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Digital LearningA PROJECT REPORTSubmitted byPriyanshi ShahVarun ShahIn fulfilment for the award of the degreeofBACHELOR OF ENGINEERINGinComputer EngineeringLDRP Institute of Technology and Research,GandhinagarGujarat Technological University, Ahmedabad Nov-Dec, 2014LDRP Institute of Technology and Research GandhinagarCE-IT DepartmentCERTIFICATEThis is to certify that the Project Work entitled "Digital Learning " has been carried out byPriyanshi Shah(110300107019) and Varun Shah(110300107020) under my guidance in fulfilment of the degree of Bachelor of Engineering in Computer Engineering (8th Semester) of Gujarat Technological University, Ahmedabad during the academic year 2014-15.Guides:Prof Abhinay Pandya, Prof. A. K. GoyalLDRP-ITRHead of the DepartmentTABLE OF CONTENTSIDP CertificateCollege CertificateCompletion of all Activities CertificatePlagiarism CertificateUndertaking of Originality of WorkAcknowledgementList of FiguresList of TablesList of AbbreviationsList of NotationsChapter : 11. IntroductionProblem SummaryIntroductionAim & ObjectivesProblem SpecificationsLiterature Review & Prior Art SearchPlan of Work Project PlanMilestones & DeliverablesMaterial & ToolChapter : 2Design: Analysis,Design Methodology & Imlementation Strategy 2.1. Design Analysis 2.2. Implementation Strategy2.3. Data Dictionary 2.4. Observation Matrix Canvas 2.5. Ideation Canvas 2.6. Product Development CanvasChapter : 3Implentation 3.1. Implentation Environment3.2. System Diagrams 3.2.1 Use Case Diagram 3.2.2 Class Diagram 3.2.3 Activity Diagram 3.2.4 State Diagram 3.2.5 Sequence Diagram3.3. Snapshots3.4. Testing 3.4.1 Testing Plan 3.4.2 Testing Method 3.4.3 Testing Strategies 3.4.5 Testing CasesChapter : 4Summary4.1 Advantages4.2 Scope4.3 Features4.4 Project Bookmarks4.5 Future EnhancementReferencesAppendix 1: Periodic Progress ReportAppendix 2: Business Model CanvasAppendix 3: Patent Drafting Exercise-: ACKNOWLEDGEMENT:-I take this opportunity to humbly express our thankfulness to all those concerned with my project.First of all I am thankful to LDRP-ITR for undertaking this project. **I am sincerely indebted** toProf. Abhinay Pandya for giving me the opportunity to work on this project. His continuous guidance and help have proved to be a key to my success in overcoming the challenges that I have faced during my project work. His support made the project a pleasantly memorable one .Without his help at all stages in spite of her own work load; the completion of the project would not have been possible.I express my sincere gratitude to Prof. A. K. GOYAL for his valuable guidance and positive feedback.There are so many people without whose help I would never have conceived and learnt, to whom I would like to express my gratitude – my friends , colleagues, and of course CE & IT Department of LDRP-ITR.Last but not least I am thankful to almighty GOD and my PARENTS for giving me such a good atmosphere to work hard and to succeed.With regards,Priyanshi ShahVarun Shah---------------------------------------ABSTRACTDigital LearningDigital Learning is any **instructional practice that uses technology to strengthen a student's learning** experience. It is an Android app which emphasizes high-quality instructions and provides access to challenging contents, feedback through formative assessment, opportunities for learning. Results can be easily evaluated by the teachers. This is an Application that would generate interest towards students.Priyanshi Shah(110300107019)Varun Shah(110300107020)LIST OF FIGURE:-No.Figure NameFigure no.Page no.1Schedule Representation212Waterfall Model223Incremental Model235Use case diagram for launcher and users(student & teacher)306Class diagram31-337Activity diagram for Generating Reports34-358State Diagram for launcher, Teacher,Establishing Connection,Learning procedure.36-379Sequence diagram for Teacher Mode,Student Mode,Parents38-39LIST OF TABLE:-No.Table NameTable no.Page no.1ABBREVIATIONS182Notation283Project Profile1.1124Data dictionary5.640ABBREVIATIONSGUIGraphical User InterfaceHTTPHyper Text Transfer ProtocolDFDData Flow DiagramJEEJava Enterprise EditionNOTATIONSGeneralizationBinary AssociationClassDependencyEnd AssociationActorUsesSystem BoundaryAction StateControl FlowInitial StateFinal StateForkObject LifetimeActivationMessageDecisionStateTransition13652510223500Actor1365256985000Data ProcessData Flow18605537655500136525905500Data StoreChapter 1IntroductionProblem SummaryThis Application

