

Business Model for UTILITY

Above the Line	AL Details	Below the Line	BL Details	Take Aways	TA Details
Value Proposition:	UTILITY provides reliable, safe, and affordable electricity, natural gas, and water services to Memphis and surrounding areas, ensuring critical infrastructure availability, customer satisfaction, and regulatory compliance while supporting community resilience and long-term sustainability.	Capabilities:	UTILITY’s core capability lies in delivering integrated, regulated utility services supported by advanced infrastructure, skilled workforce, and digital platforms to ensure operational efficiency, public safety, and compliance with regional and federal standards.		
Customers:	1. Residential households in Memphis and Shelby County	Internal Resources:	1. Power generation and distribution assets	Risks:	1. Cybersecurity threats to critical infrastructure and customer data
	2. Small and medium-sized businesses requiring essential utilities		2. Natural gas distribution pipelines and infrastructure		2. Extreme weather events impacting utility operations
	3. Large commercial and industrial enterprises with high utility demand		3. Water treatment and distribution facilities		3. Supply chain disruptions for critical equipment and materials
	4. Government and municipal organizations across the region		4. Skilled technical and operational workforce		4. Regulatory changes affecting compliance and costs
	5. Non-profit and community service organizations dependent on utility access		5. Customer service and billing systems		5. Aging infrastructure leading to reliability challenges
	6. Developers and real estate operators requiring utility infrastructure connections		6. Data centers and IT infrastructure		6. Energy market volatility affecting gas and electricity costs
Create Relationships:	1. Customer service centers (phone, email, in-person)	External Resources:	1. Electricity purchased from Tennessee Valley Authority (TVA)	Goals:	1. Maintain safe, reliable, and affordable utility service delivery
	2. Online account management portals and mobile apps		2. Natural gas supply from wholesale providers		2. Modernize and upgrade aging infrastructure
	3. Utility bill communications and notifications		3. Equipment and materials from utility suppliers		3. Enhance cybersecurity and resilience of critical systems
	4. Public meetings, hearings, and community engagement events		4. Technology vendors for IT and smart grid solutions		4. Improve customer satisfaction and digital engagement
	5. Partnerships with local government and civic organizations		5. Construction contractors for infrastructure projects		5. Advance sustainability through energy efficiency and conservation
	6. Educational outreach programs on energy and water conservation		6. Regulatory and compliance partnerships with government agencies		6. Strengthen disaster preparedness and emergency response systems
Sustain Relationships:	1. Reliable 24/7 utility service delivery and outage response	Processes:	1. Electricity, gas, and water distribution management		
	2. Customer loyalty through consistent affordability and transparency		2. Customer billing and account management		
	3. Energy efficiency and water conservation incentive programs		3. Infrastructure maintenance and upgrades		
	4. Proactive communication during emergencies and outages		4. Outage detection, response, and recovery		

	5. Account-based loyalty initiatives such as autopay and e-billing		5. Regulatory compliance and safety monitoring
	6. Long-term infrastructure investment ensuring trust and continuity		6. Energy efficiency and conservation program delivery
Revenue:	1. Electricity service charges	Policies:	1. Federal Energy Regulatory Commission (FERC) compliance
	2. Natural gas service charges		2. Environmental Protection Agency (EPA) water quality standards
	3. Water service charges		3. Occupational Safety and Health Administration (OSHA) regulations
	4. Infrastructure connection and service fees		4. Tennessee Valley Authority (TVA) contractual obligations
	5. Late payment and reconnection fees		5. State and municipal public utility regulations
	6. Miscellaneous services such as testing or inspections		6. Data privacy and cybersecurity standards
		Cost:	1. Electricity purchased from TVA
			2. Infrastructure maintenance and upgrades
			3. Natural gas procurement and transportation
			4. Workforce salaries and benefits
			5. Water treatment and distribution operations
			6. Technology and cybersecurity investments

Peer Reviewed SWOT for UTILITY

SWOT Element	Attribute	Attribute Description	Validated Description	Business Function	Operational Role
Strength	S1: Large Customer Base	Serves ~439,607 electric, ~313,010 gas, ~255,823 water customers in 2024.	validation, Confirmed by UTILITY 2024 Facts & Figures. The large, diversified customer base underpins stable revenues and regional market presence for a public utility.	Revenue & Customer Management	Chief Revenue Officer / Head of Customer Relations
Strength	S2: Key TVA Relationship	TVA's largest customer; represents ~11% of TVA's total load.	validation, Verified long-standing role as TVA's largest customer. Percentage can vary, but the relationship ensures reliable wholesale power and strategic leverage despite single-supplier dependence.	Supply / Procurement	VP of Power Supply or Supply Chain
Strength	S3: Water Source Reliability	Uses the Memphis aquifer (100+ trillion gallons, artesian system with 10 pumping stations, ~175 wells) supplying water to >250,000 customers.	validation, Memphis Sands aquifer is large and high-quality per UTILITY sources. Groundwater reliance offers resilience versus surface water systems and is recognized as a competitive advantage.	Operations / Resource Management	Director of Water Operations
Strength	S4: Strong Financial Transparency	Audited annual reports, performance scorecards, budget; recent statements show stable assets and liabilities.	validation, Tennessee Comptroller audits and public financials demonstrate transparency, including pension and OPEB reporting, reinforcing fiscal credibility and governance.	Finance & Governance	CFO / Director of Financial Planning & Analysis
Strength	S5: Regulatory & Community Engagement	Operates under EPA, TVA, OSHA standards; public reporting (water quality, scorecards), community programs bolster legitimacy and trust.	validation, Active compliance oversight and community outreach are documented, including annual water quality reporting and budgeted engagement initiatives supporting trust and accountability.	Compliance & Public Affairs	Chief Regulatory Officer / Director of Community Relations
Weakness	W1: Aging Infrastructure Costs	Large capital needed: lead service replacement \$8.55M; pipelines, wells, substations; steel tap replacements. Budget shows multi-million upgrades.	validation, 2025 budget details extensive infrastructure spend across stations, wells, and substations; multiyear plans confirm significant burdens tied to aging assets.	Capital Projects / Infrastructure	Chief Engineering Officer / Director of Infrastructure
Weakness	W2: Dependence on TVA for Electricity Supply	TVA supplies wholesale electricity; rate changes, disruptions, or policy shifts directly affect costs and service.	validation, UTILITY purchases 100% of power from TVA; proposed multi-year rate adjustments cite supplier costs and grid modernization pressures, heightening exposure.	Supply / Risk Management	VP of Power Supply / Risk Officer
Weakness	W3: Exposure to Weather and External Shocks	Freeze events caused burst pipes, boil water advisories; severe weather threatens reliability.	validation, Recent freezes and major storms caused widespread disruptions and outages, underscoring vulnerability to extreme weather across water and electric systems.	Operations / Emergency Response	Director of Operations / Director of Emergency Management
Weakness	W4: Large Deferred Liabilities & Pension / OPEB Obligations	Pension/OPEB liabilities in statements; obligations rise with aging workforce and benefits.	validation, Comptroller audit notes material pension and OPEB obligations; reported non-cash expenses materially impact long-term flexibility and budgeting.	Human Resources / Finance	CFO / Director of HR Benefits
Weakness	W5: High Capital Expenditure Demand	2025 budget lists major outlays (e.g., pumping station \$44M, wells, substation, pipeline replacements), pressuring cash flow and allocations.	validation, Significant capital program and contemplated bond issuance strain cash planning; distinct from W1 by emphasizing funding intensity and financing needs.	Capital Planning / Budgeting	Chief Operating Officer / Director of Capital Projects
Opportunity	O1: Smart Grid & Digital Transformation	Launching private 5G; potential for improved outage detection, performance, and public safety.	validation, Documented partnership to deploy private 5G and investments in ADMS/PLTE enable modern operations, reliability, and field communications.	Technology / Innovation	Chief Technology Officer / Director of Digital Strategy

