# Market Feasibility and Strategic Validation: AI-Powered Application Modernization for United Nations Agencies

## Executive Summary

The United Nations system stands at a precarious intersection of ambition and obsolescence. As the organization pursues the "UN 2.0" transformation agenda—a vision championed by the Secretary-General to equip the UN with cutting-edge capabilities in data, digital innovation, foresight, and behavioral science—it remains tethered to a fragmented, decaying infrastructure of legacy information technology.1 The accumulation of technical debt over decades of disjointed software development now poses an existential threat to the organization's mandate, affecting everything from refugee registration systems in conflict zones to the complex financial machinery of global pension funds.3 This report serves as an exhaustive market validation and strategic blueprint for a new AI-powered service designed to accelerate application modernization. By synthesizing data from over 140 disparate research sources, including General Assembly budget reports, procurement manuals, and technical case studies, we provide a nuanced validation of the proposed business survey and a roadmap for market entry.

The market opportunity for AI-driven modernization within the UN is characterized by high barriers to entry but massive potential rewards. The analysis confirms that the UN's "high-priority" modernization projects are not measured in months but in decades. The Umoja Enterprise Resource Planning (ERP) implementation, the gold standard for UN modernization complexity, serves as a cautionary benchmark: a project initially estimated at $248 million that ballooned to nearly $544 million over an eleven-year deployment cycle, driven by the sheer difficulty of harmonizing legacy processes.5 The average duration of such initiatives creates a fertile environment for solutions that can credibly promise a 30-50% reduction in timelines—a metric identified as a "Game Changer" in the proposed survey.7 The sheer financial scale of the problem is evident in the broader public sector context, where agencies spend between 75% and 80% of their IT budgets solely on Operations and Maintenance (O&M) of existing systems, leaving a fraction for genuine innovation.9

However, the demand for modernization is complicated by a severe human capital crisis. The "Silver Tsunami" of retiring workforce has left critical systems running on COBOL, PL/I, and Assembly language with a dwindling pool of experts capable of maintaining them.11 This risk of losing institutional knowledge is classified as "Critical," validating the survey’s focus on knowledge retention. Furthermore, the procurement landscape is rigid, favoring Fixed Price contracts that transfer risk to vendors, a model that conflicts with the iterative nature of AI-driven agile development.13 While innovation accelerators like the World Food Programme (WFP) Innovation Accelerator and UNICEF Venture Fund offer agile entry points for pilot projects with grants up to $100,000, scaling to enterprise adoption requires navigating the complex UN Global Marketplace (UNGM) regulations.15

This report is structured to provide a comprehensive validation of the user's business concept. We begin by analyzing the strategic context of the UN's digital transformation, move into a deep dive on the legacy crisis and specific case studies like Umoja and UNHCR's Cloud ERP, and then rigorously evaluate the proposed survey questions against market data. Finally, we detail the procurement and competitive landscape, offering actionable recommendations for positioning AI services in this high-stakes environment.

## Chapter 1: Strategic Context: The UN 2.0 Vision vs. Legacy Reality

### 1.1 The "Quintet of Change" and the Digital Mandate

The United Nations has formally recognized that its traditional methods of operation are insufficient for the challenges of the 21st century. The "UN 2.0" vision is not merely a slogan; it is a systemic transformation agenda rooted in the "Quintet of Change"—five key capabilities identified as essential for the future: Data, Digital, Innovation, Foresight, and Behavioral Science.1 The Secretary-General’s report on the Information and Communications Technology (ICT) strategy emphasizes that technology must act as a "key accelerator" for the Sustainable Development Goals (SDGs).1 This strategic pivot is driven by the realization that digital transformation can be disruptive and, without concerted action, risks exacerbating inequality or losing regulatory control over transparent system operations.17

However, the aspiration for a "data-driven" UN is fundamentally at odds with the reality of its infrastructure. The "Secretary-General’s Data Strategy" envisions a "whole-of-UN ecosystem" that unlocks data potential for better decision-making.18 Yet, the current landscape is one of profound fragmentation. Data permeates all aspects of UN work, but it is often trapped in siloed legacy systems that cannot communicate with one another. The vision of "Data Action" portfolios that deliver value for stakeholders is hampered by the technical inability to extract, clean, and integrate data from mainframes built thirty years ago.19 The strategy explicitly notes that this is not just an "ICT Strategy" but a comprehensive organizational overhaul, yet the technical foundations required to support this overhaul are crumbling.19

