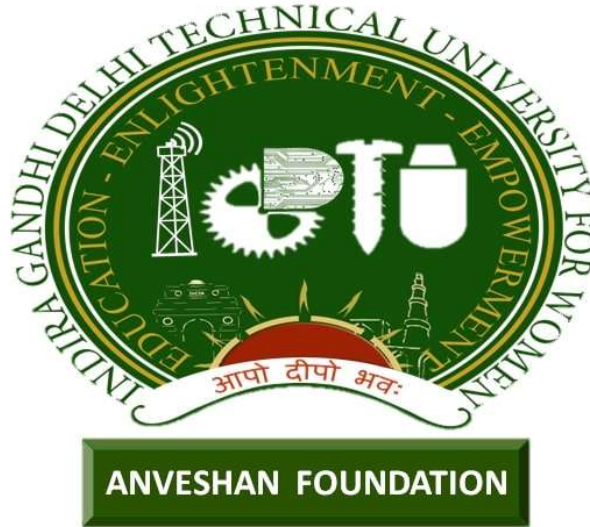


Indira Gandhi Delhi Technical University for Women

(Established by Govt. of Delhi vide Act 09 of 2012)

Kashmere Gate, Delhi – 110006



Internship Report

For

Web / App Development & Digital Marketing

Internship by

Anveshan Foundation IGDTUW

Name – Samriddhi Tiwari

Anveshan Enrolment No. – 202305251

Branch – CSE-AI

Enrolment No. - 11001172022

ACKNOWLEDGMENT

I would like to express my heartfelt gratitude to IGDTUW Anveshan Foundation for providing me with the opportunity to participate in the Web/App Development & Digital Marketing internship program. The foundation's dedication to developing talent and bridging the gap between industry and higher education is genuinely admirable.

I would like to extend a special note of appreciation to Mr. Rohit Kapoor, Founder and CEO of SK Info Techies, for his exceptional teaching and guidance in the area of web development. His extensive knowledge, practical insights, and teaching methodology have been instrumental in expanding my understanding of web development concepts. I am grateful for his dedication and willingness to share his expertise.

I would also like to express my gratitude to the Mrs. Aditi Agarwal for her expertise and guidance in the realm of digital marketing. Her insights into digital marketing strategies, trends, and analytics have been invaluable in broadening my understanding of the field.

Additionally, I would like to thank Mr. Dharam Rai Panwar and Mrs. Rashmi for their expertise and guidance in app development. Their practical insights and assistance throughout the internship have been instrumental in honing my skills and understanding of app development concepts.

Once again, I express my heartfelt appreciation to IGDTUW Anveshan Foundation, Mr. Rohit Kapoor, Mrs. Aditi Agarwal, and Mr. Dharam Rai Panwar and Mrs. Rashmi for their invaluable contributions to my internship experience. The knowledge and skills gained during this program will undoubtedly shape my future endeavours in the field.

Name- Samriddhi Tiwari

(Anveshan Enrolment No. 202305251)

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EXECUTIVE SUMMARY

A 6-week internship with IGDТУW Anveshan Foundation focused on Web/App Development and Digital Marketing was kept. The internship commenced on May 29, 2023, and concluded on July 7, 2023. The program consisted of 32 hours of online sessions conducted by industry professionals, covering various topics related to Web Development, Digital Marketing, and App Development. Additionally, students were provided with 8 hours of dedicated project assistance spread over the weeks.

During the internship, students had the opportunity to learn from experienced professionals who shared their expertise and insights in the field. The online sessions were informative and engaging, providing a comprehensive understanding of web development, digital marketing strategies, and app development concepts. The practical knowledge gained during the sessions was invaluable in bridging the gap between theoretical learning and real-world application.

FRONT-END WEB DEVELOPMENT

The initial sessions of the internship focused on the fundamental concepts of Web Development, with a particular emphasis on Front-End development. The topics covered during these sessions included the basics of HTML, CSS, Bootstrap, and jQuery. These foundational topics play a crucial role in the design and development of websites, providing web designers with the necessary tools and techniques.

The CSS segment focused on styling and design, covering selectors, cascading styles, and the box model. Participants explored a wide range of CSS properties for effective element styling, such as typography, margins, padding, and positioning. Understanding responsive design principles allowed them to create web pages that adapt seamlessly to various devices.

In the jQuery segment, interns were introduced to interactive web development. They learned to manipulate the DOM, handle events, and implement animations, enabling the creation of engaging user experiences. Real-world challenges and practical exercises honed their problem-solving abilities.

The sessions were thoroughly designed to deliver comprehensive knowledge and foster an interactive learning environment. Mr. Rohit Kapoor imparted valuable insights, explaining the key concepts and demonstrating practical examples. The interactive nature of the sessions allowed for active participation, encouraging us to ask questions and seek clarification, which further enhanced our understanding.

DIGITAL MARKETING

The following sessions of the internship were dedicated to Digital Marketing, where students looked into the essential concepts and strategies required for effective online marketing. Led by Mrs. Aditi Agarwal, these sessions provided the participants with valuable insights and practical knowledge.

Digital marketing includes a wide range of elements, including audience, content, context, and media, and has progressed far beyond simple advertising. It actively promotes goods and services through online services through platforms like social media, SEO, email marketing, and others. Effective audience targeting and engagement depend on choosing the correct marketing channel. Embracing digital marketing is crucial since it offers cost-effectiveness, convenience of control, and accessibility throughout the globe. It also symbolises the future of marketing. Data analytics plays a vital role in shaping the future of businesses by providing insights into customer behaviour, market trends, and improving decision-making.

The sessions were carefully planned to use examples from everyday life to explain the terms of digital marketing. Aditi Ma'am's engaging personality made the sessions interacting and educational. Overall, the sessions demonstrated how data analytics and digital marketing are transforming industries, propelling enterprises forward, and changing how goods and services are marketed and priced in the contemporary world. They also helped students gain insights on the topic.

APP DEVELOPMENT

The last few sessions were about App Development in which Mr. Dharam Rai and Mrs. Rashmi introduced mobile application development using MIT App Inventor. With their extensive knowledge and expertise, they guided the students through the process of creating mobile applications from scratch.

In the realm of app development, two fundamental concepts, innovation, and open source, have emerged as crucial pillars driving progress. Innovation fosters a dynamic environment, pushing developers to create cutting-edge mobile applications that cater to evolving user needs. It inspires novel frameworks and tools, fostering continuous improvement and advancement within the app development community. Simultaneously, open source promotes collaboration among developers worldwide, democratizing knowledge and accelerating app development. Open-source projects benefit from a diverse community of contributors, resulting in robust and cost-effective software accessible to a broader audience.

MIT App Inventor exemplifies the principles of innovation and open source in app development. As an open-source visual programming environment, it empowers individuals with diverse backgrounds, including educators and students, to create Android mobile applications with ease.

The sessions were designed to be interactive and project-based, allowing participants to apply the concepts learned in real-world scenarios. Collaborating in teams of 1-4 students, participants had the opportunity to work on their own app ideas, creating prototypes and refining the designs under the guidance of Sir and his team. Also, His patience, support, and willingness to address everyone's queries played a vital role in their learning journey.

INTRODUCTION

Websites and applications have assimilated into society in today's technologically advanced world, revolutionising the way tasks are carried out and facilitating easy access to services and information. These online platforms are extremely powerful and are revolutionising many facets of daily life.

Task execution has changed as a result of websites and applications, which now provide integrated experiences for learning, banking, shopping, and entertainment. Through these platforms, people may conveniently access a wide range of information, connect with people around the world, and conduct transactions while relaxing in their homes. These platforms' ease of use and accessibility have significantly altered how people engage with the outside world.

Websites and apps have expanded the marketing opportunities available to companies, allowing them to better promote their products. In order to effectively reach and engage target audiences, digital marketing methods have become potent tools. Online advertising, social media marketing, search engine optimisation (SEO), content marketing, and email marketing are just a few of the strategies used to boost brand awareness and boost sales.

Digital marketing and web/app development each have their own unique set of difficulties. Due to the importance of security and data privacy, strong safeguards must be put in place to protect user information. Usability and user experience are crucial, necessitating logical designs and easy navigation. Search engine optimization's continuous problems include adapting to search engine algorithms and creating powerful keyword strategies. Despite these challenges, understanding these fields opens the digital world to countless opportunities.

In conclusion, websites and applications have transformed how information is accessible, relationships are established, and business is done in today's digitally driven society. Along with these technological developments, the field of digital marketing has developed, giving firms strong tools for connecting with their target audiences and achieving marketing goals. To fully utilise the capabilities of these digital platforms and prosper in the constantly changing digital environment, individuals and businesses must have a firm grasp of web/app development and the principles of digital marketing.

OBJECTIVE / LEARNING OUTCOME

The objectives of the web/app development and digital marketing internship were to provide participants with comprehensive knowledge and practical skills in these domains which included:

- To Study basics of Web/ App Development in order to understand & development websites and how marketing is shifting towards digital space,
- To provide knowledge regarding all the digital marketing aspects like SEO, SEM, social media and Content Marketing, Branding, Marketing Analytics,
- Explain emerging trends in digital marketing and critically assess the use of digital marketing tools by applying relevant marketing theories and frameworks, and
- Interpret the traditional marketing mix within the context of a changing and extended range of digital strategies and tactics.

The students gained a variety of skills during the internship and the specific learning outcomes were as follows:

❖ Technological based learning:

- Understanding Web Development: Participants gained a solid understanding of web development concepts, including HTML, CSS, Bootstrap, and jQuery. They learned how to design and create visually appealing and functional websites.
- Digital Marketing Fundamentals: Participants were introduced to the fundamentals of digital marketing, including planning, SEO vs. SEM, social media marketing, email marketing, and digital tools. They learned how to develop effective digital marketing strategies and campaigns.
- Application Development: Participants learned how to utilize MIT App Inventor and its various features to develop mobile applications. They gained hands-on experience in designing and creating basic app prototypes.

❖ Experience based learning:

- Practical Project Experience: Participants had the opportunity to work on real-world projects, applying their knowledge and skills acquired during the internship. They gained practical experience in web/app development and digital marketing under the guidance of industry professionals.
- Awareness of Industry Trends: Participants were exposed to current industry trends and best practices in web/app development and digital marketing. They gained insights into emerging technologies and strategies that can shape the future of these fields.

❖ Soft Skill based learning:

- Collaboration and Teamwork: Participants learned how to work effectively in teams, collaborating with fellow interns on group projects. They developed skills in communication, problem-solving, and project management.
- Time Management: Participants learned how to manage college studies with the internship sessions effectively to get the best results out of all. They developed skill in time management and adaptability in any situation.

The main goal of these internships was to provide hands-on learning opportunities in the subjects they covered while equipping the interns with the information and abilities needed to succeed in the fast-paced and cutthroat digital sectors. The internships were designed to close the gap between theoretical understanding and real-world application by giving the interns insightful perspectives and practical experience. The expectation was that by the end of each internship, the intern would have developed a set of specialised skills and competences that would support their professional and personal development and position them for potential future careers in front end web development, digital marketing, or app development.

The interns had the chance to explore and engage with cutting-edge technology, industry trends, and real-world difficulties through these immersive and stimulating internship experiences, which encouraged a spirit of inquiry, invention, and adaptability. The internships not only gave students a chance to advance their technical knowledge but also supported the growth of crucial soft skills like teamwork, communication, and problem-solving, resulting in well-rounded professionals ready to succeed in the rapidly changing digital environment. The emphasis placed during the internships on open-source innovation, teamwork, and creative ideation encouraged an entrepreneurial perspective and prepared the interns to be change-makers in the digital sphere. These life-changing encounters not only expanded their knowledge but also gave them the self-assurance to take on difficulties and deal with complexity in their future endeavours.

REVIEW OF LITERATURE

FRONTEND WEB DEVELOPMENT

The in-depth instruction on all facets of web development throughout the Front-End Web Development part of the internship. HTML, CSS, and the fundamentals of jQuery were the three main topics of the programme. The interns learned the essentials of developing structured web content in the HTML section, which covered semantic markup and the appropriate use of tags and attributes. They developed their ability to organise content on a web page and learnt how to create key page components such headings, paragraphs, lists, and links.

The interns then dived into the area of styling and design after learning CSS. They learned about the nuances of selectors, the box model, and cascade styles. The lesson covers a wide range of CSS attributes, including colour, font, margins, padding, placement, and more, that are used to style elements. The interns were able to put their knowledge into practise and design aesthetically appealing web page layouts thanks to practical tasks. Knowing the fundamentals of responsive design, they acquired the skills necessary to create user interfaces that fluidly change to fit different screen sizes and devices.

The interns also learned the fundamentals of jQuery, allowing them to explore the world of interactive web programming. They taught how to add dynamic behaviour to web pages by modifying the Document Object Model (DOM) using jQuery. This entailed producing animations, managing events, and generating interactive features. The internship gave the interns plenty of chances to work on real-world projects and use their newly acquired skills to build straightforward yet interesting interactive features for web pages.

Problem-solving and original thought were stressed throughout the training in web development. The interns were encouraged to come up with and put into action solutions for problems in the real world. Combining the ideas from HTML, CSS, and jQuery gave them the ability to create dynamic interactions with straightforward JavaScript capabilities while yet maintaining the functionality and aesthetics of static web pages.

The interns were able to build a solid foundation in front-end web development thanks to the training's comprehensive nature and practical, hands-on approach. By the end of the internship, they had gained the self-assurance needed to take on challenging web development projects and had discovered a passion for developing engaging and user-friendly web experiences. As the interns pursue additional endeavours in the always changing field of web development, the skills learned during the internship will continue to be of great value.

HTML

With a focus on HTML (Hypertext Markup Language), the HTML Fundamentals session offered a thorough introduction to web development. The purpose of the course was to give students the fundamental information and abilities needed to build static web pages and comprehend the organisation and content of websites. Through practical

exercises and projects, students gained experience throughout the course, making it appropriate for those new to web programming.

