

A Quantitative Framework for Measuring and Prioritising Technical Debt in Mission Critical Trading Information Technology Services

Literature Review Structure for MSc Computing Project

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1 Introduction (500 words)

Purpose:

Introduce technical debt as a persistent challenge in enterprise IT, with relevance to regulated financial institutions where legacy systems, compliance constraints and operational risk coexist.

Key topics:

- Definition and evolution of technical debt in software engineering
- Relevance to enterprise IT management and financial services
- Motivation for the review and link to the artefact
- Review objectives and scope

2 Conceptual Foundations of Technical Debt (900 words)

Purpose:

Establish theoretical grounding and clarify terminology.

Key topics:

- Types of technical debt structural code architectural infrastructure and organisational
- Intentional versus unintentional debt
- Short term value versus long term cost trade off
- Critiques of the technical debt metaphor

3 Existing Technical Debt Frameworks and Metrics (1,200 words)

Purpose:

Critically review established approaches already present in the literature.

Key topics:

- Technical Debt Ratio and SonarQube based metrics
- Quadrant models including reckless prudent deliberate inadvertent debt
- Pareto and prioritisation heuristics
- Limitations of purely code centric models

4 Technical Debt in Financial and Regulated Environments (900 words)

Purpose:

Contextualise the problem within banking and trading IT.

Key topics:

- Legacy systems in capital markets and trading platforms
- Regulatory constraints risk appetite and auditability
- Empirical evidence from financial services and large enterprises
- Operational risk and service continuity implications

5 Identified Research Gap and Positioning (500 words)

Purpose:

Explicitly justify the dissertation.

Key topics:

- Absence of empirically validated frameworks connecting debt metrics to managerial decisions
- Lack of artefact-based research in regulated operational contexts
- Need for decision-oriented tooling rather than diagnostic dashboards

6 Summary and Link to Methodology (400 words)

Purpose:

Bridge literature to research design.

Key topics:

- Key themes synthesised
- How the review informs artefact design
- Justification of mixed empirical and engineering approach

7 Total Indicative Word Count

Approximately 4,400 to 4,600 words

Word Count: 287

References: