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Intelligent Technology and Its Applications
(ISITIA)**

Proceeding

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GREETINGS FROM THE GENERAL CHAIR

Welcome to 2015 International Seminar on Intelligent Technology and Its Application (ISITIA) held in Surabaya Indonesia, the second biggest city in Indonesia. It is the 16th seminar that annually organized by Electrical Engineering Department of Institut Teknologi Sepuluh Nopember (ITS). It is aimed as a forum to discuss the current Intelligent technology and Its Application that always involve academicians, professionals, researchers, and also student from various research background and interest especially electronics, information technology, power system, circuit and control, telecommunication, and biomedical engineering.

ISITIA 2015 is held in AJ Building of Electrical Engineering Department of Institut Teknologi Sepuluh Nopember (ITS) on May 20 -21. We invited three keynote speakers for giving their valuable experience and knowledge. First Keynote Speaker is Prof. Kohei Arai from Saga University Japan who expert in Human Computer Interaction as well as remote sensing. Second keynote speaker is Prof. Soegijardjo Soegijoko from Insitut Teknologi Bandung (chapter chair of EMBS and CASS IEEE Society). The last keynote speaker is Dr. Ketut Eddy Purnama from Multimedia and Network Engineering ITS Indonesia.

ISITIA 2015 received more than 170 papers, however we only accepted 82 the high quality of papers and being presented in our seminar.

I would like to thanks to all Electrical Engineering Department staffs for their support, especially to our head of department who always encourage us. Also, we would like to thank our steering committee, TPC, reviewers, students, and volunteer who always support us. It is our pleasure to serve you all, please enjoy our city and see you again.



Ronny Mardiyanto, ST, MT, Ph.D

General Chair,

2015 International Seminar on Intelligent Technology
and Its Application (ISITIA)

Conference Program

Wednesday, 20 May 2015

Time	Activity									
7:30 - 8:00	Registration									
8:00 - 8:30	Opening Ceremony - Greeting from Chairman of ISITIA 2015 - Greeting from Head of EE Departement									
8:30 - 9:15	Robot Performance - Art Robot - RoboSoccer - Wheel/Foot Drive Robot									
9:15 - 9:30	Biomedical Equipment Demo									
9:30 - 9:45	COFFEE BREAK									
9:45 - 10:30	Invited Speaker 1 Prof. Kohei Arai (Saga University, Japan) <i>Rescue system with sensor network for vital sign monitoring</i> <i>Tutorial: OpenCV - How it works for detecting forest pigs -</i>									
10:30 - 11:15	Invited Speaker 2 Prof. Soegijardjo Soegijoko (ITB, Indonesia) <i>Towards Integration of Electronic Health in Dermatology and in Drug Delivery Systems</i>									
11:15 - 12:00	Invited Speaker 3 Dr. I Ketut Eddy Purnama, ST, MT (ITS, Surabaya) <i>Ultrasound imaging for the unusual structure: see the unseed</i>									
12:00 - 13:00	LUNCH BREAK									
13:00 - 16:15	Paralel Session									
	Room A	Room B	Room C	Room D	Room E	Room F	Room G	Room H	Room I	Room J
	C-101	C-102	C-103	C-104	C-106	C-107	C-108	C-109	C-110	C-111

Session Program

Room : C-101
Topics : Artificial Intelligent

No.	Time	Paper ID	Paper Authors	Paper Title
1	13:00 - 13:15	421	Fergyanto E. Gunawan; Yanfi; Benfano Soewito	A vibratory-based method for road damage classification
2	13:15 - 13:30	435	Illa Rizianiza; Aulia Siti Aisjah	Prediction of Significant Wave Height in The Java Sea Using Artificial Neural Network
3	13:30 - 13:45	528	I Gede Pasek Suta Wijaya; Keiichi Uchimura; Gou Koutaki	Traffic Light Signal Parameters Optimization Using Particle Swarm Optimization
4	13:45 - 14:00	569	Muhammad Aminul Akbar; Wida Praponco; Mochamad Hariadi; Supeno Mardi S.N	Multi Behavior NPC Coordination Using Fuzzy Coordinator And Gaussian Distribution
5	14:00 - 14:15	586	Ary Sespajayadi; Indrabayu; Ingrid Nurtanio	Technical Data Analysis For Movement Prediction of Euro to USD Using Genetic Algorithm-Neural Network
6	14:15 - 14:30	592	Fergyanto E. Gunawan; Adrian Victor Juandi; Benfano Soewito	An Automatic Text Summarization using Text Features and Singular Value Decomposition for Popular Articles in Indonesia Language
7	14:30 - 14:45	631	Anung Kharista; Adhistya Erna Permanasari; Indriana Hidayah	The Performance of GM (1,1) and ARIMA for Forecasting of Foreign Tourists Visits to Indonesia
8	14:45 - 15:00	634	Saucha Diwandari; Adhistya Erna Permanasari; Indriana Hidayah	Performance Analysis of Naive Bayes, PART and SMO for Classification of Page Interest in Web Usage Mining

Room : C-102
Topics : Control System and Robotics

No.	Time	Paper ID	Paper Authors	Paper Title
1	13:00 - 13:15	422	Muhammad Rivai; Peter Chondro; Masaji Suwito; Shanq-Jang Ruan	Design And Implementation Of A Submerged Capacitive Sensor In PID Controller To Regulate The Concentration Of Non-Denaturated Ethyl Alcohol
2	13:15 - 13:30	480	Eka Maulana; M. Aziz Muslim; Veri Hendrayawan	Inverse Kinematic Implementation of Four-Wheels Mecanum Drive Mobile Robot Using Stepper Motors
3	13:30 - 13:45	511	Hanum Arrosida; Rusdhianto Effendy; Trihastuti Agustinah; Josaphat Pramudjanto	Design of Decoupling and Nonlinear PD Controller for Cruise Control of a Quadrotor
4	13:45 - 14:00	516	Muhtadin; Eka Prasetya Herwidodo; Ahmad Zaini;	INI Framework : Indonesian Language Interpreter Software for Controlling Nao Robot Movement
5	14:00 - 14:15	605	Muhammad Rivai; Rendyansyah; Djoko Purwanto	Implementation of Fuzzy Logic Control in Robot Arm for Searching Location of Gas Leak
6	14:15 - 14:30	611	Sritrusta Sukaridhoto; Dadet Pramadhanto; Taufiqurrahman; Muhammad Alif; Andrie Yuwono; Nobuo Funabiki	A Design of Radio-controlled Submarine Modification for River Water Quality Monitoring
7	14:30 - 14:45	623	Ronny Mardiyanto, Janu Anggoro, Fajar Budiman	2D Map Creator for Robot Navigation by Utilizing Kinect and Rotary Encoder

Room : C-103
Topics : Electronics and Biomedical Engineering

No.	Time	Paper ID	Paper Authors	Paper Title
1	13:00 - 13:15	389	Yunendah Nur Fuadah; Agung W Setiawan; Tati Latifah Erawati Rajab	Performing High Accuracy of The System for Cataract Detection Using Statistical Texture Analysis and K-Nearest Neighbor
2	13:15 - 13:30	409	I Md. Dendi Maysanjaya; Hanung Adi Nugroho; Noor Akhmad Setiawan	A Comparison of Classification Methods on Diagnosis of Thyroid Disease
3	13:30 - 13:45	427	M. Udin Harun Al Rasyid; Bih-Hwang Lee; Amang Sudarsono	Wireless Body Area Network for Monitoring Body Temperature, Heart Beat and Oxygen in Blood
4	13:45 - 14:00	446	Antonius P. Renardy; Nur Ahmadi; Ashbir A. Fadila; Naufal Shidqi; Trio Adiono	Hardware Implementation of Montgomery Modular Multiplication Algorithm Using Iterative Architecture
5	14:00 - 14:15	450	Wahyu Andhyka Kusuma; Lailatul Husniah	Skeletonization Using Thinning Method for Human Motion System
6	14:15 - 14:30	451	Sholeh Hadi Pramono; Eka Maulana; M.A.R. Sembiring	The Effect of Photoelectrode TiO ₂ Layer Thickness to The Output Power of Chlorophyll-Based Dye-Sensitized Solar Cell (DSSC)

7	14:30 - 14:45	514	Bagus Hanindhito; Nur Ahmadi; Hafez Hogantara; Annisa I. Arrahmah; Trio Adiono	FPGA Implementation of Modified Serial Montgomery Modular Multiplication for 2048-bit RSA Cryptosystems
8	14:45 - 15:00	533	Helmy Rahadian; Bambang Sutopo; Indah Soesanti	TGS2611 Performance as Biogas Monitoring Instrument in Digester Model Application
9	15:00 - 15:15	563	Nada Fitriyatul Hikmah; Achmad Arifin; Tri Arief Sardjono; * Eko Agus Suprayitno	A Signal Processing Framework for Multimodal Cardiac Analysis
10	15:15 - 15:30	591	Fauzan Arrofiqi; Achmad Arifin; Beniciditus Indrajaya	Design of Wearable System for Closed-Loop Control of Gait Restoration System by Functional Electrical Stimulation
11	15:30 - 15:45	603	Dwi Harimi Sulistyawati, Farah Zakiyah Rahmanti, I Ketut Eddy Purnama, Mauridhi Hery Purnomo	Automatic Segmentation of Malaria Parasites on Thick Blood Film using Blob Analysis

Room : C-104
Topics : Power System

No.	Time	Paper ID	Paper Authors	Paper Title
1	13:00 - 13:15	445	Leony Ariesta Wenno; F. Danang Wijaya	Conditions of PV-Diesel Hybrid Systems In Tagalaya Village, Tagalaya Island, North Halmahera, North Maluku
2	13:15 - 13:30	462	Muhammad Ruswandi Djalal; Andi Imran, Imam Robandi	Optimal Placement And Tuning Power System Stabilizer Using Participation Factor And Imperialist Competitive Algorithm In 150 Kv South Of Sulawesi System
3	13:30 - 13:45	465	Yun Tonce Kusuma Priyanto; Lukman Hendarwin	Multi Objective Optimal Power Flow To Minimize Losses and Carbon Emission Using Wolf Algorithm
4	13:45 - 14:00	466	H. Suryoatmojo; A. M. B. Zakariya; A. Musthofa; I. Robandi; S. Anam	Optimal Controller for Doubly Fed Induction Generator (DFIG) Using Differential Evolutionary Algorithm (DE)
5	14:00 - 14:15	472	Dapis; Muhammad Wahyudi; Dimas Anton Asfani; Daniar Fahmi; I Made Yulistya Negara	Accelerated Ageing experiment for Induction motor Insulation Due to Humidity Effect
6	14:15 - 14:30	475	Anang Tjahjono; Dimas Okky Anggriawan; Ardyono Priyadi; Margo Pujiantara; Mauridhi Hery Purnomo	Digital Overcurrent Relay with Conventional Curve Modeling Using Levenberg-Marquardt Backpropagation
7	14:30 - 14:45	501	Soediby; Feby Agung Pamuji; M. Ashari	Control Design of Photovoltaic BPSX-60 Using Fuzzy Logic Controller for Low Voltage Grid
8	14:45 - 15:00	509	Ardyono Priyadi; Yanuar Mahfudz Safarudin; Mauridhi Hery Purnomo; Margo Pujiantara	Combining Simplified Firefly and Modified P&O Algorithm for Maximum Power Point Tracking of Photovoltaic System Under Partial Shaded Condition
9	15:00 - 15:15	583	Rony Seto Wibowo; Nani Lathifatun Nada; Samsul Anam; Adi Soeprijanto; Ontoseno Penangsang	Dynamic Optimal Power Flow with Geothermal Power Plant under Take or Pay Energy Contract
10	15:15 - 15:30	589	Amirullah; Ontoseno Penangsang; Adi Soeprijanto	Effect of Installation of Photovoltaic (PV) Generation to Power Quality in Industrial and Residential Customers Distribution Network
11	15:30 - 15:45	609	Kharisma Bani Adam; Mochamad Ashari	Design of Bidirectional Converter Using Fuzzy Logic Controller to Optimize Battery Performance in Electric Vehicle
12	15:45 - 16:00	639	Farid Dwi Murdianto; Ontoseno Penangsang; Ardyono Priyadi	Modeling and Simulation of MPPT-Bidirectional Using Adaptive Neuro Fuzzy Inference System (ANFIS) in Distributed Energy Generation System

Room : C-106
Topics : Signal and Image Processing

No.	Time	Paper ID	Paper Authors	Paper Title
1	13:00 - 13:15	403	Mohd-Jain-Noordin Mohd Naim; Nor Ashidi Mat Isa; Wei Hong Lim	A New Quantitative Evaluation Metric for Color Correction Algorithm
2	13:15 - 13:30	404	Muhammad Rake Linggar Anggoro; Yeni Herdiyeni	SADE: Android Spectral Reflectance Estimator Application Using Wiener Estimation to Estimate Sambaloto Leaf's Age
3	13:30 - 13:45	426	Rinaldi Munir	A Chaos-based Fragile Watermarking Method in Spatial Domain for Image Authentication
4	13:45 - 14:00	443	Maulana Aziz Assuja; Iping Supriana Suwardi	3D Coordinate Extraction from Single 2D Image
5	14:00 - 14:15	471	Arun Kumar; Anurag Pandey	Digital Camera Interface Mapping With Speech And Hand Gestures For Differently Able

6	14:15 - 14:30	473	Basri; Indrabayu; Andani Achmad	Gaussian Mixture Models Optimization For Counting The Numbers Of Vehicle By Adjusting The Region Of Interest Under Heavy Traffic Condition
7	14:30 - 14:45	479	Yana Hendriana; Renna Yanwastika Ariyana	Multimedia Adventure Game Folklore "Doyan Nada" For Improving The Cultural Understanding Of Sasak (Lombok) To Children

Room : C-107

Topics : Signal and Image Processing

No.	Time	Paper ID	Paper Authors	Paper Title
1	13:00 - 13:15	488	Cahyo Dwi Raharjo; Izzati Muhimmah	Remodeling of Human Foot Using Chain Code For Designing Special Shoes
2	13:15 - 13:30	517	Hadid Tunas Bangsawan; Ronny Mardiyanto; Tri Arief Sardjono	Six Key Points Lip's Feature Extraction Using Adaptive Threshold Segmentation
3	13:30 - 13:45	600	Rindy Trisna Wulandari; Dhany Arifianto	Scattering on Mini Underwater Acoustic Tank
4	13:45 - 14:00	633	Irwan Karim ¹ ; Surya Sumpeno; Mauridhi Hery Purnomo	Synthesis of Virtual Character Poses Using Lagrange Polynomial Interpolation
5	14:00 - 14:15	636	Liza Fitria; Yoyon Kusnendar Suprpto; Mauridhi Hery Purnomo	Music Transcription of Javanese Gamelan Using Short Time Fourier Transform (STFT)
6	14:15 - 14:30	640	Atik Wintarti; Yoyon K. Suprpto	Separation of Gamelan Instruments Signal Using ICA Based on Projection Pursuit

Room : C-108

Topics : Information Systems and Computer Science

No.	Time	Paper ID	Paper Authors	Paper Title
1	13:00 - 13:15	383	Ida Bagus Budiyanto; Achmad Imam Kistijantoro; Bambang Riyanto Trilaksono	Formal Verification of Integrated Modular Avionics (IMA) Health Monitoring using Timed Automata
2	13:15 - 13:30	392	Maman Somantri, Lukito Edi Nugroho, Widyawan, Ahmad Ashari	Design Agent Framework Using Aspect Oriented Approach
3	13:30 - 13:45	401	Fergyanto E. Gunawan; Fajar Yoseph Chandra; Benfano Soewito	Data Transmission Strategy of Probe Vehicle in Floating Car Traffic Monitoring
4	13:45 - 14:00	424	Riyanarto Sarno;Endang;Dwi Sunaryono;Sarwosri	Workflow Common Fragments Extraction Based on WSDL Similarity and Graph Dependency
5	14:00 - 14:15	425	Riyanarto Sarno;Endang;Dwi Sunaryono;Sarwosri	Business Process Composition Based on Meta Models
6	14:15 - 14:30	428	Wasum; Andreas Setiyono; Raimundus Sedo; Sholeh Hadi Pramono	Application Search School Location Method Using Location Based Services (LBS) Based on J2ME
7	14:30 - 14:45	454	Uky Yudatama, Riyanarto Sarno	Evaluation Maturity Index And Risk Management For It Governance Using Fuzzy Ahp And Fuzzy Topsis (Case Study Bank XYZ)
8	14:45 - 15:00	457	Ardianto Wibowo; Saiful Akbar	Handling Of Internal Inconsistency OLAP - Based Lock Table Using Message Oriented Middleware In Near Real Time Data Warehousing

Room : C-109

Topics : System Information and Computer Science

No.	Time	Paper ID	Paper Authors	Paper Title
1	13:00 - 13:15	474	Joko Widiarto; Arry Akhmad Arman	Development of Algorithmic-Based Estimation for Cost Estimation of In-House Software in Government Agencies. Case Study: Badan Pusat Statistik
2	13:15 - 13:30	491	Arta Moro Sundjaja; Evi Ekawati	Evaluation of Edutainment e-Marketing Model Implementation at Bank Mandiri Museum
3	13:30 - 13:45	500	Ardianto Wibowo	Problems And Available Solutions On The Stage Of Extract, Transform, And Loading In Near Real-Time Data Warehousing (A Literature Study)
4	13:45 - 14:00	614	Agung Toto Wibowo; Aulia Rahmawati	Naive Random Neighbor Selection For Memory Based Collaborative Filtering
5	14:00 - 14:15	619	Mahar Faiqurahman; Achmad Imam Kistijantoro	Implementation of Modified Probabilistic Caching Schema On Bittorrent Protocol for Video on Demand Content

6	14:15 - 14:30	626	Siti Rochimah; Hanifa I Rahmani; Umi Laili Yuhana	Usability Characteristic Evaluation On Administration Module of Academic Information System Using ISO/IEC 9126 Quality Model
7	14:30 - 14:45	635	Richki Hardi	Genetic Algorithm in Solving the TSP on These Mineral Water Distribution
8	14:45 - 15:00	637	Joan Santoso; James Nakoda Nugraha; Eko Mulyanto Yuniarno; Mochamad Hariadi	Noun Ontology Generation From Wikipedia Article Using Map Reduce with Pattern Based Approach

Room : C-110

Topics : Telecommunication System and Networking

No.	Time	Paper ID	Paper Authors	Paper Title
1	13:00 - 13:15	386	Syarifah Muthia Putri; Sugihortono	Energy Efficiency in Cognitive Radio with Cooperative MME (Maximum to Minimum Eigenvalue) Spectrum Sensing Method
2	13:15 - 13:30	434	Achmad Affandi; Dhany Riyanto; Ista Pratomo; Gatot Kusrahardjo	Design and Implementation Fast Response System Monitoring Server Using Simple Network Management Protocol (SNMP)
3	13:30 - 13:45	436	Asriadi; Ista Pratomo; Achmad Affandi; Djoko Suprajitno Rahardjo	OpenVoice: Low-cost Mobile Wireless Communication Project for Rural Area Based on OpenWRT
4	13:45 - 14:00	453	Fathur Zaini Rachman	Prototype Development of Monitoring System in Patient Infusion with Wireless Sensor Network
5	14:00 - 14:15	503	Ikhwana Elfitri; Heru Dibyo Laksono; Al Kautsar Permana	Balanced-Delay Filterbank for Closed-Loop Spatial Audio Coding
6	14:15 - 14:30	529	Jane Litouw, Achmad Munir	16-Port Array Antenna Feeding Network with Programmable Phase Shifter Capability
7	14:30 - 14:45	556	Nurul Khaerani Hamzidah; Eko Setijadi	Design of Microstrip Patch Antenna Based on Complementary Split Ring Resonator Metamaterial for WiMAX Applications
8	14:45 - 15:00	557	Firdaus; Isra Darmawan; Hendra Setiawan; Ferdyan Pradana	Design and Simulation Wimax Networks 802.16d and 802.16e In Sleman