provides an interface from which student can improve their grasping power. This application provides images to fill colors and connect dots etc different tasks which can make them imaginative and creative. They can learn to identify real world objects. The drawing task can help to learn alphabets and many different entities. More Importantly Students don't have to raise hand for query and wait for teacher to be available. They can send query to their teacher and teacher will reply accordingly.IntroductionThe purpose of Project, is to provide Effective communication between mobile devices without using external router or wifi. As connection between master and clients is established, data can be shared by clients. Master will be able to broadcast messages or content connected to clients(nodes).Client will be able to identify master and will be able to connect as and when master is available. One click installer, which will act as a master or node based on configuration. Configurations are required to set after installation.As the number of Internet access points are growing rapidly, Digital-Learning is also gaining a new peak. It provides the best medium between students and teacher, with the help of rich multimedia.Aim & ObjectivesA one-stop, all-in-one Application will be provided which will include all the possible enhancements needed for a particular college. It will have all the facilities that the users of the system require to make education and also the communications easier.Education is **the most powerful weapon which you can use to change the** world. This Application can be a blessing for the students of the institution.It will be an application which will attract students towards study and other activities which can sharpen their mind.As the number of Internet access points are growing rapidly, Digital-Learning is also gaining a new peak. It provides the best medium between students and teacher, with the help of rich multimedia.Problem SpecificationsDigital Learning is any instructional practice that uses technology to strengthen a student's learning experience. **It emphasizes high-quality instruction and provides access to** challenging content, feedback through formative assessment, opportunities for learning. One click installer, which will act as a master or node based on configuration. Configurations required to set after installation.As connection between master and clients is established, data can be shared by clients.Master will be able to broadcast messages or content connected to clients(nodes).Students will learn their course thoroughly according to the tasks given in the application.Literature Review & Prior Art SearchKeywords used for search:Client server connection:A connection manager is responsive to the connections for providing the connection control blocks and to the operation calls for providing the client controll blocks where in each session between a client and a connection to a sever is established.Peer to peer Connection:Embodiments of the invention disclose the technique for establishing a point to point link between two peer nodes in a communications network using a client server connection protocol.Connection of devices:A system for controlling connections from an ip entity having an ip address to a server comprising the steps of a rule table containing the set of rules indicating a number of connections between the ip entity and the server means for receiving processing the ip packet.Digital Learning:According to the present invention related to a 360 degree learning system where in the system is creating next generation education system, a self managed learning eco-system,a personlized context for each learner.1.6 Plan Work1.6.1 Project PlanProject Development ApproachProject management is the discipline of planning, organizing, securing & managing resources to bring about the successful completion of specific project goals and objectives.It is sometimes conflated with program management, however technically that is actually a higher level construction: a group of related and somehow interdependent engineering projects.The primary challenge of project management is to achieve all of the project goals and objectives while honouring the preconceived project constraints. Typical constraints are scope,time, and budget. The secondary—and more ambitious—challenge is to optimize the allocation and integration of inputs necessary to meet pre-defined objectives.Project planning is a development strategy that is used to achieve a goal that satisfies the requirements abiding by the constraints. There are many types of software process models like linear sequential model, RAD model, incremental model, spiral model etc. By this process model we can easily make a good planning for the project we have decided to use the WaterfallModel for our project.As we working on an online project and we have a time of 1 year, we are using the waterfall model.Fig 4.2 : Waterfall ModelIn the Software Development Life Cycle, there are different stages for requirement collection, analysis, design, coding, implementation and testing. We first identify the client requirements and perform feasibility study. After all the requirements have been accumulated, the analysis phase is entered into and the system is designed after thorough understanding of the system.Once designing is completed the actual implementation of the software takes place. Along with the coding we also employ unit testing methods to uncover errors before they propagate to the next level. After the system is completely coded, we employ system testing to test the system as a whole.Incrementalmodel:-Fig 4.3 : Incremental ModelJUSTIFICATIONThe Incremental model combines elements of the linear sequential model with the iterative philosophy of the prototyping. This model has been explicitly designed to accommodate a product that evolves over time. When an incremental model is

