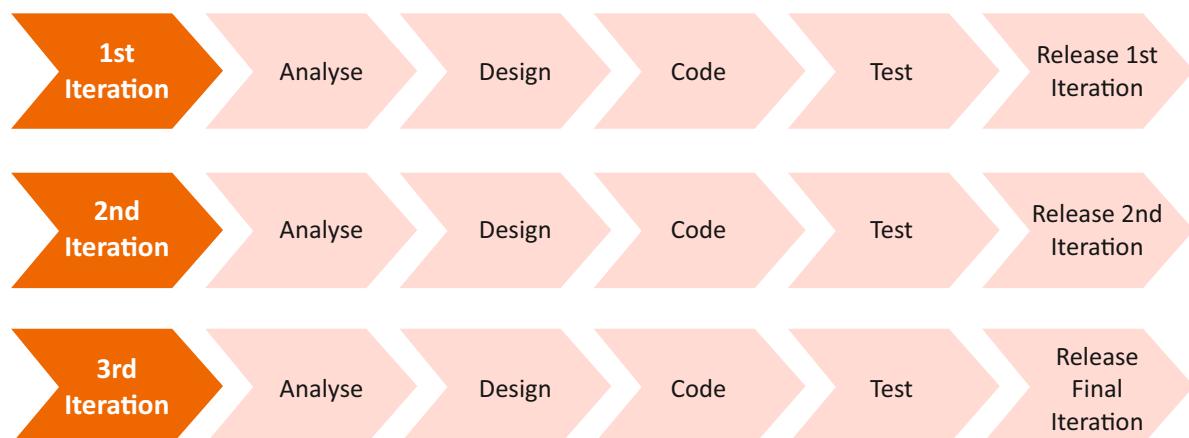


Fig. 1.1.6 Iterative Model

Agile Model

This model produces ongoing release cycles, with small incremental changes from the previous release. The product is tested after each iteration, which helps in identifying and resolving issues before they become major problems. This also helps the team members to keep all the stakeholders in the loop and get their inputs and feedback throughout the development process.

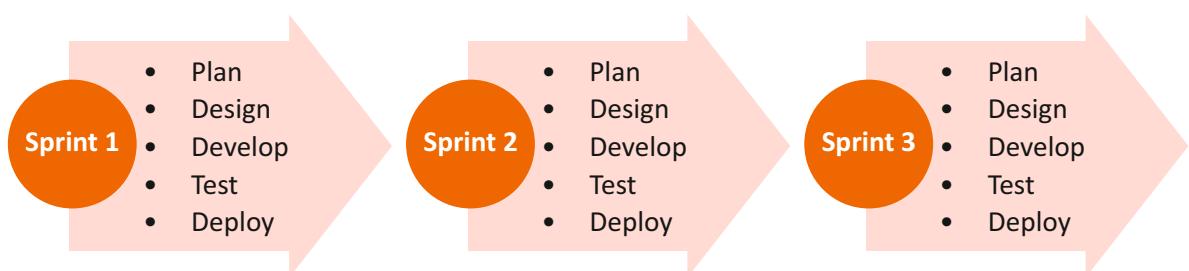


Fig. 1.1.7 Agile Model

DevOps

DevOps is a set of best practices for software development aiming at shortening delivery times for new software updates and at the same time maintaining quality. It has emerged from the agile development model. DevOps is the combination of the word's development and operations. It promotes the collaboration of the development and operations teams. It uses automation for software deployment and includes a Continuous Integration (CI) framework, where the new code is integrated into a shared repository by teams working regularly. This helps to detect and remove bugs early and ensures that the new release contains code with very few or zero errors.



Fig. 1.1.8 DevOps Model

Notes



1.1.6 Web Development Standards

Web standards are a set of technical specifications and best-practice standards used to build web applications and websites. Web standards are evolving standards developed by groups of interested parties and not by any individual or organisation developing technologies. The web standards movement was launched in August 1998 by a group of professional web developers to support and encourage the use of web standards recommended by the World Wide Web Consortium and other standard bodies like the Web Hypertext Application Technology Working Group (WHATWG), ECMA International, International Organisation for Standardisation (ISO).

In 1989 Tim Berners-Lee invented a tool called Enquire, which is later known as the World Wide Web (www). Later in 1994, he founded the World Wide Web Consortium (W3C), which created the web standards and guidelines called the W3C recommendations. Some of the standards and specifications govern certain aspects of the internet as well. They also offer online services to test websites and web browsers for compliance. These tests can be performed by both the website developers and users.

Some of the basic publications concerning the web standards are:

Recommendation/Standards Body	Standards
World Wide Web Consortium (W3C)	Markup languages HTML (Hypertext Markup Language) and XHTML (Extensible Hypertext Markup Language)
	Style sheets CSS (Cascading Style Sheets)
	Image formats PNG (Portable Network Graphics) and SVG (Scalable Vector Graphics)
	Accessibility technologies WAI-ARIA (Web Accessibility Initiative – Accessibility Rich Internet Applications)
	Semantic Web RDF (Resource Description Framework), GRDDL (Gleaning Resource Descriptions from Dialects of Languages), OWL (Web Ontology Language)
	Compliance tests for website code Markup Validation Service, CSS Validation Service
	Compliance tests for web browsers Acid2 Browser Test, Acid3 Browser Test

Continued...

Recommendation/Standards Body	Standards
ECMAScript by ECMA International	JavaScript and JSON (JavaScript Object Notation)
Web Hypertext Application Technology Working Group (WHATWG)	HTML Living Standard, DOM (Document Object Model) Standard, Encoding Standard, URL (Uniform Resource Locator) Standard
International Organisation for Standardisation (ISO)	JPEG
Internet Engineering Task Force (IETF)	RFC (Request for Comments), URIs (Uniform Resource Identifier)
Unicode Consortium	UTRs (Unicode Technical Reports)
Internet Assigned Numbers Authority (IANA)	Name and number registries

Table 1.1.1 Web Standards

Web standards are designed in such a way that data using older versions of the standards will continue to work in new browsers and the data using newer versions of the standards produce an acceptable result in the older browsers. The web standards offer a set of rules that all web developers can follow.

Unit 1.2 - Career Path for a Media Content Developer

Unit Objectives



At the end of this unit, the participant will be able to:

1. Identify the career path for a web developer

1.2.1 Roles and Responsibilities of a Media Content Developer

A web developer is responsible for designing, coding, testing and maintaining websites and web applications. The person is also responsible for uploading the site onto a server and registering it with different search engines. A web developer should communicate with clients and other stakeholders to understand their needs and also be able to work in a team. A web developer should be able to present design specifications and work with other designers. The person is responsible for troubleshooting website problems and monitoring website traffic. In many organisations, a web developer is also responsible to create content for the websites.

A web developer can get employed for various job roles like applications developer, game developer, web developer, web designer, multi-media programmer, web content manager, etc. The responsibilities and the skills depend on the specific job role. Some of the broad range of generic and functional skills that a web developer requires are:

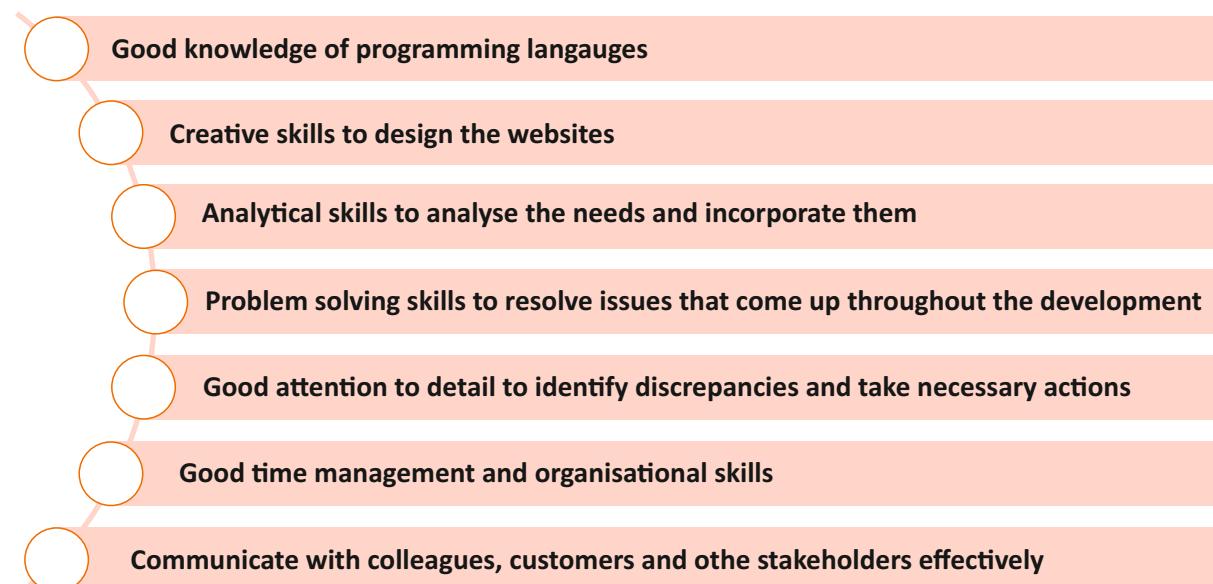


Fig. 1.2.1 Skills Required in a Media Content Developer

1.2.2 Career Growth Opportunities for a Media Content Developer

Most of the web developers enter the industry with 0 to 2 years of experience. The career of a web developer typically starts at the junior level carrying out simple tasks and learning from seniors and other colleagues. With some experience, the person can get promoted to a middle-level position as a senior programmer and later as a web solution developer. At this level, the person will be able to take on more challenging jobs and lead a team. Later, the person can enter the managerial or leadership level as a delivery head or technical director. At this stage, the person can also move into other project management job roles. The person can aspire to become the Chief Executive Officer (CEO) of the company by honing their managerial skills further.

