Armenian Priority in Legal Informatics: From *World Wide Constitutions* **Before Google Constitute** to the Concept of a Legal Neural Network

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Abstract

This article examines the pioneering role of Armenian scholars in the development of digital constitutional analysis and legal informatics. Beginning with the *World Wide Constitutions* project and culminating in the creation of the *VORONUM* system, the study highlights innovations such as multilingual constitutional databases, human rights corpora, and the early conceptualization of a **legal neural network**. These contributions, officially registered in Armenia in 1998 and positively evaluated by international experts, anticipated the integration of artificial intelligence into legal practice. The article situates these achievements within the broader context of comparative constitutional law, digital governance, and the evolution of AI-driven legal systems.

1. Introduction

The intersection of law and information technology has become one of the defining features of modern governance. While global attention often focuses on projects such as *Google Constitute*, the Armenian initiative *World Wide Constitutions* and its successor system *VORONUM* represent earlier and equally significant milestones in comparative constitutional analysis.

Developed in the late 1990s and early 2000s, *VORONUM* integrated 146 constitutions in multiple languages, extensive human rights documentation, and bilingual legal glossaries. More importantly, **Chapter 6 of the 2005 monograph "Information Technologies in Legal Activity" introduced the concept of a legal neural network**, laying the theoretical foundation for today's AI systems in the legal domain.

This article explores the historical trajectory, technical features, and international recognition of these projects, demonstrating their enduring relevance to constitutional law, legal informatics, and strategic management of knowledge in public service.

2. Project Overview

- **Name:** World Wide Constitutions
- **Year:** 1998
- **Languages:** English, Russian, Spanish, French
- **Scope:** 146 national constitutions
- **Features:** Searchable by keywords, phrases, and legal concepts
- Interactive world map and classification by government type
- Glossary of 474 constitutional terms and 179 expressions

- Developed with the Constitutional Court of Armenia

"The system allows comparative constitutional analysis across languages and legal traditions — a tool for scholars, judges, and citizens alike." — Vahanyan, 1998

3. Comparison with Google Constitute

Feature	World Wide Constitutions (1998)	Google Constitute (2013)
Launch Year	1998	2013
Languages	4 (EN, RU, ES, FR)	Primarily English
Number of Constitutions	146	~194
Search Method	Keywords, glossary, map, classification	Thematic tags
Legal Glossary	Yes	No
Government Type Classification	Yes	No
Recognition	Limited	Global

4. International Reception

Despite its innovation, the Armenian project was not cited in later initiatives. The system was presented at international conferences and shared with constitutional courts worldwide, yet its influence remains unacknowledged — even by Google.

International Endorsements: Mexico's Human Rights Commission

In 2015, the President of the Human Rights Commission of Mexico issued two formal letters endorsing the *World Wide Constitutions* project. These letters emphasized the project's relevance to human rights education, legal accessibility, and comparative constitutional analysis. The Commission expressed interest in adopting the system for civic and institutional use — affirming its international significance.

5. VORONUM: A Pioneering System for Comparative Constitutional Analysis

In 2005, Professor Vahanyan and Dr. V. Bleyan introduced *VORONUM*, a unique legal informatics system designed for comparative constitutional analysis. The system included:

- A multilingual database of **146 constitutions** (117 in English, 66 in Russian,
- 20 in Spanish, 3 in French)
- A **trilingual constitutional glossary** (English–Russian–Armenian, 474 terms)
- A **human rights document repository** with over **1,800 documents** in four languages
- A **natural language search engine** with ranking and phrase highlighting.

The *VORONUM* system was designed to simplify constitutional and human rights analysis for non-technical users. Its architecture included:

- **Multilingual corpus**: 146 constitutions (English, Russian, Spanish, French) and over 1,800 human rights documents.
- **Integrated glossaries**: English–Russian–Armenian dictionaries of constitutional and human rights terminology.