used, the first increment is often a core product. The core product is used by the customer or undergoes a detailed review. As a result of use and/or evaluation a **plan is developed for the next** increment. **The plan addresses the modification to the core product to better** meet the needs of the customer and delivery of additional features and functionality. Software is constructed in a step-by-step manner. While a software product is being developed, each **step adds to what has already been** completed. Advantages of Incremental ModelSystem is developed and delivered in increments after establishing an overall architecture. **Requirements and specifications for each increment may be** developed. Users may experiment with delivered increments while others are being developed. Intended to combine some of the advantages of prototyping but with a more manageable process and better system structure. Incremental development is especially useful when staffing is unavailable for a complete implementation by the business deadline. Early increments can be implemented with fewer people.1.6.2 Milestones & DeliverablesThe project is planned to complete in a particular time interval. For the delivery of the project, some milestones are required to indicate status of project.We have defined it for our project as per requirement and planning. These milestones are given below:The completion of Project and Domain analysis for project.Delivered: 25th July,20142. Detailed study and analysis of requirements.Comparing with other systems.Defining main modules of the system. Delivered:23rd September, 20143. Database design and creation of Data Dictionary.Delivered:10th October, 20144. Design the system and represent the system in form of Diagrams.Delivered:20th October, 20145. Development of project.Coding and Deployment.TestingDelivered: May ,2015Schedule RepresentaionMaterial & ToolsHardwareRooted Android Tablet1GB RAM (Recommended)8GB Internal Memory (Recommended)SoftwareDevelopmentTool:IntelliJ IDEAAndroid StudioDatabase Tool:Sql LiteSoftware :Sdk 16(min)Chapter 2Design:Analysis,Design Methodology & Implementation Strategy2.1 Design AnalysisIn its simplest terms, design analysis is a powerful **software technology for simulating physical behavior on the computer.Will it** break? Will it deform? Will it get too hot? These are the types of questions for which design analysis provides accurate answers.Instead of building a prototype and developing elaborate testing regimens to analyze the physical behavior of a product, engineers can elicit this information quickly and accurately on the computer.Because design analysis can minimize or even eliminate the need for physicalprototyping and testing, the technology has gone mainstream in the manufacturingworld over the past decade as a valuable product development tool and has becomeomnipresent in almost all fields of engineering.2.2 Implemenation StrategyBecause design analysis can minimize or even eliminate the need for physicalprototyping and testing, the technology has gone mainstream in the manufacturingworld over the past decade as a valuable product development tool and has becomeomnipresent in almost all fields of engineering.Implementation strategies have unparalleled importance in implementation science, as they constitute the 'how to' component of changing healthcare practice.Yet, implementation researchers and other stakeholders are not able to fully utilize thefindings of studies focusing on implementation strategies because they are ofteninconsistently labeled and poorly described, are rarely justified theoretically, lackoperational definitions or manuals to guide their use, and are part of 'packaged'approaches whose specific elements are poorly understood.We address the challenges of specifying and reporting implementation strategiesencountered by researchers who design, conduct, and report research on implementation strategies.Specifically, we propose guidelines for naming, defining, and operationalizingimplementation strategies in terms of seven dimensions: actor, the action, actiontargets, temporality, dose, implementation outcomes addressed, and theoreticaljustification.Ultimately, implementation strategies cannot be used in practice or tested in researchwithout a full description of their components and how they should be used.As with all intervention research, their descriptions must be precise enough to enablemeasurement and 'reproducibility.'We propose these recommendations to improve the reporting of implementationstrategies in research studies and to stimulate further identification of elementspertinent to implementation strategies that should be included in reporting guidelinesfor implementation strategies.2.3 Data DictionaryThe volumes of data in most information systems are substantialmore than a single analyst can easily keep of the same. When terms of analyst work on a system the task of coordinating data definition becomes more complex. Individuals depend on the information provided by others with their assumptions and the specifications made by them.Data Dictionary are integral component of structured analysis sincedata flow diagrams (DFD) by themselves do not fully describe the subject of investigation.Data Dictionary provides additional information about the system.Table Name : Student_DataDescription : This table contains information about Student.FieldDataTypeSizeNullPrimaryKeyIdint2NOYESNamevarchar20NONOagevarchar2NONOpasswordInt 4NONOimageblobNONOTable Name : Saved_ImagesDescription : This table contains information about Stored Images of drawing.FieldsDatatypesSizeNullPrimary KeyIdint100NOYESPathString100NO2.4 Observation Matrix CanvasObservation matrix has observations, scouted challenges and best out of all.Challenge faced are

covering all curriculum, handling of messages and connection of master slave.2.5 Ideation CanvasIdeation Canvas has got 4 parts: People, Activities, Location and Props.People consist of student and teacher Activities by students are completing the tasks and asking queryActivities by students are completing the tasks and asking queryTeacher receive the query and can co-ordinatly solve itLocation is the classroom and student need booted tablet to use the applicationProduct development canvas2.6 Product Development CanvasProduct development canvas has purpose, people, product experience, product. function, product features, components, customer revalidation and reject.This describes the development of the core functionalities of the application which are to be implemented between teacher and student.CHAPTER: 3 IMPLEMENTATION3.1 Implementation Environment :Implementation includes all those activities that take place to convert from old system to new. The new system be totally new, replacing an existing manual or automated system or it may be a major modification to an existing system.Basically three aspects of implementations:Training PersonnelConversion ProcedurePost ImplementationTraining Personnel: - Both System operator and user need training for how they can use systems, and what the system will or will not do. Training must ensure that they are able to handle all possible operation, both routine and extraordinary.Conversion Procedure: - Conversion is the process of changing from the old system to the new one. Post Implementation Review: - After the system is implemented and conversion is complete, a review of the system is usually conducted by users and analyst alike. The review is important to gather information the maintenance of system.3.2 System Diagrams :3.2.1 Use Case Diagram:Use Case Diagram for StudentsUse Case Diagram for RegistrationUse Case Diagram for Drawing Tasks3.2.2 Class Diagram :3.2.3 Activity Diagram :Activity Diagram for Student DetailsActivity Diagram for Student Tasks3.2.4 State Transition Diagram :State Diagram for Student DetailsState Diagram for Registration3.2.5 Sequence Diagram:Sequence Diagram for Select UserSequence Diagram for Registration3.3 Snapshots :Start Page of Digital LearningList Of StudentsRegistration pageEnter passcodeRe-enter PasscodeStudent TasksSend Query to TeacherFill ColorFor Incorrect AnswerFor Correct AnswerMatchColorDrawingSaved Images of Drawing3.4 Testing : 3.4.1 Testing PlanA test Specification is called test plan. The developers are well aware what test plans will be executed and this information is made available to management and thedevelopers.The idea is to make them more cautious when developing their code or makingadditional Changes. Some Companies have high-level documents called test strategy.3.4.2 Testing MethodBlack-Box TestingThe technique of testing without having any knowledge of the interior workings of the application is called black-box testing. The tester is oblivious to the system architecture and does not have access to the source code. **Typically, while performing a black-box test, a tester will interact** with the system's user interface by providing inputs and examining outputs without knowing how and where the inputs are worked upon.The following table lists the advantages and disadvantages of black-box testing.AdvantagesDisadvantagesWell suited and efficient for large code segments. Code access is not required. Clearly separates user's perspective from the developer's perspective through visibly defined roles. Large numbers of moderately skilled testers can test the application with no knowledge of implementation, programming language, or operating systems. Limited coverage, since only a selected number of test scenarios is actually performed. Inefficient testing, due to the fact that the tester only has limited knowledge about an application. Blind coverage, since the tester cannot target specific code segments or error-prone areas. The test cases are difficult to design. White-Box TestingWhite-box testing is the detail investigation of internal logic and structure of the code.White-Box testing is also called glass testing or open-box testing.In order to perform white box testing on an application, a tester needs to know the internal working of the code.The Tester needs to have look inside the source code and find out which unit of the code is behaving inappropriately.The following table lists the advantages and disadvantages of white box testing.The following table lists the advantages and disadvantages of white-box testing. Advantages Disadvantages As the tester has knowledge of the source code, it becomes very easy to find out which type of data can help in testing the application effectively. It helps in optimizing the code. Extra lines of code can be removed which can bring in hidden defects. Due to the tester's knowledge about the code, maximum coverage is attained during test scenario writing. Due to the fact that a skilled tester is needed to perform white-box testing, the costs are increased. Sometimes it is impossible to look into every nook and corner to find out hidden errors that may create problems, as many paths will go untested. It is difficult to maintain white-box testing, as it requires specialized tools like code analyzers and debugging tools. Grey-Box TestingGrey-Box testing is a technique to test the application with having a limited knowledge of the internal workings of an application.In Software testing, the phrase the more you know , better carries a lot of weight while testing an application.Mastering the domain of the system always gives the tester an edge over someone with limited domain knowledge. Unlike blackbox testing,where the tester only tests the application's user interface, in grey-box testing, the tester has access to design documents and database. Having this knowledge, tester can prepare better test data and test

scenarios while making a test plan.AdvantagesDisadvantagesOffers combined benefits of black- box and white-box testing wherever possible. Grey box testers don't rely on the source code; instead they rely on interface definition and functional specifications. Based on the limited information available, a grey-box tester can design excellent test scenarios especially around communication protocols and data type handling.The test is done from the point of view of the user and not the designer. Since the access to source code is not available, the ability to go over the code and test coverage is limited. The tests can be redundant if the software designer has already run a test case. Testing every possible input stream is unrealistic because it would take an unreasonable amount of time; therefore, many program paths will go untested. 3.4.3 Testing StrategyTesting stratgies are described as below:AnalyticalLet us take an example to understand this. The risk-basedstrategy involves performing a risk analysis using project documents and stakeholder input, then planning, estimating, designing, and prioritizing the tests based on risk. Another analytical test strategy is the requirements-based strategy, where an analysis of the requirements specification forms the basis for planning, estimating and designing tests. Analytical test strategies have in common the use of some formal or informal analytical technique, usually during the requirements and design stages of the project.Model-based:Let us take an example to understand this. You can buildmathematical models for loading and response for e commerce servers, and test based on that model. If the behavior of the system under test conforms to that predicted by the model, the system is deemed to be working. Model-based test strategies have in common the creation or selection of some formal or informal model for critical system behaviors, usually during the requirements and design stages of the project.Methodological:Let us take an example to understand this. You might have achecklist that you have put together over the years that suggests the major areas of testing to run or you might follow an industry-standard for software quality, such as ISO 9126, for your outline of major test areas. You then methodically design, implement and execute tests following this outline. Methodical test strategies have in common the adherence to a pre-planned, systematized approach that has been developed in-house, assembled from various concepts developed in house and gathered from outside, or adapted significantly from outside ideas and may have an early or late point of involvement for testing.Process-or standard-compliant:Let us take an example to understand this. You might adopt theIEEE 829 standard for your testing, using books such as [Craig, 2002] or [Drabick,2004] to fill in the methodological gaps. Alternatively, you might adopt one of the agile methodologies such as Extreme Programming. Process- or standard-compliant strategies have in common reliance upon an externally developed approach to testing, often with little – if any – customization and may have an early or late point of involvement for testing.Dynamic:Let us take an example to understand this. You might create alightweight set of testing guide lines that focus on rapid adaptation or knownweaknesses in software. Dynamic strategies, such as exploratory testing, have in common concentrating on finding as many defects as possible during test execution and adapting to the realities of the system under test as it is when delivered, and they typically emphasize the later stages of testing. Consultative or directed:Let us take an example to understand this. You might ask theusers or developers of the system to tell you what to test or even rely on them to do the testing. Consultative or directed strategies have in common the reliance on a group of non-testers to guide or perform the testing effort and typically emphasize the later stages of testing simply due to the lack of recognition of the value of early testing.Regressive-averse:Let us take an example to understand this. You might try toautomate all the tests of system functionality so that, whenever anything changes, you can re-run every test to ensure nothing has broken. Regression-averse strategies have in common a set of procedures – usually automated – that allow them to detect regression