Course Content:

- (1) Introduction to HTML: The course started with an overview of HTML, its role in web development, and the basic syntax of HTML tags. Learners were introduced to essential concepts like elements, attributes, and nesting.
- (2) HTML Document Structure: The course covered the essential structure of an HTML document, including the ``, ``, and `` elements. Learners understood the importance of proper document structure for creating well-formed web pages.
- (3) Text Formatting: Learners explored various text formatting tags, such as headings, paragraphs, lists, and inline elements like `**`, `*`, and `` (anchors).***
- (4) Working with Images: The course included instructions on how to embed images using the `` tag and explored image attributes for resizing and optimization.
- (5) Creating Links: Learners were taught how to create hyperlinks using the `` tag to link pages within the website or to external resources.
- (6) Tables: The course covered the creation of tables in HTML, including `

`, and ` <th>`, and how to format tabular data.</th>	`, and how to format tabular data.
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- (7) Forms and Input Elements: Learners delved into creating interactive forms using form elements like ``, ``, `<select>`, and form attributes.(8) Semantic HTML: The course introduced the concept of semantic HTML, emphasizing the use of elements like `<header>`, `<nav>`, `<main>`, `<article>`, and `<footer>` to provide better structure and meaning to web content.(9) HTML Validation and Best Practices: Learners were encouraged to validate their HTML code and adhere to best practices to ensure cross-browser compatibility and accessibility.</div><div data-bbox="81 639 888 746" data-label="Text"><p>The HTML Fundamentals course was an excellent introduction to web development for beginners. It covered all the essential HTML concepts, providing learners with a solid foundation for further exploration into front-end web development. The hands-on approach and interactive nature of the course made learning enjoyable and effective. As a result of completing this course, learners were equipped with the skills to create basic static web pages and continue their journey in web development with confidence.</p></div><div data-bbox="81 793 118 809" data-label="Section-Header"><h4>CSS</h4></div><div data-bbox="81 824 895 887" data-label="Text"><p>The course provided an in-depth exploration of Cascading Style Sheets (CSS) for web development. The course aimed to equip us with the knowledge and skills to effectively style and design web pages, enhancing their visual appeal and user experience.</p></div><div data-bbox="474 939 508 956" data-label="Page-Footer"><p>- 9 -</p></div>

Course Content:

- (1) Introduction to CSS: The course began with an introduction to CSS, its role in web development, and how it complements HTML to style and format web pages.
- (2) Selectors and Properties: Learners were taught about CSS selectors and how to target HTML elements for styling. They explored a wide range of CSS properties, including those related to color, typography, layout, margins, padding, and positioning.
- (3) Box Model: The course covered the box model concept, which is crucial for understanding how elements are displayed and spaced on a web page.
- (4) CSS Layout Techniques: Learners delved into various CSS layout techniques, including using floats, flexbox, and CSS Grid to create responsive and flexible page layouts.
- (5) CSS Transitions and Animations: The course introduced learners to CSS transitions and animations, enabling them to create engaging and interactive elements on their web pages.
- (6) Responsive Design with Media Queries: Learners explored media queries, a fundamental aspect of responsive web design, to make websites adapt and display correctly on different devices and screen sizes.

After mastering HTML, the training shifted its focus to Cascading Style Sheets (CSS). The intern was introduced to the fundamentals of CSS, including the concept of cascading, specificity, and the box model. They learned about almost all CSS properties used for styling elements, such as color, typography, margins, padding, positioning, and more. The training provided hands-on exercises to reinforce these concepts, allowing the intern to create visually appealing and responsive web page layouts. They also gained insights into CSS frameworks like Bootstrap, which further simplified the process of building responsive designs.

jQuery

The training session gave participants a thorough introduction to jQuery, a well-liked JavaScript library used to streamline and improve web development. The goal of the course was to give students the foundational knowledge and abilities they would need to use jQuery to build dynamic and interactive web sites. The course, which was created for those new to web development, reinforced the concepts taught by using real-world projects and applicable examples.

The two languages are closely related, with jQuery being a JavaScript library made to make common operations including DOM manipulation easier. Developers frequently choose jQuery because of its simplicity and cross-browser compatibility because it simplifies coding and improves user experience. But each language has advantages over the other, and combining JavaScript with jQuery makes it easier for programmers to make dynamic and interactive online apps.

Course Content:

- (1) Introduction to jQuery: The course began with an overview of jQuery, its purpose, and how it simplifies DOM manipulation and event handling compared to raw JavaScript.
- (2) Selectors: Learners were introduced to jQuery's powerful selector engine, which allows them to easily target and manipulate HTML elements using CSS-like selectors.
- (3) DOM Manipulation: The course covered essential jQuery methods for manipulating the DOM (Document Object Model), such as adding, removing, and modifying HTML elements and content.
- (4) Event Handling: Learners explored event handling in jQuery, understanding how to respond to user interactions like clicks, mouse movements, and form submissions.
- (5) Animations: The course introduced jQuery's animation capabilities, teaching learners how to create smooth transitions and animations for various web elements.

The addition of the jQuery Basics course to the field of web development education has proven to be extremely beneficial. It provided a thorough and approachable introduction to the potent jQuery library, giving learners the tools they needed to construct interactive websites. The course offered interactive projects that allowed students to get their hands dirty while learning important concepts like element selection, manipulation, event handling, and animations. This increased engagement and reinforced learning. It makes a significant contribution to the body of knowledge on web development training because of its success in generating practical expertise.

PRACTICAL EXERCISE

Throughout the training, we were given a series of practical exercises to apply the knowledge we acquired. These practice exercises were progressively challenging, allowing us to build upon our skills and tackle more complex web development tasks.

Solution for Assignment: (refer to Annexure 2 for solution code)

<p>The days in a week:</p> <ul style="list-style-type: none"> • Monday • Tuesday • Wednesday • Thursday • Friday • Saturday • Sunday 	<table border="1"> <thead> <tr> <th>Web dev</th> <th>DM</th> <th>App dev</th> </tr> </thead> <tbody> <tr> <td>CSS</td> <td>Channels</td> <td>Front-end</td> </tr> <tr> <td>Bootstrap</td> <td>SEO</td> <td>MIT App Inventor</td> </tr> <tr> <td>jQuery</td> <td>SEM</td> <td>Database</td> </tr> </tbody> </table>	Web dev	DM	App dev	CSS	Channels	Front-end	Bootstrap	SEO	MIT App Inventor	jQuery	SEM	Database	
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CSS	Channels	Front-end												
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DIGITAL MARKETING

Marketing is all about communicating right message to the right people using right channel. Mediums can be distributing posters, words of mouth, social media, etc. Digital marketing, on the other hand, uses mediums which include internet services. Digital marketing can be described as actively promoting products and services using digital distribution channels as an alternative to the more traditional mediums such as television, print and radio.

Digital marketing is all about using digital platforms like websites, blogs, social media and mobile marketing to reach target audience. It should be kept in mind that information provided in the marketing strategies is not always true. One needs to validate the claims made by the company. This doesn't change the fact that digital marketing is the future of marketing. Internet is the key enabler of Digital Marketing. It cannot exist without internet and is also known as Internet marketing or Online Marketing. Digital marketing and digital advertising have advantage over traditional methods as digital marketing is easy to start, manage and monitor. It is less expensive and more effective than traditional marketing.

There are four components of Digital Marketing- (1) Audience (2) Content (3) Context (4) Medium

(1) Audience – Audience means real people who will either read content, watch videos or listen to audios. They are people those who will consume a product's message. Audience is core of the Digital marketing

(2) Content – Content is what the audience consume. Everything in the marketing world depends on the content created. Content is the king.

(3) Context – Context will define subject or objective of content. Context and content work together to provide an ultimate value experience for the audience.

(4) Medium – Medium is the platform used for distribution of message to the audience. Choosing the right medium plays a crucial role in the world of Digital Marketing.

There can also be different marketing channels which include Content Marketing, SEO, Pay Per Click, Affiliate Marketing, Social Media Marketing, Email Marketing, Online Public Relations, Viral Marketing, Influencer Marketing. Digital Marketing channels enable you to connect with the audience efficiently and effectively. They help you expand reach and improve marketing.

DIGITAL MARKETING STRATEGY AND PLANNING

A digital marketing strategy is a comprehensive gameplan that outlines how a person reach their target audience and convert them into paying customers. Social media presents itself in the form of many variable applications like Google, Twitter, Flickr, and many more. The steps to plan an effective marketing strategy are

Step 1 – Understand your industry - It is worthwhile to analyze the state of your industry – whether as a prospective new entrant or as an existing player in the game. One way to do this is with Porter's Five Forces Analysis. This method of studying an industry considers five different criteria and how high the power, threat, or rivalry in each area is. The five forces in the analysis are Competitive Rivalry, Threat of new Entrants, Threat of Substitution, Buyer Power, and Supplier Power. After you complete your analysis, take note of how often categories are marked as "high" or "low". It is

good to have more lows than highs. These forces can change at any time, so staying on top of industry trends and getting a high-level look at your market is essential for long-term success.

Step 2 – Understand your competition - SWOT Analysis is done to analyze where you fit into the industry and understanding the competition. A SWOT Analysis looks at company's internal strengths and weaknesses and the external opportunities and threats within the market. Completing this analysis will highlight the direct areas of opportunities your company can start building on or working to overcome.

Step 3 – Understand your buyers - It is of utmost importance that you know where you stand in the eyes of your customers and potential customers. Taking this time and effort to learn how your company or product will be perceived in the market is a vital action all businesses must routinely take. This will help you gain better understanding about the facts of your target market, what matters to someone who would purchase from you, the demand for your product, the potential price points, perception on competition, and impressions of your branding. Before you get surveying your buyers, it is helpful to define them with buyer personas – semi-fictional generalizations of who your target customers are. Understanding your buyer personas guides your survey construction to be more tailored to your intended audience.

Most businesses need a combination of the above given channels to build your effective growth strategy. We like to break it down to Organic and Paid channels for further clarity on showing effectiveness of these campaigns. Organic growth channels bring in slow growth to a business but is the most valuable and trusted source, especially when you are looking to build a quality lead pipeline. Paid growth is the fastest source for lead generation and sales for any business. It is the backbone of growth for all businesses to start seeing revenue growth.

Step 4 – Understand marketing metrics and goals - For understanding marketing metrics and goals, Digital Marketing KPIs or Key Performance Indicators are quantifiable goals which help you to track and measure success. KPIs are a useful way for business owners to see the actual results of their digital marketing campaigns. The most important data point in this is 'Customer Lifetime Value'. If your digital marketing strategies are focused on increasing your customer lifetime value i.e., repeat business, it automatically sets you up for continuous growth.

Step 5 – Create digital marketing strategy - Every Digital Marketing strategy comprises of the 5D's which are Digital Technology, Digital Data, Digital Channels, Digital Metrics, Digital Devices. These 5D's together with 13 steps written above to create the digital marketing strategy can help make an effective strategy plan to boost your business.

SEARCH ENGINE OPTIMIZATION

It is the heart of digital marketing. "Natural" or "organic" search engine optimization (SEO) is designing, writing and HTML-coding a website to maximize the chance its pages will appear at the top of spider-based search engine results for selected keywords and phrases. SEO is an iterative process; it has dynamic environment. It is an art or science that what are the current algorithms for web-crawlers.

A good SEO strategy is

- Research desirable keywords and search phrases

- Identify search phrases to target (Should be relevant to business/market, obtainable and profitable)
- “Clean” and optimize a website’s HTML-code for appropriate keyword density, title tag optimization, internal linking structure, heading and subheadings, etc.
- Help in writing copy to appeal to both search engines and actual website visitors.
- Study competitors, competing websites and search engines.
- Implement a quality link building campaign.
- Add quality content.
- Constant monitoring of ranking for targeted search terms.

Search engines have algorithms which complete operations such as gathering content with the help of crawler or spider that moves recursively downloading content. There are other operations which build sophisticated indexes and individual web searches run against the index. In individual web searches run against the index, results are retrieved and ordered as well as page rank and relevance are also marked.

SEARCH ENGINE MARKETING

Search engine optimization and search engine marketing go together.

The “What” of the product is answered by ads which consists of a headline, one or two lines about the product, display URL and destination URL. But there are also some restrictions on it, such as character limit and punctuation.

There are specific companies, agencies or in-house teams who manage advertisements on search engines. Some ad agencies are RKG, iProspect, eFrontier who charge fees to manage advertisements. In-house teams are usually a subset of the marketing team and report to CMO. But these agencies are not always required because people can themselves manage advertisements and promote their business on search engines without any external help. It is beneficial for companies to promote their business using SEM because it is one of the best and easily accessible methods that usually gives positive results to marketing. Even in a down economy, it can bring profit to the company.

Now let us compare SEO with SEM. The channels look similar but are different. It seems that Google makes more money by making SEM ads look more like SEO natural results. These two channels work together and not against each other. Effective marketing programs use these to complement each other. We will compare Pay-Per-Click which is an example of SEM with “organic” SEO.

<u>Pay-Per-Click</u>	<u>“Organic” SEO</u>
<ul style="list-style-type: none"> • Results in 1-2 days • Easier for a novice or one little knowledge of SEO • Ability to turn on and off at any moment • Generally, more costly per visitor and per conversion • Fewer impressions and exposure • Easier to compete in highly competitive market space • Ability to generate exposure on related sites 	<ul style="list-style-type: none"> • Results take 2 weeks to 4 months • Requires ongoing learning and experience to achieve results • Very difficult to control flow of traffic • Generally, more cost effective, does not penalize for more traffic • SERPs are more popular than sponsored ads • Very difficult to compete in highly competitive market space • Ability to generate exposure on related websites

<ul style="list-style-type: none"> • Ability to target “local” markets • Better for short-term and high margin campaigns 	<ul style="list-style-type: none"> • More difficult to target local markets • Better for long-term and lower margin campaigns
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SOCIAL MEDIA MARKETING AND ADVERTISING

In basic terms, marketing is the process of identifying customer needs and determining best to meet those needs. In contrast, advertising is the exercise of promoting a company and its products or services through paid channels. We can say that advertising is a component of marketing. Advertising can be widely done on social media. The purpose of Social Media Marketing is to maintain a market presence, create awareness about a cause or to promote events. Social media marketing can also be used for brand management and to gather customer response. So, it becomes important to be active with meaningful messages on social media platforms to maintain market presence.

The best practices that can be followed by a marketing team can be

- Use 80/20 rule: 20% of the total content should be the content that deals with the brand and info that benefits the audience (discounts, etc.) and the remaining 80% should be interesting content that is sharable.
- Follow influencers and learn from what they find interesting
- Share interesting content with your own followers and try to connect with them
- Engage with your influencers so it motivates them to want to share your own content
- Hashtags can also be used for this purpose. A hashtag is a word or phrase preceded by a hash or pound sign (#) and is used to identify message on a single topic message on a specific topic.