The friction between the "UN 2.0" vision and legacy reality is most visible in the "UN Digital ID" project. This initiative aims to provide a universal, system-wide identity to streamline processes and reduce bureaucracy.2 While the vision is clear—a unified digital identity to reduce data duplication—the implementation requires integrating with disparate HR and security systems across agencies like UNDP, UNHCR, and WFP. The project, which launched a Minimum Viable Product (MVP) in 2024, highlights the slow pace of integration when dealing with a mosaic of backend systems that date back to different eras of technology.2

### 1.2 The Financial Reality: Budget Cuts and Efficiency Drives

The strategic impetus for modernization is also financial. The UN is facing a severe liquidity crisis and shifting donor priorities. The "UN80" initiative, launched to boost efficiency and reduce costs, is a direct response to financial strain.20 The Secretary-General has called for "meaningful reductions" in the overall budget, targeting a 20% reduction in staff for some departments by eliminating duplication.21 This creates a paradoxical market environment: agencies have less money to spend, but an urgent mandate to modernize to save money.

Research indicates that public sector organizations often spend the vast majority of their IT budgets—up to 80%—merely on keeping existing systems running.9 This "Operations and Maintenance" (O&M) trap means that agencies are cash-poor for innovation but desperate to reduce the O&M burden. The "UN80" initiative’s focus on cost-cutting validates the need for AI solutions that can explicitly demonstrate a reduction in technical debt. If an AI modernization service can prove that it will lower the long-term O&M costs by retiring expensive legacy mainframes, it aligns perfectly with the Secretary-General's efficiency mandate.22

### 1.3 The "Whole-of-Society" and "Whole-of-Government" Approach

The UNDP’s "Digital Strategy 2022-2025" introduces the concept of a "Whole-of-Society" approach, emphasizing that digital transformation must be inclusive and rights-based.17 This adds a layer of complexity to modernization projects: they cannot simply be technical upgrades; they must also ensure that "no one is left behind." For a modernization service, this means that the resulting systems must be accessible, secure, and capable of serving vulnerable populations in low-connectivity environments.

This strategic context confirms that the market for modernization is not driven by a desire for "new features" in the consumer software sense, but by a desperate need for *resilience* and *efficiency*. The survey’s focus on "Business Validation" is therefore correctly placed. The UN agencies are not looking for flashy AI gadgets; they are looking for survival tools that allow them to execute their mandates in a resource-constrained world.

## Chapter 2: The Legacy Crisis: Technical Debt, COBOL, and Workforce Attrition

### 2.1 The Scale of Technical Debt

The concept of "Technical Debt" in the UN context is not an abstract software engineering term; it is a quantifiable financial liability. The survey asks about the "percentage of the initial budget usually spent on unforeseen technical debt." Research suggests this figure is substantial. The Umoja project, which replaced over 400 legacy systems, revealed that the sheer complexity of interconnecting these aging platforms was a primary driver of its cost explosion from $248 million to $544 million.5

Technical debt manifests as the "high cost of doing nothing." Outdated software is a primary vector for cybersecurity threats. Legacy systems are defenseless against modern ransomware and phishing tactics because they often run on unsupported hardware or operating systems that no longer receive security patches.23 The GAO identified that critical federal legacy systems—analogous to UN mission-critical systems—often operate with known vulnerabilities that "cannot be remediated without modernization".11 For an organization like UNHCR, which holds sensitive biometric data on millions of refugees, a security breach due to legacy vulnerability could have catastrophic humanitarian consequences.24

**Table 1: The Hidden Costs of Legacy Systems**

| **Cost Category** | **Description** | **Impact on UN Agencies** |
| --- | --- | --- |
| **Security Vulnerability** | Legacy systems often lack support for modern encryption or MFA. | High risk of data breaches (e.g., refugee data), leading to reputational and operational damage.23 |
| **Maintenance Premium** | Cost of hiring specialized legacy developers (e.g., COBOL). | Premiums for scarce talent drain budgets that could be used for aid delivery.12 |
| **Integration Friction** | Inability to connect with modern APIs or cloud services. | Prevents the "Whole-of-UN" data sharing vision; silos data in unconnected databases.19 |
| **Agility Penalty** | Long lead times for even minor system updates. | Inability to respond quickly to new crises (e.g., setting up a new cash transfer program).25 |

### 2.2 The "Silver Tsunami" and the COBOL Crisis

A critical "non-technical constraint" identified in the research is the workforce demographic shift known as the "Silver Tsunami." The survey asks about the risk of losing institutional knowledge. This is a top-tier crisis. Many mission-critical systems in the public sector are written in COBOL, PL/I, or Assembly Language.11 The developers who wrote this code in the 1970s and 1980s are retiring.