Room : C-111

Topics : Telecommunication System and Network

No.	Time	Paper ID	Paper Authors	Paper Title
9	13:00 - 13:15	562	Puji Handayani; Lina Mubarakah; Gamantyo Hendrantoro	Pathloss and Shadowing Characteristics in Indoor Environment at 2.4 Ghz Band
10	13:15 - 13:30	566	Tanwir; Gamantyo Hendrantoro; Achmad Affandi	Early Results from Adaptive Combination of LRU, LFU and FIFO to Improve Cache Server Performance in Telecommunication Network
11	13:30 - 13:45	585	Ershad Junus Amin; Achmad Munir	Scattering Parameters Extraction of Dielectric Loaded Circular Waveguide Using Cylindrical Coordinate System-based FDTD Method
12	13:45 - 14:00	587	Abdul Haris Junus Ontowirjo; Wirawan; Adi Soeprijanto	Performance Analysis of Cooperative Spectrum Sensing with Asymmetric Channel
13	14:00 - 14:15	607	Achmad Munir; Eka Kurnia Sari	Printed Traveling Wave Antenna Composed of Interdigital Capacitor Structure for Wireless Communication Application
14	14:15 - 14:30	617	Miftahul Khairat Sukma ; Indarini Dyah Irawati, S.T M.T ; Hafidudin, S.T M.T	Comparative Analysis of Routing Protocol on Wireless Sensor Network (WSN) with Gradient Based Approach and Geographic Based Approach Method
15	14:30 - 14:45	625	Titiek Suryani; Suwadi; Hasan; Septriandi Wira Yoga	Implementation and Performance Evaluation of Orthogonal Frequency Division Multiplexing (OFDM) using WARP

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Titiek Suryani, Suwadi, Hasan, Septriandi Wira Yoga

Multimedia Adventure Game Folklore "Doyan Nada" For Improving The Cultural Understanding of Sasak (Lombok) to Children

Yana Hendriana¹
Informatics Department
Universitas Ahmad Dahlan
Yogyakarta, Indonesia
yanahendriana@tif.uad.ac.id

Renna Yanwastika Ariyana²
Informatics Department
Universitas Ahmad Dahlan
Yogyakarta, Indonesia
renna10_065@yahoo.co.id

Abstract—Many folklore of Sasak in modern age only regarded as the old myth that outdated because of the lack of a sense of pride in the local culture as a national culture. The development of information technology, especially the gaming industry which is one of the growing gaming industry is important for brain development, to improve concentration and train properly and solve problems quickly because in the game there are various conflicts which requires us to solve it quickly and precisely. With the existence of these problems then made a game application where the game contains elements of cultural knowledge especially of Sasak culture as a medium to improving the cultural understanding so that children know much more about of Sasak culture and more motivated to get to know and love the local culture.

In this research, used models of multimedia game side-scrolling with the added element of adventure which a game that offers adventure in exploring the various levels are available. There are 3 levels in this game. The software used is Adobe Flash CS3 and other support software that is CorelDraw X4, Photoshop CS3 and Action Script 2.0.

The results of the research is the establishment of a multimedia adventure game folklore "Doyan Nada" for improving the cultural understanding of Sasak (Lombok) to children. There is a significant difference in scores obtained by children between before and after testing.

Keywords—multimedia, games, adventure, sidescrolling, doyan nada, culture.

I. INTRODUCTION

The introduction of culture through folklore is very important, because there is value in folklore - noble values that shape the character of the child. Educators prefer stories translated from abroad to tell. Character recognition for early childhood through folklore local culture is not only stimulated by the media illustrated in the form of books, but can also be with dolls, puppets, and various media so that children can learn to understand the way the story is concrete. In addition, an attractive media can motivate children to stay focused listening to stories. But in reality, less creative educators in creating props for storytelling [9].

Sasak have diverse cultural richness diversity, including the arts are born, grow, and develop in accordance with the mindset, worldview, values, norms, and other aspects of life in society. of Sasak cultural values are now faced with the dynamics of society and the times that always demands a change.

Lifting the local culture that is a culture of Sasak (Lombok) one of Indonesian culture through folklore in visualized with a touch of technology is one of the best medium to introduce culture to children. It is unfortunate if the folklore which is the local culture of Indonesia disappear from public memory, because displaced by foreign cultures or claimed by other countries.

Societies of Sasak (Lombok) especially children in urgently need of a multimedia application that is a game culture, which has a cultural element Sasak (Lombok) in order folklore sasak mostly in modern age is not regarded as the old myth, fantasy or fairy tale cliches outdated by the children. The application serves as a means to improve their understanding of their own culture of Sasak.

This game will be specialized to elementary school children, aged between 7-11 years, but it is possible to be played by the age on it as a means to get to know the culture of Sasak (Lombok). With the above mentioned problems, the authors plan making of "Multimedia adventure games folklore "Doyan Nada" using side scrolling method to improve cultural understanding of Sasak (Lombok) to children".

II. MATERIALS AND METHODS

A. Overview of Previous Research

Previous research conducted by Dwi Harini Ali. In her research about how to make a side scrolling game genre is one genre of game in which the main character in this game can move sideways movement followed by background, character game must collect as many apples before the time runs out [6].

The goal of any good video game is to bring to life a story, and to immerse the player as a main character. This project describes the design and development process of such a digital

game, titled Blue Sky in which the player guides a powerful atomic helicopter in the sky through several stages of opposing enemy forces [1].

The majority of the code can be written for the general case, and then platform specific input and file systems configurations can be added to make for more natural gameplay experiences on each platform. A graphical UI would enhance the development process of creative games, allowing for easy addition of specific cases for each platform where required. In short, the tool will remove the overwhelmingly complex process of cross-platform development into a seamless and intuitive experience [3].

The lion's share of the book is devoted to examining Amiga as a device for creating multimedia, and to clarifying its exemplary. Most notably, Maher shows that the specialized hardware that allowed for stunningly beautiful and responsive 2-D side-scrolling games also prevented [2].

The projects covered a sampling of multimedia content creation technologies, including image manipulation, movie editing, and vector animation with Flash. At its most basic, Gamemaker provides simple tools for creating 2D multi-level side-scrolling platform type games [4].

Research conducted by Ella Nurfitriya discuss about how to make a side scrolling game genre where there are cultural elements included in the game. The pattern of this game that is jakatarub should save some angel in the game [7].

Research conducted by Bernard Renaldy Suteja and Freddie Setiawan, discuss game play fredo manifold adventure RPG (Role Playing Game) with flash programming. The main mission in this game is fredo must fight the monsters in each level by a predetermined amount [5].

B. Child Psychology

Child's life is a life where they start growing and have a high curiosity. Since the development of the child during an active period, computer programs can stimulate parts of the brain combines emotion with animation, sound, music, video imagery, color and others. Computer program to teach and inculcate noble image of the nation include programs of cultural games that motivate children to play again and play again. And computer games is an ideal means for introducing a noble culture in children from an early age [8].

C. Definition of the Game

Game comes from the English word which has the basic meaning Games. The game in this case refers to the definition of "intellectual agility" (intellectual playability). Games can also be interpreted as a decision of the action arena players because there are targets to be achieved, intellectual agility at a certain level is also a measure of the extent to which the game was interesting to play the maximum [10].

D. Types of Games

Several categories of games that are often used among others :

1. RPG (Role Playing Game)

2. FPS (First Person Shooting)
3. Adventure
4. Fighting
5. Raching
6. Simulation
7. sport
8. Strategy
9. Side Scrolling

III. METODOLOGY

In a study has design (research design) specific. The function of this research is to find explanations and answers to the problems as well as provide an alternative to the possibilities that can be used for solving, Below is a the research framework that can explain the flow the research to be developed, as shown in fig. 1 :

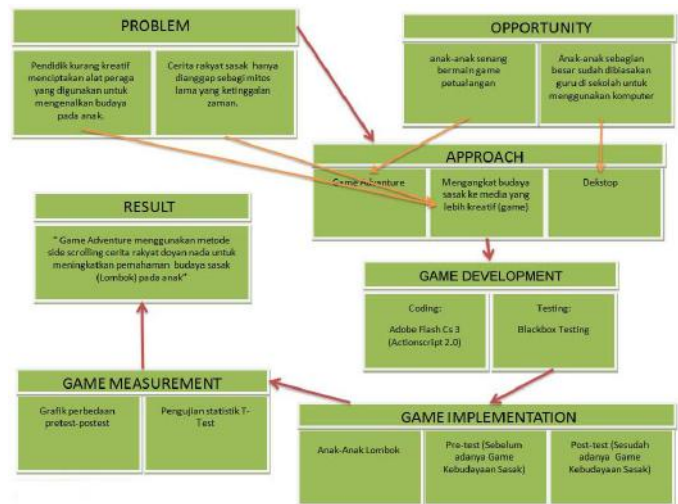


Fig. 1. Research Framework

A. Research Subject

Research subjects to be discussed in this research is the analysis and creating "Multimedia adventure games folklore "Doyan Nada" using side scrolling method to improve cultural understanding of Sasak (Lombok) to children".

B. Research Tools

In this research use of hardware and software with certain specifications to complete an application to be built. Hardware is all the physical parts of a computer and is distinguished by the data therein and is distinguished by the software that provides instructions for the hardware to accomplish tasks.

C. User analysis

Users of this system is children aged 7-11 years or elementary school students grade 1 to grade 5. The age of 7-11 years is the age at which a child is affected, with the game that contains this folklore could help shape the mindset of a child to love and preserve their own culture. The system is expected to increase the motivation of a child to know the culture of Indonesia, especially the culture of Sasak (Lombok).

D. Stages of Making Games

1. Determine the theme of the game
2. Determine game genres
3. Determine the software used
4. Finding and determining sound effects or music
5. Make the game

IV. RESULTS AND DISCUSSION

A. Analysis System Requirements

Analysis of the system is one of the stages in the development of the system. Phase analysis is a critical stage and very important, because errors in this stage also will cause an error in the next stage. Phase analysis is performed after the system design stage and before the system design phase.

