Looma AI - Project Plan

Looma Education Company

Subject: Strategy and timeline for “AI technology to improve Looma”
Date: JAN 2024
Author: Skip Stritter, Technical Director, Looma Education
Version: 1.0

Use modern AI technology to enhance the Looma Education System

Background:

The Looma Education system, produced by Looma Education, a California non-profit [looma.education] is in use every day by 1000's of teachers and students in Nepal.
View Looma Online here looma.website.

Looma delivers the approved government textbooks to the classroom and enhances the curriculum with a built-in library of 10's of 1000's of digital media resources. To make each chapter of each textbook more engaging, Looma connects the chapter to relevant resources in the built-in Looma library. Also, the resources for a chapter can be combined into a pre-built lesson that the teacher can follow for teaching that textbook chapter.

The Looma education system can be accessed 3 ways:

for remote schools with no power or Internet, using the Looma box,
for schools with computer labs, using Looma Server on a PC, and
for connected users, using Looma Online on Amazon AWS

Summary of the problem:

The great advantage of Looma is combining the national textbooks with relevant resources from a large built-in digital library. There are 24,000 digital media resources on Looma and 1800 chapters over all the subjects from Grade 1 to Grade 12.

Up to now, we have tried to match resources to chapters manually, but this process cannot scale to complete the task. In addition, the textbooks sometimes change from year to year.

Recent advances in machine learning and large language models make it possible to automatically process the Looma resources and textbook chapters.

Proposed deliverables:

This project will apply AI techniques to create software tools that Looma administrators can use to perform these tasks:

- generate summaries of textbook chapters
- generate summaries of Looma Library resources

- generate list of topics for each textbook chapter
- generate list of topics for each Looma Library resource

- match relevant resources to each textbook chapter using the keywords

- [project extension] implement semantic search of resources based on user-input search terms

Details:

Since Looma in the field runs on a small Linux computer in rural schools that are completely off-line, the solutions developed by this project won't be run in "real-time" on Looma. Most of the work proposed here can be done in advance and pre-built into Loomas.

Probably the scripts will be Python programs. They will access the chapter and resource files, use online APIs or local language models for some sub-tasks, and store the results, such as topic lists, in Looma's database.

[Project extension] The exception is "semantic search" which has to run in "real-time" since it is based on user input of search terms. We will have to investigate how to implement the semantic search efficiently on Looma's limited, off-line capabilities.

Database structure

Looma uses MongoDB to store all the metadata for Looma resources and chapters. We will add fields to documents in Mongo to store resource and chapter topics.

Resource formats

The resources on Looma that we want to index are in these formats:

- PDF
- HTML
- Video (need a tool to convert the dialog to text)

Chapter formats

Textbooks on Looma are PDFs.

Future work:

There are several potential follow-on projects when this project is done:

- GUI version of the resource-to-chapter matching tool that can be run on any new resource or any new textbook added to Looma
- generate interesting, relevant vocabulary list from a chapter
- automatically generate classroom games using the chapter vocabularies and the chapter resources
- apply the same NLP techniques to Nepali language resources and chapters in Looma
- automatically generate Looma lessons for chapters using the chapter's resources

Contact:

Skip Stritter
skip@stritter.com
650 248 9341