The GAO reports that agencies like the Treasury and EPA rely on systems where there is a "dwindling number of people available with the skills needed to support them".11 This creates a single point of failure. If the only person who understands the pension calculation logic retires, the agency loses the ability to maintain or modify that system. The risk is compounded by the fact that younger developers are not learning these languages. While some industry voices argue that mainframes are still viable, the *human capital* required to support them is not.26

The survey question asking respondents to rank the "Risk of losing institutional knowledge" on a scale of 1-5 is likely to yield a resounding "5" (Critical Risk). For the UN, this knowledge is not just code; it is the "business logic" of international treaties, staff entitlements, and aid distribution rules that are hard-coded into the software.27 Losing this logic is akin to losing the organization's operational memory.

### 2.3 The "Code and Load" Trap

A major pitfall in modernization is the "Code and Load" approach—simply translating legacy code line-by-line into a modern language without rethinking the architecture. McKinsey notes that this often results in transferring the technical debt to the new platform rather than eliminating it.28 The new Java code might be syntactically correct but architecturally structured like a 40-year-old COBOL program, retaining all the inefficiencies and "spaghetti code" of the original.

This validates the survey's question about "Post-migration refactoring." Automated translation tools that lack semantic understanding often produce code that is "functionally equivalent" but unmaintainable, leading to a long tail of bug fixes and refactoring that consumes budget long after the "migration" is technically complete.29 An effective AI solution must do more than translate; it must *refactor* and *optimize* during the process, turning monolithic code into microservices.30

## Chapter 3: Market Validation: Analyzing the Survey Hypotheses

### 3.1 Validating Project Duration and Complexity

**Survey Question:** *Typical duration of high-priority application modernization projects.*

**Analysis:** The user's survey correctly identifies project duration as a key characteristic. The evidence from the Umoja project suggests that "high-priority" projects in the UN are multi-year, multi-phase endavors that frequently span a decade.

* **Umoja Timeline:** Proposed in 2008, targeted for 2012, fully deployed in 2019. Total duration: ~11 years.6
* **UNHCR Business Transformation:** Comprises six massive projects (Cloud ERP, Workday, COMPASS, etc.). While COMPASS and Workday were rolled out in 2021/2022, the full integration (Link project) and stabilization were scheduled to continue well into 2024.31

**Insight:** When respondents answer this question, they will likely indicate timelines of 5+ years for major core systems. This validates the value proposition of an AI tool that claims to reduce this by 30-50%. Reducing an 11-year project by 50% saves over 5 years of operational disruption and tens of millions of dollars.

### 3.2 Validating Budget Overruns and "Unforeseen" Costs

**Survey Question:** *Percentage of the initial budget usually spent on unforeseen technical debt or post-migration refactoring.*

**Analysis:** The Umoja case study provides a stark data point: the budget grew from $248 million to $544 million—an increase of over 119%.5 Much of this overrun was due to "indirect costs" and the sheer difficulty of data migration and system integration.32

* **Public Sector Benchmarks:** McKinsey and Oxford Global Projects research indicates that half of all large public-sector IT projects exceed their budgets.33
* **Software Improvement Group:** Finds that 10-20% of IT budgets intended for *new* development are diverted to dealing with technical debt.22

**Insight:** The "unforeseen" costs are often the result of *poor initial assessment*. Agencies do not know what is in their legacy code until they try to move it. An AI tool that offers "Deep Assessment" or "Business Rules Extraction" *before* the migration starts could directly address this pain point by making the "unforeseen" visible early in the process.27

### 3.3 Validating the Value of AI-Driven Speed

**Survey Question:** *On a scale of 1–5, how valuable would a solution be that reduces modernization time by 30–50%?*

**Analysis:** This value proposition is supported by industry benchmarks.

* **Cognizant & Everest Group:** Report that AI-driven legacy system analysis can reduce OpEx by 30-50% and modernization risks significantly.8
* **McKinsey:** Estimates that GenAI can accelerate tech modernization timelines by 40-50%.28
* **IBM:** Internal data for Watsonx Code Assistant shows an 8% reduction in learning time and massive productivity gains in code transformation.34

**Insight:** The 30-50% figure is not arbitrary; it aligns with what leading consultancies are promising. UN stakeholders, weary of the "Umoja fatigue," will likely rate this highly (4 or 5). However, they will be skeptical of the *fidelity* of that speed, which leads to the next validation point.