The following figure shows the job roles for the IT-ITeS/Application Development sub-sector at various levels:

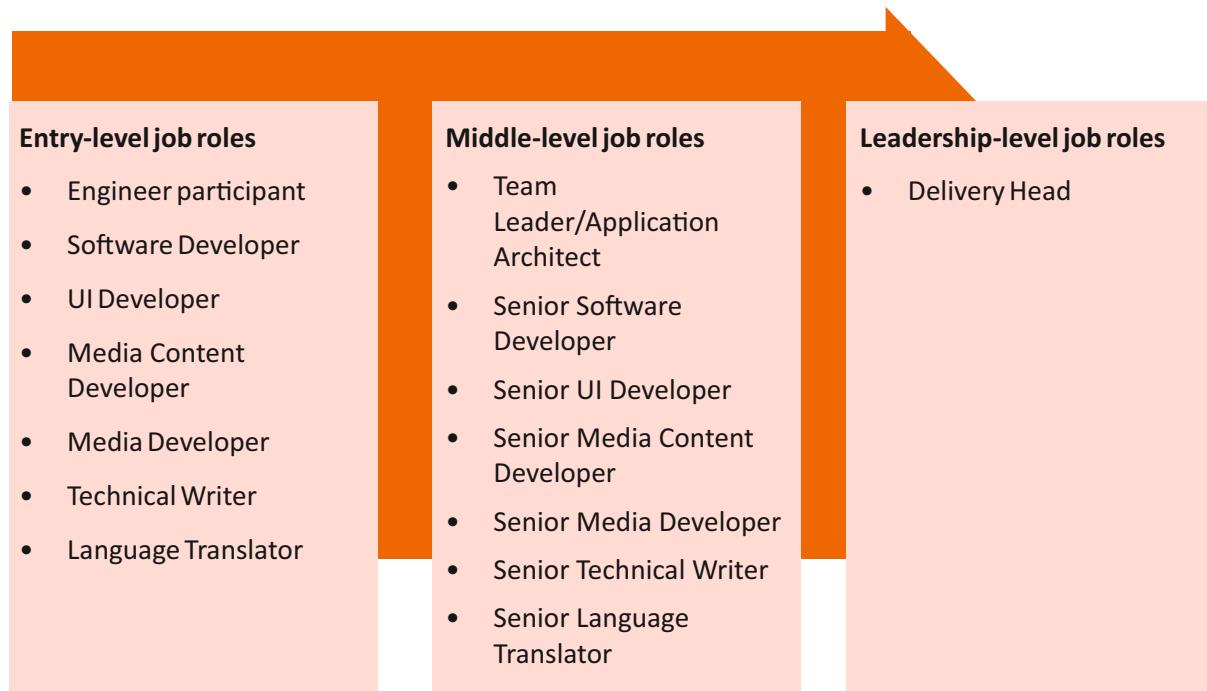


Fig. 1.2.2 Job roles for the IT-ITeS/Application Development sub-sector
(Source: IT-ITeS Sector Skill Council NASSCOM)

The following figure shows the career path of a web developer:

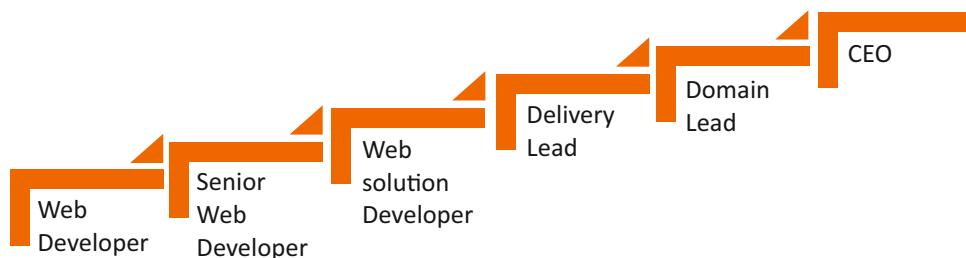


Fig. 1.2.3 Career Growth Opportunities for a Media Content Developer

Summary



- Information Technology (IT) refers to the creation, management, retaining, and transfer of ideas. IT includes all forms of information technology, including computer hardware and software used for digital resources, storage, and transfer.
- Information Technology Enabled Services (ITeS) also known as web-enabled or remote services utilize a wide range of operations that uses IT to improve the efficiency of the business, company or organisation.
- The IT industry is broadly divided into IT Services, Business Process Management (BPM), Software Products and Engineering Research and Development.
- India's IT/ITeS sector contributes enormously to the economy by creating significant employment opportunities. India is considered the knowledge powerhouse for information technology. The IT industry has greatly boosted the socio-economic parameters in addition to the Gross Domestic Product (GDP) and exports.
- The Government of India has helped in the advancement of the IT industry by introducing many liberalization policies and other initiatives.
- The government initiatives like setting up Special Economic Zones (SEZ), Export Oriented Units (EOU), Software Technology Parks (STP) and Foreign Direct Investments (FDI) have helped the Indian IT industry to achieve a leading position in the global IT industry.
- Information Technology Application Development is the process of designing, creating, and implementing a set of computer programs to perform various tasks that a business process requires. The main steps involved in application development are planning, designing, coding, testing, deploying and maintaining.
- Desktop application development is developed for desktops and laptops. While developing the application, the Operating System has to be considered and the Application Programming Interfaces (APIs) and programming languages have to be chosen accordingly.
- Web application development consists of creating two apps, one running in the browser and the other on the server, known as the front-end and back-end technologies. HTML, CSS and JavaScript are required for developing the browser application and for the server application development AJAX and PHP are required.
- Mobile application development is developed for mobile devices which have Android and iOS platforms. Android mobile apps use Java and iOS mobile apps use Objective C for development.
- Cross-platform application development consists of developing an application which is suitable for all three systems mentioned above. It requires a single set of API and language to develop.
- Custom application development is the process of building applications as per the requirements or specifications of the customers. This type of development has challenges concerning cost and time and very often the final output may not match all the specifications of the customers.
- India occupies the number one position in mobile data consumption in the world. Apart from individual users, many businesses, enterprises and government agencies are using apps. This has given significant importance to application development in the country. IT applications are used for communication, entertainment, e-commerce, education, etc.
- Today, technology is used in many areas and on multiple platforms. Application software is developed to enable the user to carry out business-related tasks, communication, online shopping, entertainment, gaming, etc. to name a few.

- Today, technology is used in many areas and on multiple platforms. Application software is developed to enable the user to carry out business-related tasks, communication, online shopping, entertainment, gaming, etc. to name a few. An application is designed in such a way that it can perform a specific task like for example sending an email, creating documents, designing graphics, playing music, browsing the net, etc.
- The various sub-sectors of application development are software development, functional development, media development, web development, user interface development and technical documentation.
- Some of the emerging trends in application development are the Internet of Things (IoT), Artificial Intelligence (AI), Machine Learning (ML), Cloud computing, Wearable devices, Augmented Reality (AR), Virtual Reality (VR), E-commerce, Entertainment, Gaming and low code, no code.
- After the software or application is developed, it has to be deployed or delivered to the user. The application undergoes several rounds of quality tests after programming to ensure that all the specifications are met and then delivered. The entire process starting from planning to the delivery of the application to the user is known as the application or software development life cycle (SDLC).
- The Waterfall model is the oldest, simplest, and most structured model of SDLC. It is also known as the linear-sequential life cycle model. All the phases run sequentially and each phase depends on the outcome of the previous phase. It gives a tangible outcome at the end of each phase.
- In the Iterative model software requirements are broken down into smaller parts and each cycle produces a partial but deployable version of the software. The first iteration contains a small set of software requirements and every subsequent version adds more requirements to it and the final iteration contains the complete set of requirements.
- The Agile model produces ongoing release cycles, with small incremental changes from the previous release. The product is tested after each iteration, which helps in identifying and resolving issues before they become major problems.
- DevOps is a set of best practices for software development aiming at shortening delivery times for new software updates and at the same time maintaining quality. It has emerged from the agile development model. DevOps is the combination of the word's development and operations. It promotes the collaboration of the development and operations teams.
- Web standards are a set of technical specifications and best-practice standards used to build web applications and websites. Web standards are evolving standards developed by groups of interested parties and not by any individual or organisation developing technologies.
- Web standards are designed in such a way that data using older versions of the standards will continue to work in new browsers and the data using newer versions of the standards produce an acceptable result in the older browsers.
- A web developer is responsible for designing, coding, testing and maintaining websites and web applications. A web developer can get employed for various job roles like applications developer, game developer, web developer, web designer, multi-media programmer, web content manager, etc.
- Most of the web developers enter the industry with 0 to 2 years of experience. The career of a web developer typically starts at the junior level carrying out simple tasks and learning from seniors and other colleagues. With some experience, the person can get promoted to a middle-level position as a senior programmer and later as a web solution developer.

Exercise



Answer the following questions:

1. What are the different types of IT application development?

2. Write a brief note on the web development standards.

Fill in the Blanks:

1. _____ type of SDLC model is also known as line sequential life cycle model.
2. _____ technologies are required for back-end application development.