defects. A regression-averse strategy may involve automating functional tests prior to release of the function, in which case it requires early testing, but sometimes the testing is almost entirely focused on testing functions that already have been released, which is in some sense a form of post release test involvement.3.4.4 Testing CasesA test case, in software engineering, is a set of conditions under which a tester willdetermine whether an application, software system or one of its features is working asit was originally established for it to do.Writing effective test cases is a skill and that can be achieved by some experience andin-depth study of the application on which test cases are being written.Here are some tips on how to write test cases, test case procedures and some basic test case definitions.What is a test case?"A test case has components that describes an input, action or event and an expectedresponse, to determine if a feature of an application is working correctly."There are levels in which each test case will fall in order to avoid duplication efforts.Level 1:There are levels in which each test case will fall in order to avoid duplication efforts.Level 2: This is the practical stage in which writing test cases depend on actual functional and system flow of the application.Level 3: This is the stage in which you will group some test cases and write a test procedure. Test procedure is nothing but a group of small test cases maximum of 10.Level 4: Automation of the project. This will minimize human interaction with system and thus QA can focus on current updated functionalities to test rather than

remaining busy with regression testing.So you can observe a systematic growth from no testable item to a Automation suit.Why we write test cases?The basic objective of writing test cases is to validate thetesting coverage of the application. If you are working in any CMMi company then you will strictly follow test cases standards. So writing test cases brings some sort of standardization and minimizes the ad-hoc approach in testing.Chapter 4SUMMARY4.1 AdvantagesStudents will be able to think practically considering the real world applications of their course.It will be helpful for teacher to explain and know the exact evaluation of the student.Teacher will get query message from students and will be able to attend students problem accordingly.Reduces paper-work & time for both students and teachers. 4.2 ScopeTo improve student's learning through technology:Students can easily connect to the teachers, by their Tablets.The application also provides, to choose the appropriate task. To serve the students, in best manner:Students can ask their query to teacher through client server communication.4.3 FeaturesThis is a basic application for kids who will get attracted towards the tablets to study.They can learn many other activities like drawing, fill color, match the color and join the dots.Application provides different tasks that can help them in improve their ability.Multiple students can use a tablet at a time as it has functionality of multiuser.Users will be password protected.Students can send query via message.Teacher will be able to see which student has whichever query and will attend student accordingly.4.4 Future EnhancementIn future it is possible to make users dynamic that users can access their data on any tablet as data for all users uniquely stored in database.Client and Server can share data and messages both ways.Report can be generated after every task. Teacher can send this task reports to their parents which can help them to know in which area student need to practice more.Conclusion :- The project DIGITAL LEARNING is made after checking project's workability in all aspects and in accordance to the users' requirements with a moderate degree of security mechanisms as well as provision for future enhancements, as they would come with time. The Digital Learningis an education Applicationsystem improves vastly over the old system, which was inefficient. The project DIGITAL LEARNING is made keeping in mind the present requirements, the lessons learnt from the past system and possible future needs of the users. These Application would generate curiosity in Students to learn their academics in enhanced way. Students can send query message to teacher which teacher will reply accordingly.So students don't have to wait for teacher to be available. To make DIGITAL LEARNING more flexible for all users, emphasis was on proper management of resources (Device as well as humans) during the analysis as well as the designing too. Thus the system is capable of handling a wide range of enhancements.Thus, DIGITAL LEARNING hopes to serve the purpose for which it was created well and adapt to the changing requirements in an effective way.ReferencesBooks:-SoftwareEngineering:APractioner'sApproach6theditionbyRogerPressman, McGrawHillinternational edition.TheObjectOrientedApproachConcepts,SystemDevelopmentandModellingwithUML, Satzinger, Orvik,2ndedition.JAVA –Complete ReferenceAuthor Sams, "Teach Yourself Android Application Development in 24 hours".Authored by Ed Burnette, "Hello, Android".References :-www.google.comjetbrains.com/idea/developer.android.comwww.stackoverflow.comwww.tutorialpoints.comSearch EngineWikipediaGoogleYoutube