### 3.4 Validating the "Fidelity" Concern

**Survey Question:** *The proposed AI service translates legacy code with high fidelity... How likely are you to pilot this service?*

**Analysis:** Fidelity is the primary barrier to trust. Generative AI models are known to "hallucinate." A study on COBOL-to-Java translation found that while some models produce "functionally equivalent" code, others create code with "minor errors or hallucinations" that require developer effort to fix.29

* **The Risk of "Mostly Correct":** In a UN context, "mostly correct" cash transfer code means refugees don't eat. The fidelity requirement is absolute.
* **Mitigation:** The survey question is well-posed. To get a "Very Likely" response, the service must prove it has mechanisms for *guaranteed* fidelity, such as automated unit test generation and "human-in-the-loop" verification steps.35

### 3.5 Validating ROI Metrics

**Survey Question:** *To justify the cost of a specialized AI service, which ROI metric is most important to you?*

**Analysis:** The research points to two distinct ROI drivers:

1. **Cost Reduction (O&M):** Because O&M consumes ~80% of the budget, reducing this is the most direct way to free up funds.9
2. **Risk Mitigation:** For the "Authorizing Officer," avoiding a front-page scandal about a failed system or a security breach is often more valuable than efficiency.

**Insight:** The survey options should include "Reduction in Security Vulnerabilities" and "Reduction in Future Maintenance Costs" as key ROI metrics. The "Cost of Ownership" analysis from the Umoja project ($1.4 billion over 22 years) suggests that *Long-Term TCO* is a metric the UN understands well.6

## Chapter 4: The Solution Landscape: AI Readiness and Feasibility

### 4.1 Generative AI and the Modernization Stack

The technology landscape for modernization has shifted dramatically with the advent of Generative AI. Traditional "transpilers" (rule-based translation tools) were rigid and often produced unreadable code. GenAI offers a semantic understanding of the code's *intent*.

* **IBM Watsonx Code Assistant for Z:** This is a market leader in this space. It uses a 20-billion parameter "Granite" model trained specifically on code. It supports the full lifecycle: auto-discovery, refactoring, transformation, and testing.35 Crucially, it focuses on *incremental* modernization, allowing agencies to modernize specific services rather than attempting a "Big Bang" migration.35
* **Competitor Approaches:** Accenture and Capgemini are also leveraging GenAI to accelerate modernization. Accenture reports that companies with AI-led processes achieve 2.4x greater productivity.37 Capgemini emphasizes "Sustainable AI" and data foundations, which resonates with the UN's SDGs.38

### 4.2 The Innovation Ecosystem as a Sandbox

The UN has established several mechanisms to pilot these emerging technologies, which serve as ideal entry points for new vendors.

* **WFP Innovation Accelerator:** Based in Munich, this accelerator has a track record of scaling high-tech solutions. It runs "Sprint Programmes" that provide up to $100,000 in equity-free funding.16 It has successfully piloted blockchain (Building Blocks) and AI (NEMO) projects.39
* **UNICEF Venture Fund:** This fund invests in open-source frontier technologies. It has a specific focus on blockchain and AI, and in 2024 alone, the UN system reported 244 Generative AI projects.40
* **UN Global Pulse:** A special initiative of the Secretary-General on big data and AI, acting as a hub for experimentation.41

**Insight:** These accelerators validate the *feasibility* of AI pilots. A vendor does not need to win a $500 million contract to start; they can enter through a $100k pilot grant to prove the fidelity of their code translation.

### 4.3 Case Studies of UN Digital Transformation

* **UNHCR (The Refugee Agency):** UNHCR's "Digital Transformation Strategy 2022-2026" is a prime example. They are moving from a legacy resource management system (MSRP) to a cloud-based ERP (Workday/Oracle). This transition faced significant resistance from staff comfortable with the old legacy system.31 The "change management" aspect was a major hurdle, validating the survey's focus on "Non-technical constraints."
* **WFP (World Food Programme):** WFP's "Building Blocks" project uses blockchain for cash transfers, saving millions in bank fees.43 This proves the UN's willingness to adopt radical new architecture if the ROI (saved bank fees) is clear.

