**The Compliance Gateway:**

**A Literature Review Evaluating Justification for Data Integration,**

**Cost Transparency, and the Pursuit of Compliance**

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This literature review outline addresses the IT challenges of the Arborwood University cost calculator project by grounding the technical solution in compliance, data integrity, and the strategic necessity of cost transparency.

I. Governing Risk: Formalizing Compliance Gateways in IT Projects

This theme reviews research concerning how organizations mitigate critical regulatory risks by embedding formal legal and compliance checkpoints (or “gateways”) directly into the technology development and governance lifecycle.

Resource Topic: The Strategic Role of Governance

Benabderrahmane, R., Benouaret, Z. N., & Mounir, B. H. (2010). *ICOMPLY: An incremental*

*and dynamic compliance checking framework for evolving software.* Retrieved from https://users.encs.concordia.ca/home/a/abdelw/papers/ICOMPLY10.pdf

The ICOMPLY framework presents a strong academic and technical justification for the legal/compliance approval milestone in the Arborwood Cost Calculator project. This framework proposes that compliance checking must be an incremental process rather than a single, late-stage gate. By mandating a formal compliance review following completion of UI/UX design, use case development, and requirements finalization, the ICOMPLY methodology ensures that the calculator's critical use cases, financial logic, and required disclaimers are evaluated against regulatory requirements before development begins. This strategy directly addresses the core project risk by converting the critical threat of regulatory rejection into a managed, preemptive milestone, thereby guaranteeing that compliance is built into the solution.

Resource Topic: Empirical Study on COBIT and Compliance

Huygh, T., De Smedt, J., & D'Haen, J. (2021). *The role of compliance requirements in IT*

*governance implementation: An empirical study based on COBIT 2019.* ResearchGate. Retrieved from <https://www.researchgate.net/profile/Tim-Huygh/publication/354718657_The_Role_of_Compliance_Requirements_in_IT_Governance_Implementation_An_Empirical_Study_Based_on_COBIT_2019/links/61498d9e519a1a381f71b992/The-Role-of-Compliance-Requirements-in-IT-Governance-Implementation-An-Empirical-Study-Based-on-COBIT-2019.pdf>

The empirical study on COBIT 2019 demonstrates that compliance requirements act as a catalyst and a success factor for implementing robust IT governance frameworks within an organization. By analyzing real-world data, the research validates the project's strategy of using the regulatory threat in higher education as the core business driver for IT change. Specifically, the findings support the mandatory inclusion of a formal, auditable legal/compliance gateway milestone, which moves the regulatory risk from acting as an external blocker and into an internal, managed governance checkpoint. This ensures the technology solution is aligned with non-negotiable legal requirements from the outset.

Resource Topic: Aligning Compliance in Software Project Management

*Arvidsson, A. (2023). Process-oriented risk and issue management for IT projects.*

*[Master's thesis, University of Gothenburg]. Retrieved from* [*https://gupea.ub.gu.se/handle/2077/88228*](https://gupea.ub.gu.se/handle/2077/88228)

The Master's thesis, "*Process-oriented risk and issue management for IT projects*," reinforces the project's governance strategy by moving beyond general risk identification to advocate for a structured, process-based risk methodology. The research provides a framework for transforming major threats into mandatory, predefined project activities. This academically justifies the decision to establish the legal/compliance approval milestone as a formal project checkpoint, ensuring that the regulatory risk is managed proactively and structurally addressed through a defined governance process before significant development resources are invested in the technical build.

II. Ensuring Accuracy: API-Driven Data Integration Best Practices

This theme explores the business case for implementation of Application Programming Interfaces (APIs) to ensure the accuracy and real-time reliability of financial data, thereby mitigating the risk associated with manual data entry.

Resource Topic: The Case for Real-Time Data

*Acharige, B., Wijesundara, L., & Herath, V. (2017). Real-time data processing architecture and*

*framework for business intelligence. In Proceedings of the International Conference on Computing and Engineering (ICCE 2017). Retrieved from https://ieeexplore.ieee.org/abstract/document/10220070*

The academic paper, "*Real-time data processing architecture and framework for business intelligence,*" provides the necessary technical and architectural justification for the project's strategy regarding data integration. Specifically, the research details the rigorous frameworks required to achieve real-time data fidelity in applications, underscoring that accurate, up-to-the-second data cannot be reliably achieved through manual or simple cached data retrieval. This directly validates the decision to include a project milestone addressing the API/Data Integration development effort, proving that the technical complexity of creating a dedicated, real-time integration layer is not merely a preference but a compliance necessity for any financial calculator that must mitigate the severe risk of displaying inaccurate or outdated cost information.