1) Functional Requirement System

Functional requirements system contains process will be done by the system. In making this game application program required a supporting applications capable of performing the functions, among others :

a) Doyan Nada

1. The character can move forward left side, move forward and make the leap to right side.
2. The character can fight the enemy by means of stepping on the heads of enemies.
3. To run the character, the user uses the keyboard. Right arrow key to move forward toward the right, the left arrow key to move forward toward the left, up arrow key to jump, up arrow key simultaneously once the left arrow to jump to the left, up arrow key simultaneously once the right arrow to jump to right.
4. The character can jump to take something (icon goods) are scattered randomly on the screen.
5. When exposed to enemy characters (not stepping on the head), the energy is reduced as much as 20% of the total energy of 100%.
6. Characters can add energy to take a basket of rice scattered on the screen, the energy will increase by 20% when a basket of rice taken by the character, but when energy is equal to 100%, then the energy will not increase.
7. The character can add score points by taking pieces scattered on the screen and step on the enemy, as well as read some knowledge about the island of Lombok is on screen scattered ketupat.
8. At each level 2 character will get equipt form of clothes that will be used at the next level, but the characters have to answer the questions in advance when it will get equipt.
9. The character must fight the big enemy to get the key in order to finish the level 3.

b) Enemy

1. Lion without a crown is the enemy of the lowest level, to defeat it "Doyan Nada" must step on the enemy head once so that the enemy dead. There are 25 enemies at level 1, 10 enemies at level 2 and 15 enemies at level 3.

2. Crowned lion is the enemy of level 2 and 3, to defeat it "Doyan Nada" must step on the enemy's head twice so that the enemy dead. There are 15 enemies at level 2 and 20 enemies at level 3.

3. Big Giant is the enemy of the highest level, to defeat it "Doyan Nada" must step on the enemy's head as much as five times that the enemy dead, this giant is the last enemy at level 3.

c) Basket of Rice

At the beginning of the game as much as 100% of energy supplied. At each level can be increased to 20% when Doyan Nada managed to take a basket of rice, but when energy is equal to 100%, then the energy will not increase. At each level is provided 5 baskets of rice.

d) Ketupat

To obtain information about the culture of Sasak "Doyan Nada" can take ketupat scattered on the screen, each ketupat contains knowledge about culture of Sasak that will be used to answer questions when "Doyan Nada" will open the door and take equipt used at the next level. At level 1 there are 3 ketupat, level 2 there are 4 ketupat, and 5 ketupat at level 3.

e) Fruit

1. To add points "Doyan Nada" should take cherry fruit scattered on the screen.
2. On the first level there are 25 pieces of cherry, level 2 there are 30 pieces of cherry, and level 3 there are 20 pieces of cherry and 10 pieces of pear.

f) Score

1. When "Doyan Nada" beat the Lions without the crown, then the player will get a score of 10 each enemy.
2. When "Doyan Nada" beat the crowned lion, then the player will get a score of 30 each enemy.
3. When "Doyan Nada" beat the big giants then the score will increase by 100 points.
4. When "Doyan Nada" managed to get cherry fruit scores increased 10 and for pears the scores will increase 20.
5. When "Doyan Nada" obtain information on ketupat is taken then the score will increase 50.

g) Level

1. There are 3 levels in this game.
2. The minimum scores may be obtained at level 1 to level 2 is 450 from the maximum score of 650.
3. The minimum scores may be obtained at level 2 to level 3 is 650 from the maximum score of 800 and a score will be added to the scores obtained at level 1.
4. The minimum score to complete a level 3 is 1300 and the scores will be added to the scores obtained at level 1 and 2.
5. On the last level scores will be accumulated when the player managed to score more than 2400 then the player won.

2) Scenario of Gameplay

Gameplay from this game, among others:

a. The player should be able to get the minimum points to proceed to the next level by running the main character (Doyan Nada) to wander and conquer the jungle.

b. Doyan Nada should be able to beat the lion to increase the score.

c. The player can add energy by taking a basket of rice scattered randomly on the screen.

d. If can beat lion then the score will increase 20 per 1 lion.

e. If can beat the crowned lion the score will increase 30 per 1 crowned lion.

f. If successful take cherry fruit then the score will increase 10 and if successful take a pear then the score will increase 20.

g. If can beat the giants the scores increased 100.

h. Doyan Nada must step on giant head 5 times to fight it.

i. If the player have gotten a minimum score of 450 and the lives of at least 1 then the player can proceed to the second level, a minimum score of 650 on level 2 and plus score at least 450 on level 1 and the lives of at least 1 then the player can continue to level 3.

j. The game is finished if the player manages to beat the last giant.

k. If the player gets a score ≥ 2400 then the game is finished and Doyan Nada will be won.

l. Total scores will continue to accumulate at each level. If player has not reached the minimum score and the life was gone, the game was over and the player can repeat the game.

3) Design System Process

a) Background Story

This Multimedia game tells about a knight errant named Doyan Nada, which has the amazing power from childhood, he was able to conquer his enemies through the power he has. He was able to rescue two people hermit and a beautiful princess who later became his wife.

b) Details of Game

This game is made to be implemented on a PC with Windows operating system.

Below the details of the game which will be made :

1. Genre of Game is side scrolling.

2. Game model is a single player game, character can only go forward, backward, jumping and throwing weapons.

3. Game consists 3 levels and each level has its different difficulty levels.

4. People who are in this game is "Doyan Nada" as the main character, a rock fall, fallen trees, wild animals and giant as an enemy character in the game.

5. The element will find is an element of culture, especially the culture of Sasak ranging from traditional houses, clothing, and weapons used. The language used is Indonesian.