Opportunity	O2: Energy Efficiency & Demand Response Programs	Large customer base enables peak reduction to lower supply costs and defer capital.	validation, TVA regional programs and pathways emphasize demand-side management; UTILITY can leverage these to mitigate wholesale costs and enhance grid stability.	Customer Programs / Sustainability	Director of Energy Programs / Sustainability Officer
Opportunity	O3: Renewable and Distributed Energy Resources	Budget notes solar, battery storage; potential to diversify and reduce external dependence.	validation, Budgeted DER and storage initiatives offer diversification and resilience benefits, building optionality alongside TVA procurement.	Resource Planning / Sustainability	VP of Resource Planning / Renewable Energy Lead
Opportunity	O4: Water Infrastructure Modernization Grants	Federal/state funding available for lead replacement, water quality, resilience.	validation, Ongoing federal and state programs provide grants and guidance; UTILITY’s track record indicates ability to secure and deploy funding for modernization.	Capital Projects / External Affairs	Director of Grants & Funding / Chief of Infrastructure
Opportunity	O5: Customer Engagement & Digital Services	Expand online account tools, outage alerts, e-billing, analytics to boost satisfaction and reduce costs.	validation, Strategy and budget allocate material spend to customer communication platforms, supporting digital expansion and experience improvements.	Customer Service / IT	Director of Customer Experience / Director of IT Systems
Threat	T1: Regulatory & Environmental Compliance Risk	Stricter EPA and state requirements; non-compliance risks fines and reputational damage.	validation, Federal alerts highlight compliance and cybersecurity gaps at water systems; enforcement risk and reputational exposure are material.	Compliance / Risk Management	Chief Regulatory Officer / General Counsel
Threat	T2: Rising Costs of Input and Supply	Natural gas, wholesale power, materials, and labor costs rising with volatility.	validation, Inflationary pressures and supplier-driven costs necessitate rate actions; volatility in fuel and materials challenges financial stability.	Procurement / Financial Planning	Vice President of Procurement / CFO
Threat	T3: Climate Change & Extreme Weather Events	Increasing frequency of freezes, storms, droughts threatens infrastructure and reliability.	validation, National disaster data and recent local events evidence escalating weather impacts, stressing emergency response and asset hardening.	Operations / Resilience Planning	Director of Emergency Management / Chief Resilience Officer
Threat	T4: Aging Workforce & Skills Gaps	Retirements and tech skill shortages risk operations and modernization.	validation, Workforce development programs and partnerships target pipeline needs, confirming recognized exposure to retirements and specialized skill gaps.	Human Resources / Talent Management	Director of HR / Chief Human Resources Officer
Threat	T5: Cybersecurity & Infrastructure Vulnerability	Digitization (e.g., 5G, smart grid) increases attack surface and systemic risk.	validation, Federal enforcement alerts emphasize rising cyber threats to water and utility systems; modernization must be paired with robust cybersecurity controls.	IT / Security	Chief Information Security Officer / Director of Cybersecurity

AI Analysis for UTILITY

Outcome	AI Initiatives	Primary (SWOT)	Counter (SWOT)	Business Strategy	Business Use Case	AI Area	AI Solutions	AI Methods	Function	Role
Save Money	1: Optimize Grid Maintenance	S1: Large Customer Base	W1: Aging Infrastructure Costs	Use extensive customer base insights to prioritize infrastructure maintenance projects that minimize disruptions and improve long-term cost efficiency.	•Asset monitoring •Failure prediction •Repair scheduling	Predictive Maintenance	•failure detection •predictive modeling •asset forecasting	•neural networks •Bayesian inference •time series analysis	Infrastructure Management	Director of Infrastructure
Reduce Risk	2: Enhance Supply Reliability	S2: Key TVA Relationship	W2: Dependence on TVA for Electricity Supply	Strengthen supply resilience by forecasting demand patterns to mitigate TVA dependence and anticipate shifts in wholesale electricity costs.	•Load forecasting •Rate planning •Contingency analysis	Forecasting	•demand prediction •cost forecasting •scenario modeling	•regression models •time series •reinforcement learning	Power Supply Planning	VP of Power Supply
Reduce Risk	3: Predict Weather Impacts	S3: Water Source Reliability	W3: Exposure to Weather and External Shocks	Leverage water source stability with predictive analytics to prepare for outages from extreme weather events and minimize service disruptions.	•Weather modeling •Outage prediction •Impact mapping	Climate Modeling	•storm prediction •disruption mapping •impact analysis	•simulation models •decision trees •neural networks	Emergency Response	Director of Emergency Management
Save Money	4: Manage Pension Exposure	S4: Strong Financial Transparency	W4: Large Deferred Liabilities & Pension / OPEB Obligations	Use financial transparency to build predictive models managing pension obligations and long-term workforce benefit liabilities.	•Cost forecasting •Liability analysis •Budget optimization	Financial Forecasting	•liability prediction •budget modeling •expense optimization	•Bayesian inference •stochastic modeling •decision trees	Finance Planning	CFO
Save Money	5: Optimize Capital Allocation	S4: Strong Financial Transparency	W5: High Capital Expenditure Demand	Apply transparent reporting to model capital expenditure needs and optimize funding allocation for infrastructure improvements.	•Project prioritization •Funding optimization •Expenditure monitoring	Capital Optimization	•project ranking •budget forecasting •fund allocation	•linear programming •Bayesian models •simulation models	Capital Planning	COO
Protect	6: Improve Compliance Monitoring	S5: Regulatory & Community Engagement	T1: Regulatory & Environmental Compliance Risk	Leverage regulatory engagement to automate monitoring of compliance data to avoid fines and sustain community trust.	•Emission tracking •Permit monitoring •Violation alerts	Compliance Automation	•anomaly detection •violation prediction •document analysis	•natural language processing •Bayesian inference •classification models	Compliance Oversight	Chief Regulatory Officer
Save Money	7: Mitigate Supply Cost Volatility	S2: Key TVA Relationship	T2: Rising Costs of Input and Supply	Strengthen TVA partnership to model supply input cost fluctuations and prepare cost-saving purchasing strategies.	•Price forecasting •Supply risk •Procurement planning	Market Forecasting	•cost modeling •supply prediction •procurement optimization	•time series •Bayesian networks •reinforcement learning	Procurement	VP of Procurement
Reduce Risk	8: Strengthen Resilience Planning	S3: Water Source Reliability	T3: Climate Change & Extreme Weather Events	Utilize resilient aquifer resources alongside predictive analytics to strengthen resilience planning for extreme weather impacts.	•Water demand •Resource stress •Emergency planning	Resource Planning	•demand modeling •impact forecasting •capacity planning	•neural networks •simulation models •time series	Resilience Planning	Chief Resilience Officer