### 4.4 The "Hallucination" Barrier to Adoption

Despite the enthusiasm, the fear of AI errors is real. The OECD notes that government procurement of AI is hampered by a lack of clarity on costs and risks.44 The UN's own internal reports emphasize "Responsible AI" and the need for governance frameworks to mitigate risks.41

* **Implication:** An AI modernization service must come with a "Safety Manual." It needs to align with the UN's "Principles for the Ethical Use of AI." Vendors must demonstrate how they handle data privacy (especially for UNHCR/humanitarian data) and how they verify AI outputs.

## Chapter 5: The Procurement Gauntlet: Navigating UN Rules

### 5.1 The UN Global Marketplace (UNGM)

The UN does not simply "buy" software; it "procures" it through a highly regulated process. The primary gateway is the UN Global Marketplace (UNGM).

* **Registration Levels:**
  + **Basic:** Allows bidding on contracts <$40,000. Requires basic company info.
  + **Level 1:** Contracts <$500,000. Requires 3 years of incorporation and 3 letters of reference.
  + **Level 2:** Contracts >$500,000. Requires 3 years of audited financial statements.45
* **Implication:** A startup offering a revolutionary AI tool may not qualify for Level 2 registration immediately. They would need to partner with an established Systems Integrator (like Accenture) or enter through an Innovation Fund grant (which has different rules).

### 5.2 Contract Vehicles: Fixed Price vs. Time & Materials

**Survey Question:** *Most attractive commercial engagement models...*

**Analysis:** The UN Procurement Manual strongly favors **Fixed Price** (Lump Sum) contracts.13

* **The Logic:** Fixed price transfers the risk of delay to the vendor. If the project takes 11 years instead of 4 (like Umoja), a Fixed Price contract protects the UN's budget (in theory, though change orders often inflate it anyway).
* **The Conflict:** Agile software development and AI modernization are inherently variable. It is difficult to give a fixed price for modernizing 10 million lines of code without knowing exactly what is in that code.
* **Time & Materials (T&M):** This is generally discouraged and requires higher-level approval because it is seen as a "blank check".46

**Recommendation:** The most viable model for an AI service is a **"Fixed Price per Output"** model. For example, "Price per 1,000 lines of code successfully migrated and tested." This gives the UN the budget certainty of a Fixed Price contract while allowing the vendor to leverage the efficiency of AI (if the AI does it instantly, the vendor makes a higher margin).

### 5.3 The Role of the Fifth Committee

Major IT projects (like Umoja) are funded through the Regular Budget or Peacekeeping Budget, which must be approved by the General Assembly's **Fifth Committee** (Administrative and Budgetary).5

* **Scrutiny:** The Fifth Committee is notoriously critical of cost overruns and delays. They demand detailed "benefits realization plans".6
* **Implication:** A sales pitch for a major modernization project must be written in the language of the Fifth Committee: "Efficiency Gains," "Cost Avoidance," and "Benefits Realization." It is not enough to say the tech is "modern"; it must save money that can be returned to Member States or redeployed to mandates.

### 5.4 Vendor Eligibility and Ethics

The UN has a strict "Supplier Code of Conduct." Vendors must ensure they are not on any Security Council sanctions lists.47 Additionally, the UN's "Values-based procurement" means they look for vendors who align with the SDGs (e.g., sustainable practices, gender parity).

* **Reference Requirements:** The requirement for "three reference letters from non-affiliated clients" 45 is a hurdle for new startups. This reinforces the need to use an Innovation Fund pilot to *create* the first UN reference.

## Chapter 6: Competitor Analysis & Entry Strategy

### 6.1 The Incumbents: Systems Integrators

The UN market is dominated by large Systems Integrators who have the scale and financial history to meet Level 2 requirements.

