Lab 1 – Product Description

Paul Schacht, Caleb Anderson, Krishna Paneru, Mia Lai, Trent Thorne

Old Dominion University

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Dr Sanobar

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V1

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1 Introduction

LogicPath addresses a growing societal concern: the decline of critical thinking and logical reasoning skills, especially in the face of misinformation and poor digital literacy. Studies show that 96% of students fail to evaluate source credibility online (Breakstone et al., 2019), and OECD reports a decade-long stagnation in adult problem-solving skills (OECD, 2024). LogicPath is an interactive learning platform designed to "level up your thinking" by blending formal and informal logic education with gamified engagement. Through adaptive learning, real-world applications, and structured progression, LogicPath empowers learners to build lasting reasoning skills in a fun and accessible way.

2 Product Description

LogicPath is a web-based educational tool that teaches logic through interactive modules, gamified challenges, and real-world reasoning exercises. Its goal is to make logic learning engaging, structured, and applicable to everyday decision-making. The platform targets high school and college students, lifelong learners, and educators seeking to improve critical thinking outcomes**.**

2.1 Key Product Features and Capabilities

2.2 **Interactive Module:** Lessons will progress from informal reasoning to formal logic.

- **Gamified Learning:** Quests, streaks, and achievements motivate sustained engagement.
- **Real-Worlds Application**: Exercises tied to news, debates, and personal decisions
- **Adaptive Learning**: Difficulty adjust based on user performance

2.3 **Visual Aids**: Diagrams and simulations simplify abstract concepts

2.4 Major Components (Hardware/Software)

- **Hardware:**
- **Software Architecture:**
    - **Presentation layer:** React-based UI for learners and educators
    - **Application Layer:** Engines for learning modules, gamification, adaptive logic, and feedback.

2.5 Data Layer: PostgreSQL database storing user profiles, performance metrics, and learning history.

Tech Stack: HTML, CSS, JavaScript, React (frontend); Node.js (backend); PostgreSQL (database).

- Provide an overview of the hardware needed to support the solution.
- Describe how it is structured based on CS 410 MFCD.
- Define and describe the software to be developed.

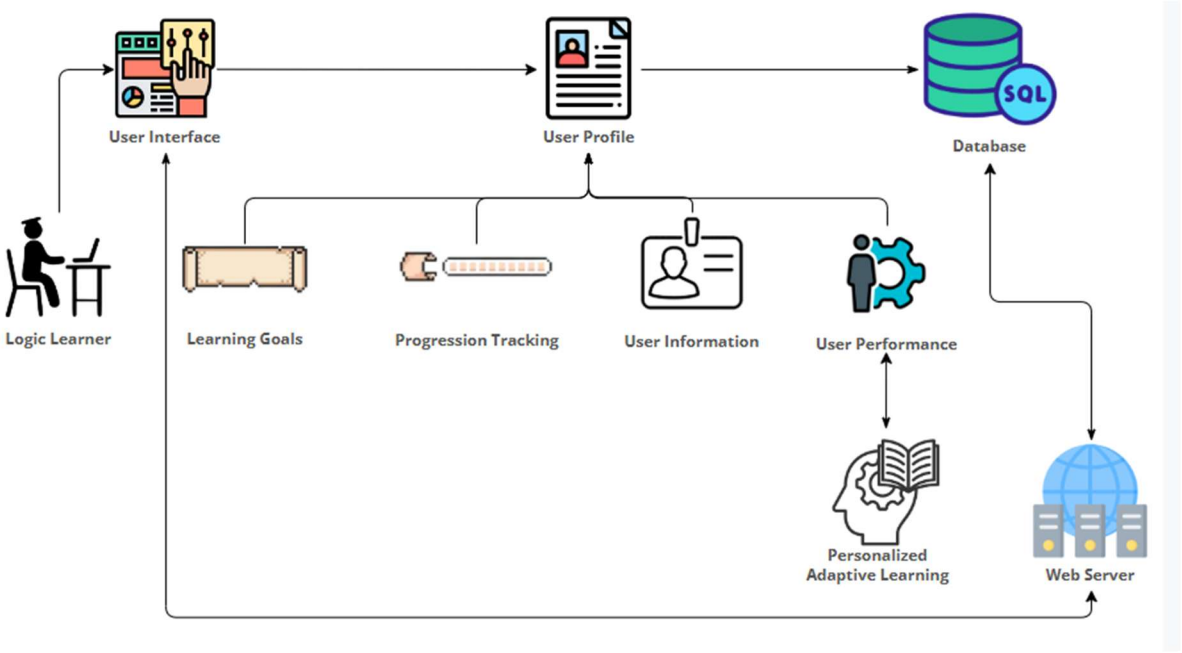

Figure 1

3 Identification of Case Study

LogicPath is being developed for high school juniors/seniors preparing for standardized tests, college students in logic-heavy disciplines, and adult learners seeking career advancement.

The case study group includes college students at Old Dominion University who will test the prototype and provide feedback. Future users may include educators, institutions, and lifelong learners across various domains.

4 Glossary

- **Logic:** the systematic use of symbolic and mathematical techniques to determine the forms of valid deductive argument.

- **Formal/Informal Logic:** Formal logic is based off deductively valid reasoning. Informal logic is based off natural languages.
- **IDE**: Integrated Development Environment
- **CI**: Continuous Integration
- **CD**: Continuous Deployment

5 References

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