The optimal techniques to get market success using social media marketing are

1. Create a business page
2. Verify your page
3. Invite friends to like your page
4. Enable reviews
5. Use the correct size cover photo (generally 851px by 315px)
6. Use the correct size for profile picture (generally 180px by 180px)
7. Search through the settings for publishing options, messaging options, page roles, etc.

E-MAIL MARKETING

Email marketing is a powerful digital marketing tactic that enables companies to communicate directly and specifically with their audience. Companies can send their target customers relevant and interesting material by creating an email list of subscribers who have voluntarily chosen to receive communications. Promotional offers, product updates, educational newsletters, and useful links might all be included in this content. Businesses may carefully segment their audiences and personalise their communications to fit the requirements and interests of each group, ensuring that receivers get material that is relevant to them.

Effectively managing email marketing involves a series of strategic steps. Firstly, defining clear objectives is crucial to aligning campaigns with business goals. Determining communication strategies ensures that the right messages are delivered to the right audience at the right time. Reaching the target audience involves segmenting the email list and using personalized content. Designing creative emails with engaging visuals and compelling copy is essential to capturing recipients' attention. Regularly evaluating results allows for data-driven optimizations and improvements. Selecting a suitable email marketing solution simplifies the process and enhances efficiency. By following these steps, businesses can harness the power of email marketing to drive success and achieve their marketing objectives.

Email marketing serves a multitude of common objectives for businesses seeking to expand their reach and foster stronger connections with their audience. It works as an effective tool to attract new leads, registrants, customers, and clients by luring potential customers with alluring content and offers. In addition, it promotes quick sales through carefully planned ads that nudge audience members towards action. Email marketing is also essential for boosting customer retention programmes, cultivating long-lasting relationships with current clients, and giving them useful information about a business or a product. Targeted emails sent after orders are placed enable post-purchase communication, assuring client satisfaction and promoting repeat business. By supporting growth through customised and effective communication, email marketing equips companies to reach their objectives.

Viral marketing is a powerful and cost-effective strategy that leverages social networks and word-of-mouth to rapidly spread messages and content among a large audience. The ultimate goal of viral marketing is to generate buzz and excitement around a brand, product, or message, tapping into the power of social influence to achieve widespread awareness and recognition. In viral marketing, various messages gain traction and spread rapidly across social networks and messaging platforms. Merchandise deals, promotions, and price/coupon offers create urgency and drive sales, while social and political messages aligning with audience beliefs invoke passionate sharing. Warnings and advisories provide valuable information for safety and health, while funny, informative, work-related, and tech-related messages trigger emotional responses, captivating a broad audience. The common thread among these shareable messages is their relevance and ability to strike a chord with recipients, encouraging widespread sharing and engagement.

Email user's preferred email marketing privacy and customer support practices

- Unsubscribe option in all emails
- Explicit no-share-address policy
- 48-hour email support answers
- Editable personal preferences page
- Provide phone numbers in emails
- Explicit privacy policy
- Double opt-in confirmation
- Unchecked default opt-in box
- Third-party privacy seal in emails

Crafting effective email messages involves attention to key factors like an enticing subject line, creativity, and dynamic content. Keep emails short and include relevant links to your website. Avoid reusing content to keep messages fresh.

Understanding your customers allows for targeted and personalized content. Test different elements to optimize email performance.

There are some methods to measure the effectiveness of email marketing campaigns-

- Click through rates – unique and sum of events and comparisons
- Unsubscribe rates
- Open rates
- Conversion rates (website tracking)
- Click-stream analysis
- Email pass along rates – viral marketing
- Coupon codes
- Anonymous tracking to respect privacy
- Campaign comparison reporting

<u>Maintain your server</u>	<u>Outsource your list hosting</u>
<ul style="list-style-type: none">• Hardware / computer network• Dedicated internet connection• Software for email management and delivery• Best for large loads and those with experience• More cost-effective / economics of scale• Flexibility to create campaigns on the fly	<ul style="list-style-type: none">• Reliability and experience• Redundant servers and delivery capacity• Flexibility to maintain company internet presence• Ability to move from hosting to in-house when ready• More expensive• Rely on company's schedule

Evaluating options

- Evaluate software product or hosting service before purchasing
- Determine if solution provides appropriate features
- Decide what reporting features you need such as online real-time reporting, compatibility with other software you employ
- Differentiating levels of privacy tracking
- Campaign manager to organize jobs
- Integration with your database and other applications
- Handle bounces

THE FUTURE OF ANALYTICS – DATA ANALYTICS

Data analytics is the process of exploring and analyzing large datasets to find hidden patterns, unseen trends, discover correlations, derive valuable insights to make business predictions. It improves the speed and efficiency of your business. Data analytics can be used for improving decision making, better customer service, efficient operations and effective marketing.

Data analysts are people who figure out what the data means. Data analysts typically use computer systems and complex calculation applications to get their numbers nailed down. But there are still a lot of intellectuals who know how that goes into making these systems work. Data analysts use this data for extrapolation and interpretation, for projections and advisory responsibilities, research and writing, task system expertise and troubleshooting and training. The purpose of their job is to assign numerical values to different business functions and are responsible for identifying efficiencies, problem areas and possible improvements. They collect, organize, interpret, study and apply statistical data into projects. They do this as a project process of inspecting, cleaning, transforming and modelling data with the goal of discovering useful information.

Data analytics and eliminate guesswork and manual task, be it choosing the right content planning, marketing campaigns or developing products. Organizations can use their insights they gain from data analytics to make informed decisions. Thus, leading to better outcomes and customer satisfaction. It also allows you to tailor customer service according to their needs. It provides personalization and build stronger relationships with customers. Analyze data can reveal information about customer's interest, concerns, and more. It helps you give better recommendations for products and services.

Data analytics gives you valuable insights into how your campaigns are performing. This helps in fine tuning them for optimal outcomes. Additionally, you can also find potential customers who are most likely to interact with the campaign and convert into Leads.

Steps involved in data analytics are

- Understand the problem.
- Data collection.
- Data cleaning.
- Data exploration and analysis.
- Interpret the result.

With the results of these analytics,

- you can identify when a customer purchases the next product.
- You can understand how long it took to deliver the product.
- You get a better insight into the kind of items a customer looks for product returns, etc.
- Be able to predict the sales and profit for the next quarter.
- You can minimize order cancellation by dispatching only relevant products.
- You will be able to figure out the shortest route to deliver the product.

Some data analytics tools are Python, R and Tableau. Python is an object-oriented open-source programming language that supports a range of libraries for data manipulation, data visualization, and data modelling. There is another language named R, an open-source programming language majorly used for numerical and statistical analysis. We can also use Tableau, a simplified data visualization and analytics tools which helps you to create a variety of visualization to present the data interactively build reports and dashboards to showcase insights and trends.

CASE STUDIES

1. JIO

The name of brand is Jio and the company which created it was Reliance Jio Infocomm Limited with parent industry as Reliance Industries, founded in Mumbai, Maharashtra. The owner of the company is Mukesh Ambani. This company creates products related to mobile telephony and wireless broadbands and comes under wireless telecommunications industry. Their marketing strategy included competitive pricing and tariff plans. Jio offered special operating Phone apps like Jio play, Jio Money, Jio Security etc. Jio was going to charge 1/10th of standard in telecommunication charges, focusing on calls, text and data respectively without any roaming charges throughout India. Students could get an additional 25% data usage if they register their SIM card on their student ID.

2. #NoConditionsApply (Sindoor Khela) BY THE TIMES OF INDIA

FCB India made its main goal to change the 400-year long tradition that is a symbol of discrimination and will treatment of wounded women into a tradition of acceptance to help the Times of India emerge as a local newspaper with strong old traditions in Bengali culture. In just four weeks, the Times of India amassed 912,335 USD In earned media and reached 708 million people, becoming the number one trending topic on social media with thousands of two Sindoor images. The more important part was this campaign striped the 400-year-old tradition in modern India which was still a symbol of discrimination and inequality in women and help break the orthodox mentality tradition and for the first time in history, single, married, widowed, transgender individuals and sex workers joined to participate in Sindoor Khela. Ultimately, in the process of finding cultural relevance, The Times of India became the number one newspaper in Calcutta. This campaign was nominated for Cannes Lions, the most prestigious media award in the world.

3. FACE APP OLD AGE FILTER

Face App is AI based facial filter app which was founded in 2017 by Russian company Wireless Lab. It launched a new upgrade filter which made the user look old and this filter was an instant hit as it was too accurate and fun to make and share. As soon as face app Old Age Filter went viral, many international and Indian brands started using this opportunity and started using the viral trend for theatre brand promotion companies like Nivea, Hotstar, Berger paints, Fevicol, etc. started posting #faceapp with unique product placement with face app old age filter.

4. OLX INDIA DIGITAL MARKETING

In order to build a brand image and obtain a good online appearance, OLX came up with an idea of using Independence Day for their aid. A campaign that allowed people to share their memories of partition or its belonging was launched. This not only attracted the users but also helped the brand connect with the consumers, allowing them the loyalty and obviously more sales.

5. MAKE MY TRIP DIGITAL MARKETING

The company widely used Independence Day with that idea of #DilHaiHindustani. Practically, this was an unusual yet effective recreation of the Independence Story. A microsite that took the Odyssey of 1857 to 1947 was created for this purpose. This proved to be really effective with the traffic on the website increasing instantly and also the company gaining more following in terms of online appearance.

6. BABA RAMDEV – A NEW AGE MARKETING GURU

Patanjali reported Indian incomes of around rupees 5000 crore or 750,000,000 USD for the last financial year. Furthermore, in doing so, it went past Colgate in India. Much all the more fascinating is that Colgate is nearly 8 decades old in India, while Baba Ramdev images scarcely 15 years of age.

Patanjali has a noteworthy favourable position as it is connected with an acclaimed identity, Baba Ramdev, who is a yoga master who has a fan following of millions who specifically advance this brand through his yoga camps. Baba Ramdev direct cooperation with the purchasers, have advanced the brand universally. Yoga master Baba Ramdev's purchase products organization Patanjali was the third most promoted brand on TV and YouTube in India amid the most recent week of November, behind Cadbury and Fair and Lovely.

Baba Ramdev's image appears to be very much designed and prepared for take-off. It appears to have all the enchantments, elements of accomplishment. Brand has moved into e-business, other than being accessible with retail chains and under its own particular dispersion focuses. The Ramdev Medicine brand is prepared for the fair with outside trade winning potential, and could be an awesome achievement if they advertise effectively given the shortcomings that the West has for both yoga and herbal choices. Items are accessible online and through disconnected retails. Baba Ramdev has 541K devotees on Twitter. On Facebook, Baba Ramdev has 5.7 million individuals liking his page.

DARK SIDE OF TECHNOLOGY

Technology can have many different disadvantages. Some of them are that technology is the main contributor of crimes. It is a distraction for children. It makes people inactive and dependent. It causes redundancies in jobs. It reduces face to face communication. Excessive usage of social media can lead to social media addiction which causes anxiety and depression, isolation, poor sleep, low self-esteem and performance drop. Social isolation is on the increase. People are spending more time playing video games, learning how to use new modern technologies, using social networks, and they neglect their real life. The side effects of using social media for excessive period of time has led to suicide scenes for many people.

Modern technology has also replaced many humans. Robots are doing the jobs which used to be done by humans. Increased dependency on modern tools like calculators has reduced our creativity. Reliance on technology means mankind is forgetting the natural techniques developed by our forefathers. Technology also affects our health. There are different kinds of diseases found in people are caused by the extensive use of technology. Most people use their mobile

phones nowadays which also affects the health of people like damage eyesight, damage hearing, increase obesity, brain cancer, asthma problems, skin cancer, increase obesity.

The more advanced society becomes technologically, the more people begin to depend on computers and other forms of technology for everyday existence. Most teenagers are affected by addiction to technology. By the extensive usage of mobile phones put them in different kind of diseases such as depression, anxiety, social isolation, etc. Technology is also a hub for cyber bullying, cyber-sex.

THE PROMISE OF TECHNOLOGY

Since technology is challenging, it sparks the brain to work to its full potential. It encourages innovation and creativity in a person. It has also become very easy to get access to relevant information at anytime, anywhere. This has been possible because of modern technologies like broadband Internet. Lot of data is being published and indexed online. Sites like Wikipedia and YouTube have created original content which can be used in research or entertainment.

Communication technology has changed the way companies do business. People are able to instantly pass on important information during emergencies or disasters. Communication technologies such as web cameras, cell phones, emails, text messages and online voice calling make global communication more efficient and economical. Also, modern transportation technology makes it very easy to travel long distances. Technologies have also helped in improved housing and lifestyle. It is able to manage all of your home devices from one place, maximize home security with remote control or home functions and increase energy efficiency.

Modern technology has played a big role in changing the entertainment industry. Creative tools that were once way too expensive for average folks are now dirt cheap. Digital platforms like Netflix, Gaana, which allow people to listen to music or watch films, are now commonplace. With the growing popularity of smartphone applications, games can be played almost anywhere.

Modern technology has made it simple for students to learn from anywhere through online education on mobile education. It improves engagement when technology is integrated into lessons, students are expected to be more interested in the subjects they are studying. Technology provides different opportunities to make learning more fun and enjoyable in terms of teaching the same things in new ways. What is more, technology can encourage a more active participation in the learning process which can be hard to achieve through a traditional lecture environment.

Nowadays, most hospitals have implemented modern technology and surgical rooms. Increase accessibility of treatment is one of the most tangible ways that technology has changed healthcare. The fact that nurses and doctors are now routinely using handheld computers to record important real time patient data and then sharing it instantly with their updated medical history is an excellent illustration of the benefits of health IT. Being able to accumulate lab results, records of vital signs and other critical patient data into one centralized area has transformed the level of care and efficiency a patient can expect to receive when they enter the healthcare system. An increased level of efficiency in data collection means that a vast online resource of patient histories available to scientists who are finding new ways to study trends and make medical breakthroughs at a faster rate. Software also improves healthcare and Disease Control.

IMPLICATIONS FOR ANALYTICS

Analytics can affect our future in a lot of ways. Organizations that adapt to customer needs must, much faster than their competitors, rely on data analytics to enhance their business. Data analytics provides various advantages, such as identifying new opportunities, understanding customer behaviour, becoming more agile and outperforming the competition. Analytics can assist companies to better exploit data for improving customer satisfaction, managing supply chain risk, generating competitive intelligence and providing business real time insights to help make important decisions and optimize pricing if appropriately utilized.