Reduce Risk	9: Address Workforce Transitions	S5: Regulatory & Community Engagement	T4: Aging Workforce & Skills Gaps	Use community engagement to build predictive models for workforce planning to anticipate retirements and skills shortages.	•Retirement planning •Skill gap analysis •Recruitment planning	Workforce Analytics	•attrition prediction •skill mapping •recruitment forecasting	•Bayesian inference •decision trees •clustering	Human Resources	Chief Human Resources Officer
Reduce Risk	10: Prevent Cyber Incidents	O1: Smart Grid & Digital Transformation	T5: Cybersecurity & Infrastructure Vulnerability	Integrate digital transformation with proactive threat detection systems to manage increased attack surfaces and prevent infrastructure vulnerabilities.	•Threat detection •Vulnerability monitoring •Anomaly alerts	Cyber Risk Analytics	•intrusion detection •threat modeling •risk scoring	•anomaly detection •graph analysis •neural networks	Cybersecurity	Director of Cybersecurity
Save Money	11: Optimize Outage Response	O1: Smart Grid & Digital Transformation	W1: Aging Infrastructure Costs	Apply smart grid monitoring to predict asset failures and dispatch resources to reduce outage duration and maintenance costs.	•Outage prediction •Dispatch optimization •Repair prioritization	Grid Monitoring	•failure detection •dispatch modeling •resource allocation	•neural networks •reinforcement learning •graph models	Grid Operations	Director of Grid Operations
Save Money	12: Reduce Peak Load Costs	O2: Energy Efficiency & Demand Response Programs	W2: Dependence on TVA for Electricity Supply	Use demand-side programs to reduce peak usage and dependence on TVA by predicting consumption patterns and incentivizing reductions.	•Peak forecasting •Customer targeting •Usage modeling	Demand Management	•load modeling •response forecasting •customer segmentation	•clustering •time series •reinforcement learning	Energy Programs	Director of Energy Programs
Save Money	13: Integrate Distributed Energy	O3: Renewable and Distributed Energy Resources	W2: Dependence on TVA for Electricity Supply	Expand renewable and distributed resources to decrease TVA reliance through predictive energy storage and production models.	•Solar output •Battery planning •Grid balancing	Renewable Optimization	•generation prediction •storage modeling •grid balancing	•regression models •time series •simulation	Renewable Energy Planning	Renewable Energy Lead
Save Money	14: Secure Grant Utilization	O4: Water Infrastructure Modernization Grants	W5: High Capital Expenditure Demand	Align infrastructure projects with grant opportunities by modeling eligibility and financial outcomes to maximize external funding benefits.	•Grant matching •Project modeling •Funding optimization	Grant Modeling	•eligibility scoring •fund forecasting •impact modeling	•classification models •Bayesian networks •simulation models	Grants Management	Director of Grants & Funding
Save Money	15: Expand Digital Services	O5: Customer Engagement & Digital Services	W1: Aging Infrastructure Costs	Improve customer communication platforms to automate outage updates and reduce costs tied to infrastructure maintenance.	•Outage alerts •E-billing •Usage analytics	Customer Engagement	•alert automation •billing optimization •usage segmentation	•natural language processing •clustering •decision trees	Customer Service	Director of Customer Experience
Make Money	16: Monetize Energy Insights	S1: Large Customer Base	O2: Energy Efficiency & Demand Response Programs	Use insights from the customer base to develop new products and services around efficiency and energy demand solutions.	•Customer segmentation •Efficiency planning •Program design	Customer Analytics	•customer profiling •demand modeling •efficiency targeting	•clustering •regression models •decision trees	Sustainability Programs	Sustainability Officer
Save Money	17: Advance Asset Digital Twins	O1: Smart Grid & Digital Transformation	W3: Exposure to Weather and External Shocks	Create digital twins of grid assets to simulate performance and minimize service disruptions during extreme events.	•Asset simulation •Failure modeling •Event planning	Digital Twin Modeling	•simulation engines •failure prediction •performance modeling	•digital twin •neural networks •simulation models	Asset Management	Director of Infrastructure

Save Money	18: Improve Energy Forecasting	O2: Energy Efficiency & Demand Response Programs	T2: Rising Costs of Input and Supply	Use advanced forecasting models to reduce supply-side cost exposure by better aligning demand with resource availability.	•Load prediction •Resource alignment •Peak reduction	Energy Forecasting	•demand modeling •resource planning •cost prediction	•time series •regression models •Bayesian inference	Energy Planning	VP of Resource Planning
Reduce Risk	19: Optimize Emergency Planning	O3: Renewable and Distributed Energy Resources	T3: Climate Change & Extreme Weather Events	Use renewable energy and distributed resources to enhance emergency planning and ensure continued service during extreme events.	•Backup planning •Load shifting •Outage mitigation	Emergency Preparedness	•backup modeling •shift planning •resilience simulation	•simulation models •decision trees •neural networks	Emergency Planning	Director of Emergency Management
Make Money	20: Expand Digital Products	O5: Customer Engagement & Digital Services	S1: Large Customer Base	Use digital platforms to offer new services and products that enhance customer experience and generate new revenue.	•Online services •Billing upgrades •Product bundling	Digital Products	•service automation •billing customization •product recommendation	•natural language processing •collaborative filtering •decision trees	Customer Services	Director of Digital Strategy
Save Money	21: Automate Compliance Reporting	O4: Water Infrastructure Modernization Grants	T1: Regulatory & Environmental Compliance Risk	Automate grant and compliance reporting to reduce administrative overhead and ensure regulatory alignment.	•Report automation •Compliance alerts •Audit preparation	Reporting Automation	•document analysis •alert generation •record validation	•natural language processing •classification models •Bayesian inference	Compliance & Grants	Director of Community Relations
Reduce Risk	22: Forecast Workforce Needs	T4: Aging Workforce & Skills Gaps	O5: Customer Engagement & Digital Services	Anticipate workforce requirements by aligning customer digital adoption trends with skill demand and training programs.	•Skill forecasting •Training design •Recruitment planning	Workforce Planning	•skill mapping •training optimization •attrition prediction	•clustering •decision trees •Bayesian inference	Human Resources	Director of HR
Reduce Risk	23: Strengthen Cyber Resilience	T5: Cybersecurity & Infrastructure Vulnerability	O1: Smart Grid & Digital Transformation	Embed resilience into digital transformation by automating anomaly detection and proactive cyber risk analysis.	•Anomaly detection •Threat modeling •Risk scoring	Cyber Defense	•intrusion detection •risk modeling •pattern recognition	•graph analysis •anomaly detection •neural networks	Security Management	Chief Information Security Officer
Save Money	24: Optimize Pipeline Replacement	W1: Aging Infrastructure Costs	O4: Water Infrastructure Modernization Grants	Use predictive models to align pipeline replacement with grant availability to maximize financial efficiency.	•Pipeline prioritization •Funding allocation •Replacement scheduling	Pipeline Optimization	•failure prediction •fund matching •replacement scheduling	•regression models •simulation models •Bayesian inference	Capital Projects	Director of Capital Projects
Save Money	25: Streamline Procurement	T2: Rising Costs of Input and Supply	S4: Strong Financial Transparency	Apply transparent financial data to optimize procurement decisions and reduce supply cost volatility.	•Supplier evaluation •Cost modeling •Bid selection	Procurement Analytics	•supplier scoring •cost analysis •bid optimization	•decision trees •regression models •Bayesian inference	Procurement	Vice President of Procurement
Protect	26: Monitor Environmental Impacts	T3: Climate Change & Extreme Weather Events	S5: Regulatory & Community Engagement	Use community partnerships to model and monitor environmental impacts for proactive risk mitigation and compliance.	•Impact assessment •Risk alerts •Mitigation planning	Environmental Monitoring	•impact forecasting •alert modeling •scenario planning	•simulation models •clustering •decision trees	Environmental Programs	Chief Regulatory Officer