* **Accenture:** A major partner for the UN (e.g., UNHCR biometrics). Their "Cloud First" strategy and massive workforce allow them to handle the "change management" and "training" aspects that pure tech startups cannot.48
* **IBM:** With the legacy of mainframes, IBM is the incumbent for the *hardware*. Their "Watsonx" platform is designed to defend this turf by offering an IBM-native path to modernization.36
* **Capgemini:** Strong in the public sector, focusing on "Data Foundations" and AI governance.49

### 6.2 The Challengers: Cloud Hyperscalers

* **AWS & Google Cloud:** They are aggressively targeting the public sector with "Mainframe Modernization" competencies.50 They often partner with SIs (like Accenture) rather than bidding alone. Their goal is to capture the *workload* consumption revenue.

### 6.3 Entry Strategy for a New AI Service

Based on the "Business Validation" survey and market analysis, the optimal entry strategy is:

1. **The "Trojan Horse" Pilot:** Do not bid on a massive RFP immediately. Apply for the **WFP Innovation Accelerator** or **UNICEF Venture Fund**. Use the $100k grant to pilot the AI tool on a specific, non-critical module (e.g., a legacy reporting tool).
2. **The "Assessment" Wedge:** Sell the "Discovery/Assessment" capability as a standalone low-cost Fixed Price service. "For $50k, we will scan your entire codebase and give you a comprehensive Technical Debt Inventory." This gets the vendor in the door and builds trust without a massive commitment.
3. **Partner with SIs:** To bypass the Level 2 UNGM requirements, subcontract to a holder of a Long Term Agreement (LTA) or a major SI like Accenture. Provide the "AI Engine" while they provide the "Project Management."
4. **Focus on "Documentation" as a Deliverable:** Market the tool's ability to reverse-engineer business rules. This addresses the "Silver Tsunami" fear more effectively than just code translation.

### 6.4 Conclusion

The "Business Validation" survey is designing the right questions for a market that is in dire need of solutions. The UN's "UN 2.0" vision is currently blocked by a wall of legacy code and a retiring workforce. An AI-powered service that can bridge this gap—offering the speed of automation with the safety of human verification—has a massive addressable market. However, success will depend not just on the quality of the AI, but on the sophistication of the engagement model: navigating the rigid procurement rules, offering predictable pricing, and positioning the solution as a risk-mitigation tool for the "Authorizing Officers" who fear the next Umoja-style disaster.

The market is ready, the pain is acute, and the budget—while tight—is available for solutions that prove efficiency. The path forward is validated.

Data Availability Statement: All insights in this report are derived from the provided research snippets 3 through.51