The single biggest blind spot in marketing prior to digital transformation was the lack of high quality, actionable data for marketing experts to make decisions. Digital transformation now gives marketing experts much more precise user data and mattresses, allowing them to tweak and optimize marketing plans by knowing what doesn't work or what does, and just how well it makes it possible to be far more agile, responsive and targeted.

The growth of remote working has also seen analytics vendors build mobile platforms so that business users can get access to critical data whether in the office, on the shop floor or relaxing on the beach. With the growing technological use, data volumes will continue to increase and migrate to the cloud. The amount of generated data will be growing exponentially in the future. In its Data Age 2025 report of Seagate, IDC forecast Global Data Sphere will reach 175 zettabytes by 2025.

HOW DIGITAL TOOLS ARE CHANGING PROMOTION

Customers are aware of the new digital technologies due to which their expectations are rising. They have more options to choose from. Now they don't have to buy anymore whatever is produced in the market. In fact, they tell their requirements to producers and accordingly things are produced. Customer prefers those organizations who treat them as a separate individual and recommends products for their purchase history.

Digital technology helps an organization to build trust, relationships and helps in interacting with the customers, allowing them to reach a lot of customers throughout the day with new advertising formats. Advertisers can now access personal data with the help of cookies. Now they can provide products which are useful and one can know about the products with just a click and can get the best deal.

The brand is now focusing more on content strategy. They believe that they can reach a larger number of buyers through social media by messaging, providing videos, organizing live streams. Social media plays a significant role when we want direct customer interaction. We can also do this by asking for feedback through online polls.

Even customers themselves help in creating more customers by influencing through social media. They produce their own content by posting pictures of their favorite brands and products. This is evidently seen in the marketing landscape with companies like Warby Parker, which is a manufacturer of eyeglasses. They encourage customer to take photos of themselves in these glasses and post them on social media with #WarbyHomeTryOn. After trying them on for five days, customers can return their glasses if they don't like it. This strategy helps the company with free exposure and advertising. Thus, we can say that these tools have enabled customers to take a more active role in promotion.

Starbucks is a good example of making good use of social media and its famous marketing strategies. They exploit what their fans want. The combination of the extremely fluent Facebook, Twitter and Instagram platforms is a hallmark of Starbucks. In 2017, Starbucks enjoyed a 26% growth in followers as it gained nearly 3.3 million new followers on Instagram. They posted 241 posts of which more than 77% were photos. Starbucks regularly posts pictures of its product, but usually in a unique and attractive setting. Brand engaged the best between 9:00 AM to 10:00 AM. Perhaps all those people standing in line waiting for their coffee fire up Instagram to see what Starbucks is doing. The brand posted the most between 11:00 AM to 12:00 PM. Interestingly, this corresponds to the findings which suggest that the best time to post photos is between 11:00 AM to 12:00 PM. The brand performed fairly consistently on all days of the week, engaging the bests on Sundays.

HOW DIGITAL TOOLS ARE CHANGING PRICE

Price is different from the other three elements of marketing mix that are product, promotion and placement. All of these create value for a customer while price captures its value. Having a good pricing strategy is critical for your firm's profitability and very survival of the firm. The development of a pricing strategy is a complex decision and often entails considering a product's cost of production, What customers are willing to pay for it and the price of competing products.

The three of the most common pricing strategies are cost-plus pricing, competitor-based pricing, and value-based Pricing. Cost plus pricing is a technique in which the price of a product is based upon the cost of manufacturing or acquiring a product plus a commonly accepted markup percentage. Competitor based pricing is a strategy in which the price of a product is based upon closely matching the prices of relevant competitors. Value based pricing is a strategy that focuses on added value that a product delivers to its customer.

Dynamic pricing, also referred to as surge pricing, demand rising or time-based pricing is a pricing strategy in which businesses set flexible prices for products or service based on market demands. It focuses on competitive pricing. This model is accepted by Myntra. Although Myntra sells branded products, it follows a heavily discounted pricing model. The discounting is done to attract more customers and create a loyal user base. This discounted model has been augmented by tech-lead pricing in recent years using Myntra's Inhouse software and algorithms.

Apple uses a MAP (minimum advertised price) retail strategy. MAP policies prohibit resellers or dealers from advertising a manufacturer's product below a certain minimum price. MAPs are usually enforced through marketing subsidies offered by a manufacturer to its reseller. This pricing strategy is effective as it prevents retailers from competing directly with Apple own stores.

APP DEVELOPMENT

INNOVATION AND OPEN-SOURCE

In the realm of app development, two vital concepts have emerged as key pillars for progress: innovation and the concept of open source.

Innovation has become a driving force in the tech world, continually pushing app developers to create cutting-edge mobile applications that cater to the ever-changing needs and preferences of users. Simultaneously, the concept of open source has brought about a revolutionary shift in collaboration among app developers. By promoting transparency, open source allows developers from around the globe to access, modify, and contribute to the source code of various app projects.

As the app development landscape evolves, it is clear that embracing the principles of innovation and open source plays a critical role in shaping the industry's trajectory. By acknowledging the transformative influence of innovation, developers can continue to push the boundaries of what's possible and create apps that resonate with users on a deeper level. Simultaneously, the collaborative nature of open source allows developers to leverage collective knowledge and expertise, fostering a thriving community that drives progress and innovation in app development.

MIT APP INVENTOR

MIT App Inventor exemplifies the principles of open source and innovation in the realm of app development, building upon the foundation laid by these transformative concepts. As a user-friendly, visual programming environment developed by MIT (Massachusetts Institute of Technology), MIT App Inventor embodies the spirit of open source by making app development accessible to a broader audience.

Just like open-source projects, MIT App Inventor fosters transparency and collaboration by democratizing app development. It provides users, including those with limited coding experience, with the tools to create mobile applications for Android devices. By offering a visual interface and drag-and-drop functionality, the platform abstracts complex coding processes, allowing developers to focus on app logic and design. This encourages a diverse community of educators, students, and enthusiasts to participate actively in app creation, exchanging ideas and building upon each other's work.

The platform's commitment to open source further reinforces its collaborative nature. Developers can share their app projects, allowing others to learn from, modify, and improve upon their creations. This open exchange of knowledge fosters a supportive community, where the collective expertise fuels progress and innovation. It encapsulates the essence of open-source principles, driving creativity, and enabling a diverse range of voices to contribute to the advancement of app development technology.

KEY FEATURES:

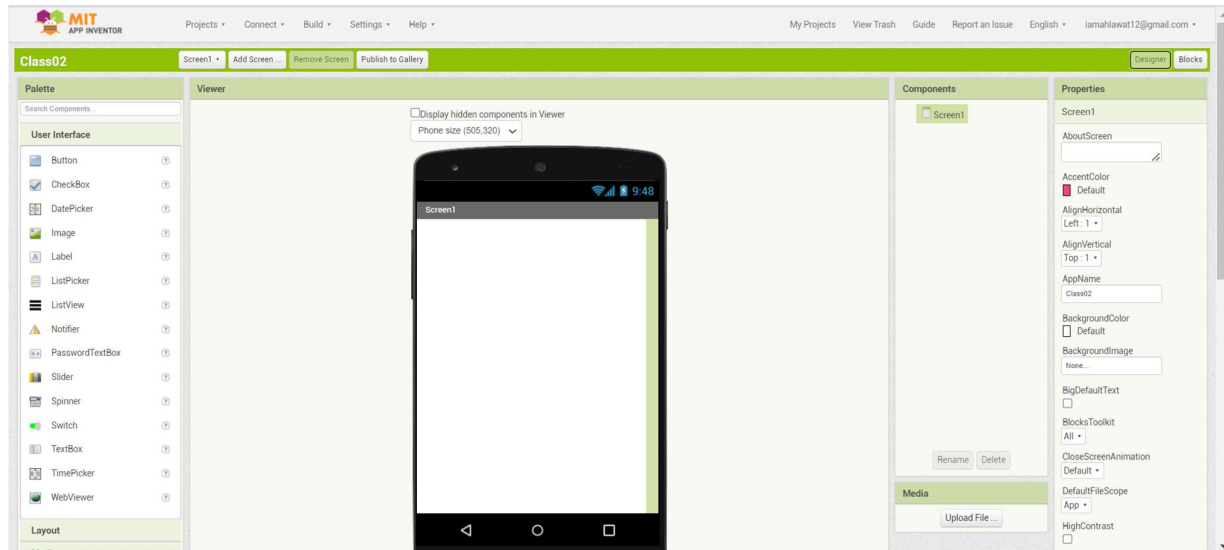
Some key features available in MIT App Inventor are:

- (1) Visual Programming Environment: MIT App Inventor offers a visual drag-and-drop interface, allowing users to build apps without the need for extensive coding knowledge. Components can be visually connected to define app behavior, simplifying the development process.
- (2) Built-in Components: The platform provides a wide range of built-in components, such as buttons, labels, text boxes, sensors, multimedia, and more. These components can be easily integrated into the app to add various functionalities.
- (3) Real-time Testing: MIT App Inventor supports real-time testing through the AI Companion app. Developers can see the behavior of their app directly on Android devices as they build it, enabling instant feedback and debugging.
- (4) Open Source and Collaboration: As an open-source platform, MIT App Inventor encourages collaboration and knowledge sharing among developers.
- (5) Accessibility: The platform aims to democratize app development by making it accessible to a broader audience, including educators, students, and enthusiasts with little or no coding experience.
- (6) Educational Resources: MIT App Inventor provides a wealth of educational resources, tutorials, and documentation to help users get started and advance their app development skills.
- (7) Multi-platform Support: While primarily focused on Android app development, MIT App Inventor also offers experimental support for iOS devices, allowing users to explore app creation for both platforms.
- (8) Cloud Data Storage: The platform supports cloud data storage, enabling developers to store and retrieve data on remote servers, making it convenient for apps that require data persistence.
- (9) GPS and Location Services: MIT App Inventor allows integration of GPS and location-based functionalities into apps, enabling location-aware features.
- (10) Extensibility: Users can create their custom components and extensions, extending the capabilities of MIT App Inventor and enabling the integration of third-party services.
- (11) QR Code Scanning: The platform supports QR code scanning, enabling developers to incorporate this functionality into their apps for various purposes.
- (12) Bluetooth Connectivity: MIT App Inventor facilitates Bluetooth communication, allowing apps to interact with Bluetooth-enabled devices and peripherals.

INTERFACES

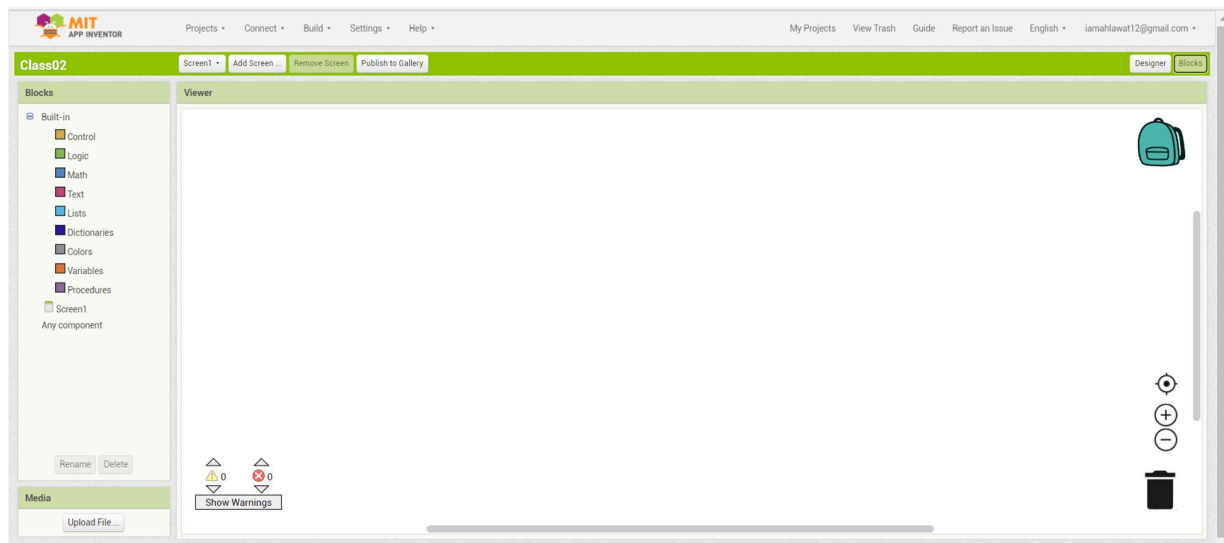
MIT App Inventor features two distinct interfaces to facilitate app development.

(1) Designer Interface: The designer interface is a visual, drag-and-drop environment where users can create app layouts. It allows developers to design the front-end of their apps by adding and arranging components such as buttons, labels, text boxes, images, and more. This interface simplifies the process of creating app user interfaces without requiring complex coding skills.



(2) Blocks Interface: The blocks interface is where the app's functionality is defined and organized. Using a visual programming approach, developers can connect blocks representing different app components to create the desired behaviour. This interface abstracts complex coding concepts, making it easier for users to define app logic and behavior without having to write code manually.

Together, these interfaces provide a seamless and accessible environment for users to design, build, and customize their mobile applications using MIT App Inventor.



TESTING:

To test the apps created in MIT App Inventor on our phones, we can follow these steps:

(1) Download MIT App Inventor Companion App: We can download the "MIT App Inventor Companion" app from the Google Play Store for Android devices or the App Store for iOS devices. This app serves as a bridge between the MIT App Inventor platform and our mobile devices.

(2) Connect with QR Code: After designing and programming the app using MIT App Inventor on a computer, we can generate a QR code for our project. By scanning this QR code using the MIT App Inventor Companion app on our phone, we can instantly load and test the app on our device. This provides a real-time testing experience, allowing us to see how the app behaves on a physical device.

(3) Test Using "Connect": Another option is to use the "Connect" feature available in MIT App Inventor. This allows us to establish a live connection between the MIT App Inventor platform on our computer and the MIT App Inventor Companion app on our phone. With the connection established, any changes made to the app in the platform will reflect in real-time on the phone, allowing us to test and debug the app effectively.

(4) Download App to the Phone: Once we are satisfied with the app's performance and want to keep it on our phone without the need for a live connection, we can use the "Build" option in MIT App Inventor. This allows us to generate an APK (Android Package) file, which we can download and install on our phone. This way, we can have the app available on our device even without an active connection to the MIT App Inventor platform.

By following these steps, we can easily test and deploy the apps created in MIT App Inventor on our mobile devices, ensuring a seamless development and testing process.

OUR CREATED APPS:

Throughout our sessions, we embarked on a journey of app development using MIT App Inventor, crafting various projects that are detailed below: -

(1) IMAGESspeak: We developed a fun app with buttons featuring images of actors. When a button was clicked, we received a voice response of the actor's famous dialogue. There were four buttons to begin with. Also, we demonstrated a button, by clicking on which we can go to a different screen.

(2) 15 Concept Cards:

- Bounce Sprite Off Canvas Edge: The second app involved making a ball bounce when it hit the edge of a Canvas. Through coding and event handling, we achieved a dynamic and interactive animation within the app.
- Adding Sound: In the third app, we implemented sound effects to provide audio feedback when clicking on a button with a cat image. Upon interaction, the app produced a delightful "meow" sound, enhancing the user's engagement and enjoyment.
- Movement on a Timer: In the fourth app, we utilized timers to enable movement within the app. Objects or elements moved automatically at regular intervals, enhancing interactivity and creating dynamic animations that responded to the app's logic and design.

- **Start/Stop Timed Movement:** In the fifth app, the end user could control the movement of an ImageSprite using a button. By touching the button, they could start and stop the ImageSprite's motion, which occurred gradually over time.
- **Speech Recognition:** In the sixth app using MIT App Inventor, we implemented a feature to display the text of what is being said on the phone screen. This enhanced user experience by providing real-time feedback and interaction with the app's audio output.
- **Movement with Sensors:** In the seventh app, we utilized the orientation sensor to enable movement. Users could control the ImageSprite's motion by tilting their phone, providing an interactive and engaging app experience through the orientation sensor's data.
- **Random Numbers:** In the eighth app, we worked on generating random numbers to make ImageSprites appear at random (x, y) coordinate locations. By utilizing this feature, the app achieved dynamic and unpredictable placement of ImageSprites, enhancing its visual appeal and interactivity.
- **Multiple Screens:** In the ninth app, we explored the concept of multiple screens in MIT App Inventor. By incorporating multiple screens, users could navigate through the app's content seamlessly. A button click triggered the transition to the next screen, enhancing user interaction and providing a well-structured app experience.
- **Creating your own colour:** In the tenth app, we delved into the concept of creating our own colours in MIT App Inventor. By customizing and combining different colour components (RGB values), we achieved a personalized colour palette, adding uniqueness and creativity to the app's visual design.
- **Fling Movement:** In the eleventh app, we explored "Fling Movement" using MIT App Inventor. By incorporating touch events, users could change the heading and speed of a sprite by flinging their fingers on the screen, creating a dynamic and interactive animation.
- **Drawing on a Canvas:** In the twelfth app, we introduced "Drawing on a Canvas" with MIT App Inventor. Users could draw curved lines by dragging their finger across the screen, creating interactive and artistic designs along the path of their finger's movement.
- **Shaking Phone:** The thirteenth app we developed using MIT App Inventor incorporated a "Shaking Phone" feature. Users could trigger specific actions or events by shaking their phones, adding a playful and interactive element to the app's behaviour.
- **Collision Detection:** In the fourteenth app, we created an engaging user experience by implementing a feature where the app triggered specific actions upon detecting sprite collisions. This interactive behaviour added excitement and captivated users.
- **Drag a Sprite:** In the fifteenth app, we delved into the concept of moving a sprite side-to-side. Through intuitive interaction, users could effortlessly control the sprite's movement by dragging their finger across the screen, creating a seamless and engaging experience.
- **Movement with Buttons:** In the sixteenth app, we implemented a feature where users could control a sprite's movement by touching a button. This interactive functionality added dynamism and enhanced the app's user experience.

Building these 15 apps taught us about the following components of MIT App Inventor:

- Buttons: Interactivity through touch-based controls.
- Labels: Displaying textual information in the app interface.
- Textboxes: Capturing user input and displaying text.
- ImageSprites: Incorporating interactive images and animations.
- Canvas: Creating dynamic graphics and animations.
- Sensors (Location, Accelerometer, Orientation): Adding real-world interactivity and motion detection.
- Multimedia (Sound, Player, VideoPlayer, TextToSpeech, SpeechRecognizer): Enhancing user experience with audio, video, and speech functionalities.

(3) descriptionTOimages: To culminate the sessions with a grand finale, we ventured into an extraordinary project that left us in awe. Leveraging the power of AI technology, we embarked on an immersive journey into the world of OpenAI. By integrating our app with OpenAI's API, we unlocked an astounding feature - the ability to input text descriptions, such as "lion eating an apple," and witness in amazement as the app generated corresponding images like magic.

The process began with our visit to the OpenAI website, where we were granted access to their API and received a secret key that unlocked the gates to a treasure trove of AI-generated wonders. Armed with this secret key, we ventured back into our app development environment and seamlessly integrated the AI magic into our creation.

The results were nothing short of astonishing. As we entered various descriptive texts, the app summoned forth vivid images that matched our descriptions in an eerily accurate manner. The AI's ability to comprehend and visualize the text inputs was mind-boggling, delivering an experience that sparked curiosity and wonder among all of us.

This extraordinary project served as a testament to the incredible possibilities that AI technology brings to the realm of app development. The marriage of our ingenuity with the cutting-edge AI capabilities of OpenAI resulted in an app that felt like a magical window into a world where imagination and reality merged seamlessly. The journey with OpenAI provided us with a glimpse of the boundless potential of AI, inspiring us to continue exploring and pushing the boundaries of what's possible in the realm of app development and beyond.

PROPOSED PROJECT WORK INTRODUCTION

PROJECT OVERVIEW

The Tribute Page on Aryabhata is a web development project that aims to pay homage to the renowned Indian mathematician and astronomer, Aryabhata. The webpage serves as an informative and engaging platform for users to learn about Aryabhata's life, significant contributions to science, and his influence on the field of astronomy and mathematics.

The project's primary goal is to create a visually appealing and user-friendly webpage that presents the information in a structured and organized manner. It seeks to provide a comprehensive overview of Aryabhata's achievements and historical significance, catering to a diverse audience interested in science, history, and Indian culture.

The webpage's content will be carefully curated to include key biographical details, insights into Aryabhata's major works like "Aryabhata's" and "Arya-siddhanta," and descriptions of his groundbreaking discoveries in astronomy and mathematics. The design approach will focus on creating an aesthetically pleasing layout, incorporating relevant images and graphics to complement the content and engage users effectively.

To achieve cross-device compatibility, the webpage will be designed using responsive web design techniques, ensuring optimal viewing experiences on various devices, including desktops, tablets, and smartphones. The use of HTML and CSS will form the foundation of the project, enabling an organized structure and appealing visual elements.

Additionally, the project will incorporate SEO best practices to improve the webpage's visibility on search engines, enabling more individuals interested in Aryabhata and his work to discover and explore the tribute page.

Upon completion, the Tribute Page on Aryabhata will be hosted on a suitable platform, making it accessible to a global audience interested in learning about this legendary Indian mathematician and astronomer.

Overall, the project aims to serve as an educational and inspirational resource, celebrating the life and legacy of Aryabhata while fostering a deeper appreciation for his contributions to the fields of astronomy and mathematics.

PROBLEM STATEMENT

It is necessary to construct a page in honour of Aryabhata, a renowned Indian mathematician and astronomer, in order to recognise his life, accomplishments, and vital contributions to science. The problem is in creating an interesting and educational website that accurately depicts Aryabhata's accomplishments, his significant contributions to mathematics and astronomy, and his influence on scientific traditions around the world. The goal of the project is to inform and inspire visitors about Aryabhata's ground-breaking discoveries by developing interesting information, choosing appropriate pictures, and putting it all together in an easy style. The ultimate objective is to develop an engaging online platform that celebrates Aryabhata's legacy and fosters appreciation for his priceless contributions to science.

A tribute page is a webpage specifically designed to accolade a person who might be an important figure in one's life or in the general public. It typically includes information about the individual or entity, such as their background, biography, accomplishments, and notable milestones. It may also include personal anecdotes, quotes, and testimonials to provide a more personal touch. The page can incorporate various multimedia elements, such as images, videos, and audio clips, to enhance the storytelling and create a visually engaging experience.

TARGET AUDIENCE

The people who are interested in history, mathematics, and astronomy, as well as students, academics, and lovers of science and Indian culture, are the target market for the tribute page on Aryabhata. It provides information to anyone who are interested in learning about notable figures in science and mathematics and their contributions to humanity. Aryabhata's life and work are also covered on this page, which is also intended for researchers and educators who might want to utilise it as a teaching tool and resource. The tribute website overall intends to enthrall and interest people who have an intellectual curiosity and a passion for learning about the extraordinary accomplishments of historical leaders like Aryabhata.

PROJECT GOALS

The project goals for the tribute page on Aryabhata are as follows:

1. **Educational Resource:** The primary goal of the tribute page is to serve as an informative and educational resource about Aryabhata, the renowned Indian mathematician, and astronomer. It aims to provide detailed and accurate information about his life, work, and significant contributions to science.
2. **Celebrating Aryabhata's Legacy:** The tribute page aims to celebrate the legacy of Aryabhata and raise awareness about his pioneering achievements in the fields of mathematics and astronomy. It seeks to honour his intellectual contributions and the impact he had on the world of science.
3. **Engaging Content:** The project aims to present the information in a captivating and engaging manner, making use of multimedia elements like images and graphics to enhance the user experience. It seeks to keep the visitors interested and involved throughout their exploration of Aryabhata's life and work.
4. **Targeting a Diverse Audience:** The tribute page endeavours to reach a diverse audience, including students, educators, researchers, history enthusiasts, and individuals interested in Indian culture and scientific heritage. It strives to be accessible and appealing to various age groups and levels of expertise.
5. **User-Friendly Design:** The project seeks to create a user-friendly design that allows easy navigation and readability. It aims to provide a seamless browsing experience for visitors to find the information they seek effortlessly.
6. **Inspiring Interest in Science and Mathematics:** Through the tribute page, the project aims to inspire interest in science and mathematics among the audience. By showcasing Aryabhata's accomplishments, it encourages visitors to explore the wonders of these fields and their practical applications.

7. Promoting Cultural Appreciation: The tribute page also has the goal of promoting cultural appreciation by highlighting the significant contributions of Indian scholars to the world of science and knowledge. It encourages a deeper understanding and respect for diverse cultural heritages.
8. Feedback and Interaction: The project encourages user feedback and interaction to continually improve the content and user experience. It provides avenues for visitors to share their thoughts, ask questions, and engage with the material.

Overall, the tribute page on Aryabhata aims to serve as a comprehensive and inspiring platform, fostering an appreciation for historical figures and their enduring impact on the world of science, while also promoting curiosity and learning among its visitors.

TECHNOLOGY STACK

The technology stack for the Tribute Page on Aryabhata consists of essential web development tools and languages, including HTML and CSS for structuring and styling the webpage's content. A code editor like Sublime Text is used for efficient coding and debugging. Graphics and images are created and edited using image editing tools like Adobe Photoshop or GIMP. To publish the webpage online, a hosting platform like GitHub Pages or Netlify is utilized. The implementation adopts responsive design principles to ensure the webpage's adaptability across different devices. Search Engine Optimization (SEO) techniques are applied to optimize the page's visibility on search engines. Cross-browser compatibility is considered, and testing is conducted on various web browsers like Chrome, Firefox, Safari, and Edge to ensure smooth performance.

DESIGN APPROACH

The design approach for the Tribute Page on Aryabhata focuses on creating an engaging and visually appealing user experience. The layout is carefully crafted using HTML and CSS, emphasizing a clean and organized presentation of content. The design is responsive, allowing the page to adapt seamlessly to various screen sizes and devices, ensuring accessibility for a broader audience. Graphics and images are thoughtfully selected and edited to enhance the storytelling and showcase Aryabhata's contributions effectively. The colour scheme and typography are chosen to reflect the historical context while maintaining readability. User-friendly navigation is incorporated, enabling visitors to access information easily. The overall design approach prioritizes a harmonious blend of aesthetics and functionality, offering a captivating tribute to the legendary Indian mathematician and astronomer.

In conclusion, the tribute page successfully accomplishes its purpose of honouring Aryabhata's legacy and inspiring users with his significant contributions to science. It stands as a fitting homage to this great mathematician and astronomer, providing an informative and visually captivating experience for all visitors.

IMPLEMENTATION AND METHODOLOGY

TECHNOLOGY STACK

The technology stack for the tribute page on Aryabhata may include the following components:

1. **HTML (Hypertext Markup Language):** HTML serves as the backbone of the webpage, defining its structure and organizing the content. Through HTML tags and elements, developers can create headings, paragraphs, images, links, and other essential components that form the basis of the webpage. It provides the framework for presenting information to users and enables the integration of other technologies like CSS and JavaScript.
2. **CSS (Cascading Style Sheets):** CSS is a powerful tool for enhancing the appearance and layout of the webpage. By using CSS, developers can apply styles, colours, fonts, and positioning to HTML elements, making the webpage visually appealing and consistent across different browsers and devices. CSS enables the separation of design and content, making it easier to maintain and update the webpage's appearance without changing its underlying structure.
3. **Code Editor:** A code editor is a software application used by developers to write, edit, and manage code efficiently. It offers features like syntax highlighting, auto-completion, and error checking, which aid in writing clean and error-free code. Code editors provide a seamless development environment and streamline the coding process, contributing to increased productivity and code quality.
4. **Image Editing Tools:** Graphics and images are vital components of a visually engaging webpage. Image editing tools like Adobe Photoshop or GIMP allow developers to create, modify, and optimize images for use on the webpage. These tools enable resizing, cropping, colour correction, and other adjustments to ensure that images align with the overall design and enhance the user experience.
5. **Hosting Platform:** To make the webpage accessible to a global audience, it needs to be hosted on a server. Hosting platforms like GitHub Pages or Netlify provide free and easy hosting solutions for static websites. They allow developers to deploy the webpage quickly, making it available online for users to visit and interact with.
6. **Responsive Design:** With the prevalence of various devices with different screen sizes, it is crucial to ensure that the webpage appears well on all of them. Responsive design techniques, such as using media queries and flexible layouts, enable the webpage to adapt seamlessly to different screen sizes. This provides users with an optimal experience regardless of whether they are accessing the site from a desktop, tablet, or smartphone.
7. **SEO (Search Engine Optimization):** SEO is essential for improving the webpage's visibility in search engine results. By incorporating relevant keywords, writing descriptive meta tags, and creating high-quality content, developers can increase the chances of the webpage ranking higher in search engine results pages (SERPs). This, in turn, drives more organic traffic to the webpage and expands its reach to a broader audience.
8. **Cross-Browser Compatibility:** Webpages should be thoroughly tested on various web browsers to ensure that they render correctly and function as intended across different environments. Each browser has its rendering engine, and minor differences may affect the webpage's appearance or functionality. By performing cross-browser testing, developers can identify and address any compatibility issues, ensuring a consistent and reliable user experience for

all visitors. The choice of the technology stack may vary depending on the developer's expertise, project requirements, and specific tools or libraries they prefer to use.

DESIGN APPROACH

The design approach for the tribute page on Aryabhata should focus on creating a visually engaging and informative user experience. Here's an outline of the design approach:

1. **Research and Understanding:** Conduct research on Aryabhata's life, work, and contributions to gain a comprehensive understanding of the subject matter. Identify key elements, historical context, and significant achievements that should be highlighted on the page.
2. **Audience-Centric Design:** Keep the target audience in mind throughout the design process. Understand their interests, knowledge level, and what they would expect from a tribute page about Aryabhata. Tailor the design to resonate with the audience and meet their expectations.
3. **Visual Design and Branding:** Choose an appropriate colour scheme and typography that aligns with the theme of the tribute page. Consider incorporating elements of Indian heritage and astronomy to create a unique and relevant visual identity.
4. **User-Friendly Navigation:** Ensure the navigation is intuitive and user-friendly. Use a well-structured menu bar to provide easy access to different sections of the page, such as About Aryabhata, Aryabhata's Work, Influence, and Contact.
5. **Content Presentation:** Organize the content into clear sections, using headings, subheadings, and bullet points for easy readability. Use a mix of text, images, and possibly videos to present Aryabhata's life and achievements in a compelling manner.
6. **Responsive Design:** Implement a responsive design to ensure the page displays correctly on various devices, such as desktops, tablets, and smartphones. Test the responsiveness thoroughly to guarantee a seamless user experience across platforms.
7. **Interactive Elements:** Utilize JavaScript and CSS to add interactive elements like animations, image galleries, and tooltips. Interactive features can enhance user engagement and make the page more enjoyable to explore.
8. **Call-to-Action (CTA):** Incorporate clear and relevant CTAs strategically throughout the page. CTAs can encourage users to take specific actions, such as exploring more about Aryabhata or contacting for further information.
9. **Accessibility:** Ensure the page meets accessibility standards to make it usable by people with disabilities. Use semantic HTML tags, provide alt text for images, and follow other accessibility guidelines.
10. **Testing and Iteration:** Thoroughly test the tribute page on different browsers and devices to identify and fix any design or functionality issues. Gather feedback from users and stakeholders and make necessary iterations to improve the overall design.
11. **SEO Optimization:** Implement SEO best practices to enhance the page's visibility in search engine results. Use relevant keywords, meta tags, and a descriptive title to improve its search engine ranking.

12. Consistency and Balance: Maintain design consistency throughout the page to create a harmonious visual experience. Strike a balance between textual content and visual elements to avoid overwhelming the users with information.

By following this design approach, the tribute page on Aryabhata can effectively pay homage to the renowned Indian mathematician and astronomer while providing an enjoyable and informative experience to its visitors.

PROJECT ARCHITECTURE

As a tribute page for Aryabhata, the project's architecture can be represented as a simple front-end architecture. Here's an overview of the project architecture:

- **Front-End Components:** The front-end of the project consists of HTML, CSS, and client-side JavaScript. HTML is used for the structural elements of the webpage, CSS for styling and layout, and JavaScript for adding interactivity and dynamic content.
- **HTML Structure:** The HTML file contains the main structure of the tribute page. It includes sections such as the header, navigation bar, main content area, and footer. Each section is organized using HTML tags and classes to provide a clear and semantic structure.
- **CSS Styling:** The CSS file contains the styles for various elements in the HTML. It defines the colours, fonts, margins, and padding to create a visually appealing design. CSS also handles the responsiveness of the page, ensuring that it adapts well to different screen sizes.
- **Bootstrap Integration:** The project utilizes Bootstrap, a popular CSS framework, to enhance the layout and responsiveness of certain components. Bootstrap's grid system and navigation components are employed to build a responsive navigation bar that adjusts based on the device's screen size.
- **Images and Media:** The project includes images of Aryabhata and other relevant media to enrich the content and create a visually engaging experience. CSS properties are used to ensure these images scale appropriately on various devices.
- **Metadata and SEO:** The HTML head section contains meta tags that provide essential information about the webpage, including its title, description, author, and keywords. This metadata helps improve the webpage's visibility in search engines and enhances its search engine optimization (SEO).

Overall, the project architecture follows a client-side approach, where all the rendering and user interactions happen on the user's browser. The front-end technologies work together to create a tribute page that effectively presents information about Aryabhata's life, work, and contributions to science in a visually appealing and responsive manner.

KEY FEATURES

The key features of the Tribute Page on Aryabhata include:

1. **Interactive Content:** The page provides engaging and informative content about Aryabhata, presenting his life, work, and contributions to science in an interactive and captivating manner.
2. **Responsive Design:** The webpage is designed to be responsive, ensuring that it looks and functions seamlessly across various devices and screen sizes, providing a consistent user experience.
3. **Visuals and Media:** Thoughtfully selected graphics, images, and media elements are used to complement the content, enhancing the storytelling and creating an immersive experience for visitors.
4. **Navigation:** User-friendly navigation allows visitors to easily explore different sections of the tribute page, making it convenient to access specific information of interest.
5. **Aesthetics:** The design employs a visually appealing layout with an appropriate colour scheme and typography that aligns with the historical context of Aryabhata's era.
6. **SEO Optimization:** The webpage is optimized for search engines, improving its discoverability and reach among potential users searching for information about Aryabhata.
7. **Performance:** The webpage is optimized for fast loading times and optimal performance to deliver a seamless experience to users.
8. **Educational Value:** The project aims to serve as an educational resource, providing valuable insights into the life and work of Aryabhata, inspiring curiosity and interest in science and history.

IMPLEMENTATION

The implementation of the tribute page on Aryabhata involved several key steps to create a visually appealing and informative webpage. The foundation of the page was built using HTML, which provided the structural framework for organizing the content. HTML elements like headings, paragraphs, images, and links were strategically utilized to present information about Aryabhata's life, work, and contributions to science.

To enhance the visual presentation and layout of the webpage, Cascading Style Sheets (CSS) were employed. Custom styles were defined to set the colors, fonts, margins, and padding for different elements. The CSS also played a crucial role in creating a responsive design, ensuring that the page renders and functions well on various devices, including desktops, tablets, and mobile phones.

The Bootstrap CSS framework was integrated into the project, particularly for the navigation bar. This allowed for the creation of a responsive and user-friendly navigation menu that enabled visitors to easily access different sections of the tribute page. The Bootstrap grid system was also utilized to ensure that the content adapts seamlessly to different screen sizes, providing an optimal viewing experience.

Meta tags were added to the HTML head section to provide essential metadata about the webpage. This includes information such as the page's title, description, author, and keywords. These meta tags play a crucial role in optimizing the webpage for search engines, making it more discoverable to users.

To make the webpage visually engaging, responsive images were incorporated. The images were styled with CSS properties to ensure they scale proportionally based on the screen size. This approach ensured that the images maintain their quality and load efficiently on various devices, contributing to a positive user experience.

The completed tribute page was deployed and hosted on GitHub Pages, a reliable platform for hosting static websites. This hosting solution made the webpage accessible to a global audience, allowing easy sharing and access to the valuable information about Aryabhata's legacy.

Throughout the implementation process, thorough testing and debugging were conducted. The webpage was rigorously tested on various web browsers and devices to identify and address any compatibility or layout issues. This testing phase played a crucial role in ensuring that the tribute page functions seamlessly across different environments, delivering a consistent and informative experience to all visitors.

FUNCTIONALITIES

The tribute page for Aryabhata incorporates several key functionalities to provide an engaging and informative user experience. Here are the main functionalities of the project:

- **Navigation Bar:** The project features a responsive navigation bar that allows users to easily navigate through different sections of the tribute page. Users can click on the navigation links, such as "About Aryabhata," "Aryabhata's Work," "Influence," and "Contact," to jump to the corresponding sections of the page.
- **Content Presentation:** The tribute page presents detailed information about Aryabhata's life, work, and contributions to science. Each section is organized in a structured manner, providing relevant and concise information about the renowned Indian mathematician and astronomer.
- **Images and Media:** Images of Aryabhata and other relevant media are integrated into the page to visually enhance the content. Users can view pictures of Aryabhata and related astronomical elements that support the textual information.
- **Responsive Design:** The page layout is designed to be responsive, ensuring optimal viewing across various devices, including desktops, tablets, and mobile phones. The responsive design provides a seamless user experience, regardless of the device used to access the tribute page.
- **Meta Tags and SEO:** The project utilizes meta tags to optimize search engine visibility. These tags include the page title, description, author, and keywords, enhancing the page's chances of being discovered by search engines and improving its SEO ranking.
- **Interactive Components:** The project may incorporate interactive elements, such as buttons, links, or modals, to engage users and encourage them to explore the content further.
- **External Links:** The tribute page can include external links to relevant sources, articles, or other websites, allowing users to access additional information about Aryabhata and related topics.
- **Accessibility:** Efforts are made to ensure the content is accessible to all users, including those with disabilities. Proper heading structure, alt text for images, and semantic HTML tags contribute to the page's accessibility.

- **Cross-Browser Compatibility:** The page is tested to ensure it functions correctly and displays consistently across various web browsers, such as Chrome, Firefox, Safari, and Edge.

By incorporating these functionalities, the tribute page aims to provide a comprehensive and enjoyable experience for users seeking to learn more about Aryabhata and his significant contributions to the fields of astronomy and mathematics.

METHODOLOGY

The development of the tribute page on Aryabhata followed a systematic and thorough methodology to ensure a high-quality and engaging final product. The first crucial step involved conducting extensive research on Aryabhata's life, work, and contributions to science. This research process involved studying historical documents, academic papers, and reliable sources to gather accurate and up-to-date information.

With a solid foundation of knowledge, the next phase was to design the webpage's layout and structure using HTML. Careful attention was paid to organizing the content in a logical manner, creating sections that cover various aspects of Aryabhata's life and achievements. Additionally, semantic HTML tags were used to enhance the page's accessibility and search engine optimization.

To enhance the visual appeal and user experience, CSS was employed to style the webpage. Custom styles and formatting were applied to elements like headings, paragraphs, images, and the navigation bar. The use of responsive design techniques ensured that the tribute page would adapt seamlessly to different screen sizes and devices, making it accessible to a wider audience.

Strategically chosen images and graphics were integrated into the page to complement the written content and provide visual context to Aryabhata's historical background. Image editing tools were utilized to optimize the images for faster loading times without compromising on quality.

To facilitate easy navigation, a responsive navigation bar was implemented using Bootstrap, allowing users to jump to specific sections of the tribute page with ease. This made the overall user experience more intuitive and user-friendly.

Throughout the development process, regular testing and optimization were carried out to identify and resolve any compatibility or performance issues that may have arisen across different web browsers and devices. This ensured that the tribute page would provide a consistent and seamless experience for all visitors.

The main objective of this project was to create an informative and compelling tribute page that educates and captivates visitors about Aryabhata's extraordinary contributions to mathematics and astronomy. The design approach prioritized clarity, coherence, and aesthetics, presenting the information in a visually engaging manner while maintaining a user-friendly layout.

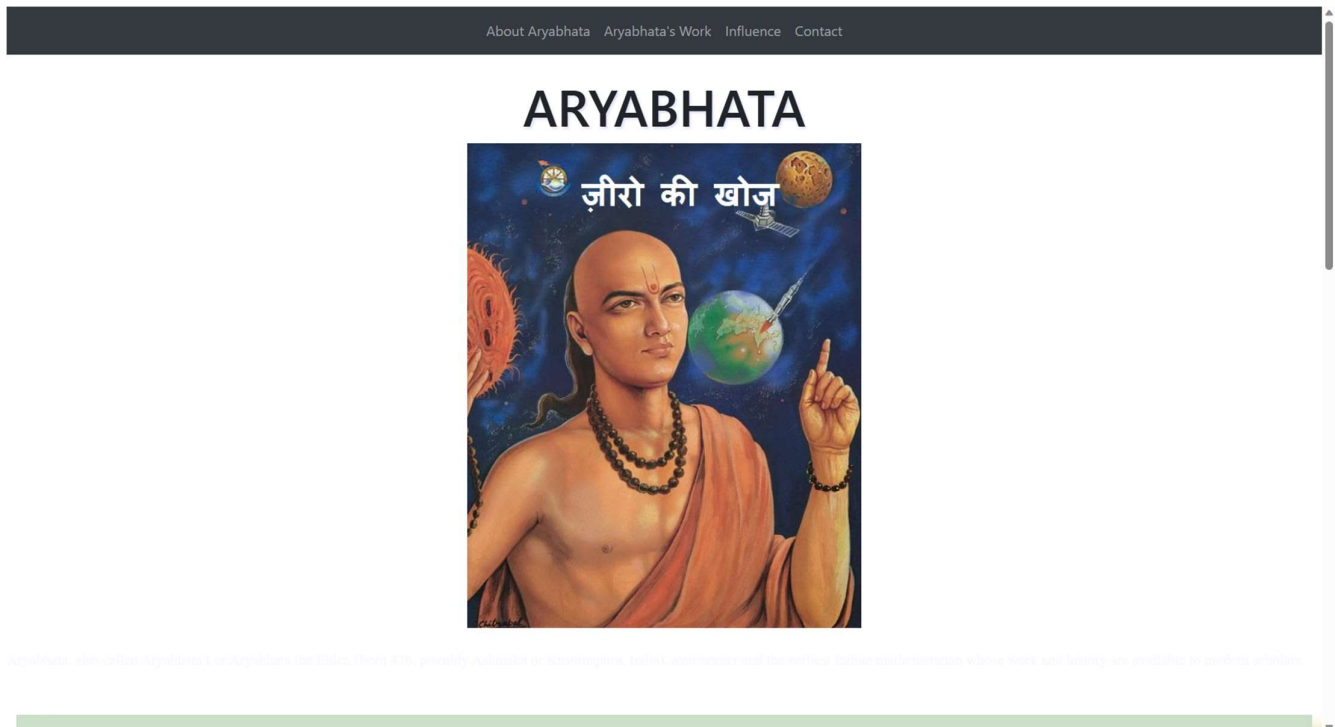
By adhering to this comprehensive methodology, the tribute page on Aryabhata was successfully brought to life, serving as a valuable online resource for individuals interested in learning about the remarkable life and achievements of this ancient Indian scholar.