Resource Topic: Microservices and Integration Patterns

Parikh, P., & Haddad, K. (2019). Architecting a microservice based solution: Challenges and

considerations. *Journal of Financial Service Technology*, *3*(1), 77–86. Retrieved from [https://rainmaker-s3-media.s3.amazonaws.com/prod/media/library/CPD/PDFs/Journals/  
Financial%20Services%20Technology/Volume%203/Number%201/JFST-v3n01\_  
ParikhHaddad\_09.pdf](https://rainmaker-s3-media.s3.amazonaws.com/prod/media/library/CPD/PDFs/Journals/Financial%20Services%20Technology/Volume%203/Number%201/JFST-v3n01_ParikhHaddad_09.pdf)

The article, "Architecting a Microservice-Based Solution: Challenges and Considerations," provides academic support for the technical scope of the Arborwood project by addressing the necessary complexity of the API/data integration effort required to realize a legally-compliant cost calculator. This research moves beyond the theoretical justification of using microservices to detail the real-world architectural challenges that the IT team will face. By explicitly documenting these complex technical considerations, the paper validates that the project's requirement to build a dedicated API layer to pull real-time data from the student administration system is a sophisticated engineering effort essential for mitigating the regulatory compliance risk associated with inaccurate financial data.

Resource Topic: The Value of API Development in Higher Education

Vossen, J., & Meijer, M. (2014). *IT governance and enterprise architecture: A new approach for*

*application integration and data access in higher education.* Proceedings of the 20th Annual Conference of the European University Information Systems Organisation (EUNIS 2014). Retrieved from [https://eunis.org/download/2014/papers/eunis2014\_  
submission\_71.pdf](https://eunis.org/download/2014/papers/eunis2014_submission_71.pdf)

**“**IT Governance and Enterprise Architecture: A New Approach for Application Integration and Data Access in Higher Education" provides industry-specific validation for the Arborwood project's technical foundation. By analyzing the challenges faced by higher education institutions, the research demonstrates that leveraging formal enterprise architecture and structured API development is the default best practice for breaking down legacy data silos that prevent access to accurate, real-time information. This directly supports the project's API/data integration milestone, establishing that the creation of the new API layer is not merely a technical necessity for the calculator, but is a strategic, value-adding investment that promotes institutional data agility and enables the rapid, reliable deployment of future public-facing applications.

III. Mitigating Litigation Risk: Transparency and the Regulatory Environment

This theme directly addresses the legal environment of higher education, focusing on government mandates and public documentation that reinforce the necessity of accurate, non-misleading financial transparency tools.

Resource Topic: Federal Disclosure Requirements in Higher Education

Higher Education Act of 1965, 20 U.S.C. § 1094 et seq. (2020). Retrieved from

https://www.law.cornell.edu/uscode/text/20/1094

Federal legislation dictates the degree of required financial disclosure under Title IV of the HEA, specifically mandating transparency regarding costs, financial aid, and outcomes as a condition of participation. Referencing the U.S. Code (U.S.C.) section establishes the non-negotiable legal basis for why cost transparency is mandatory, and why any online tool providing cost estimates must be scrupulously accurate to avoid statutory violations that could result in substantial financial or operational impacts and open the University to litigation.

Cost Transparency as a Market Driver in Higher Education

*Snead, M. B. (2025). The effects of cost transparency on students' college enrollment decisions*

*[Masters thesis, California State University, Fresno]. ProQuest Dissertations Publishing*

"The Effects of Cost Transparency on Students' College Enrollment Decisions" provides empirical evidence directly supporting the business case for the Arborwood project's new cost calculator. This academic research validates the fundamental assumption that financial clarity is a major factor driving student behavior, establishing that a student's ability to easily and accurately calculate their educational costs significantly affects their final enrollment decisions. By quantifying the value of transparency and linking it to market outcomes, the thesis justifies the significant technical and governance investment required, reframing the project as a strategic imperative for mitigating student attrition and improving conversion rates, rather than simply an exercise in regulatory compliance.

Resource Topic: Policy Rationale for Cost Transparency

*Goldrick-Rab, S., & Cook, M. (2021). Financial aid communication: A guide for institutions.*

*The Institute for Research on Higher Education (IRHE). Retrieved from https://files.eric.ed.gov/fulltext/ED619542.pdf*

This policy brief provides strong policy-level justification for the cost calculator's design and functionality. The research identifies that widespread communication failures in higher education, often characterized by complex and non-personalized information, directly contribute to student confusion and a lack of financial literacy. By emphasizing the need for clarity, simplicity, and personalization in cost estimates, the brief validates the project's strategy to build a dedicated, high-fidelity calculator that pulls real-time data. This positions the Arborwood project as a best-practice policy solution designed to overcome systemic communication hurdles and, by extension, reduce the risk of misleading disclosures that could result in regulatory scrutiny.

Resource Topic: Financial Transparency and Equity for Minority Students

White, J. M. (2020). *The effects of financial transparency on college-going behaviors of first-*

*generation, low-income and/or racial-minority students in the State of California* [Doctoral dissertation, University of Southern California]. ProQuest Dissertations Publishing. (Accessed via ProQuest OpenView).

This doctoral dissertation provides the strategic equity justification for the project. It demonstrates that the lack of clear, personalized financial information hinders the enrollment and persistence of first-generation and racial-minority students. This research frames the cost calculator as a necessary tool for systemic change that removes barriers to access, making it a powerful strategic priority for a progressive institution like Arborwood University, which has an established mission to improve financial and social mobility through educational programs that improve career outcomes.