Choose the correct option:

1. Which one of the following is the oldest, simplest and most structured model of SLDC?
 - a. Iterative
 - b. Agile
 - c. Waterfall
 - d. DevOps
2. Which one of the following is an entry-level job role in the IT-ITeS/Application Development subsector?
 - a. Team Leader
 - b. Delivery Head
 - c. Media Content Developer
 - d. Senior UI Developer



**IT - ITeS SSC
NASSCOM**

2. Analysis and Design of Web Based Applications

Unit 2.1 - Process of conversions and testing new products and applications



SSC/N0503

Key Learning Outcomes



At the end of this module, the participant will be able to:

1. Evaluate the process for converting designs into media and graphic content
2. Examine how to test new products and applications

Unit 2.1 - Process of Conversions and Testing New Products and Applications

Unit Objectives



At the end of this unit, the participant will be able to:

1. Discuss the implications that new products and applications may have on business processes
2. Identify the sources of information to design software products and specifications
3. List range of equipment used to design software products and applications

2.1.1 Introduction to the elements of Graphic Design

Graphic design is the art of organizing and generating visual material to express ideas and thoughts. Graphic design can be found worldwide—from banners to advertisements to smartphone applications. These designs can impact the vision and feelings by combining many aspects and ideas. Graphic designers are visual communicators. They use text, visuals, and pictures to highlight and engage customers by bringing visual thoughts to reality, most typically using graphic design software.

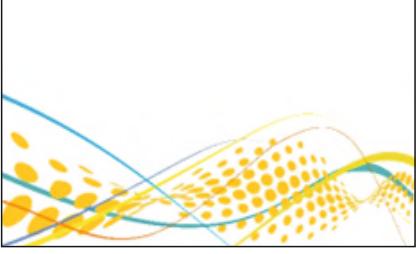
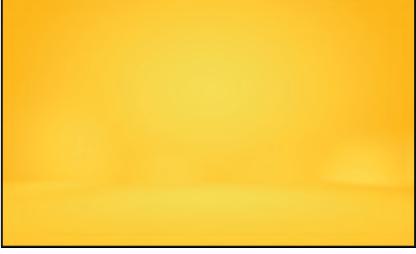
Graphic design is one way for businesses to communicate with their customers. Design can be utilized to advertise and market items, send out a message, or establish a company's identity.



Fig. 2.1.1 Graphic Designing

Elements and Principles of Graphic Design:

Line, color, form, space, texture, typography, size, dominance and emphasis, and balance are all elements and principles of graphic design. They collaborate to create attractive work that delivers a message.

<p>1. Line:</p> 	<ul style="list-style-type: none"> • Lines can be straight, curvy, thin, thick, dashed, long, or short and appear in practically all kinds of design. • Any two points can be connected by a line. 						
<p>2. Color:</p> 	<ul style="list-style-type: none"> • Color is often the most essential and visible aspect of a design. • It has an immediate effect and is observed by everybody, even those with little design knowledge. • Colors can be used as backdrops or in conjunction with other components like as lines, forms, or text. • Colors influence human feelings and moods. 						
<p>3. Shape:</p> 	<ul style="list-style-type: none"> • Shape, often referred as form, is a grouping of lines. • Shapes can take the form of circles, squares, rectangles, triangles, or other abstract shapes. • The majority of designs incorporate at least one form. Shapes, like colors, have many connections. 						
<p>4. Space:</p> <table border="1" data-bbox="203 1635 619 1882"> <tr> <td style="text-align: center; padding: 5px;">No</td> <td style="text-align: center; padding: 5px;">Yes</td> </tr> <tr> <td style="padding: 5px;"> <small> Lorem ipsum dolor sit amet, consectetur adipiscing elit. Mauris ullam corper accumsan enim blandit. Proin non magna semper nulla. Sed id aliquet massa. Nullam posuere cubilia Curae; Pellentesque eleifend sapien non magna semper ullamcorper accumsan enim blandit. </small> </td> <td style="padding: 5px;"> <small> Lorem ipsum dolor sit amet, consectetur adipiscing elit. Mauris ullamcorper placerat sollicitudin. Mauris eu eros elit, eu fermentum nisl. </small> </td> </tr> <tr> <td style="padding: 5px;"> <small> Ve stibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; </small> </td> <td style="padding: 5px;"> <small> Ve stibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; </small> </td> </tr> </table>	No	Yes	<small> Lorem ipsum dolor sit amet, consectetur adipiscing elit. Mauris ullam corper accumsan enim blandit. Proin non magna semper nulla. Sed id aliquet massa. Nullam posuere cubilia Curae; Pellentesque eleifend sapien non magna semper ullamcorper accumsan enim blandit. </small>	<small> Lorem ipsum dolor sit amet, consectetur adipiscing elit. Mauris ullamcorper placerat sollicitudin. Mauris eu eros elit, eu fermentum nisl. </small>	<small> Ve stibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; </small>	<small> Ve stibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; </small>	<ul style="list-style-type: none"> • Space is important in design because it improves readability for the human eye.
No	Yes						
<small> Lorem ipsum dolor sit amet, consectetur adipiscing elit. Mauris ullam corper accumsan enim blandit. Proin non magna semper nulla. Sed id aliquet massa. Nullam posuere cubilia Curae; Pellentesque eleifend sapien non magna semper ullamcorper accumsan enim blandit. </small>	<small> Lorem ipsum dolor sit amet, consectetur adipiscing elit. Mauris ullamcorper placerat sollicitudin. Mauris eu eros elit, eu fermentum nisl. </small>						
<small> Ve stibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; </small>	<small> Ve stibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; </small>						

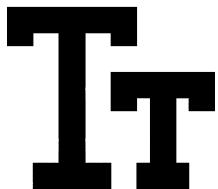
Continued...

5. Texture



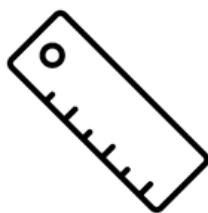
- Textures are increasingly being utilized to replace single-color backdrops. Paper, stone, concrete, brick, and cloth are examples of textures.

6. Typography



- When dealing with text, Graphic Designers must analyze the link between how language appears and what it conveys.
- Typography is the skill of arranging words in intelligible and interesting ways.

7. Scale



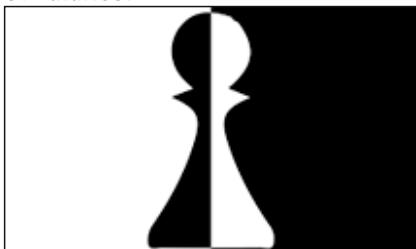
- The scale and proportions of objects, forms, and other features may make specific areas of a design more versatile.

8. Dominance and emphasis:



- In a design, dominance and focus establish a focal point.
- It improves the design flow and can direct the audience to other elements of the design.

9. Balance:

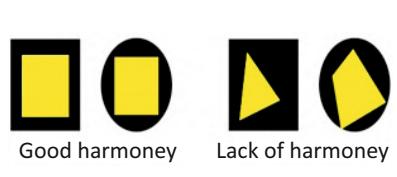


(Image Source:
<https://in.pinterest.com/pin/13018286412479795/>)

- Graphic designers must examine whether design components are scattered.
- Balanced designs provide steadiness, but unstable designs can be dynamic.

Continued...

10. Harmony:



(Image

Source:<https://www.blendspace.com/lessons/j-q3Cj2eyrtDmQ/e-7-principles-of-design>)

- One of the primary objectives of graphic design is harmony.
- Every aspect in a good design must collaborate and compliment one another.

Table. 2.1.1 Elements of Graphic Designing

2.1.2 Sources of Information for Designing

With the emergence of newer technologies, the range of graphic design has expanded dramatically. Designers are getting more familiar with the latest digital technologies and generating amazing works of art.

The platforms listed below assist designers to get inspired for artistic work:

1. Behance.net:

Behance, which is owned by Adobe, is simply an online portfolio, or as they put it, "a place where great artists across sectors can exhibit amazing work." This website is one of the preferred places to find design ideas because of the vast amount of designers with portfolios, the top quality of some of the artwork, and the effective search. Utilizing own's Behance account, anyone can save samples of work that like into collections for later use.



Fig.2.1.2 Behance.

2. Google images:



Fig. 2.1.3 Google

It can appear to be an easy one, but consider how often it is neglected as an excellent source of inspiration. The key to utilizing it effectively is to strike the search keyword.

3. Designspiration.net:

Designspiration operates in the same manner that Behance does. Designers submit creative work, viewers like it, favorites are added to lists, and so on. It has a pretty unique function where user can search by color. Users may choose up to five colors to explore design work that fits the palette.

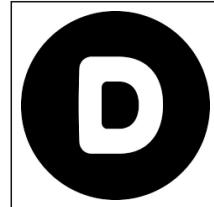


Fig. 2.1.4 Designspiration



Fig. 2.1.5 Pinterest

4. Pinterest:

While a lot of the design work from Behance has been incorporated onto Pinterest (either through the designers or through users saving the photos to the boards), the improved layout and categorizing using boards makes it easier to use than Behance. In instance, users can see a variety of designs on one page, which speeds up surfing, whereas Behance needs users to click into each item to see the entire design.

The ability to see other artists Pinterest boards is also quite handy, since user can delegate much of the curating to those with good taste by just following the board.

5. Keeping samples:

Not everything needs to be available online! For years, maintain copies of every other marketing that organization received that like the appearance of. The workplace has a 'inspiration' folder full of posters, banners, business cards, and other promotional materials.

Organization often go in there and scatter them all over the floor in search of inspiration. Having actual samples to look at can be just as pleasant. Print is alive and well!