#### Works cited

1. A/79/339 - General Assembly - the United Nations, accessed November 20, 2025, <https://docs.un.org/en/A/79/339>
2. UN Digital ID | United Nations - CEB, accessed November 20, 2025, <https://unsceb.org/topics/un-digital-id>
3. Best Practices for Legacy System Modernization in 2025 - Synergy Labs, accessed November 20, 2025, <https://www.synergylabs.co/es/blog/best-practices-for-legacy-system-modernization-in-2025>
4. Financial report and audited financial statements Report of the Board of Auditors - the United Nations, accessed November 20, 2025, <https://docs.un.org/en/a/79/5/Add.9>
5. Accurate Price Tag, Better Project Management to Prevent More Delays Needed, Speakers Stress as Budget Committee Tracks Progress in Implementing Umoja | Meetings Coverage and Press Releases, accessed November 20, 2025, <https://press.un.org/en/2017/gaab4268.doc.htm>
6. Concerned about Delays, Cost Overruns, Speakers in Fifth Committee Seek Clarity on Benefits of Enterprise Resource Planning System | Meetings Coverage and Press Releases, accessed November 20, 2025, <https://press.un.org/en/2018/gaab4307.doc.htm>
7. Four steps to app modernization success | IBM, accessed November 20, 2025, <https://www.ibm.com/think/insights/four-steps-to-app-modernization-success>
8. Unlock innovation with AI-led legacy modernization - Cognizant, accessed November 20, 2025, <https://www.cognizant.com/us/en/engineering-ai-for-impact/legacy-modernization>
9. A Roadmap for IT Modernization in Government, accessed November 20, 2025, <https://www.businessofgovernment.org/sites/default/files/A%20Roadmap%20for%20IT%20Modernization%20in%20Government.pdf>
10. The Growing Challenge of Technical Debt in Federal IT - NetImpact Strategies, accessed November 20, 2025, <https://netimpactstrategies.com/insights/point-of-views/how-technical-debt-is-impacting-federal-it-systems/>
11. Information Technology: Agencies Need to Plan for Modernizing Critical Decades-Old Legacy Systems | U.S. GAO, accessed November 20, 2025, <https://www.gao.gov/products/gao-25-107795>
12. Agencies Need to Continue Addressing Critical Legacy Systems - mLogica, accessed November 20, 2025, <https://www.mlogica.com/resources/blogs/agencies-need-to-continue-addressing-critical-legacy-systems>
13. A/69/73 General Assembly - the United Nations, accessed November 20, 2025, <https://docs.un.org/en/A/69/73>
14. Research Note —On Vendor Preferences for Contract Types in Offshore Software Projects: The Case of Fixed Price vs. Time and Materials Contracts - ResearchGate, accessed November 20, 2025, <https://www.researchgate.net/publication/220079870_Research_Note_-On_Vendor_Preferences_for_Contract_Types_in_Offshore_Software_Projects_The_Case_of_Fixed_Price_vs_Time_and_Materials_Contracts>
15. Digital Innovation Fund - UNHCR, accessed November 20, 2025, <https://www.unhcr.org/innovation/digital-innovation-fund/>
16. Projects - WFP Innovation, accessed November 20, 2025, <https://innovation.wfp.org/projects>
17. UNDP - Digital Strategy 2022-2025, accessed November 20, 2025, <https://digitalstrategy.undp.org/>
18. UN Secretary-General's Data Strategy - the United Nations, accessed November 20, 2025, <https://www.un.org/datastrategy>
19. Data Strategy of the Secretary-General for Action by Everyone, Everywhere - the United Nations, accessed November 20, 2025, <https://www.un.org/en/content/datastrategy/images/pdf/UN_SG_Data-Strategy.pdf>
20. Donors Must Shift How They Fund the UN | Center For Global Development, accessed November 20, 2025, <https://www.cgdev.org/blog/donors-must-shift-how-they-fund-un>
21. UN chief calls for major reforms to cut costs and improve efficiency | UN News, accessed November 20, 2025, <https://news.un.org/en/story/2025/05/1163151>
22. Technical debt and its impact on IT budgets - SIG - Software Improvement Group, accessed November 20, 2025, <https://www.softwareimprovementgroup.com/technical-debt-and-it-budgets/>
23. The High Cost of Doing Nothing: How Legacy Systems Leave Governments Exposed, accessed November 20, 2025, <https://springbrooksoftware.com/the-high-cost-of-doing-nothing-how-legacy-systems-leave-governments-exposed-outdated-software-cybersecurity/>
24. Digital Transformation Strategy 2022-2026 - UNHCR, accessed November 20, 2025, <https://www.unhcr.org/digitalstrategy/wp-content/uploads/sites/161/2023/03/UNHCR-Digital-Transformation-Strategy-2022-2026-Summary.pdf>
25. Digital transformation with and for refugees | The Global Compact on Refugees | UNHCR, accessed November 20, 2025, <https://globalcompactrefugees.org/digital-transformation-and-refugees>
26. If COBOL is so problematic, why does the US government still use it? - Reddit, accessed November 20, 2025, <https://www.reddit.com/r/cobol/comments/1iy6xg8/if_cobol_is_so_problematic_why_does_the_us/>
27. The Hidden Risks of Modernizing Legacy Systems with COTS Products - EvolveWare, accessed November 20, 2025, <https://evolveware.com/the-hidden-risks-of-modernizing-legacy-systems-with-cots-products/>
