Token ROI™: A Micro-Costing Framework for Determining When AI Improves Healthcare Workflow Economics

Cloe Ying Chee Koh, BSc(Pharm), MS[1]; Mark Dranias, PhD[1]
[1]AureusIQ LLC, North Carolina, USA

AureusIQ

Code EE306

Objective

Economic drivers of AI-enabled healthcare workflows remain poorly characterized[1].

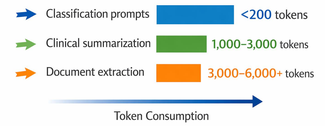
Token ROI applies traditional *micro-costing*[2] approaches by explicitly modeling AI inference (token) costs, human oversight, and error-related rework into workflow-level economic evaluation **(Figure 1)**.

Key Insights

$$\text{Token ROI} = \frac{(Human\ Cost - AI\ Cost)}{AI\ Cost}$$

Interpretation: Token ROI > 0 indicates economic benefit of AI-enabled workflow.

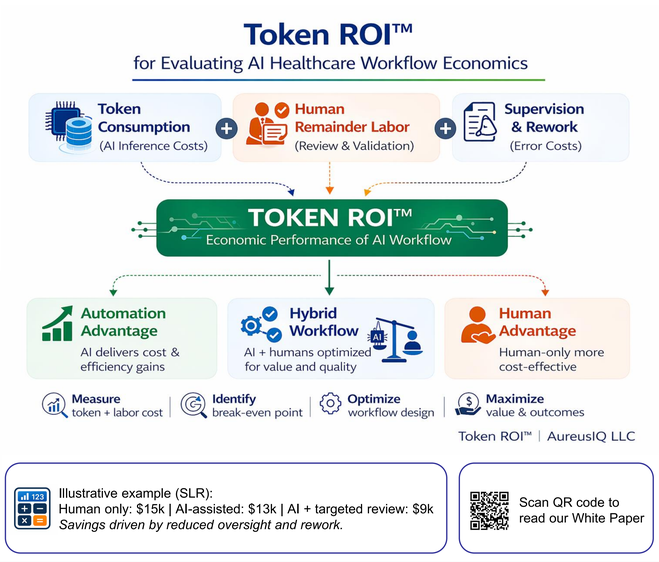
Token Consumption Varies Across Healthcare Tasks



Token ROI™ Series | AI Workflow Economics

The economic impact of AI-enabled workflows is driven by *variability* in token consumption[3], human oversight[4] and error costs.

Figure 1. Token-level costing introduces a new unit of economic analysis for AI healthcare workflows.



Illustrative example (SLR):
Human only: $15k | AI-assisted: $13k | AI + targeted review: $9k
Savings driven by reduced oversight and rework.

Scan QR code to read our White Paper

Payer & HEOR Decision Impact

- Prevents underestimation of AI cost due to hidden oversight
- Supports budget impact modeling for AI adoption
- Enables vendor comparison beyond accuracy metrics
- Improves confidence in AI-supported evidence submissions through transparent and reproducible economic assumptions

Potential Applications

High-impact applications include:

- Evidence synthesis & regulatory writing (e.g. SLRs, HTA, value dossiers)
- AI medical scribe
- AI clinical documentation
- AI vendor evaluation (AI unit economics)

References

1. Voets MM et al. Economic evaluations of AI in healthcare: systematic review. Value Health. 2022;25:340–349.
2. Frick KD. Micro-costing quantity data collection methods. Med Care. 2009;47:S76–S81.
3. Chen L et al. FrugalGPT: reducing cost and improving performance. arXiv. 2023.
4. Morley J, Morton C, Karpathakis K, et al. Sci Eng Ethics. 2021;27:1–19.
5. Elvidge J et al. CHEERS-AI reporting standards. Value Health. 2024;27:1196–1205.

Presented at the Professional Society for Health Economics and Outcomes Research (ISPOR) Annual Meeting, May 19th , 2026