- **Natural language search**: Queries in Russian and English with ranking by relevance.
- **Contextual highlighting**: Automatic identification of key words and phrases in documents.
- **High-speed processing**: Up to 35 million characters per minute on 486DX4-100 computers.
- **Compatibility**: Supported Word, HTML, RTF, and ASCII formats.
- **Distribution**: Entire system stored on a single CD-ROM, ensuring portability and accessibility.

VORONUM was designed for non-technical users — judges, lawyers, students, and public officials — and enabled intuitive, multilingual access to constitutional texts and human rights instruments. It was officially registered with the Armenian Copyright Agency (No. 00227, April 15, 1998). The system was positively evaluated by international experts, including:

- Prof. Herman Schwartz (American University, USA)
- Dr. Arne Mavčič (Constitutional Court of Slovenia)
- Prof. Dominique Rousseau (University of Montpellier, France)
- Prof. Michel Lesage (University of Paris 1)
- Pierre Garrone (Venice Commission, Council of Europe)
- Prof. Étienne Grisel (Switzerland)
- Representatives from Belarus, Bulgaria, Germany, Kazakhstan, Kyrgyzstan, Lithuania, Moldova, Russia, Tajikistan, and Yugoslavia.

VORONUM was used in constitutional reform processes in Armenia and cited in scholarly works by G. Harutyunyan and A. Mavčič. It significantly reduced the time required for comparative legal analysis and helped shape a comprehensive understanding of human rights across jurisdictions.

6. VORONUM and the Legal Neural Network Concept

Notably, **Chapter 6 of the 2005 monograph** introduces and explores the concept of a **legal neural network** — a pioneering idea that anticipated the integration of artificial intelligence into the legal domain. This concept laid the theoretical foundation for modern AI systems operating in legal contexts, including constitutional analysis, human rights indexing, and legal decision support. One of the most innovative aspects of the 2005 monograph *Information Technologies in Legal Activity* is **Chapter 6**, which introduces the concept of a **legal neural network**. This idea anticipated the application of artificial intelligence to legal analysis long before such systems became mainstream. The legal neural network was conceived as a model capable of:

- **Semantic structuring of constitutional texts** — identifying relationships between legal norms across jurisdictions.
- **Pattern recognition in human rights documents** — detecting recurring principles and divergences.
- **Adaptive learning** — improving search and analysis results based on user queries and feedback.

- **Decision-support functionality** — assisting judges, lawyers, and policymakers in comparative constitutional review.

The system's architecture and multilingual legal corpus enabled semantic search, document ranking, and contextual highlighting — features now standard in AI-driven legal platforms. VORONUM thus represents an early and visionary implementation of legal informatics and cognitive modeling in public governance.

7. Connection to Modern AI Systems

Today, many AI-driven legal platforms implement features that were conceptually outlined in *VORONUM*:

- **Natural language processing (NLP)** for multilingual legal search.
- **Neural network models** for classification and clustering of legal texts.
- **Knowledge graphs** for mapping constitutional principles and human rights standards.
- **Predictive analytics** for supporting constitutional reform and judicial decision-making.

The early articulation of a legal neural network in Armenia thus represents a **scientific priority** in the field of legal informatics and AI in law. It demonstrates how foundational ideas from the late 1990s and early 2000s continue to shape the digital transformation of legal systems worldwide.

8. Conclusion

The Armenian initiatives *World Wide Constitutions* and *VORONUM* represent pioneering achievements in the field of legal informatics and comparative constitutional analysis. Their multilingual databases, integrated glossaries, and innovative search technologies anticipated the digital transformation of law and governance.

Most importantly, the introduction of the **legal neural network concept** in 2005 established a theoretical foundation for the application of artificial intelligence in the legal domain. This concept, officially registered in Armenia in 1998, demonstrates a clear scientific priority and continues to influence the development of AI-driven legal systems worldwide.

The international recognition of these projects — through scholarly evaluations, citations, and practical use in constitutional reforms — underscores their enduring relevance. They not only saved time and resources in comparative legal analysis but also shaped a comprehensive understanding of human rights across jurisdictions.

By situating these contributions within the broader context of strategic knowledge management, constitutional law, and artificial intelligence, this article affirms Armenia's role as a **global innovator in legal technology**.

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