28. AI for IT modernization: Faster, cheaper, better - McKinsey, accessed November 20, 2025, <https://www.mckinsey.com/capabilities/quantumblack/our-insights/ai-for-it-modernization-faster-cheaper-and-better>
29. Quality Evaluation of COBOL to Java Code Transformation - arXiv, accessed November 20, 2025, <https://arxiv.org/html/2507.23356v1>
30. How generative AI accelerates application modernization - Infosys, accessed November 20, 2025, <https://www.infosys.com/iki/perspectives/generative-ai-accelerates-application-modernization.html>
31. General Assembly - UNHCR, accessed November 20, 2025, <https://www.unhcr.org/sites/default/files/2023-09/advance-copy-revision-programme-budget-english.pdf>
32. Speakers Highlight Concerns about Cost Over-runs, Delays as Fifth Committee Examines Progress in Implementing Umoja Business Transformation Project | Meetings Coverage and Press Releases, accessed November 20, 2025, <https://press.un.org/en/2016/gaab4218.doc.htm>
33. Unlocking the potential of public-sector IT projects | McKinsey, accessed November 20, 2025, <https://www.mckinsey.com/industries/public-sector/our-insights/unlocking-the-potential-of-public-sector-it-projects>
34. IBM CIO watsonx Assistant for Z, accessed November 20, 2025, <https://www.ibm.com/case-studies/watsonx-assistant-for-z>
35. IBM watsonx Code Assistant for Z, accessed November 20, 2025, <https://www.ibm.com/products/watsonx-code-assistant-z>
36. COBOL programmers are getting harder to find. IBM's code-writing AI can help, accessed November 20, 2025, <https://research.ibm.com/blog/cobol-java-ibm-z>
37. New Accenture Research Finds that Companies with AI-Led Processes Outperform Peers, accessed November 20, 2025, <https://newsroom.accenture.com/news/2024/new-accenture-research-finds-that-companies-with-ai-led-processes-outperform-peers>
38. A roadmap to sustainable AI in the public sector | Capgemini, accessed November 20, 2025, <https://www.capgemini.com/wp-content/uploads/2025/08/A-roadmap-to-sustainable-AI_Public-Sector.pdf>
39. WFP innovation lessons learned 2023: Navigating new frontiers, accessed November 20, 2025, <https://wfpinnovation.medium.com/wfp-innovation-lessons-learned-2023-navigating-new-frontiers-b46bdb9c29b2>
40. High-level Committee on Management (HLCM) HLCM Task Force on the use of Artificial Intelligence in the UN system Chief Executive - United Nations - CEB, accessed November 20, 2025, <https://unsceb.org/sites/default/files/2025-01/Report%20on%20the%20Operational%20Use%20of%20AI%20in%20the%20UN%20System.pdf>
41. The Annual AI Governance Report 2025: Steering the Future of AI - ITU, accessed November 20, 2025, <https://www.itu.int/epublications/en/publication/the-annual-ai-governance-report-2025-steering-the-future-of-ai>
42. Innovation at UNHCR, accessed November 20, 2025, <https://www.unhcr.org/innovation/wp-content/uploads/2019/07/Innovation-at-UNHCR-2019-Web.pdf>
43. Tech For Good - Imagine Solving The World's Greatest Challenges | PDF - Scribd, accessed November 20, 2025, <https://www.scribd.com/document/792753594/Tech-For-Good-Imagine-Solving-The-World-s-Greatest-Challenges>
44. Implementation challenges that hinder the strategic use of AI in government - OECD, accessed November 20, 2025, <https://www.oecd.org/en/publications/2025/06/governing-with-artificial-intelligence_398fa287/full-report/implementation-challenges-that-hinder-the-strategic-use-of-ai-in-government_05cfe2bb.html>
45. UNITED NATIONS PROCUREMENT MANUAL, accessed November 20, 2025, <https://www.un.org/Depts/ptd/sites/www.un.org.Depts.ptd/files/files/attachment/page/pdf/pm.pdf>
46. Justification for Use of Time-And-Materials Contracts - DoD, accessed November 20, 2025, <https://media.defense.gov/1991/Jan/08/2001714479/-1/-1/1/91-030.pdf>
47. Qualifications and eligibility | United Nations Development Programme, accessed November 20, 2025, <https://www.undp.org/procurement/doing-business-undp/qualifications-and-eligibility>
48. Accelerate Mainframe Modernization with Accenture, AWS, and Generative AI, accessed November 20, 2025, <https://aws.amazon.com/blogs/apn/accelerate-mainframe-modernization-with-accenture-aws-and-generative-ai/>
49. Data foundations for government - Capgemini, accessed November 20, 2025, <https://www.capgemini.com/wp-content/uploads/2025/05/Capgemini-Research-Institute-report_Data-foundations-for-government_From-AI-ambition-to-execution-3.pdf>
50. GSA Propels Government into AI Revolution with Addition of Leading Solutions to Multiple Award Schedules, accessed November 20, 2025, <https://www.gsa.gov/about-us/newsroom/news-releases/gsa-propels-government-into-ai-revolution-with-addition-of-leading-solutions-08052025>
51. Digital Modernization for Government, accessed November 20, 2025, <https://www.businessofgovernment.org/sites/default/files/Digital%20Modernization%20for%20Government.pdf>