6. The game will be accompanied by music as accompaniment game.

7. The concept of how to play is the player trying to get a high point that is by defeating enemies and rescue friends and Doyan nada to continue to the next level.

c) Content Designing

The design is used in order to fill interactive applications to be built according to the analysis system. In designing the content that has been established which contains information on the design of the menu with the menu description and the buttons are there on the menu design, as shown in fig.2 :

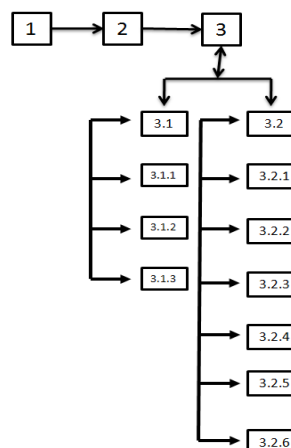


Fig. 2. Design Menu

Figure 2 Shows about Design Menu, such as :

1. Title
2. Intro
3. Main Menu
 - 3.1. Play menu
 - 3.1.1. Play Level 1
 - 3.1.2. Play Level 2
 - 3.1.3. Play Level 3
 - 3.2. Menu Settings
 - 3.2.1. Profile
 - 3.2.2. Guidance
 - 3.2.3. Sound & Music
 - 3.2.4. Mutte
 - 3.2.5. Screen
 - 3.2.6. Exit

d) Input Designing

The aim from the input design is to give control to the design of the game created, the user is required to select a menu by clicking the button display - navigation buttons according to the information available at each level and use the keyboard input made during running game that will be used to provide interaction in the form of movements that occur on the player character in the game.

e) Output Designing

Output of the product from games that can be played. Game identical with a good movement automatic movement and the movement was ruled by using a keyboard or mouse. Both movements are the basis for the making of the game. When a key on the keyboard is pressed, the output of which is derived in the form of movement from game characters and

patterns of certain rules in order to continue the game to the next level.

f) Storyboard Designing

Next is the design of the storyboard. This stage is very helpful in putting together frame by frame making games. With the storyboard will be easier to determine the exact position and can clarify any level of the game to the user by providing information or explanations, commands in the game, so that the relationship between the level of the program being organized systematically and in case of a fault will soon be known and repaired.

B. Implementation System

This implementation phase is the phase to build and develop the game according to the script that has been made.

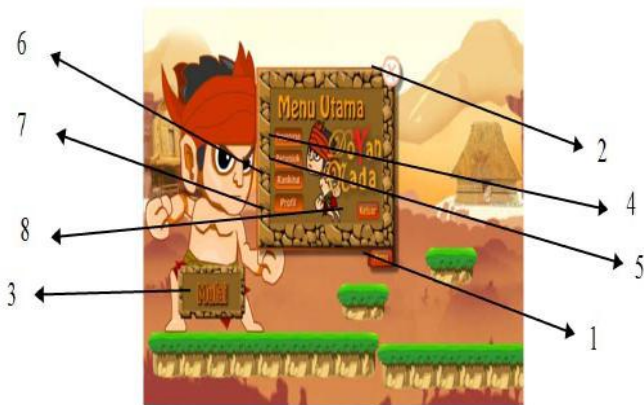


Fig. 3. Main Menu

Figure 3 shows the display of Main Menu there are 8 menu buttons that is, (1) the menu button, (2) minimize button, (3) button start, (4) key setting, (5) the hint button, (6) button rank, (7) buttons on and (8) exit button.



Fig. 4. Level 1

Figure 4 shows the first-level display that tells the beginning of a new adventure wandering Doyan Nada when exploring the hilly forest. At level 1 the player must complete its mission of answering a question on a gate, but to open the gates of the player should be able to fight the lion blocking and read all the info is in ketupat. If you can answer the questions that are in ketupat so he could continue the mission to level 2.



Fig. 5. Level 2

Figure 5 tells about adventure Doyan Nada when it is in the forest, and want to save the princess kidnapped by Giant. Level 2 is almost the same as level 1, the end of the mission to finish the level 2 is to answer the question that is at the gate, and the rules used at two levels equal to level 1, but at level 2 there are additional equipt to be taken for use on level 3.



Fig. 6. Level 3

Figure 6 shows Level 3 which at this level is the end from the story Doyan Nada, he must save the princess kidnapped by a giant, Doyan Nada must fight against the evil giants until the end of the giant dead and managed to rescue the princess. At level 3 there is an additional form of pear as an addition to the points, the number of enemies faced more and more. At level 3 there are obstacles that more extreme from the previous level in the form of ground (ground moving) and falling rocks. At level 3 player must fight the big giant that is the main enemy from 3 levels traversed.

C. Discussion

This game is interesting to use because in this game there is knowledge of the culture that needs to be conveyed to the children. Children feel attracted to this game because they feel curious to continue the game seen from their enthusiastic when wrong answer questions that arise at the gate, they have to re-read all the information present in the ketupat. Curiosity to make children should read the information in the ketupat, but without conscious children are studying their own culture. With it makes the teacher does not have to explain at length about the culture of the children, with the media to explain the game makes the lesson more quickly conveyed culture.

V. CONCLUSION

Based on the analysis and design of game development Doyan Nada can be concluded that :

1. It has been made application Multimedia adventure games folklore “Doyan Nada” for improving the cultural understanding of Sasak (Lombok) to children.
2. From these results concluded that, there is a difference / no increase cultural understanding of Sasak (Lombok) to children before and after trials conducted using this game applications using side-scrolling method.

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