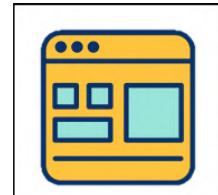


Fig. 2.1.6 Keeping samples

2.1.3 Software for Conversion

When developing high-quality graphics and designs, selecting the appropriate graphic design software is essential. The most effective graphic design software can assist us in achieving goals, from designing logos and graphics to picture editing and site design.

1. Adobe Photoshop:

Adobe Photoshop is linked with picture editing for graphic designers. It is one of the most renowned picture editing software tools on the marketplace in a powerful bundle with strong graphic design features.

About Photoshop:

- It provides a free mobile application.
- Its clean user interface provides a lot of help for easy use.
- You have an extensive collection of typographic and drawing tools.
- It has three dimensional design capabilities.



Fig. 2.1.7 Adobe Photoshop

The Adobe Photoshop graphic design software interface is constantly upgraded to create a more customized user experience. It provides numerous focused workspace layouts, such as Graphics and Web, Movement, 3-dimensional, Painting, and Photography. Designer may also construct the original unique arrangement of panels and windows.

2. Adobe InDesign:

If designer work in the publishing industry, Adobe InDesign is an essential software product. It has outstanding capability for creating visually appealing magazine, info sheets, and pamphlet that can be quickly exported to PDF or HTML.

About InDesign:

- Designers may use its Eyedropper tool to rapidly apply positions or dimension to another object within the page.
- It provides HTML exporting, which allows web developers to export neat and straightforward codes during the execution of website layout designs. Its is ideal for WordPress website.



Fig. 2.1.8 Adobe InDesign

As a consequence, user may rapidly learn how to blend text and visuals for the greatest effects.

The designer only needs to alter the content in the templates, and the design is automatically modified, which is ideal for infographics.

3. Adobe Illustrator:

Adobe Illustrator is far beyond precisely a graphic design tool for illustrating artist's work, page layouts, business logos, website prototypes, and nearly everything else. Furthermore, it is an industry standard in vector creation software.

About Adobe Illustrator:

- It generates graphics files in comparatively tiny size, allowing designers to quickly distribute them via e-mail attachment.
- Adobe Stock provides access to over 90 million photos, visual effects, templates, and videos.



Fig. 2.1.9 Adobe Illustrator

Adobe Illustrator is extremely configurable, with several preset layouts and other customization possibilities. Users may move panels across the screen by dragging and dropping them.

4. GIMP (GNU Image Manipulation Program):

GIMP is far from a picture editor that provides many amazing Photoshop features for free. It has a wide range of professional functionality for fine-tuning snaps and creating artwork from scratch.

About GIMP:

- It allows users to create drawings by utilizing tools such as cloning, pencil, and airbrush.
- To assist users, GIMP provides lessons for each function.
- Its Layers function enables designers to create a new picture on top of an old one.
- For individuals who are new to the concept of picture editing, the user interface is simple and straightforward.



Fig. 2.1.10 GIMP

The user interface of the picture editing software is very configurable, and the GIMP community has created some great plugins for additional functions that are completely free. People who actually know how to code can extend it to professional degrees as needed.

5. Sketch:

Sketch is a vector-based visual design tool that is ideal for application, web, and interface development. It is ideally suited for developing interactive UI/UX prototypes. Sketch's functioning designs allow the clients to get a clearer sense of how everything appears and behaves. As a result, they are better able to offer relevant input on functionality (user interface, or UI) and user experience (UX).

About Sketch:

- Users can replicate designs on bigger devices for staff monitoring in order to determine how well the design might appear in a certain device.
- Through a simple file sharing method, designers may share the full interface on the cloud.



Fig. 2.1.11 Sketch.

To eliminate half-pixel renderings or poor misalignment, it makes use of grids, snap to grid capabilities, and snap to pixel functionality. These refinements are essential for ensuring flawless responsive design/multiple screen sizes and resolutions.

Notes



2.1.4 Process for Conversion

A strong graphic design approach can assist businesses in producing better graphics. This method may be used for almost any design project:

Phase of Definition

- Step 1: Create a Creative Brief
- Step 2: Conduct Graphic Design Research
- Step 3: Brainstorming / Mood Boarding Phase

Phase of Definition

Phase of Creation

- Step 4: Make a sketch
- Step 5: Create a Building Design
- Step 6: Feedback Refinement

Step 4: Make a sketch

- Step 5: Create a Building Design
- Step 6: Feedback Refinement

Phase of Delivery

- Step 9: Complete Delivery

Phase of Feedback

Fig. 2.1.12 Process for Conversion.

Step 1. Create a Creative Brief:

The creative brief is the starting stage in the process of creating an innovative graphic design. It enables the designer to understand more about the customer's requirements. This is an important phase as that designer requires to obtain as much information as possible about the customer, his or her organization, and the project goals.

The creative brief serves as the project's basis and has a considerable impact on the subsequent processes.

Step 2. Conduct Graphic Design Research:

The purpose of the research phase is to study more about the client's rivals. Designs from competitors may be useful sources of motivation. Designers should not imitate their client's competitor designs, but rather study what works, what doesn't, and how to better. Finally, designers strive to be unique while still learning about typical tones and designs.

Step 3. Brainstorming/ Mood Boarding phase:

It's time to produce design concepts when designer gained a clear grasp of the customer and his or her competition. Designers can map out the primary goal of the design with a pen and paper.

What feelings and concepts should be used as design cues? What is the design's sentiment? Of course, brainstorming is heading up with a large number of ideas. However, keep the main theme in mind when photographing concepts.

Following the collection of ideas, the designer might develop a vision board to help in the collection of ideas.

Step 4. Make a sketch:

It's now time to draw depending on the designer's preferred ideas. Designers will frequently not utilize a computer for the designs. Designers do not need to draw online. Instead, begin offline to aid concentration and eliminate any internet interruptions from the workplace. Designers should use a big sketchpad and their preferred pens to reduce interruptions and boost performance and concentration.

Step 5: Create a Building Design:

The designer will offer customer with prior comments after sharing the finest sketches with the customer. Designers may now (finally!) begin working on final designs. At this point, it will be critical to create many design options.

Designers can then offer clients to select amongst existing designs. To produce these designs, designer most likely require a variety of graphic materials; designers shouldn't have to develop nearly every aspect from scratch.

Step 6: Feedback Refinement:

Let's be honest. Clients will always have lots of suggestions and requests for changes. In other terms, designers must begin improving their designs. However, before showing the ideas to the customer again, the designer might get immediate input from others.

Step 7: Making a Presentation:

The manner in which the designer presents the work will influence the amount of revisions as well as the associated feedback. Of course, it is also determined by the clients. The ability to convey a story about the designs will help in influencing and convincing the customer. Take the time to display the job appropriately. Of course, designers cannot organize a one-hour meeting every time they make a change. However, the timeframe necessitates design milestones and significant revisions.

Step 8: Delivery of Revisions:

Designers are frequently flooded with modification requests and unfiltered comments. As a result, in order to develop a permit process, designer must collect input, structure it, and execute the necessary modifications. It's much simpler said than done.

Step 9: Complete Delivery:

Kudos! The designer completed the final design(s), and the customer is pleased. It's time to issue an invoice. Ensure that the designer receives the funds as soon as feasible. This guarantee necessitates the creation of an invoice as soon as possible.

Notes

2.1.5 Equipment for Designing

Designers use tools to make the things humans need, want, or fantasize about. Likewise, graphic designers require more than simply ability or expertise to produce illustrations. Graphic designers employ basic and complex graphic design tools to capture the ever-changing forms and colors in their heads in order to create captivating pictures.

1. Pen and paper:

Pen and paper are the quickest, least expensive, and simplest way to bring creative ideas from the mind to the real life. Aside from allowing designer to disconnect for a few seconds, analogue drawings act as a sort of holy connection between the brilliant graphic artists of the past and the modern tech-enabled designers of nowadays.

2. Computer:

This is the ideal tool for digital creatives that does all of the heavy work in the industry. If designers can afford the greatest and most powerful computers, such as the iMac Pro or the Surface Studio, go for it.

3. Stylus and graphics tablet:

Creatives with a strong technological gene in their DNA would most likely choose the digital version of a pencil and paper for drawing and doodling jobs. Either might approximate the real experience of sketching or developing wireframes, in addition to providing some wicked features (immediate color, filters, eraser, storage, fantastic editing, and so forth) that regular pen and paper cannot replicate.

4. Smartphone:

This device assists in connecting with colleagues, consumers, and the internet. It also hosts beloved programs, such as incredibly useful on-the-go sketching and image-editing tools. Furthermore, the smartphone serves as a decent camera for those unpredictable situations that require it, and the strong Canon or Nikon is snug as a bug within its case at house.

A smartphone in hand is also the most convenient approach for web designers to determine whether a certain web page design appears effectively on tiny screens.

5. Camera:

Only a competent DSLR (Digital Single Lens Reflex) would serve for creative types that need to shoot, edit, and maintain hyper-precise photographs and films. When it comes to DSLRs, two classic brands stand out: the Canon EOS and Nikon D-series. Of course, both are expensive, and if money is a concern, there are less expensive options on the market that can still capture pixel-perfect photos.

6. Storage:

Since cloud storage is now available, several graphic artists prefer to keep backups physical storage devices on standby. As the libraries of photographs and films may quickly consume storage space, high-capacity, portable versions may be worth considering. Models having at least a terabyte of storage should be considered. Solid state SSDs are likely to be preferred by designers with bigger budgets who desire super-fast plug-and-play processing (SSD). If designer fall into this category, Samsung's T3 SSD with 1 terabyte of storage capacity is a decent alternative.