Serve	27: Enhance Community Programs	O2: Energy Efficiency & Demand Response Programs	S5: Regulatory & Community Engagement	Leverage demand programs and community ties to design targeted initiatives that enhance service outcomes and customer satisfaction.	•Program targeting •Participation forecasting •Impact analysis	Program Analytics	•participation prediction •impact scoring •engagement modeling	•clustering •Bayesian inference •regression models	Community Engagement	Director of Community Relations
Reduce Risk	28: Strengthen Asset Hardening	T3: Climate Change & Extreme Weather Events	W1: Aging Infrastructure Costs	Combine weather forecasting and asset monitoring to prioritize hardening projects for at-risk infrastructure.	•Asset risk •Hardening planning •Weather exposure	Asset Risk Analysis	•risk modeling •exposure analysis •project prioritization	•simulation models •decision trees •Bayesian inference	Infrastructure Hardening	Director of Infrastructure
Save Money	29: Streamline Customer Billing	O5: Customer Engagement & Digital Services	W4: Large Deferred Liabilities & Pension / OPEB Obligations	Optimize billing systems to reduce operational costs and improve revenue collection to offset long-term liabilities.	•Billing accuracy •Payment forecasting •Collection optimization	Billing Analytics	•payment prediction •error detection •collection modeling	•decision trees •regression models •Bayesian inference	Revenue Management	Chief Revenue Officer
Make Money	30: Create Renewable Products	O3: Renewable and Distributed Energy Resources	S1: Large Customer Base	Build new renewable products for customers using distributed energy models to expand revenue and sustainability programs.	•Solar packages •Battery services •Customer bundling	Renewable Products	•generation modeling •package design •customer segmentation	•clustering •simulation models •regression models	Renewable Programs	VP of Resource Planning

Fine-Tuned (Back Office) AI Analysis for UTILITY

Outcome	AI Initiatives	Primary (SWOT)	Counter (SWOT)	Business Strategy	Business Use Case	AI Area	AI Solutions	AI Methods	Function	Role
Save Money	1: Automate Invoice Processing	S4: Strong Financial Transparency	W5: High Capital Expenditure Demand	Streamline end-to-end vendor invoice intake, validation, coding, and three-way matching to reduce manual workload, payment errors, and working capital leakage.	•Invoice intake •Three-way match •Exception routing	Document Automation	•ocr extraction •invoice matching •workflow automation	•ocr •rule engines •rpa	Procurement	Accounts Payable Lead
Save Money	2: Contract Lifecycle Automation	S5: Regulatory & Community Engagement	T1: Regulatory & Environmental Compliance Risk	Standardize authoring, clause selection, approvals, and obligation tracking to shorten cycle time, enforce standards, and minimize noncompliant terms across supplier agreements.	•Clause search •Redline review •Obligation tracking	Knowledge Automation	•contract analysis •clause recommendation •obligation alerts	•natural language processing •retrieval augmentation •classification models	Legal Affairs	Contracts Manager
Save Money	3: Optimize Grant Administration	O4: Water Infrastructure Modernization Grants	W5: High Capital Expenditure Demand	Centralize grant discovery, eligibility assessment, application drafting, and reporting to maximize awards while lowering administrative burden and rework.	•Grant scouting •Eligibility scoring •Report drafting	Funding Analytics	•grant matching •narrative drafting •compliance checks	•ranking models •generative models •ocr	Grants Management	Director of Grants
Save Money	4: Fleet Maintenance Scheduling	S1: Large Customer Base	W1: Aging Infrastructure Costs	Prioritize fleet service and parts procurement using predictive wear patterns, route demand, and downtime cost to reduce truck unavailability and emergency repairs.	•Work order •Parts planning •Downtime prediction	Predictive Maintenance	•failure prediction •spare planning •route alignment	•time series •survival models •optimization	Field Operations	Fleet Manager
Save Money	5: Workforce Shift Optimization	T4: Aging Workforce & Skills Gaps	W4: Large Deferred Liabilities & Pension / OPEB Obligations	Balance shift rosters, certifications, and overtime thresholds with seasonal workload to lower overtime, ensure coverage, and enhance training utilization.	•Roster creation •Overtime control •Certification checks	Scheduling Optimization	•shift optimization •overtime prediction •coverage modeling	•mixed-integer programming •time series •constraint solvers	Workforce Management	Scheduling Supervisor
Save Money	6: Revenue Cycle Accuracy	S4: Strong Financial Transparency	W1: Aging Infrastructure Costs	Detect billing anomalies, misreads, and adjustments early to reduce write-offs, speed collections, and stabilize cash application processes.	•Exception detection •Back-bill review •Dispute routing	Billing Analytics	•anomaly detection •account scoring •dispute triage	•isolation forest •gradient boosting •rpa	Revenue Management	Billing Operations Lead
Save Money	7: Materials Demand Planning	T2: Rising Costs of Input and Supply	W5: High Capital Expenditure Demand	Forecast materials usage by job types and outage seasonality to optimize buy quantities, reduce expedited orders, and improve supplier commitments.	•Usage forecasting •Order sizing •Safety stock	Supply Planning	•demand forecasting •inventory optimization •lead-time modeling	•time series •newsvendor models •Bayesian inference	Supply Chain	Materials Manager

