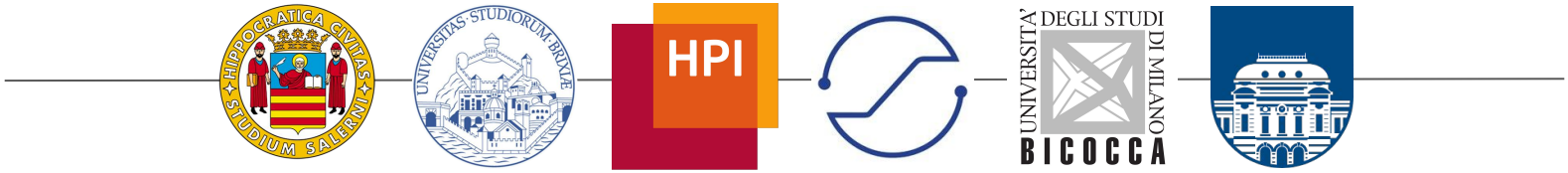
ESWC26

QKG@ESWC 2026 - Workshop on Quality of Knowledge Graphs

Measuring What Matters:
User Perceptions of Knowledge Graph Quality Dimensions in Cultural Heritage



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GOBLIN

Motivation

- Knowledge Graph (KG) quality is multi-dimensional
- Many frameworks exist

❗ Problem:

- No clear way to prioritize these dimensions

- Weights are often:
  - Arbitrary
  - Expert-based (not empirical)

Motivation

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What actually matters to users?

Motivation

- Existing work:
  - Defines dimensions
  - Provides metrics & tools

- Missing:
  - ❌ Empirical prioritization
  - ❌ Context-aware weighting

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Quality ≠ fixed
depends on tasks & user context

Research questions

RQ1: Which KG quality dimensions matter most?

RQ2: Does importance change across tasks and roles?

Methodology

Key idea…

based on a user-centered approach
and on “fitness for use” principle

Evaluate quality based on:

- Roles (publisher vs consumer)
- Task (use context) > Focus on Cultural Heritage
  due to its relevance in the GOBLIN project

Methodology

- Structured **survey** administered online and anonymously
- **15 participants** (cultural heritage domain)
- Evaluate **19 quality dimensions** taken from the Zaveri et al. [1] survey grouped into 4 categories:
  - Intrinsic - as accuracy, completeness, consistency
  - Accessibility - as availability, licensing, performance
  - Representational - as interoperability, understandability
  - Contextual - as timeliness, verifiability, reputation
- **Two scenarios**:
  - Data publication - Preparing KGs for reuse
  - Data consumption - Using KGs for research/decisions

[1] Zaveri, A., et al. (2015) *Quality assessment for Linked Data: A Survey: A systematic literature review and conceptual framework*. In Semantic Web

Methodology

Shared Perspective on data quality dimensions

Categorical rating

- Irrelevant
- Worth having
- Must have

Best–Worst Scaling driven by quality categories

- Select most important
- Select least important

Methodology - *Data quality dimensions*

*

Performance

The efficiency and responsiveness of systems that deliver or process cultural heritage data (e.g. query response time).

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

To avoid divergent weights due to definitions disagreement

Would you apply any change to the **performance** definition?

Testo risposta lunga

Methodology - *Role-based categorical rating*

Rate each dimension in each scenario as irrelevant/worth having/must having.

	Irrelevant	Worth having	Must having
Availability	○	○	○
Licensing	○	○	
Interlinking	○	○	
Security	○	○	○
Performance	○	○	○

Same questions in two different role-based scenarios.

Methodology - *Best–Worst Scaling*

Which dimension is considered the most relevant, and which is considered the least relevant among the following ones?

	Most relevant	Least relevant
Availability	○	○
Licensing	○	○
Interlinking	○	○
Security	○	○
Performance	○	○

Forcing priorities in each data quality category.

Methodology - *Best–Worst Scaling*

Data publisher **Data consumer**

Dimension	Scenario A	Scenario B	Status
Accuracy	Must have	Must have	Stable
Availability	Must have	Must have	Stable
Verifiability	Top (BWS)	Top (BWS)	Stable
Licensing	Must have	Worth having	Context-sensitive (↓)
Understandability	Top (BWS)	Mid	Context-sensitive (↓)
Interoperability	Mid	Top (BWS)	Context-sensitive (↑)
Performance	Least (BWS)	Mid	Context-sensitive (↑)
Completeness	Least (BWS)	Mid	Context-sensitive (↑)
Versatility	Least (BWS)	Least (BWS)	Stable (low)

Results

Stable dimensions (RQ1):

- **Accuracy**
- **Availability**
- **Verifiability**

Context-Sensitive Dimensions (RQ2):

- **Licensing** → for publishers
- **Interoperability** → for consumers
- **Understandability** → for publishers

Dimension	Status
Accuracy	Stable
Availability	Stable
Verifiability	Stable
Licensing	Context-sensitive (↓)
Understandability	Context-sensitive (↓)
Interoperability	Context-sensitive (↑)
Performance	Context-sensitive (↑)
Completeness	Context-sensitive (↑)
Versatility	Stable (low)

Results

Driven by scenarios, …

Publishers focus more on:
- Legal reuse
- Clarity

Consumers focus more on:
- Integration
- Navigation across datasets

Dimension	Status
Accuracy	Stable
Availability	Stable
Verifiability	Stable
Licensing	Context-sensitive (↓)
Understandability	Context-sensitive (↓)
Interoperability	Context-sensitive (↑)
Performance	Context-sensitive (↑)
Completeness	Context-sensitive (↑)
Versatility	Stable (low)

Limitations

- Small sample (15 participants)

- Some dimensions unclear:
  - Timeliness
  - Security
  - Reputation vs believability

- Domain-specific (cultural heritage)
  - However the questionnaire is general-purpose

- Theoretical work, still requiring converting priorities into weights

Future direction

- Update the Zaveri et al. [1] survey
  verifying if and to what extent definitions changed
  - Traditionally, accuracy
    = the degree to which data correctly represent real-world objects
  - In AI/LLM-driven era, accuracy = the degree to which generated or inferred data are plausible, contextually valid, and aligned with available evidence, often under uncertainty.

- Generalized questionnaire, domain independent

- Supporting weights configuration and suggestions in KGHeartBeat [2]

[1] Zaveri, A., et al. (2015) *Quality assessment for Linked Data: A Survey: A systematic literature review and conceptual framework*. In Semantic Web
[2] Pellegrino M.A. et al. (2024) *KGHeartBeat: An Open Source Tool for Periodically Evaluating the Quality of Knowledge Graphs*. In ISWC

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Join the questionnaire!