7. Graphic design applications:

It is the most substantial and, possibly, most crucial component of a digital artist's toolkit. The software tools, whether installed on a desktop computer or provided as a cloud-based service, allow graphic designers to create, modify, save, and maintain their artistic abilities, which includes pictures, photographs, video files, slideshows, posters, and other visual forms.

2.1.6 Testing of New Products and Applications

Software test is a process of verifying whether the required software product matches the intended criteria and confirming that the software product is defect-free. The purpose of software testing is to identify faults, loopholes, or missing information in relation to the actual specifications.

When working on a software development project, it is important to understand that mistakes can occur at any stage of the life cycle. Here are the main reasons that software testing is essential:

Saves money

- If a defect is discovered early in the development process, it is less expensive to repair it.

Security

- When a product is tested, the consumer may be confident that they will obtain a dependable product.
- The consumer's personal information is secure. With the help of software testing, consumers may acquire products that are secure.

Product excellence

- Products must serve the users in some way. It must deliver on its promises of benefit.

Customers' satisfaction

- Earning the customer's trust is not an easy task, especially if the product is proven to be working and super buggy at the same time.

Improving the Development Procedure

- Quality Management system can help to identify a wide range of circumstances and faults for the repetition of the problem.

Simple when adding additional features

- Tests prevent rigidity by allowing developers to reliably add new functionality.

Determining software performance

- Discovering software or applications with poor or limited performance may harm the organization market reputation.

Fig. 2.1.13 Testing of New Products

2.1.7 Implications of New Products and Applications on Business Processes

Determining the implications and consequences of difficulties in a specific project undertaking such as (project timeline, budget, and result). It's indeed simple thing to identify a specific problem, but if management truly wants to stir up the team, they should discuss the consequences of that situation in greater depth.

Implication	Description
 Scope Creep	<ul style="list-style-type: none"> Scope risk develops when the initial planning requirements are not clearly stated. Developing detailed construction criteria from the beginning will increase the extent of the project. Defining the project scope and conveying that idea to stakeholders from the start can reduce scope creep. Progress reports verification can also help to verify that the project maintains within the initial project scope.
 Low Performance	<ul style="list-style-type: none"> When a project does not execute as well as intended, performance risk arises. While employees cannot always determine the core reason of poor performance, they may identify project risks that may contribute to poor performance and seek measures to mitigate those risks. Recognizing possible performance risks early in the planning phase can assist a corporation in preparing for it.
 High Cost	<ul style="list-style-type: none"> Cost risk arises when a project's expenditure is exceeded. Cost risk can develop as a result of inadequate or insufficient budgeting during the project planning phase. To reduce cost risk, correctly estimate each project aspect and keep to the budget.
 Time Constraint	<ul style="list-style-type: none"> Time risk, often known as project schedule risk, is the chance that project activities may take longer than intended. Prolonged deadlines may have an influence on other factors such as budget, delivery date, or overall performance. This is a frequent issue that a project manager may face.

Continued...

Implication	Description
 Limited Resources	<ul style="list-style-type: none"> When a corporation does not have adequate resources to execute a project, it faces resource risk. Time, expertise, funds, and tools are all examples of resources. Depending on the seriousness of the project, resource allocation must occur early in the project planning phase, often 1-2 months before project execution.
 Changes in Operations	<ul style="list-style-type: none"> Modifications in organization or team procedures, such as an unanticipated shift in team duties, alterations in management, or new processes that the team must react to, are examples of operational risk. These factors can cause diversions, need changes to procedures, and have an influence on project deadlines.
 Absence of clarity	<ul style="list-style-type: none"> A lack of clarity might reflect itself as misunderstanding between stakeholders, imprecise project scopes, or missed deadlines. As a result of segmented work, there may be a lack of visibility, budget overruns, missed timelines, and changing project needs.

Table. 2.1.2 Implications of New Products.

Notes

Summary



- Graphic design is the art of organizing and generating visual material to express ideas and thoughts.
- There are 10 Elements and Principles of Graphic Design.
- **Process for conversion:** A strong graphic design approach can assist businesses in producing better graphics.
- **Software for conversion:** Several software tools used for graphic design.
- **Sources of information for designing:** All graphic artists have own go-to destinations for source of inspiration. Any designer who professes not to borrow other people's ideas is deceiving themselves.
- **Equipment for designing:** Designers use tools to make the things humans need, want, or fantasize about. Likewise, graphic designers require more than simply ability or expertise to produce illustrations.
- Software test is a process of verifying whether the required software product matches the intended criteria and confirming that the software product is defect-free.
- **Testing of new products and applications:** Software test is a process of verifying whether the required software product matches the intended criteria and confirming that the software product is defect-free.
- **Implications of new products and applications on business processes:** Determining the implications and consequences of difficulties in a specific project undertaking such as (project timeline, budget, and result).

Exercise



Answer the following questions:

1. Define Graphic design.

2. Explain different elements of graphic design.

3. What are the implications of new products and applications on business processes?

4. List down different equipment's of graphic designing.

5. Explain the process for conversion.

6. Explain different software used for conversion.

Fill in the Blanks:

1. Only a competent _____ would serve for creative types that need to shoot, edit, and maintain hyper-precise photographs and films.
2. _____ is linked with picture editing for graphic designers.
3. Graphic artists produce unique artwork by combining many_____ and _____.

Choose the correct option:

1. What is the name of the platform that helps designers to get inspired for artistic work?
 - a. Behance.net
 - b. Google images
 - c. Designspiration.net
 - d. Pinterest
2. Which software provides many amazing Photoshop features for free?
 - a. Sketch
 - b. Adobe InDesign
 - c. Adobe Illustrator
 - d. GIMP (GNU Image Manipulation Program)

QR Code

Scan the QR Code to watch the related video



<https://youtu.be/RXOq0d-5g9g>

Unit 2.1 Process of conversions and testing new products and applications



3. Develop Media Content and Graphic Designs for Software Products and Application



**IT - ITeS SSC
NASSCOM**

Unit 3.1 - Selection of Components and Tools for Web/Media Content Development

Unit 3.2 - Verification and Validation of Media and Graphics



Key Learning Outcomes



At the end of this module, the participant will be able to:

1. Illustrate the various forms of coding tools required for software applications and web designs
2. Convert requirements into web content and graphic designs, leveraging reusable components

Unit 3.1 - Selection of Components and Tools for Web/Media Content Development

Unit Objectives



At the end of this unit, the participant will be able to:

1. Select reusable components, media and graphical packages and tools to develop media content

3.1.1 Reusable Components, Media and Graphical Packages

Reusable components are components that can be used many times in an application. The component has to be generic and has simple logic to be reusable. Along with components, content in the form of text, graphics, media and charts can also be reused. It is easy to reuse text-based in comparison to media and graphics. Text can be reused in parts like words, sentences or paragraphs. It is easy to reuse media and graphics as a whole rather than in portions. With the help of new internet graphic standards, it is easy to create reusable media and graphical content. Reusable content consists of graphics (patterns), templates, assets, content, frameworks, etc. Some of the common components that can be reused are source codes, documents, design and interfaces, user manuals, etc. To reuse components, a library of all the reusable components is created and any required component can be imported into any of the existing or new applications. Reusability helps to avoid duplication and wasted effort. Reuse can be a manual or an automated process.

Characteristics of reusable components:

A component should have certain qualities that make it reusable.

Each component should be well defined, serve a single function and be ready for reuse.

Interfaces should be defined as a small set of functions and used to bridge between components.

Modules and functions should be designed in a simple manner.

Fig. 3.1.1 Characteristics of Reusable Components

3.1.2 Benefits of Reusable Components, Media and Graphical Packages

Reusable components and content have become a necessity in organisations to fulfil the rising demand for quick and customized content along with decreased budgets, time and other resources. Systematic reuse leads to an increase in productivity, quality and costs. Some of the benefits are:

Increased speed in the development of new applications

Reduced maintenance time

Effective use of developers and content creators

Increased dependability as the software is already tried and tested

Consistency in content throughout the site

Utilization of the same content and components in different locations within and between sites

Reusing variations of similar content

Lower development costs

Helps in making updates and global changes quickly and easily

Enables a reusable framework that can be adapted for new projects

Fig. 3.1.2 Benefits of Reusable Components, Media and Graphical Packages

3.1.3 Drawbacks of Reusable Components, Media and Graphical Packages

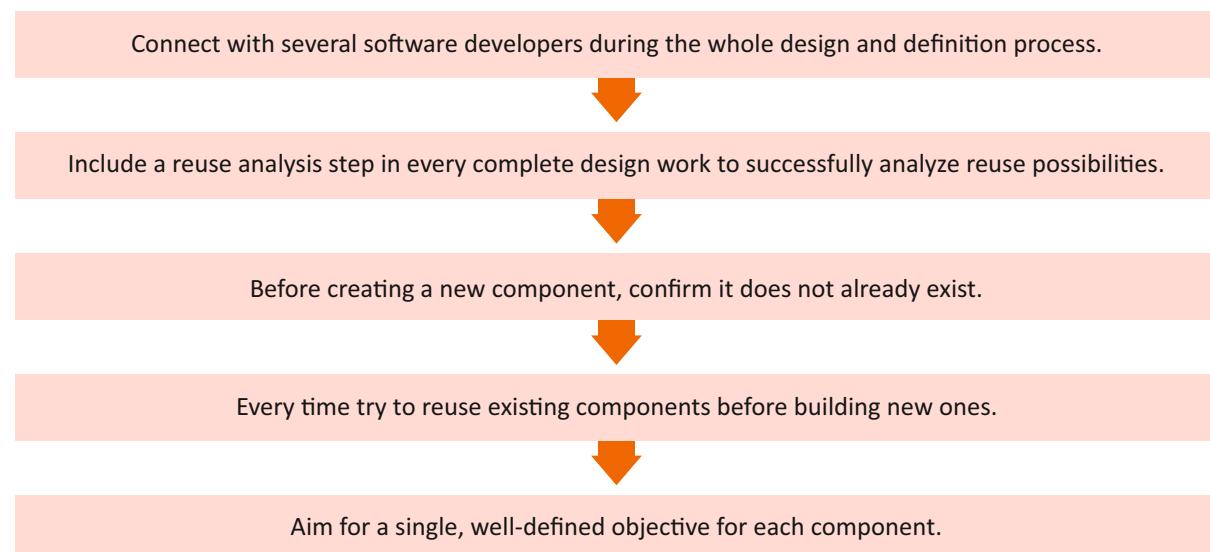
While reusable components are beneficial in many ways, most often the components are not reused as developers prefer to rewrite content rather than modify and use the existing content. In certain cases, the components may not be compatible with the existing systems. Some of the other common drawbacks are:



Fig. 3.1.3 Drawbacks of Reusable Components, Media and Graphical Packages

3.1.4 Guidelines to Create Reusable Components

The following are some of the practical principles and suggestions to help developers create new reusable components:



Continued...