Save Money	8: Payroll Exception Reduction	W4: Large Deferred Liabilities & Pension / OPEB Obligations	S4: Strong Financial Transparency	Validate timesheets, premiums, and allowances against policy to minimize corrections, overpayments, and audit findings.	•Timesheet checks •Premium validation •Adjustment routing	Policy Automation	•rule validation •exception scoring •auto reconciliation	•rpa •rule engines •classification models	Human Resources	Payroll Manager
Save Money	9: Back Office Virtual Assistant	O5: Customer Engagement & Digital Services	W5: High Capital Expenditure Demand	Provide staff assistants for policies, forms, and data lookups to cut task switching, reduce tickets, and accelerate administrative throughput.	•Policy lookup •Form guidance •Data retrieval	Enterprise Assistance	•knowledge search •form drafting •task orchestration	•retrieval augmentation •generative models •workflow engines	Administrative Services	Operations Coordinator
Save Money	10: Procurement Bid Analysis	S4: Strong Financial Transparency	T2: Rising Costs of Input and Supply	Compare supplier bids using normalized terms, risk scoring, and lifetime cost models to select economically efficient awards.	•Bid normalization •Risk scoring •Lifecycle costing	Sourcing Analytics	•price benchmarking •term scoring •award optimization	•nlp •utility models •linear programming	Procurement	Strategic Sourcing Lead
Save Money	11: Mailroom Digitization	O1: Smart Grid & Digital Transformation	W1: Aging Infrastructure Costs	Digitize incoming correspondence and route with automated indexing to reduce manual handling, lost documents, and processing delays.	•Scan capture •Auto indexing •Queue routing	Document Intake	•ocr extraction •content tagging •work queueing	•ocr •embedding models •rpa	Business Services	Mailroom Supervisor
Save Money	12: Accounts Receivable Prioritization	S1: Large Customer Base	W5: High Capital Expenditure Demand	Rank receivables by payment likelihood and contact cost to focus outreach where recoveries are highest and fees are lowest.	•Delinquency scoring •Call targeting •Plan offers	Collections Analytics	•propensity modeling •contact optimization •offer testing	•gradient boosting •uplift models •bandits	Revenue Management	Collections Manager
Save Money	13: Capital Project Controls	W5: High Capital Expenditure Demand	S4: Strong Financial Transparency	Track budgets, commitments, and change orders with risk alerts and earned value projections to reduce overruns and rework.	•Variance alerts •Change order •Cashflow forecast	Project Analytics	•cost prediction •schedule risk •earned value	•Bayesian forecasting •Monte Carlo •graph models	Capital Projects	Project Controls Lead
Save Money	14: Asset Record Reconciliation	W1: Aging Infrastructure Costs	S4: Strong Financial Transparency	Reconcile asset registers, work histories, and geospatial records to fix duplicates, missing attributes, and depreciation mismatches.	•Record matching •Geo validation •Depreciation checks	Master Data	•entity resolution •schema mapping •quality scoring	•probabilistic matching •knowledge graphs •rpa	Asset Accounting	Fixed Asset Manager
Save Money	15: Travel And Expense Audit	S5: Regulatory & Community Engagement	T1: Regulatory & Environmental Compliance Risk	Audit receipts and claims automatically against policy and rate tables to reduce noncompliance, leakage, and manual reviews.	•Receipt parsing •Policy checks •Exception escalation	Expense Compliance	•ocr parsing •policy validation •risk scoring	•ocr •rule engines •classification models	Finance Operations	Expense Audit Lead
Save Money	16: Customer Correspondence Drafting	O5: Customer Engagement & Digital Services	S5: Regulatory & Community Engagement	Generate consistent letters and emails using approved templates and tone to lower editing effort and turnaround time.	•Letter drafting •Template selection •Tone control	Language Generation	•template filling •style guidance •approval routing	•generative models •prompt rules •rpa	Customer Communications	Correspondence Manager

Save Money	17: Vendor Master Hygiene	S4: Strong Financial Transparency	T2: Rising Costs of Input and Supply	Cleanse and deduplicate vendor data with sanction checks to reduce fraud risk and payment errors.	•Duplicate removal •Sanction checks •Bank validation	Data Quality	•entity matching •list screening •account verification	•probabilistic matching •graph checks •rpa	Procurement	Supplier Data Lead
Save Money	18: Records Retention Automation	S5: Regulatory & Community Engagement	T1: Regulatory & Environmental Compliance Risk	Classify documents and apply retention schedules automatically to cut storage costs and improve audit readiness.	•Auto classification •Retention tagging •Disposition workflow	Information Governance	•document labeling •policy enforcement •destruction scheduling	•nlp •policy engines •rpa	Records Management	Records Officer
Save Money	19: Call Disposition Summaries	O5: Customer Engagement & Digital Services	W5: High Capital Expenditure Demand	Summarize agent calls and auto-populate systems to reduce after-call work and increase handled volume per agent.	•Auto summary •Case coding •Form filling	Voice Analytics	•speech to text •topic tagging •auto updates	•asr models •topic models •rpa	Contact Center	Operations Supervisor
Save Money	20: Rate Case Preparation	S4: Strong Financial Transparency	T2: Rising Costs of Input and Supply	Assemble evidence, benchmarks, and narratives from source systems to reduce preparation time and external consulting spend.	•Data extraction •Benchmark tables •Narrative drafting	Regulatory Support	•evidence retrieval •table building •document drafting	•retrieval augmentation •tabular synthesis •generative models	Regulatory Affairs	Rate Case Manager
Save Money	21: Warehouse Slotting Optimization	T2: Rising Costs of Input and Supply	W1: Aging Infrastructure Costs	Arrange parts locations using pick frequency and job urgency to shorten travel time and reduce picking errors.	•Pick routing •Location scoring •Replenishment timing	Operations Optimization	•slotting optimization •route planning •cycle prediction	•heuristics •reinforcement learning •time series	Warehousing	Warehouse Supervisor
Save Money	22: Payment Arrangement Routing	S1: Large Customer Base	W5: High Capital Expenditure Demand	Route customers to the most effective payment options based on risk, hardship signals, and program eligibility to reduce expensive escalations.	•Eligibility checks •Plan recommendation •Channel routing	Decisioning	•propensity scoring •eligibility rules •channel optimization	•gradient boosting •rule engines •bandits	Revenue Operations	Credit Manager
Save Money	23: Meter Data Exception Triage	O1: Smart Grid & Digital Transformation	W1: Aging Infrastructure Costs	Auto-detect and categorize meter read anomalies, estimated reads, and gaps to reduce manual corrections and site visits.	•Gap detection •Tamper flags •Auto tickets	Data Operations	•outlier detection •pattern labeling •ticket creation	•statistical tests •sequence models •rpa	Metering Services	Data Ops Lead
Save Money	24: Supply Contract Indexation	S2: Key TVA Relationship	T2: Rising Costs of Input and Supply	Monitor indices and adjust allowable price changes automatically to prevent overpayments and ensure fair escalation.	•Index tracking •Price checks •Variance alerts	Price Governance	•index linkage •variance analysis •term enforcement	•time series •rule engines •rpa	Procurement	Contract Manager
Save Money	25: Audit Workpaper Assembly	S4: Strong Financial Transparency	T1: Regulatory & Environmental Compliance Risk	Collect, label, and cross-reference evidence into standardized workpapers to reduce audit preparation hours and review cycles.	•Evidence gathering •Cross-reference •Control mapping	Audit Support	•document retrieval •reference linking •control tagging	•nlp •embedding search •rpa	Finance & Governance	Audit Coordinator

Save Money	26: Claims Intake Automation	W3: Exposure to Weather and External Shocks	S5: Regulatory & Community Engagement	Triage damage claims with photo parsing, address validation, and policy checks to reduce manual reviews and cycle time.	•Photo parsing •Address checks •Policy validation	Claims Processing	•image analysis •form parsing •eligibility rules	•cnn •ocr •rule engines	Customer Programs	Claims Manager
Save Money	27: Training Content Generator	T4: Aging Workforce & Skills Gaps	O5: Customer Engagement & Digital Services	Generate step-by-step guides and quizzes from procedures to shorten onboarding and reduce classroom hours.	•Guide creation •Quiz building •Version updates	Learning Tools	•procedure summarization •question generation •update alerts	•generative models •retrieval augmentation •classification	Human Resources	Training Lead
Save Money	28: Treasury Cash Forecasting	S4: Strong Financial Transparency	W5: High Capital Expenditure Demand	Forecast daily cash needs across receivables, payables, and capital draws to minimize idle balances and borrowing costs.	•Inflow modeling •Outflow timing •Variance alerts	Financial Forecasting	•cash prediction •liquidity modeling •anomaly alerts	•time series •state-space models •change detection	Treasury	Cash Manager
Save Money	29: Work Order Coding Assistant	W1: Aging Infrastructure Costs	O1: Smart Grid & Digital Transformation	Suggest standardized work order codes and descriptions from notes to reduce rework and improve downstream analytics.	•Code suggestion •Note parsing •Error checks	Data Standardization	•text classification •auto coding •validation rules	•nlp •sequence models •rule engines	Operations Support	Work Order Lead
Reduce Risk	30: Policy Update Monitoring	S5: Regulatory & Community Engagement	T1: Regulatory & Environmental Compliance Risk	Track new regulations and map required internal policy changes to ensure timely updates and reduce enforcement exposure.	•Rule tracking •Impact mapping •Task routing	Policy Intelligence	•regulatory parsing •gap analysis •remediation workflow	•nlp •knowledge graphs •rpa	Compliance Oversight	Compliance Manager
Reduce Risk	30: Monitor Financial Exposure	T3: Insurance Liability Risk	S3: Improved Profitability	Build predictive insurance exposure models to balance profitability with liability management.	•Exposure analysis •Liability forecasting •Claim prediction	Liability Management	•risk prediction •claim analysis •cost modeling	•Bayesian inference •neural networks •ensemble models	Risk	Chief Risk Officer

