JEL Classification: Z11, G32
ORCID: 0000-0002-7271-5166

Context Engineering in Value Construction

An Architectural and Mathematical-Logical Model for Cultural and Jewelry Assets

RESEARCH ARTICLE

Context Engineering in Value Construction:

An Architectural and Mathematical-Logical Model for Cultural and Jewelry Assets

Published: April 15, 2026

JEL Classification: Z11, G32 | ORCID: 0000-0002-7271-5166

ABSTRACT

*This study explores an innovative approach to value creation for cultural and jewelry assets through context engineering. It introduces the axiomatic model $V = f(C)$. and presents the "**Value Passport**" as a tool for enhancing the economic security of unique assets.*

Read More ›

KEYWORDS: *Context Engineering, Value Construction, Cultural Assets, Economic Security, Intangible Assets*

Context Engineering in Value Construction
An Architectural and Mathematical-Logical Model for Cultural and Jewelry Assets

Anna Pivtorak
Independent Researcher, Portugal
ORCID: 0000-0002-7271-5166

UDC: 330.1:7.03:671.1
JEL Classification: Z11, G32

Published: April 15, 2026

Abstract

This paper proposes an innovative approach to the formation of value in unique assets through the implementation of a **context engineering** methodology. The transition from traditional static valuation (**valuation**) to the proactive design of value systems (**value construction**) is substantiated.

The author introduces an axiomatic model **V = f(C)**, where value is treated as a dynamic function of structured context. The study further develops the concept of **“Semantic Passportization”** as a mechanism for ensuring the economic security of an asset and enhancing its liquidity in global markets.

Keywords: context engineering, value construction, cultural assets, economic security, valuation, intangible assets.

1

Introduction

Relevance of the study:

Traditional approaches to commodity valuation and banking practices often overlook the **semantic volatility** of assets, focusing primarily on their material characteristics. In the context of a knowledge-based economy, the value of an asset increasingly depends on the informational and symbolic field surrounding it.

Problem statement:

There is a lack of a formalized, mathematically grounded model that explains the direct relationship between **expert-designed context** and the mechanisms of market value formation.

Literature review:

The study builds upon foundational works in marketing (**O. Korchynska**), economic security (**I. Chornodid**), commodity science (**T. Artiukh**), financial instruments (**L. Hulyaieva**), and systemic expertise (**S. Indutnyi**, **R. Platonov**).

In a broader theoretical framework, value formation is examined through the lens of **information asymmetry** (Akerlof, 1970), **symbolic capital** (Bourdieu, 1986), and **cultural economics** (Throsby, 2001). Additionally, the concept of **antifragility** (Taleb, 2012) and the theory of **fuzzy systems** (Zadeh, 1965) provide complementary perspectives for interpreting uncertainty and multidimensional valuation.

The author’s contribution lies in the **synthesis of these approaches** and the transition toward controlled modeling of context architecture as a primary factor of capitalization.

Aim of the study:

To develop and formalize a methodology for value construction through architectural modeling of context, and to demonstrate that the inclusion of context (**C**) and authorship (**A**) operators in the value function enables the objectification of expert evaluation.

2

Methodology

Economic and Mathematical Modeling of Context Architecture

The study proposes a shift from static valuation methods toward **dynamic modeling of value**, based on the quantification of contextual factors.

2.1. Formalization of the Value Model

The general function of asset value is defined as:

V_total = f(M, T, C, A) (1)

Where:

- **M** — material component (gemological characteristics, raw materials);
- **T** — temporal vector (historical continuity, time dimension);
- **C** — integrated context (expert capital);
- **A** — authorship (agency in value creation).

Interpretation:

Context (**C**) acts as a **meta-operator**. Without it, the system degrades to material valuation,

losing the premium associated with uniqueness and intellectual capital. This aligns with the concept of information asymmetry (Akerlof, 1970) and the role of symbolic capital in value formation (Bourdieu, 1986).

2.2. Mathematical Logic in Asset Identification

To structure expert evaluation, the study applies formal logic:

1. **Universal validation operator:**
   $\forall\ \mathbf{x} \in \mathbf{S} : \mathbf{R(x)}$ (2)
   (For every object x in the market set S, the condition of relevance R holds)
2. **Unique determination operator:**
   $\exists\ \mathbf{c} \in \mathbf{C} : \mathbf{\Delta V(c)} \gg \mathbf{0}$ (3)
   (There exists a contextual element c within C that produces a significant increase in value ΔV)

Core synthesis (⊙):
A point of convergence where an object transforms from a **commodity** into a **unique asset**.

3

Results and Discussion

Unlike traditional approaches, the **Value Passport** functions as an anti-degradation mechanism by embedding the asset within a structured semantic continuum. This transforms subjective expert judgment into a **verifiable logical proof**, partially resolving market uncertainty as described in classical economic models (Akerlof, 1970), and aligning with contemporary approaches in cultural economics (Throsby, 2001).

3.1. Operational Model of the Value Passport

The **Value Passport** is defined not as a descriptive document, but as a technological construct with the following properties:

- **Determinacy:** verifiability of each parameter;
- **Irreversibility:** impossibility of arbitrary modification of the recorded context;
- **Cumulativity:** capacity to accumulate value without loss of prior layers.

3.2. Scientific Novelty

- **Conceptual:** Introduction of the paradigm of **context architecture** as a controlled capital-forming factor;
- **Mathematical:** Integration of **C** and **A** as dynamic variables in the value function;
- **Instrumental:** Development of the **Value Passport** as a mechanism of economic security and value stabilization.

3.3. Practical Implications

The practical significance of the study lies in the development of an applied toolkit for stabilizing the market of unique assets. The proposed model and the **Value Passport** protocol can be applied:

- **in banking and insurance** — to objectify the valuation of artworks and jewelry used as collateral, reducing credit risks;
- **in art expertise and attribution** — as a structured algorithm that transforms subjective evaluation into a verifiable logical framework;
- **in private investment management** — for developing long-term capital preservation strategies through protection against semantic devaluation and market volatility;

- **in the digital economy** — as a conceptual foundation for next-generation smart contracts and NFT registries, where context is embedded within the structure of digital assets.

4

Conclusions

1. It is demonstrated that value is not an inherent property of an object, but the result of **context design**.
2. The proposed mathematical model enables the formalization of work with intangible assets.
3. The implementation of the **Value Passport** minimizes information asymmetry (Akerlof, 1970), thereby increasing trust among investors and financial institutions in cultural assets.

5

References

Артюх Т. М. (2003). Товарознавча експертиза коштовних каменів та виробів з них [Монографія]. КНТЕУ.

- **Гуляєва Л. П.** (2014). Роль банківського кредитування у розвитку економіки України [Дис. канд. екон. наук]. АПСВТ.
- **Індутний В. В.** (2012). Оцінка культурних цінностей [Монографія]. СМИТ.
- **Корчинська О. А.** (2017). Маркетингові стратегії інноваційного розвитку підприємств [Монографія]. АПСВТ.
- **Платонов Б. О.** (2012). Експертна оцінка антикваріату: теорія та практика. Експерт-центр.
- **Чорнодід І. С.** (2014). Соціальна конкурентоспроможність країни: теоретико-методологічні та прикладні аспекти [Дис. д-ра екон. наук]. АПСВТ.
- **Akerlof G. A.** (1970). The Market for Lemons: Quality Uncertainty and the Market Mechanism. The Quarterly Journal of Economics, 84(3), 488–500.
- **Bourdieu P.** (1986). The Forms of Capital. In J. Richardson (Ed.), Handbook of Theory and Research for the Sociology of Education (pp. 241–258). Greenwood.
- **Taleb N. N.** (2012). Antifragile: Things That Gain from Disorder. Random House.
- **Throsby D.** (2001). Economics and Culture. Cambridge University Press.
- **Zadeh L. A.** (1965). Fuzzy Sets. Information and Control, 8(3), 338–353.