In short, the creation of the Aryabhata tribute page as an internship project has not only allowed for the exploration and celebration of Aryabhata's achievements but has also provided a platform to enhance skills and foster a deeper understanding of web development, content creation, and design. The tribute page stands as a testament to Aryabhata's enduring legacy and serves as an inspiration for future generations to appreciate and contribute to the fields of mathematics and astronomy.

RESULTS

The tribute page dedicated to Aryabhata, the renowned Indian mathematician and astronomer, has been successfully developed. The project aimed to honour his legacy, accomplishments, and invaluable contributions to the fields of science and astronomy. Through careful research and content curation, the page offers a comprehensive overview of Aryabhata's life, works, and impact on the scientific community. The project's architecture and implementation were thoughtfully designed to ensure a seamless user experience. With a responsive layout and cross-browser compatibility, users can access and navigate the tribute page from various devices and browsers. The inclusion of interactive components, such as the navigation bar and engaging media elements, enhances user engagement and encourages exploration of the content. Efforts were made to optimize the page for search engines through the use of meta tags and proper SEO practices. Overall, the tribute page stands as a testament to Aryabhata's brilliance and serves as an educational resource for those interested in the history of mathematics and astronomy. The project is a fitting tribute to honour the legacy of Aryabhata and to inspire future generations to explore the wonders of science and mathematics.

Screenshots of the web page from laptop Dell Vostro 5620



About the Legend

~~ He was student of Nalanda university, latter he even became head of one department of it. So Aryabhata got his major source of knowledge from Nalanda and his major work was based on previous inventions by Greeks, Mesopotamians and Nalanda university itself.

~~ Direct details of Aryabhata's work are known only from the Aryabhatiya. The name "Aryabhatiya" is due to later commentators. Aryabhata himself may not have given it a name. His disciple Bhaskara I calls it Ashmakatantra.

~~ The Arya-siddhanta, a lost work on astronomical computations, is known through the writings of Aryabhata's contemporary, Varahamihira, and later mathematicians and commentators, including Brahmagupta and Bhaskara I.

~~ The Aryabhatiya text consists of the 108 verses and 13 introductory verses, and is divided into four pādas or chapters which are Gitikapada, Ganitapada, Kalakriyapada and Golapada.

~~ The place-value system, first seen in the 3rd-century Bakhshali Manuscript, was clearly in place in his work. While he did not use a symbol for zero, the French mathematician Georges Ifrah argues that knowledge of zero was implicit in Aryabhata's place-value system as a place holder for the powers of ten with null coefficients.

~~ Aryabhata worked on the approximation for pi (π), and may have come to the conclusion that π is irrational. In the second part of the Aryabhatiyam (gaṇitapāda 10).

~~ Aryabhata discussed the concept of sine in his work by the name of ardha-jya, which literally means "half-chord". For simplicity, people started calling it jya.

~~ Diophantine equations have the form $ax + by = c$. Aryabhata's method of solving such problems, elaborated by Bhaskara in 621 CE, is called the kuṭṭaka (कुट्टक) method. Kuṭṭaka means "pulverizing" or "breaking into small pieces", and the method involves a recursive algorithm for writing the original factors in smaller numbers.

~~ In Aryabhatiya, Aryabhata provided elegant results for the summation of series of squares and cubes.

~~ Aryabhata's system of astronomy was called the audAyaka system, in which days are reckoned from uday, dawn at lanka or "equator". Some of his later writings on astronomy, which apparently proposed a second model (or ardha-rAtrika, midnight) are lost.

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~~ Aryabhata correctly insisted that the Earth rotates about its axis daily, and that the apparent movement of the stars is a relative motion caused by the rotation of the Earth, contrary to the then-prevailing view, that the sky rotated.[19] This is indicated in the first chapter of the Aryabhatiya, where he gives the number of rotations of the Earth in a yuga.

~~ Aryabhata described a geocentric model of the Solar System, in which the Sun and Moon are each carried by epicycles. They in turn revolve around the Earth. In this model, which is also found in the Paitāmhasiddhānta.

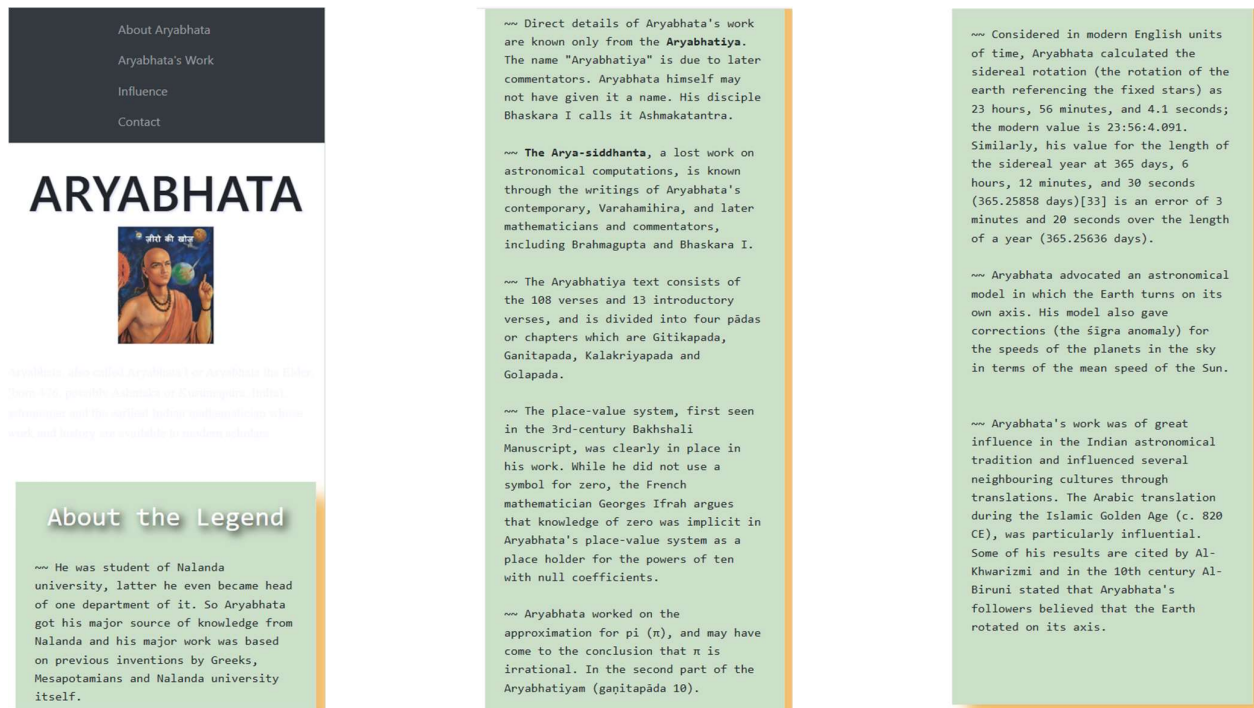
~~ The positions and periods of the planets was calculated relative to uniformly moving points. In the case of Mercury and Venus, they move around the Earth at the same mean speed as the Sun. In the case of Mars, Jupiter, and Saturn, they move around the Earth at specific speeds, representing each planet's motion through the zodiac.

~~ Solar and lunar eclipses were scientifically explained by Aryabhata. He states that the Moon and planets shine by reflected sunlight. Instead of the prevailing cosmogony in which eclipses were caused by Rahu and Ketu (identified as the pseudo-planetary lunar nodes), he explains eclipses in terms of shadows cast by and falling on Earth.

~~ Considered in modern English units of time, Aryabhata calculated the sidereal rotation (the rotation of the earth referencing the fixed stars) as 23 hours, 56 minutes, and 4.1 seconds; the modern value is 23:56:4.091. Similarly, his value for the length of the sidereal year at 365 days, 6 hours, 12 minutes, and 30 seconds (365.25858 days)[33] is an error of 3 minutes and 20 seconds over the length of a year (365.25636 days).

~~ Aryabhata advocated an astronomical model in which the Earth turns on its own axis. His model also gave corrections (the śigra anomaly) for the speeds of the planets in the sky in terms of the mean speed of the Sun.

~~ Aryabhata's work was of great influence in the Indian astronomical tradition and influenced several neighbouring cultures through translations. The Arabic translation during the Islamic Golden Age (c. 820 CE), was particularly influential. Some of his results are cited by Al-Khwarizmi and in the 10th century Al-Biruni stated that Aryabhata's followers believed that the Earth rotated on its axis.



CONCLUSION

This project was successfully completed because of the opportunity provided to the students by IGDTUW Anveshan Foundation. The Web/App Development & Digital Marketing internship by IGDTUW Anveshan Foundation was a transformative experience that equipped students with the knowledge, skills, and some practical experience necessary to thrive in the digital landscape. Throughout the internship, participants gained a comprehensive understanding of Web/App Development & Digital Marketing concepts, techniques, and tools.

The internship provided a platform for students to explore and look into various aspects of web/app development, including front-end design, HTML, CSS, Bootstrap, and jQuery. They also received valuable insights into digital marketing, covering topics such as planning, SEO vs SEM, social media marketing, email marketing, digital tools and some case studies. Additionally, they discovered the resources available for designing and creating various mobile applications. The hands-on sessions, guided by experienced professionals, allowed participants to apply their knowledge in real-world scenarios and enhance their problem-solving abilities.

Moreover, the internship fostered a collaborative and interactive learning environment, enabling participants to work in teams, exchange ideas, and tackle challenges collectively. The practical projects assigned during the internship further honed their skills and allowed them to create innovative web designs, develop mobile applications, and devise effective digital marketing strategies.

Overall, the web/app development and digital marketing internship proved to be a transformative journey, empowering participants with the necessary knowledge, skills, and industry insights. It provided them with a solid foundation to pursue successful careers in these domains. The internship experience was instrumental in shaping their professional growth, enhancing their problem-solving capabilities, and preparing them to navigate the complexities of the digital world with confidence and proficiency. The project making was a great experience gained thanks to the internship opportunity provided to the students.

SUGGESTIONS AND FUTURE SCOPE

The fields of web/app development and digital marketing offer numerous opportunities for growth and innovation. Here are some suggestions and future scope in web/app development and digital marketing:

- **Designing Mobile web/app first:** The importance of optimising websites and applications for mobile users has increased with the widespread use of smartphones and mobile devices. By prioritising designing and developing for mobile devices first and scaling up to desktop versions afterwards can drastically improve user experiences and reach a wider audience.
- **Investing in Progressive Web Apps (PWAs):** Progressive Web Apps give customers an app-like experience through their browsers by combining the greatest features of webpages and mobile apps. Businesses can gain a competitive edge by investing in PWA development by enhancing performance, accessibility, and user engagement across a range of devices.
- **Master Data-analytics for digital marketing:** With the amount of data accessible, utilising data-driven insights can lead to the development of more intelligent and successful marketing tactics. Learning data analytics, data gathering, analysis, and visualisation, may provide digital marketers with the tools they need to make statistics-backed decisions and enhance the effectiveness of their marketing strategies.
- **Stay Updated with SEO Best Practices:** Search Engine Optimization (SEO) remains a vital aspect of digital marketing. As search engine algorithms evolve, staying updated with SEO best practices is essential for maintaining website visibility and driving organic traffic. Continuously optimizing content, understanding keyword research, and implementing technical SEO strategies are critical for successful digital marketing campaigns.
- **Explore Emerging Technologies:** Web/app development and digital marketing are continuously evolving with the emergence of new technologies. Exploring emerging trends such as voice search, artificial intelligence (AI), augmented reality (AR), and virtual reality (VR) can open up new opportunities for innovative and engaging user experiences.
- **Enhance Social Media Advertising Strategies:** Social media platforms continue to be powerful channels for reaching and engaging with audiences. Investing in social media advertising and mastering platform-specific features, targeting options, and analytics can help businesses maximize their social media presence and achieve their marketing goals.
- **Embrace User Experience (UX) Design:** User experience plays a crucial role in web/app development and digital marketing. By prioritizing intuitive designs, user-friendly interfaces, and seamless navigation, businesses can enhance customer satisfaction and drive higher conversions. Understanding UX principles, conducting user research, and incorporating feedback can contribute to delivering exceptional user experiences.
- **Cultivate Collaboration and Networking:** Collaboration and networking are key components of success in web/app development and digital marketing. Actively participating in industry events, joining professional communities, and fostering collaborations with fellow professionals can expand opportunities for learning, sharing insights, and staying updated with industry trends.

- **Embrace Continuous Learning:** The field of web/app development and digital marketing is dynamic and ever-changing. Embracing a mindset of continuous learning and professional development is essential to stay ahead of the curve. Engage in online courses, attend workshops, and explore industry certifications to acquire new skills, deepen your expertise, and adapt to emerging technologies and trends.

By embracing these suggestions and actively seeking out new opportunities for growth and innovation, professionals in web/app development and digital marketing can position themselves for success in the rapidly evolving digital landscape.