Fine-Tuned (IT) AI Analysis for UTILITY

Outcome	AI Initiatives	Primary (SWOT)	Counter (SWOT)	Business Strategy	Business Use Case	AI Area	AI Solutions	AI Methods	Function	Role
Save Money	1: Cloud Cost Optimization	S4: Strong Financial Transparency	W5: High Capital Expenditure Demand	Consolidate usage data, allocate shared costs, and rightsize environments to cut waste while preserving performance commitments across development, testing, and production workloads.	•Usage tagging •Rightsizing plans •Idle cleanup	Cost Management	•cost anomaly detection •rightsizing recommendation •scheduling automation	•time series modeling •Bayesian inference •reinforcement learning	Information Technology Finance	Technology Cost Manager
Save Money	2: Service Desk Assistant	O5: Customer Engagement & Digital Services	W5: High Capital Expenditure Demand	Standardize internal request handling with conversational guidance, knowledge retrieval, and automated fulfillment to shrink ticket volumes and reduce average handling time.	•Answer retrieval •Form completion •Ticket routing	Generative Assistance	•knowledge search •response drafting •workflow orchestration	•retrieval augmentation •transformer models •robotic process automation	Service Management	Service Desk Lead
Reduce Risk	3: Code Quality Analytics	O1: Smart Grid & Digital Transformation	W3: Exposure to Weather and External Shocks	Introduce continuous code review signals and defect prediction to stabilize release quality for systems supporting outage management and field operations.	•Defect prediction •Hotspot detection •Refactor guidance	Quality Engineering	•defect scoring •complexity analysis •refactor suggestion	•gradient boosting •graph analysis •sequence models	Application Engineering	Quality Engineering Lead
Save Money	4: Test Case Generation	O1: Smart Grid & Digital Transformation	W1: Aging Infrastructure Costs	Expand automated test creation from requirements and logs to reduce manual scripting effort and increase regression coverage across mission critical applications.	•Scenario creation •Data synthesis •Regression selection	Testing Automation	•synthetic test creation •coverage optimization •failure replay	•transformer models •constraint solvers •causal analysis	Quality Assurance	Test Automation Lead
Reduce Risk	5: Release Risk Scoring	S4: Strong Financial Transparency	T2: Rising Costs of Input and Supply	Score releases using change history, dependencies, and incident patterns to prioritize approvals and staged rollouts that reduce production instability.	•Change scoring •Canary planning •Rollback choice	Release Management	•risk prediction •deployment planning •rollback recommendation	•time series modeling •Markov models •reinforcement learning	Platform Engineering	Release Manager
Save Money	6: Application Interface Inventory	S5: Regulatory & Community Engagement	W1: Aging Infrastructure Costs	Catalog internal and external interfaces, map dependencies, and rationalize traffic to lower maintenance effort and simplify modernization planning.	•Endpoint discovery •Usage metering •Dependency maps	Integration Management	•interface discovery •traffic analysis •portfolio rationalization	•embedding models •graph neural networks •clustering	Enterprise Architecture	Integration Architect
Save Money	7: Data Cataloging Automation	O1: Smart Grid & Digital Transformation	W5: High Capital Expenditure Demand	Auto-curate datasets with lineage, ownership, and quality metrics to reduce discovery time and duplicated data preparation across teams.	•Schema detection •Owner suggestion •Lineage capture	Data Governance	•metadata extraction •owner inference •lineage stitching	•natural language processing •graph analysis •probabilistic matching	Data Management	Data Governance Lead

Save Money	8: Master Data Cleansing	S4: Strong Financial Transparency	W4: Large Deferred Liabilities & Pension / OPEB Obligations	Standardize customer, asset, and supplier profiles with deduplication and survivorship rules to improve billing accuracy and financial reporting.	•Duplicate merge •Golden record •Address standardize	Master Data	•entity resolution •record survivorship •address validation	•probabilistic matching •rule engines •knowledge graphs	Data Management	Master Data Manager
Save Money	9: Document Digitization Hub	O5: Customer Engagement & Digital Services	W1: Aging Infrastructure Costs	Centralize intake of forms, diagrams, and invoices with automated classification and routing to reduce manual keying and processing time.	•Image capture •Auto classify •Queue routing	Document Automation	•optical character recognition •content labeling •workflow automation	•computer vision •natural language processing •robotic process automation	Business Services	Document Operations Lead
Save Money	10: Vendor License Optimization	S4: Strong Financial Transparency	T2: Rising Costs of Input and Supply	Normalize usage, entitlements, and contracts to reallocate or retire licenses and negotiate fair terms with accurate consumption insights.	•Usage normalization •Entitlement mapping •Reclaim workflow	Asset Management	•license metering •entitlement matching •reclaim automation	•graph analysis •rule engines •robotic process automation	Information Technology Procurement	Software Asset Manager
Save Money	11: Software As A Service Rationalization	S4: Strong Financial Transparency	W5: High Capital Expenditure Demand	Consolidate overlapping software as a service tools using adoption signals and contract data to reduce spend and support overhead.	•Overlap detection •Adoption scoring •Exit planning	Portfolio Management	•application clustering •usage scoring •retirement planning	•clustering •Bayesian inference •optimization models	Enterprise Applications	Portfolio Manager
Reduce Risk	12: Infrastructure Forecasting	S2: Key TVA Relationship	T2: Rising Costs of Input and Supply	Forecast compute and storage demand tied to program schedules to prevent capacity shortfalls during critical operational periods.	•Capacity prediction •Queue saturation •Upgrade timing	Capacity Analytics	•demand forecasting •bottleneck prediction •upgrade scheduling	•time series modeling •queuing models •optimization models	Infrastructure Services	Capacity Planning Lead
Save Money	13: Platform Capacity Planning	S1: Large Customer Base	W5: High Capital Expenditure Demand	Align platform scaling with seasonal customer patterns to minimize overprovisioning while maintaining service level targets.	•Seasonality modeling •Scale planning •Workload placement	Forecasting Models	•workload forecasting •placement optimization •autoscale tuning	•state space models •reinforcement learning •linear programming	Platform Engineering	Platform Planning Lead
Reduce Risk	14: Backup Failure Prediction	S4: Strong Financial Transparency	T3: Climate Change & Extreme Weather Events	Predict backup job failures and validate recoverability to strengthen resilience for mission critical applications and data platforms.	•Job risk •Restore validation •Gap alerts	Resilience Operations	•failure prediction •restore testing •gap detection	•gradient boosting •simulation models •anomaly detection	Infrastructure Services	Backup Operations Lead
Reduce Risk	15: Disaster Recovery Orchestration	W3: Exposure to Weather and External Shocks	O1: Smart Grid & Digital Transformation	Orchestrate failover runbooks with dependency graphs and readiness scoring to reduce recovery time during regional disruptions.	•Runbook generation •Dependency checks •Readiness scoring	Continuity Planning	•failover planning •dependency mapping •readiness validation	•graph neural networks •constraint solvers •simulation models	Business Continuity	Recovery Manager
Save Money	16: Integration Mapping Assistant	O1: Smart Grid & Digital Transformation	W1: Aging Infrastructure Costs	Generate interface specifications and test stubs from schemas and logs to cut custom integration effort and defects.	•Specification drafts •Stub creation •Contract tests	Integration Design	•schema summarization •stub generation •contract checking	•transformer models •program synthesis •rule engines	Integration Services	Integration Lead

