AVIATION ENGLISH LANGUAGE ASSESSMENT SYSTEM

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ABSTRACT

The system in scope focuses on English language assessment of pilots and air traffic controllers in the continent of Africa. The AELAS team will be designing, developing, simulating, and analyzing an assessment system that will meet the objectives outlined while fulfilling the ICAO standards. The system to be designed will be modular in nature. The final paper will describe simulation of two alternative designs and present the results of analysis.

Since 1951 the international language of aviation has been English, yet pilot error due to language confusion is still a contributing factor to aviation accidents. Miscommunication is a concern in aviation given that among pilots and air traffic controllers, the percentage of native English speakers is below 30% and less than 15% of the entire world’s population speaks English as a mother tongue. It is estimated that 70% of all accidents are traceable to pilot communication errors.

INTRODUCTION

Compliance by the pilot with instructions from the air traffic controller is possible only if the messages are fully understood and vice versa. In order to secure a global standard, the international civil aviation organization defined new requirements concerning the level of English language proficiency needed among aviation professionals. As of 2008 all aviation professionals will have been assessed concerning their proficiency in listening and speaking in the context of aviation.

COMMUNICATING INSTRUCTIONS AND RECEIVING/TRANSMITTING ACKNOWLEDGEMENTS BETWEEN AIR TRAFFIC CONTROLLERS AND PILOTS IS NECESSARY FOR THE SUCCESS OF OUR SYSTEM. THE AVIATION ENGLISH LANGUAGE ASSESSMENT SYSTEM (AELAS) IS GUIDED BY THE STANDARDS THE INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) HAS DEFINED, REQUIRING A MINIMUM LEVEL OF ENGLISH LANGUAGE PROFICIENCY NEEDED AMONG AVIATION PROFESSIONALS. THE SYSTEM WILL NEED TO COMPLETE ITS PROCESS BY MARCH 2008.

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) REQUIREMENTS

ICAO requires pilots to be Level 4 proficient in English which includes criteria for: Pronunciation, Structure, Vocabulary, Fluency, Comprehension, Interactions.

The system is broken down into four subsystems/functions: User identification, User Registration, User Assessment, and Training and Re-assessment. The assessment is a formal evaluation to assure aviation personnel meet an English Language requirement of having a proficiency level of 4 which is an operative level as defined by ICAO. The assessment process is broken down into four sections consisting of listening, speaking, reading, and writing, and these sections will be focused on testing for: Pronunciation, Structure, Vocabulary, Fluency, Comprehension, and Interactions.
There are three options for the system design to perform the assessment: Manual, Semi-automatic, Fully-automatic. The manual design refers to a test that is proctored using assessors and no computer interaction with test takers. Semi-automatic is a mixture with using the computer and the assessors, which depends on which section of the assessment the individual is taking. The last option, fully-automatic, involves computer interaction with the user for the entire process.

**SOLUTION APPROACH**

Our Team will follow waterfall model for this project. The various phases in this project are:

- Project Planning/Initiation
- Research
- Requirements Consolidation and Analysis
- Design
- Analysis – Simulation & Risk
- System Testing

This architecture will use the robustness of open source systems across the multiple layers. The system will be multiple layer architecture and will have modular design. For e.g. application layer will consist of modules:

- Marketing module
- Registration module
- Assessment & Certification module

The Project will be executed using the following approach:

**SIMULATION APPROACH**

The simulation for these models is based off the manual model. The manual model is broken down into two options: non-grouping and grouping. The grouping deals with 10 individuals being placed into groups to have their assessments done together, while no-grouping has individuals going in separately to be assessed.

The simulation model has the individuals enter the assessment system (either grouping or non grouping) and the listening, reading, and writing portions are all simulated on a single block by a triangular distribution because of the known times to conduct an assessment. The test-takers are then separated to individually be tested on the speaking portion of the assessment.

After the assessment is finished there is a grading period, then once the levels have been determined, the aviation personnel that took the assessment will be broken down into three groups, level 4 proficiency which is passing, level 3, and level 2 proficiency. Those only making level 2 and level 3 will be sent to an outsourced training facility. Initial estimates give a time frame of 4 weeks before re-assessing if you initially reached level 3 proficiency and 7 weeks for individuals who were level 2 proficiency. Level 1 proficiency individuals will be discarded.
as they will need to find other resources to reach a higher level of English proficiency.

Risk Assessment & Mitigation Plan

We have a strong risk management process for proactively identifying and monitoring risks. An effective risk management process is essential for preventing program disruption, project budget overruns, missed implementation deadlines, unhappy users or missed opportunities for realizing targeted benefits. This process is indicated in the figure below.

All potential risks are identified at the start of the project and proposed mitigation plans are created. However, we continuously monitors the project landscape, for risks arising as a result of various dynamics. The mitigation plan is tracked throughout the project, depending upon the extent of risk exposure. The identified risks are tracked and controlled at all phases of the engagement.

Figure2: Diagram of Assessment process up to grading

Figure3: Diagram depicting breakdown of individuals after proficiency level determined