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Филипович Елена Владиславовна, *начальник отдела международной деятельности*

УО «Барановичский государственный университет»

Барановичи, Республика Беларусь

электронная почта: Filipovich.2003@mail.ru

Elena Filipovich, *Head of the Department of International Affairs*

Baranavichy State University

Baranavichy, Republic of Belarus

e-mail: Filipovich.2003@mail.ru

АРХИТЕКТУРНЫЕ ОСНОВЫ ДЛЯ ВОЗОБНОВЛЯЕМЫХ ОБРАЗОВАТЕЛЬНЫХ ИГРОВЫХ КОРПУСОВ: НА ПРИМЕРЕ АВТОРСКОГО ПРОЕКТА FILLION ARCADES

Статья посвящена описанию архитектурной модели для создания обновляемых корпусов образовательных игр с использованием искусственного интеллекта, способных адаптироваться к культурным и технологическим изменениям с сохранением педагогической ценности.

Ключевые слова: возобновляемые корпуса; интернет-мемы; эмоциональное вовлечение; персонализация контента; интернет-игры.

ARCHITECTURAL FRAMEWORKS FOR RENEWABLE EDUCATIONAL GAME CORPORA: CASE OF FILLION ARCADES AN AUTHOR'S PROJECT

The work is devoted to the development of an architectural model for creating updated educational game buildings using AI that can adapt to cultural and technological changes while maintaining pedagogical value.

Key words: renewable enclosures; Internet memes; emotional engagement; content personalization; Internet-games.

The design of educational games has traditionally relied on static corpora, often leading to rapid cultural obsolescence and limited adaptability to learner needs. In contrast, the concept of renewable corpora emphasizes dynamic, AI-driven updating mechanisms that preserve pedagogical rigor while maintaining cultural relevance. By integrating modular front-end interfaces, scalable back-end APIs and AI-enabled update cycles, the framework enables teachers to tailor linguistic dimensions (lexis, grammar, phonetics) to diverse audiences while ensuring the corpus evolves in parallel with cultural and technological change [1, p. 179]. Our study proposes a generalized framework for renewable educational game corpora and also presents its implications for language learning, emotional engagement and sustainable digital pedagogy.

Digital game-based learning (GBL) has advanced significantly over the past two decades, yet its underlying architectures remain largely tethered to static repositories of learning materials [2, p. 472]. Such rigidity is problematic in contemporary educational contexts, where cultural references and learner expectations evolve rapidly. This creates a pedagogical gap between the relevance of instructional materials and the lived experiences of learners.

The Fillion_arcades initiative emerged as a bold response to this challenge, pioneering the use of renewable corpora ever-evolving collections of educational games continuously refreshed through systematic updates. At the heart of its innovation lies the strategic integration of internet memes, whose ephemeral, emotionally charged, and culturally resonant nature makes them uniquely suited to captivate learners. By weaving these digital artifacts into pedagogical gameplay and automating the renewal of content, the project reimagines educational architecture, forging a dynamic framework designed to sustain deep, long-term learner engagement.

Conventional educational game corpora are often meticulously curated sets of tasks or scenarios anchored to predefined learning objectives. While they function well within controlled environments, they frequently fall short in adapting to shifting cultural contexts [3, p. 40]. Inspired by ecological metaphors, renewable corpora represent a transformative departure from static repositories they are dynamic, self-renewing ecosystems. These living systems thrive on continuous updates, rigorous validation, and pedagogical recalibration woven into their very architecture. At the heart of this regenerative process lie AI-powered data pipelines, community-driven content contributions, and robust moderation frameworks.

Crucially, emotional resonance in learning is deeply intertwined with cultural relevance. Learners are more likely to engage meaningfully when educational materials reflect their lived experiences and current realities. In this light, a renewable corpus transcends its technical function it becomes an essential pedagogical instrument for navigating the fluid terrain of contemporary cultural landscapes.

The user interface is implemented in React with Tailwind CSS, styled in an arcade aesthetic to foster immersion. Teachers interact with three primary modules:

- corpus upload that enables educators to contribute new didactic games in JSON format;
- linguistic dimension Selector that allows filtering by lexicon, grammar, or phonetics;
- audience profiling Survey that collects age, personal interests and emotional parameters to tailor recommendations.

An Express.js server with JWT-based authentication supports role-based access (teachers and administrators). The corpus is stored in a database, while APIs handle:

- corpus management (/api/upload-corpus, /api/admin/games);
- recommendation engine (heuristic + embedding similarity);

- webhook scheduling (/api/webhook/meme-update for annual renewal triggers).

The renewal pipeline is the architectural innovation of Fillion_arcades:

- Data Harvesting: External APIs (e.g., *Reddit*, *Giphy*, *Tenor*) provide candidate memes;

- Filtering & Moderation: AI moderation (e.g., *toxicity classifiers*, *bias filters*) removes inappropriate content;

- Semantic Alignment: Embedding-based similarity scoring (e.g., *cosine similarity*) aligns new memes with linguistic objectives;

- Corpus Integration: Approved memes are integrated into the game corpus, available for teacher validation.

Administrators access a React-based panel for:

- reviewing and editing meme-game entries;

- validating corpus updates;

- monitoring system logs and AI renewal events.

From the case of Fillion_arcades, a generalized architectural framework emerges, composed of five layers:

- Input Layer. Contributions from teachers, learners, or external cultural streams;

- Processing Layer. AI-driven filtering, moderation, and alignment with pedagogy;

- Storage Layer. A structured, queryable corpus of renewable games;

- Recommendation Layer. Personalization through survey data, embeddings, and heuristics;

- Interface Layer. User-centered design that frames corpus content in immersive formats.

Renewable corpora reframe language learning as a culturally synchronized practice rather than a static accumulation of knowledge. Learners encounter linguistic tasks embedded in emotional and cultural contexts, strengthening retention and transfer [4, p. 129].

Renewable educational game corpora represent a paradigm shift in digital pedagogy. By embedding mechanisms of cultural updating, emotional engagement, and teacher validation, such systems address the dual challenge of maintaining relevance and ensuring rigor. The Fillion_arcades project illustrates how meme-inspired didactic games can be systematically integrated into an architectural framework for renewal. Future research should focus on empirical evaluation of learning outcomes, scalability across disciplines, and cross-cultural adaptability.

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