Keep in mind that component reuse needs a lot more forward preparation. Project managers should prepare for further design time and less construction time.



Some other software developer must be able to maximize a component based on its inputs, final result, or outcomes and a summary. The component must pass this "self test."



Build components with the long term in mind, not simply a specific project in mind.



Make an additional effort to handle errors and make components sturdy.



Create a certification program and convey the certification requirements to all component developers.



Establish consistent design styles.



Implement and utilize naming standards.



When developing documentation, consider describing the component to a developer who is unaware with its underlying functioning or a developer who will never check at the component's code.

Fig. 3.1.4 Guidelines to Create Reusable Components

3.1.5 Tools Used for Reusing Media Content

There are various tools by developers to work to create new websites, improve and update existing ones, incorporate new components and designs, etc. The various reusable elements that are developed are patterns, components, frameworks, contents, assets, etc. These elements are implemented in a reusable design by using universal navigation and templates. Chunking and assembling techniques are used to break the web page into components which are assembled as blocks in specific regions on a page. Adobe Fireworks and Dreamweaver can be used to create websites with reusable components. These two tools provide a streamlined workflow for editing, optimizing and placing graphic files on HTML pages.

The designing skills require creating templates and reusable designs like:

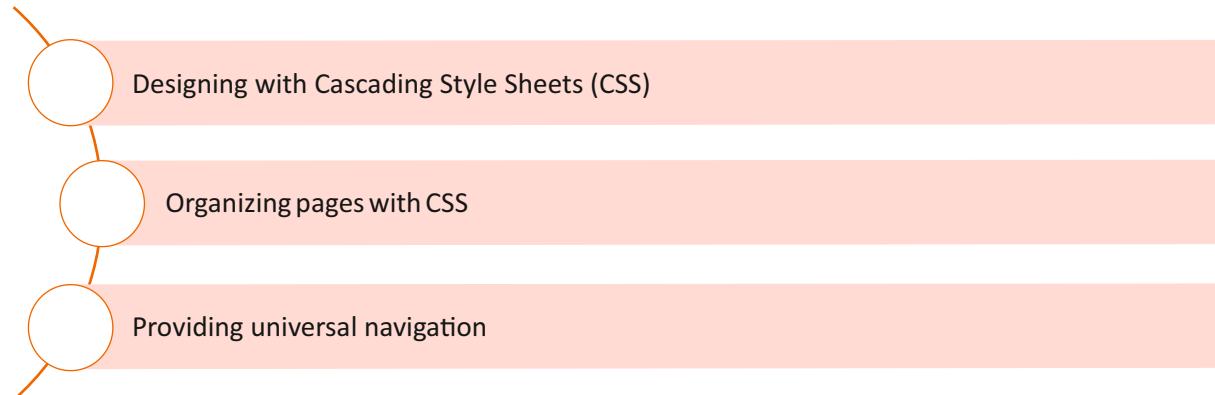


Fig. 3.1.5 Designing Skills Required for Creating Templates and Reusable designs

The following technical tasks are performed first by creating them in Fireworks and then importing them into Dreamweaver:

Fireworks

- Creating templates
- Creating buttons
- Creating navigation bars
- Creating pop-up menus

Dreamweaver

- Creating templates
- Creating rollover images
- Creating interactive buttons with CSS

Fig. 3.1.6 Technical Tasks Performed Using Fireworks and Dreamweaver

Some of the other tools that can be used are StoryBook, StencilJS, Bit and Styleguidist.

Unit 3.2 - Verification and Validation of Media and Graphics

Unit Objectives



At the end of this unit, the trainee will be able to:

1. Identify any defects and corrective actions taken to improve media and graphics

3.2.1 Verification of Media and Graphics

The process of design verification involves examining and showing proof to ascertain that the outcome of a software application satisfies the input requirements. It helps to understand if the design of the product is as per the requirement and is performed concurrently with the development stage of a specification.

The verification process typically includes identification of the specifications that can be verified; planning and selection of testing methods and strategies; carrying out the tests and reporting the findings. There are numerous methods for practising verification, such as peer reviews, walkthroughs, inspections, and so on, that can assist us in the prevention of potential flaws, which could lead to software failure.

- i. Verification ensures the product being developed is according to design specifications.
- ii. Verification answers the question— “Are we developing this product by firmly following all design specifications?”
- iii. Verifications concentrate on the design and system specifications.

3.2.2 Validation of Media and Graphics

The process of design validation involves checking the software application against the precise needs of stakeholders or end-users. Design validation is used to evaluate a software product once it has been developed to confirm that it fulfils the business needs for applications in the user's environment.



Fig. 3.2.1 Phases for Design Validation

Validation is focused on establishing the design's accuracy and reliability to the user's demands. This is the stage at which designers simply construct a product version and validate it against the customer's needs.

It is critical to provide the following details while conducting design validation:

Increased speed in the development of new applications

Reduced maintenance time

Effective use of developers and content creators

Increased dependability as the software is already tried and tested

Fig. 3.2.2 Details Required for Design Validation

The validation process involves the following steps:

A few of the designs may be evaluated by comparing them to similar components that serve the same goal. This approach is effective for validating configuration modifications for current infrastructure or basic designs that will be included in the latest system or application.

Validation of needs and other product functionality may be accomplished through demonstration and/or inspection.

The design can be analyzed using techniques such as arithmetical modelling and simulation to rebuild the necessary functions.

On the final design, tests are conducted to confirm the system's potential to function as specified.

The test plan, implementation, and outcomes should all be recorded and kept as part of the design records. As a result, validation is a compilation of the outcomes of all validation activities.

When using exactly equal products in final design validation, the manufacturing company must record the resemblance and any differences from early production.

Fig. 3.2.3 Steps for Validation Process

A product can pass verification and fail validation, when the product created meets the specifications but does not satisfy the user's demands.

Summary



- Reusable components are components that can be used many times in an application. Along with components, content in the form of text, graphics, media and charts can also be reused. Some of the common components that can be reused are source codes, documents, design and interfaces, user manuals, etc.
- Reusable components and content have become a necessity in organisations to fulfil the rising demand for quick and customized content along with decreased budgets, time and other resources. Systematic reuse leads to an increase in productivity, quality and costs.
- While reusable components are beneficial in many ways, most often the components are not reused as developers prefer to rewrite content rather than modify and use the existing content. In certain cases, the components may not be compatible with the existing systems.
- There are various tools by developers to work to create new websites, improve and update existing ones, incorporate new components and designs, etc. The various reusable elements that are developed are patterns, components, frameworks, contents, assets, etc. These elements are implemented in a reusable design by using universal navigation and templates. Chunking and assembling techniques are used to break the web page into components which are assembled as blocks in specific regions on a page.
- Some of the other tools that can be used are StoryBook, StencilJS, Bit and Styleguidist.
- The process of design verification involves examining and showing proof to ascertain that the outcome of a software application satisfies the input requirements. It helps to understand if the design of the product is as per the requirement and is performed concurrently with the development stage of a specification.
- The process of design validation involves checking the software application against the precise needs of stakeholders or end-users. Design validation is used to evaluate a software product once it has been developed to confirm that it fulfils the business needs for applications in the user's environment.
- It is possible for a product to pass verification and fail validation, when the product created meets the specifications but does not satisfy the user's demands.

Notes



Exercise



Answer the following questions:

1. List the benefits and drawbacks of reusable components.

2. Discuss the guideline to create reusable components.

3. What is meant by verification and validation of design?

Fill in the Blanks:

1. _____ are components that can be used many times in an application.
2. _____ and _____ techniques are used to break the web page into components which are assembled as blocks in specific regions on a page.
3. _____ is used to evaluate a software product once it has been developed to confirm that it fulfils the business needs for applications in the user's environment.

Choose the correct option:

1. Which one of the following is a tool that can be used for reusing media content?
 - a. Mockito
 - b. Joomla
 - c. StoryBook
 - d. Sketch
2. Which is not a phase of design validation?
 - a. User requirements
 - b. Design analysis
 - c. Design input
 - d. Design output

QR Code

Scan the QR Code to watch the related video



<https://youtu.be/IrdTWzRz5v0>

Unit 3.2 Verification and Validation of Media and Graphics





**IT - ITeS SSC
NASSCOM**

4. Interpret Design Specification

Unit 4.1 - Implementation of Web Design

Unit 4.2 - Technical Validation of a Web's HTML Implementation



SSC/N0503

Key Learning Outcomes



At the end of this module, the participant will be able to:

1. Identify any defects and corrective actions taken to improve media and graphics

Unit 4.1 - Implementation of Web Design

Unit Objectives



At the end of this unit, the participant will be able to:

- Identify the current practice in developing media content and graphic designs

4.1.1 Best Practices in Developing Media Content and Graphic Designs

We have covered the concept of graphic design, the different elements, and the tools used in the earlier modules. Here, we look into the web design standards.