Save Money	17: Data Pipeline Optimization	O1: Smart Grid & Digital Transformation	W5: High Capital Expenditure Demand	Optimize data jobs with workload profiling, window tuning, and failure retry policies to lower compute costs and reprocessing.	•Job profiling •Window tuning •Retry policy	Pipeline Optimization	•workload tuning •cost modeling •failure mitigation	•reinforcement learning •queuing models •time series modeling	Data Engineering	Data Pipeline Lead
Reduce Risk	18: Data Lineage Mapping	S5: Regulatory & Community Engagement	T1: Regulatory & Environmental Compliance Risk	Build end to end lineage across reports and models to trace changes and support defensible compliance responses.	•Source tracing •Impact analysis •Change history	Data Governance	•lineage extraction •impact analysis •audit trails	•graph analysis •natural language processing •probabilistic matching	Data Management	Data Governance Lead
Save Money	19: Report Consolidation Assistant	S4: Strong Financial Transparency	W5: High Capital Expenditure Demand	Merge duplicative reporting with auto discovery, owner outreach, and migration plans to reduce maintenance and compute consumption.	•Duplicate find •Owner contact •Migration plan	Reporting Automation	•report clustering •owner identification •migration guidance	•clustering •embedding models •generative models	Business Intelligence	Reporting Manager
Save Money	20: Knowledge Base Generation	O5: Customer Engagement & Digital Services	W4: Large Deferred Liabilities & Pension / OPEB Obligations	Generate and refresh procedures from tickets and telemetry to reduce training time and improve first contact resolution.	•Procedure drafts •Answer snippets •Auto updates	Knowledge Management	•document generation •snippet retrieval •drift detection	•transformer models •retrieval augmentation •change detection	Service Management	Knowledge Manager
Save Money	21: Meeting Notes Summarization	O5: Customer Engagement & Digital Services	W5: High Capital Expenditure Demand	Capture decisions and actions from calls and workshops to reduce manual documentation and missed follow ups.	•Decision capture •Action items •System update	Collaboration Analytics	•speech transcription •summary drafting •system writing	•automatic speech recognition •transformer models •robotic process automation	Enterprise Collaboration	Collaboration Lead
Save Money	22: Employee Onboarding Automation	T4: Aging Workforce & Skills Gaps	O5: Customer Engagement & Digital Services	Automate new hire setup, access requests, and training assignment to reduce cycle time and coordination burden across teams.	•Form intake •Access setup •Training schedule	Workforce Automation	•form parsing •task orchestration •assignment planning	•optical character recognition •workflow engines •constraint solvers	Human Resources Systems	Onboarding Manager
Save Money	23: Change Ticket Triage	S4: Strong Financial Transparency	W1: Aging Infrastructure Costs	Classify and prioritize change tickets using impact, dependencies, and historical outcomes to reduce review queues and failed changes.	•Impact scoring •Dependency check •Priority setting	Information Technology Service	•ticket classification •impact prediction •priority optimization	•classification models •graph analysis •reinforcement learning	Service Management	Change Manager
Reduce Risk	24: Root Cause Analysis	O1: Smart Grid & Digital Transformation	W3: Exposure to Weather and External Shocks	Correlate logs, traces, and metrics to isolate causality faster and prevent repeat incidents during high demand periods.	•Pattern detection •Blame isolation •Remediation guide	Observability Analytics	•event correlation •causal inference •remediation suggestion	•probabilistic graphs •causal modeling •sequence mining	Site Reliability	Observability Lead
Save Money	25: Network Capacity Planning	S2: Key TVA Relationship	W5: High Capital Expenditure Demand	Forecast traffic and prioritize link upgrades to deliver service levels while avoiding unnecessary overbuild.	•Hotspot prediction •Upgrade timing •Route planning	Network Planning	•traffic forecasting •upgrade scheduling •route optimization	•time series modeling •queuing models •linear programming	Network Services	Network Planning Lead

Save Money	26: Asset Lifecycle Tracking	W1: Aging Infrastructure Costs	S4: Strong Financial Transparency	Track hardware and software lifecycles with automated depreciation and refresh planning to minimize reactive purchases.	•Age profiling •Refresh timing •Disposition plans	Asset Management	•lifecycle prediction •refresh optimization •disposition planning	•survival analysis •optimization models •rule engines	Information Technology Finance	Asset Manager
Reduce Risk	27: Patch Window Scheduling	W3: Exposure to Weather and External Shocks	S5: Regulatory & Community Engagement	Schedule patch windows around operational peaks with dependency checks to reduce service disruption risk.	•Window selection •Dependency validation •Rollback plan	Change Planning	•window optimization •dependency mapping •rollback planning	•constraint solvers •graph analysis •simulation models	Platform Engineering	Change Planner
Save Money	28: Vendor Contract Parsing	S5: Regulatory & Community Engagement	T2: Rising Costs of Input and Supply	Extract obligations, renewals, and pricing terms from agreements to prevent overspend and missed negotiation opportunities.	•Term extraction •Renewal alerts •Obligation mapping	Contract Intelligence	•clause extraction •renewal detection •obligation linking	•natural language processing •sequence labeling •knowledge graphs	Legal Affairs	Contracts Manager
Save Money	29: Legacy System Modernization	O1: Smart Grid & Digital Transformation	W1: Aging Infrastructure Costs	Prioritize modernization candidates using maintenance cost, incident history, and integration complexity to plan phased replatforming.	•Candidate scoring •Pattern mapping •Phased roadmap	Modernization Planning	•portfolio scoring •pattern mining •roadmap generation	•clustering •graph analysis •generative models	Enterprise Architecture	Modernization Lead
Reduce Risk	30: Data Retention Tuning	S5: Regulatory & Community Engagement	T1: Regulatory & Environmental Compliance Risk	Apply policy aware retention with storage class optimization to reduce exposure and unnecessary storage consumption.	•Policy tagging •Class selection •Disposition review	Records Governance	•policy mapping •class optimization •disposition automation	•rule engines •optimization models •robotic process automation	Information Governance	Records Officer
Reduce Risk	30: Monitor Financial Exposure	T3: Insurance Liability Risk	S3: Improved Profitability	Build predictive insurance exposure models to balance profitability with liability management.	•Exposure analysis •Liability forecasting •Claim prediction	Liability Management	•risk prediction •claim analysis •cost modeling	•Bayesian inference •neural networks •ensemble models	Risk	Chief Risk Officer