ANNEXURE 1

Code for the project – tribute page on Aryabhata

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <meta name="description" content="A tribute page for Aryabhata, the renowned Indian
mathematician and astronomer. Learn about his life, work, and contributions to science.">
  <meta name="keywords" content="Aryabhata, mathematician, astronomer, tribute, India,
science">
  <meta name="author" content="Your Name">
  <meta name="robots" content="index, follow">

  <title>ARYABHATA - A Tribute Page</title>

  <style>

    body {
      background-color: #25383C;
      margin-left: 20%;
      margin-right: 20%;
      color: #F2BB66;
    }

    #title {
      text-align: center;
      text-shadow: 2px 2px 2px #E3E4FA;
      font-size: 7vh;
    }

    img {
      display: inline-block;
      display: block;
      margin-left: auto;
      margin-right: auto;
      width: 30%;
    }

    #caption {
      font-size: 17px;
      font-family: Gill Sans;
      color: ghostwhite;
    }

    div#tribute-data {
```



```

        background-color: rgb(46, 128, 40, 0.25) !important;
        box-shadow: 20px 20px 20px #F2BB66;
        font-family: monospace;
        padding: 25px 25px;
        margin: 11px;
        margin-top: 50px;
    }

    h1.title-aryabhata {
        font-size: 35px;
        color: white;
        text-align: center;
        text-shadow: 5px 5px 10px black;
    }

    #tribute-link {
        text-decoration: none;
        color: floralwhite;
    }
</style>
<link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">
</head>

<body>
    <nav class="navbar navbar-expand-md bg-dark navbar-dark">
        <ul class="navbar-nav mx-auto">
            <li class="nav-item">
                <a class="nav-link" href="#about">About Aryabhata</a>
            </li>
            <li class="nav-item">
                <a class="nav-link" href="#work">Aryabhata's Work</a>
            </li>
            <li class="nav-item">
                <a class="nav-link" href="#influence">Influence</a>
            </li>
            <li class="nav-item">
                <a class="nav-link" href="#contact">Contact</a>
            </li>
        </ul>
    </nav>
    <main id="main">

        <br>
        <h1 id="title">
            ARYABHATA
        </h1>

        <div id="img">
            <img src="aryabhata.jpg"
                id="image"

```



```

    alt="Error Loading Image">
    <br>
    <small id="caption">
        Aryabhata, also called Aryabhata I or Aryabhata the Elder, (born 476,
possibly Ashmaka or Kusumapura, India), astronomer and the earliest Indian mathematician
whose work and history are available to modern scholars.
    </small>
</div>

<div id="tribute-data">
    <h1 class="title-aryabhata">
        About the Legend
    </h1>
    <br>
    <p>
        ~~ He was student of Nalanda university, latter he even became head of one
department of it. So Aryabhata got his major source of knowledge from Nalanda and his major
work was based on previous inventions by Greeks, Mesopotamians and Nalanda university
itself.

        <br><br>
        ~~ Direct details of Aryabhata's work are known only from the
<b>Aryabhatiya</b>. The name "Aryabhatiya" is due to later commentators. Aryabhata himself
may not have given it a name. His disciple Bhaskara I calls it Ashmakatantra.
        <br><br>
        ~~ <b>The Arya-siddhanta</b>, a lost work on astronomical computations, is
known through the writings of Aryabhata's contemporary, Varahamihira, and later
mathematicians and commentators, including Brahmagupta and Bhaskara I.
        <br><br>
        ~~ The Aryabhatiya text consists of the 108 verses and 13 introductory
verses, and is divided into four pādas or chapters which are Gitikapada, Ganitapada,
Kalakriyapada and Golapada.
        <br><br>
        ~~ The place-value system, first seen in the 3rd-century Bakhshali
Manuscript, was clearly in place in his work. While he did not use a symbol for zero, the
French mathematician Georges Ifrah argues that knowledge of zero was implicit in Aryabhata's
place-value system as a place holder for the powers of ten with null coefficients.
        <br><br>
        ~~ Aryabhata worked on the approximation for pi ( $\pi$ ), and may have come to
the conclusion that  $\pi$  is irrational. In the second part of the Aryabhatiyam (gaṇitapāda 10).
        <br><br>
        ~~ Aryabhata discussed the concept of sine in his work by the name of ardha-
jya, which literally means "half-chord". For simplicity, people started calling it jya.
        <br><br>
        ~~ Diophantine equations have the form  $ax + by = c$ . Aryabhata's method of
solving such problems, elaborated by Bhaskara in 621 CE, is called the kuṭṭaka (कुट्टक)
method. Kuṭṭaka means "pulverizing" or "breaking into small pieces", and the method involves
a recursive algorithm for writing the original factors in smaller numbers.
        <br><br>
        ~~ In Aryabhatiya, Aryabhata provided elegant results for the summation of
series of squares and cubes.
        <br><br>

```

~~ Aryabhata's system of astronomy was called the audAyaka system, in which days are reckoned from uday, dawn at lanka or "equator". Some of his later writings on astronomy, which apparently proposed a second model (or ardha-rAtrika, midnight) are lost.

~~ Aryabhata correctly insisted that the Earth rotates about its axis daily, and that the apparent movement of the stars is a relative motion caused by the rotation of the Earth, contrary to the then-prevailing view, that the sky rotated.[19] This is indicated in the first chapter of the Aryabhatiya, where he gives the number of rotations of the Earth in a yuga.

~~ Aryabhata described a geocentric model of the Solar System, in which the Sun and Moon are each carried by epicycles. They in turn revolve around the Earth. In this model, which is also found in the Paitāmahasiddhānta.

~~ The positions and periods of the planets was calculated relative to uniformly moving points. In the case of Mercury and Venus, they move around the Earth at the same mean speed as the Sun. In the case of Mars, Jupiter, and Saturn, they move around the Earth at specific speeds, representing each planet's motion through the zodiac.

~~ Solar and lunar eclipses were scientifically explained by Aryabhata. He states that the Moon and planets shine by reflected sunlight. Instead of the prevailing cosmogony in which eclipses were caused by Rahu and Ketu (identified as the pseudo-planetary lunar nodes), he explains eclipses in terms of shadows cast by and falling on Earth.

~~ Considered in modern English units of time, Aryabhata calculated the sidereal rotation (the rotation of the earth referencing the fixed stars) as 23 hours, 56 minutes, and 4.1 seconds; the modern value is 23:56:4.091. Similarly, his value for the length of the sidereal year at 365 days, 6 hours, 12 minutes, and 30 seconds (365.25858 days)[33] is an error of 3 minutes and 20 seconds over the length of a year (365.25636 days).

~~ Aryabhata advocated an astronomical model in which the Earth turns on its own axis. His model also gave corrections (the śigra anomaly) for the speeds of the planets in the sky in terms of the mean speed of the Sun.

~~ Aryabhata's work was of great influence in the Indian astronomical tradition and influenced several neighbouring cultures through translations. The Arabic translation during the Islamic Golden Age (c. 820 CE), was particularly influential. Some of his results are cited by Al-Khwarizmi and in the 10th century Al-Biruni stated that Aryabhata's followers believed that the Earth rotated on its axis.

</p>

</div>

</main>

</body>

</html>

ANNEXURE 2

WEB DEVELOPMENT

Solution code for assignment 1

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta http-equiv="X-UA-Compatible" content="IE=edge" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title>Assignment 1</title>
    <link
      rel="stylesheet"
      href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css"
      integrity="sha384-Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
      crossorigin="anonymous"
    />
    <style>
      .col-md-4 {
        border: 2px solid green;
        margin-bottom: 5px;
      }
      .col-md-6 {
        border: 2px solid pink;
      }
      .table-heading{
        background: rgb(22, 122, 124)!important;
      }
    </style>
  </head>
  <body>
    <div class="container">
      <div class="row">
        <div class="col-md-4">
          <h4>The days in a week:</h4>
          <ul>
            <li style="color: red">Monday</li>
            <li style="color: orange">Tuesday</li>
            <li style="color: yellow">Wednesday</li>
            <li style="color: green">Thursday</li>
            <li style="color: blue">Friday</li>
            <li style="color: indigo">Saturday</li>
            <li style="color: violet">Sunday</li>
          </ul>
        </div>
        <div class="col-md-4">
          <table class="table table-bordered table-striped">
```

```

        <tr class="table-heading">
            <td>Web dev</td>
            <td>DM</td>
            <td>App dev</td>
        </tr>
        <tr>
            <td>CSS</td>
            <td>Channels</td>
            <td>Front-end</td>
        </tr>
        <tr>
            <td>Bootstrap</td>
            <td>SEO</td>
            <td>MIT App Inventor</td>
        </tr>
        <tr>
            <td>jQuery</td>
            <td>SEM</td>
            <td>Database</td>
        </tr>
    </table>
</div>
<div class="col-md-4">
    
</div>
</div>
<div class="row">
    <div class="col-md-6">
        <h6 style="color: #565051">Heading 1</h6>
        <h5 style="color: #504A4B">Heading 2</h5>
        <h4 style="color: #4C4646">Heading 3</h4>
        <h3 style="color: #463E3F">Heading 4</h3>
        <h2 style="color: #3D3C3A">Heading 5</h2>
        <h1 style="color: #413839">Heading 6</h1>
    </div>
    <div class="col-md-6">
        <div class="row">
            <div class="col-md-6" style="background-color: #2554C7">
                <p>
                    Lorem ipsum, dolor sit amet consectetur adipisicing elit.
                    Molestiae omnis quidem voluptas magnam quas id aut
                </p>
            </div>
            <div class="col-md-6" style="background-color: #1E90FF">
                <p>
                    Lorem ipsum, dolor sit amet consectetur adipisicing elit.
                    Molestiae omnis quidem voluptas magnam quas id aut
                </p>
            </div>
        </div>
    </div>
</div>
<div class="row">

```

```

<div class="col-md-6" style="background-color: #368BC1">
  <p>
    Lorem ipsum, dolor sit amet consectetur adipisicing elit.
    Molestiae omnis quidem voluptas magnam quas id aut
  </p>
</div>
<div class="col-md-6" style="background-color: #87AFC7">
  <p>
    Lorem ipsum, dolor sit amet consectetur adipisicing elit.
    Molestiae omnis quidem voluptas magnam quas id aut
  </p>
</div>
</div>
</div>
</div>
</body>
</html>

```

APP DEVELOPMENT

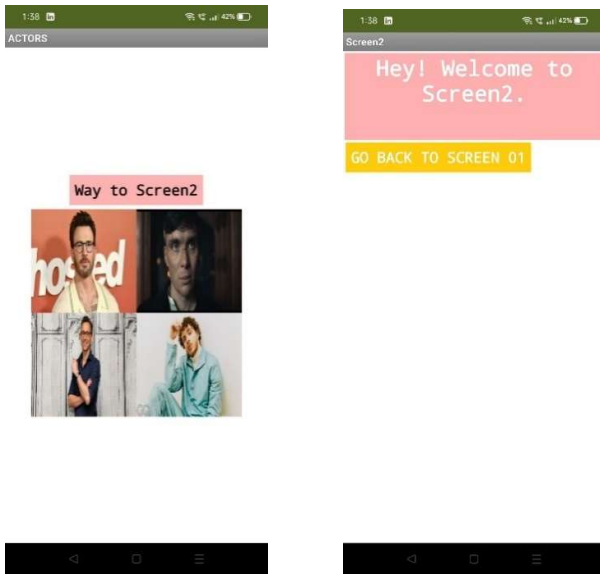
(1) IMAGESpeak: You will hear the text mentioned in the code as speech when you click the buttons. Also you can navigate between screens by a button.

The screenshot displays the App Inventor web interface. On the left, the 'Components' palette shows a project structure with 'Screen1' containing 'SCREEN_02' and a 'TableArrangement1' with buttons for 'Evans', 'Shelby', 'Ioki', and 'Harlow'. Below the table are four 'TextToSpeech' components. On the right, the 'Code' area shows five event-driven code blocks:

- when Evans .Click**: do call TextToSpeech1 .Speak message "Hey! I am Chris Evans. "
- when Ioki .Click**: do call TextToSpeech1 .Speak message "Madam, a god doesn't plead. "
- when Harlow .Click**: do call TextToSpeech1 .Speak message "Hey! I am Jack Harlow. "
- when Shelby .Click**: do call TextToSpeech1 .Speak message "We are the peaky blinders. "
- when SCREEN_02 .Click**: do open another screen screenName Screen2

At the bottom of the code area, there are two warning icons (a yellow triangle and a red X) both with a '0' next to them, and a 'Show Warnings' button.

App:



(2) QR Code Scanner: Scans the QR code and displays the associated content.

Code:

Components

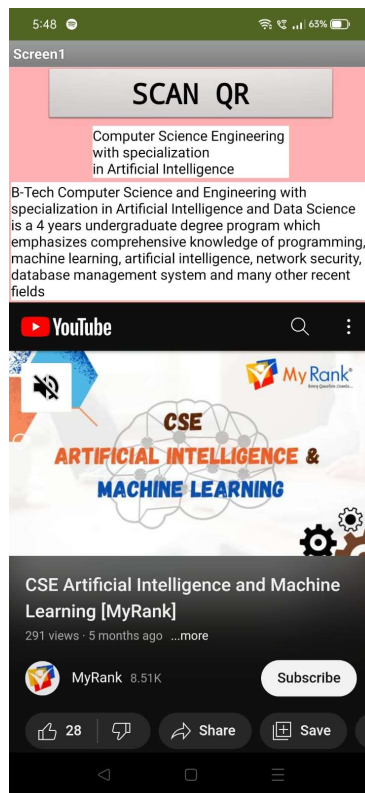
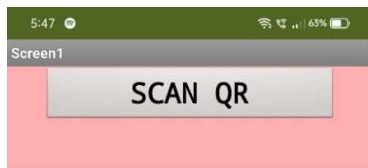
- Screen1
 - ScanBUTTON
 - DEPTname
 - DEPTdesc
 - WebView1
 - BarcodeScanner1

```

when BarcodeScanner1.AfterScan
  result
do
  if get result = "CSE"
  then
    set DEPTname.Text to "Computer Science Engineering"
    set DEPTdesc.Text to "Computer Science Engineering (CSE) encompasses a..."
    call WebView1.GoToUrl
      url "https://youtu.be/vR8PIfdqUo"
  else if get result = "IT"
  then
    set DEPTname.Text to "Department of Information and Technology"
    set DEPTdesc.Text to "The IT department has three major areas of conce..."
    call WebView1.GoToUrl
      url "https://youtu.be/vR8PIfdqUo"
  else if get result = "CSEAI"
  then
    set DEPTname.Text to "Computer Science Engineering\nwith specializatio..."
    set DEPTdesc.Text to "B-Tech Computer Science and Engineering with spe..."
    call WebView1.GoToUrl
      url "https://youtu.be/vR8PIfdqUo"
  else
    set DEPTname.Text to "THIS IS NOT \nA VALID QR."

```

App:



REFERENCES

FOR RESEARCH PURPOSES

<https://www.britannica.com/biography/Aryabhata-I>

<https://en.wikipedia.org/wiki/Aryabhata>

<https://aryabhatacollege.ac.in/about-aryabhata.aspx?id=3>

FOR IMPLEMENTATION PURPOSES

<https://jquery.com/>

<https://getbootstrap.com/>

<https://www.geeksforgeeks.org/html/>