While designing for the web, beyond aesthetics, user experience, usability, accessibility and business objectives also play an important role. The best practices for web design consider mainly three categories of standards, namely, brand standards, coding standards and accessibility standards.

Brand standards include all the objects that contribute to the look and feel of the Website. These include fonts, font styles and sizes, colors, positioning of objects, and other elements that pertain to the business.

Coding standards include programming standards defined by W3C. W3C is the international community that works together to develop web standards.

Accessibility standards are those standards, if adopted, ensure universal access. The standards and the guidelines to adopt them are covered by Web Content Accessibility Guidelines (WCAG) which is developed through the W3C process.

Refer to these links for details on this topic.

<https://www.w3.org/WAI/standards-guidelines/wcag/>

<https://www.w3.org/WAI/standards-guidelines/w3c-process/>

Let's look at little more details of these standards.

Standard	Description of Elements
Brand	<p>The effective distribution of visual elements on a web page is governed by the principle of design, Balance. A balanced design gives a clean and natural appearance with a good symmetry.</p> <p>Balance is achieved through symmetrical design, asymmetrical design or off-balance design.</p> <p>Composition involves the positioning and organisation of design elements on a web page. This is usually done as per the Rule of Thirds.</p> <p>Other things to be taken into consideration are color, font, typography, spacing, hierarchy, formatting,</p>

Continued...

Standard	Description of Elements
Coding	SEO practices, responsive design, navigation, page speed, and security are covered by coding in addition to the standard website design coding practices.
Accessibility	<p>The internet was designed to work for all people, irrespective of the hardware or software used, the user's language, and user's ability. In short, the internet aims at universal access with no barriers.</p> <p>Incorporating accessibility standards ensures the removal of any kind of barriers due to:</p> <ul style="list-style-type: none"> • Situations • Permanent disabilities • Temporary disabilities • Internet connection issues • Language differences • Type of Hardware/software <p>Making a website accessible has become mandatory due to:</p> <ul style="list-style-type: none"> • International standards and local laws • Need to cater diverse users • Need for Inclusivity • Win more business • SEO benefits

Table 4.1.1 Details of Design Standards

Notes



Fig. 4.1.1 Positioning of Web Design Elements

Careful design and delivery, meeting guidelines and standards, have become an integral part of website development to meet the growing needs of diverse learners and to meet the legal requirements.

4.1.2 Implementation of Web Page

The web design process includes defining strategy, creating wireframes, developing content, layout, creating visuals and media content, and more. The final step is the implementation of the webpage.

The process of building the web application in accordance with the planned design is implementation. As part of web implementation, hypertext markup language (HTML), Common Gateway Interface (CGI) programs, and/or Java scripts and/or applets are created.

Implementing a website means transitioning from the design stage to the completion and the launch of the site. During these phases, all the steps in the web development process are completed and finally the web pages are populated.

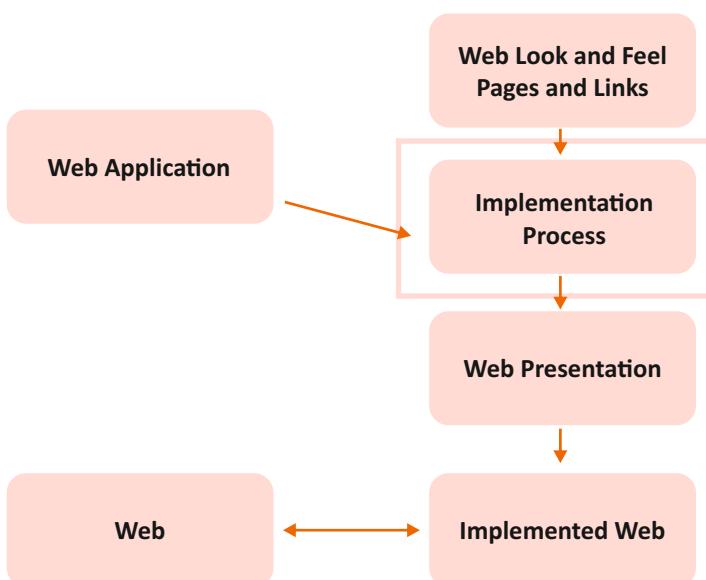


Fig 4.1.2 Web Implementation

4.1.3 Procedure for implementation

Designing of the images, graphics, content, layout and other elements for the web pages is a part of the development process. Implementation is the incorporation of these elements as per web design standards to ensure error-free sites.

Technical, accessibility and usability testing, recording errors, redesigning as per revised requirements, executing repeated tests, and revising based on test results are the various tasks done as part of implementation before the final version is deployed.

A web implementer should follow certain implementation practices during the implementation process.

Create an extendible directory and file structure to manage the web's files and/or software components (CGI or Java programs).

Use HTML tools where helpful.

Key Implementation Practices

Check the web's implementation in various browsers.

Use templates or web-generating schemes for supporting a consistent look and feel.

Fig. 4.1.3 Key Implementation Practices

4.1.4 Testing and Validating

Web sites might have different types of errors such as broken links, incorrect or difficult navigation, errors related to content, graphics, animation and more. Additionally, there can be security risks. The purpose of testing before deployment of web sites to minimise these errors and ensure quality. When deployed, anything can happen: broken links, difficult navigation, web security, and many other potential risks. A careful testing process is key to reducing these risks and maintaining web quality.

The different types of testing cover various aspects of a website.



Fig. 4.1.4 Types of Testing

Validation aims at the performance of the website. It focuses on whether the website functions as it was intended to and checks whether they meet the requirements of the end-users and all stakeholders.

Validation testing is done after the development process and the completion of verification testing.

4.1.5 Rework to Incorporate Feedback

Testing of web sites might be done by the testing team within the project team, end-users, or some defined groups. Pilot testing helps to identify various bugs.

All the reports are analysed, and changes required in the design is done. Retests are performed to ensure that all bugs are fixed.

Website feedback also includes customer feedback. Customers can share their experiences, issues, concerns, complaints, and appreciation of a website. This feedback gives an opportunity to the development team to improve the website and make it more user-friendly and functional to meet the needs of the customers.

Feedback can be obtained through mails, surveys, customer satisfaction surveys (CSAT), interviews, usability tests, polls, chats, widgets and more.

The feedback from users and customers help to analyze the requirements of the customers and also understand the performance of the website. It will provide actionable insights to improve the website and rank better.

Unit 4.2 Technical Validation of a Web's HTML Implementation

Unit Objectives



At the end of this unit, the participant will be able to:

1. Discuss the technical validation of a web's HTML implementation

4.2.1 Validation and its Importance

Validating a website is the process of ensuring that the web pages on a website conform to the norms or standards defined by different organisations. The importance of validation lies in the fact that all web pages have to be interpreted in an expected way by various devices, search engines, users and visitors to the web page.

If web pages conform to standards and regulations, it can be ensured that they are universally understood. Codes and styles have to meet the standards set by the World Wide Web Consortium (W3C) and pass the tests for CSS and XHTML. Besides setting standards, W3C also hosts a variety of page validators that are used for testing web pages.

Valid code is more accessible because of its compliance with standards. It works across more browsers and devices making it more usable and accessible. The treatment of invalid code will vary by different browsers. The validity of code would help a website to rank better.

HTML Validator is an online tool. It is used to validate the HTML syntax such as Open tags or unnecessary blanks in the application. This type of validation is done before the final deployment to ensure no disruption in the application flow at the time of execution.

4.2.2 Scope of Validation

Validation of websites ensures:

- Acceptance by most web designers
- Universal access across web browsers and operation systems
- Detection of problems and syntax errors
- Correctness of coding

Validation goes beyond testing using testing tools. It also includes user testing by people belonging to different persona, people using different devices and people with different abilities. This extended testing helps in universal acceptance of web pages and the barriers to access are removed.

Validation includes validation of/for:



Fig. 4.2.1 Validation Objects

4.2.3 Validation Tools

Here are a few validation tools and their uses. The tools are used for checking different aspects on a web page.

- Nu HTML Checker** • Checks HTML documents.
- Web-platform-tests** • Test and help the interoperability of the Web.
- CSS Validator** • Checks your Cascading Style Sheets (CSS).
- Link Checker** • Checks your web pages for broken links.
- Internationalization Checker** • Checks level of internationalization - friendliness.
- RDF Validator** • Checks and visualizes RDF documents.
- RSS feed Validator** • Validator for syndicated feeds. (RSS and Atom feeds)
- Unicorn** • Unified validator. HTML, CSS, Links & Mobile.

Fig. 4.2.2 Validation Tools

The validators fall under four main categories.

Free HTML Validators

- The Nu HTML5 Validator
- Aborla HTML Validator
- Dr. Watson HTML Validator

Premium HTML Validation Tools

- Total HTML Validator
- CSS HTML Validator
- Rocket Validator

Browser Extensions

- Firefox HTML Validator
- HTML Validator for Chrome
- Skynet

Online HTML Validators

- WDG Validator
- Freeformatter Validator
- W3C Markup Validation Service Online Tool
- JSON Formatter
- W3schools Validation Online Tool
- Validome Validator Online Tool

Fig. 4.2.3 Categories of Validation Tools

Notes



4.2.4 HTML Validation Methods by W3C's Markup Validation Service

Markup Validation Service checks the markup validity of Web documents in HTML, XHTML, SMIL, MathML, etc. through three different methods.

Validate by URL – Validation is done by using the URL of the web page.

Validate by Upload – Validation is done by uploading a document.

Validate by Direct Input – Validation is done by entering the HTML code.

Fig. 4.2.4 HTML Validation Methods

For each of these validation types, additional options can be defined to get output in different ways.

4.2.5 CSS HTML Validator

CSS HTML Validator can be used by anyone who has a website. It features a powerful custom syntax checking engine that is specifically designed to check HTML, XHTML, CSS, SEO, and more.

The advantage of CSS HTML Validator is that it does not send the HTML code and CSS documents over the internet and thereby protects privacy to the owner of the web page.

Notes



4.2.6 Implementation Checkpoints

While implementation of a website involves various testing and validation procedures, a final check may be done based on the following checklist. This would ensure elimination of errors and provide the users a good experience.

Proofread Your Content	Be aware of Legal requirements	Ensure Image Compatibility	Ensure security
Ensure identification by search engines	Make sure you have images configured to appear in social media shares	Set up a favicon	Validate titles
Check navigation	Check links and applications	Check forms and contact points	Test performance

Fig 4.2.5 Checklist Items for Website Implementation

Conclusion

The need for having a website is becoming more of a mandate than a choice in this competitive business world. It is also necessary to have a website that is informative, universally accessible and usable, and is user-friendly. To ensure that a website meets these qualities, testing and validation play a major role.

Summary



- A good website is an essential requirement for any business. Careful design and delivery, meeting guidelines and standards, have become an integral part of website development to meet the growing needs of diverse learners and to meet the legal requirements.
- While designing for the web, beyond aesthetics, user experience, usability, accessibility and business objectives also play an important role. The best practices for web design consider mainly three categories of standards, namely, brand standards, coding standards and accessibility standards.
 - Brand standards include all the objects that contribute to the look and feel of the Website. These include fonts, font styles and sizes, colors, positioning of objects, and other elements that pertain to the business.
 - Coding standards include programming standards defined by W3C. W3C is the international community that works together to develop web standards.

- Accessibility standards are those standards, if adopted, ensure universal access. The standards and the guidelines to adopt them are covered by Web Content Accessibility Guidelines (WCAG) which is developed through the W3C process.
- The web design process includes defining strategy, creating wireframes, developing content, layout, creating visuals and media content, and more. The final step is the implementation of the webpage.
- The process of building the web application in accordance with the planned design is implementation. As part of web implementation, hypertext markup language (HTML), Common Gateway Interface (CGI) programs, and/or Java scripts and/or applets are created.
- Designing of the images, graphics, content, layout and other elements for the web pages is a part of the development process. Implementation is the incorporation of these elements as per web design standards to ensure error-free sites.
- Technical, accessibility and usability testing, recording errors, redesigning as per revised requirements, executing repeated tests, and revising based on test results are the various tasks done as part of implementation before the final version is deployed.
- Key Implementation Practices include:
 - Create an extendible directory and file structure to manage the web's files and/or software components (CGI or Java programs).
 - Use HTML tools where helpful.
 - Check the web's implementation in various browsers.
 - Use templates or web-generating schemes for supporting a consistent look and feel.
- Web sites might have different types of errors such as broken links, incorrect or difficult navigation, errors related to content, graphics, animation and more. Additionally, there can be security risks. The purpose of testing before deployment of web sites to minimise these errors and ensure quality. is deployed, anything can happen: broken links, difficult navigation, web security, and many other potential risks. A careful testing process is key to reducing these risks and maintaining web quality.
- The different types of testing cover various aspects of a website.
 - Functionality Testing
 - Usability testing
 - Interface testing
 - Compatibility testing
 - Performance testing
 - Security testing
- Validating a website is the process of ensuring that the web pages on a website conform to the norms or standards defined by different organisations. The importance of validation lies in the fact that all web pages have to be interpreted in an expected way by various devices, search engines, users and visitors to the web page.
- Validation is done by using various tools and it ensures:
 - Acceptance by most web designers

- Universal access across web browsers and operation systems
- Detection of problems and syntax errors
- Correctness of coding

Exercise



Answer the following questions.

1. Name the three main standards followed in web designing.

2. Name the processes that are included in web design.

3. What are the key elements on a web page?

4. State key implementation practices that a web implementer should follow during the implementation process.

5. Explain the purpose of testing before the deployment of websites.

6. Describe the need for validation in web design.

7. Define the use of HTML Validator.

8. Explain the function of the following validation tools:

- a) Link Checker

b) Unicorn

c) Web-platform-tests

9. Describe the three methods through which Markup Validation Service checks the markup validity.

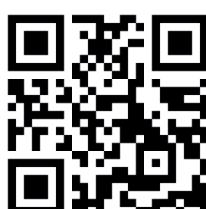
10. State the advantage of CSS HTML Validator.

Choose the correct option:

1. Which one of the following tools is not used for checking different aspects of a web page?
 - a. Web-platform-tests
 - b. RDF Validator
 - c. CSS Validator
 - d. Interface testing
2. Which type of testing is used to cover the various aspects of a website?
 - a. Interface testing
 - b. Compatibility testing
 - c. Performance testing
 - d. All of the above

QR Code

Scan the QR Code to watch the related video



<https://youtu.be/HF2fnQt-4xE>

Unit 4.1 Implementation of Web Design





**IT - ITeS SSC
NASSCOM**



<https://eskillindia.org/NewEmployability>



DGT/VSQ/N0102

Employability skills can be defined as those soft skills which employers look for in a potential employee. These skills equip the employees to carry out their role to the best of their ability and client satisfaction. For example, the ability to explain what you mean in a clear and concise way through written and spoken means helps to build a better relationship with the client or the customer. Similarly, handling stress that comes with deadlines for finishing work and ensuring that you meet the deadlines can be done through effective self-management training. It can also be done by working well with other people from different disciplines, backgrounds, and expertise to accomplish a task or goal. In today's digital age, employers expect that the employees should be able to make use of elementary functions of information and communication technology to retrieve, access, store, and produce, present and exchange information in collaborative networks via the Internet. Students need to develop entrepreneurial skills, so that they can develop necessary knowledge and skills to start their own business, thus becoming job creators rather than job seekers. Potential employees need to develop green skills, which are the technical skills, knowledge, values and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community. Thus, students are expected to acquire a range of skills so that you can meet the skill demands of the organisation that you would work for or to set up and run your own business.

This chapter is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

The scope covers the following:

- Introduction to Employability Skills
- Constitutional values – Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs.

Scan/Click this QR Code to access eBook

<https://eskillindia.org/NewEmployability>



Scan the QR codes or click on the link to watch the related videos



youtu.be/SVPIPwNekWc

Work ethics to follow in an organization



youtu.be/g3dN1wkiOL4

Significance of Healthy Team Bonding in Ideal Work Culture



youtu.be/MMTsI2xT2_8

Evacuation procedures for workers and visitors



youtu.be/jtmfiltg8Jw

Health, Safety, and Accident Reporting Procedures and the Importance



youtu.be/pNKOC9mNIOs

Follow the accurate process flow to analyze data





**IT - ITeS SSC
NASSCOM**

6. Annexure

Annexure : QR codes



ANNEXURE - QR Codes

Sl. No.	Chapter No.	Unit No.	Topic name	Page No.	QR Codes	URL
1	2. Analysis and Design of Web Based Applications	Unit 2.1 Process of conversions and testing new products and applications	Unit 2.1 Process of conversions and testing new products and applications	35		youtu.be/RXOq0d-5g9g
2	3. Develop Media Content and Graphic Designs for Software Products and Application	Unit 3.2 Verification and Validation of Media and Graphics	Unit 3.2 Verification and Validation of Media and Graphics	47		youtu.be/IrdTWzRz5v0
3	4. Interpret Design Specification	Unit 4.1 Implementation of Web Design	Unit 4.1 Implementation of Web Design	63		youtu.be/HF2fnQt-4xE
4	5. Employability Skills (DGT/VSQ/NO 102)	Employability and Entrepreneurship Skills	Work ethics to follow in an organization	67		youtu.be/XjUM90uNBSc
5	5. Employability Skills (DGT/VSQ/NO 102)	Employability and Entrepreneurship Skills	Significance of Healthy Team Bonding in Ideal Work Culture	67		youtu.be/WG5ag12xPbY

Sl. No.	Chapter No.	Unit No.	Topic name	Page No.	QR Codes	URL
6	5. Employability Skills (DGT/VSQ/N0 102)	Employability and Entrepreneurship Skills	Evacuation procedures for workers and visitors	67		youtu.be/MMTsl2xT2_8
7	5. Employability Skills (DGT/VSQ/N0 102)	Employability and Entrepreneurship Skills	Health, Safety, and Accident Reporting Procedures and the Importance	67		youtu.be/jtmfiltg8Jw
8	5. Employability Skills (DGT/VSQ/N0 102)	Employability and Entrepreneurship Skills	Follow the accurate process flow to analyze data	67		youtu.be/a8NETGQQhyl







Skill India
कौशल भारत - कुशल भारत



**IT - ITeS SSC
NASSCOM**

Address: IT - ITeS Sector Skill Council NASSCOM Plot No -7 to 10, Sector 126,

Noida, UP - 201303

Email: ssc@nasscom.in

Phone: 0120 4990172