Fine-Tuned (Security) AI Analysis for UTILITY

Outcome	AI Initiatives	Primary (SWOT)	Counter (SWOT)	Business Strategy	Business Use Case	AI Area	AI Solutions	AI Methods	Function	Role
Reduce Risk	1: Adaptive Access Control	S5: Regulatory & Community Engagement	T5: Cybersecurity & Infrastructure Vulnerability	Implement contextual authentication policies that adapt dynamically to user risk, improving access safety while maintaining operational continuity.	•User profiling •Session risk •Policy enforcement	Identity Analytics	•anomaly detection •risk scoring •access monitoring	•Bayesian inference •decision trees •neural networks	Access Management	Identity Manager
Save Money	2: Passwordless Authentication	S2: Key TVA Relationship	T5: Cybersecurity & Infrastructure Vulnerability	Replace costly password resets with biometric and token-based authentication to cut helpdesk expenses and strengthen credential integrity.	•Credential replacement •Biometric validation •Token issuance	Authentication Systems	•biometric match •token validation •credential management	•cnn •cryptographic models •rule engines	Identity Services	Authentication Lead
Reduce Risk	3: Role Access Optimization	S1: Large Customer Base	T5: Cybersecurity & Infrastructure Vulnerability	Automate access role assignments with fine-grained rules to reduce excessive entitlements and prevent insider misuse.	•Role mining •Policy enforcement •Entitlement cleanup	Access Governance	•role mining •policy mapping •risk scoring	•clustering •graph analysis •rule engines	Access Management	Access Governance Lead
Save Money	4: Encryption Key Lifecycle	S4: Strong Financial Transparency	T1: Regulatory & Environmental Compliance Risk	Automate generation, rotation, and retirement of encryption keys to lower administrative overhead and reduce compliance failures.	•Key rotation •Usage monitoring •Expiry alerts	Cryptography Operations	•key scheduling •usage analysis •expiry detection	•rule engines •Bayesian inference •cryptographic models	Data Security	Key Management Lead
Reduce Risk	5: Sensitive Data Discovery	W1: Aging Infrastructure Costs	T1: Regulatory & Environmental Compliance Risk	Continuously identify and classify sensitive data to reduce exposure and improve compliance with data protection requirements.	•Pattern scanning •Classification •Exposure alerts	Data Classification	•entity detection •pattern matching •exposure analysis	•natural language processing •ocr •regular expressions	Data Security	Data Classification Lead
Save Money	6: Data Tokenization Engine	W4: Large Deferred Liabilities & Pension / OPEB Obligations	T1: Regulatory & Environmental Compliance Risk	Automate tokenization of sensitive records to simplify audits and reduce operational compliance costs across data environments.	•Token mapping •Policy enforcement •Audit support	Data Protection	•token generation •mapping storage •policy enforcement	•rule engines •hashing algorithms •Bayesian inference	Data Security	Data Protection Lead
Reduce Risk	7: Input Validation Monitor	O1: Smart Grid & Digital Transformation	T5: Cybersecurity & Infrastructure Vulnerability	Monitor input streams for anomalies to block injection and cross-site scripting attempts in customer-facing applications.	•Injection detection •Pattern blocking •Alert routing	Application Security	•signature matching •pattern analysis •input sanitization	•regex engines •classification models •decision trees	Application Security	Application Security Lead
Reduce Risk	8: API Threat Analytics	O5: Customer Engagement & Digital Services	T5: Cybersecurity & Infrastructure Vulnerability	Continuously monitor and score API calls to reduce exploitation risks and maintain customer trust in digital services.	•Abuse detection •Rate analysis •Key misuse	API Analytics	•traffic scoring •misuse detection •session monitoring	•graph analysis •anomaly detection •time series modeling	Integration Security	API Security Lead
Save Money	9: Log Anomaly Reduction	S4: Strong Financial Transparency	W5: High Capital Expenditure Demand	Apply anomaly detection to log streams to reduce alert fatigue and minimize analyst hours spent on false positives.	•Noise filtering •Anomaly ranking •Event grouping	Log Analytics	•outlier detection •event clustering •priority ranking	•isolation forest •clustering •Bayesian inference	Security Monitoring	SIEM Manager

Reduce Risk	10: Threat Hunting Assistant	O1: Smart Grid & Digital Transformation	T5: Cybersecurity & Infrastructure Vulnerability	Provide analysts with guided hunt playbooks and anomaly summaries to shorten investigation cycles and improve detection.	•Playbook generation •Signal prioritization •Hypothesis support	Threat Analytics	•event summarization •playbook building •signal scoring	•retrieval augmentation •transformer models •graph analysis	Security Operations	Threat Hunting Lead
Save Money	11: Static Code Analysis	O1: Smart Grid & Digital Transformation	W1: Aging Infrastructure Costs	Automate static analysis at commit time to reduce rework and limit defects entering later testing phases.	•Code scanning •Pattern detection •Issue routing	Code Analysis	•vulnerability scanning •pattern recognition •auto fixing	•abstract syntax trees •classification models •transformer models	Software Development	DevSecOps Lead
Reduce Risk	12: Dynamic Code Testing	O1: Smart Grid & Digital Transformation	T5: Cybersecurity & Infrastructure Vulnerability	Simulate attacks against applications in real time to uncover vulnerabilities before deployment.	•Attack simulation •Error detection •Response scoring	Code Testing	•vulnerability injection •response scoring •sandbox analysis	•fuzzing algorithms •simulation models •rule engines	Software Testing	Application Testing Lead
Reduce Risk	13: Dependency Risk Scoring	S4: Strong Financial Transparency	T5: Cybersecurity & Infrastructure Vulnerability	Analyze open-source libraries for known vulnerabilities and license risks to prevent insecure components in production.	•Library scanning •Risk scoring •Upgrade alerts	Dependency Analysis	•vulnerability scanning •license analysis •risk modeling	•knowledge graphs •classification models •rule engines	Application Security	Dependency Manager
Save Money	14: DevSecOps Policy Checks	S5: Regulatory & Community Engagement	T1: Regulatory & Environmental Compliance Risk	Enforce security policies in pipelines automatically to reduce manual approvals and accelerate secure releases.	•Policy enforcement •Pipeline checks •Violation alerts	Policy Automation	•policy matching •pipeline validation •violation detection	•rule engines •Bayesian inference •classification models	DevSecOps	Pipeline Security Lead
Reduce Risk	15: Data Masking Automation	W1: Aging Infrastructure Costs	T1: Regulatory & Environmental Compliance Risk	Apply masking to sensitive data in non-production environments to reduce breach risk and maintain compliance.	•Mask generation •Test data •Audit support	Data Governance	•mask creation •policy enforcement •test data substitution	•rule engines •probabilistic models •hashing functions	Data Governance	Data Privacy Lead
Reduce Risk	16: Model Integrity Checks	O2: Energy Efficiency & Demand Response Programs	T5: Cybersecurity & Infrastructure Vulnerability	Continuously validate model outputs against known baselines to prevent exploitation of model inversion or membership inference.	•Baseline comparison •Output analysis •Deviation alerts	Model Monitoring	•output validation •baseline checks •alert generation	•statistical tests •Bayesian inference •decision trees	AI Governance	Model Integrity Lead
Reduce Risk	17: Poisoned Data Detection	O3: Renewable and Distributed Energy Resources	T5: Cybersecurity & Infrastructure Vulnerability	Identify malicious training data that could skew model predictions and degrade operational decision making.	•Data validation •Source scoring •Poison detection	Data Validation	•anomaly detection •source scoring •label analysis	•clustering •probabilistic models •transformer models	AI Governance	Data Validation Lead
Reduce Risk	18: Adversarial Input Defense	O1: Smart Grid & Digital Transformation	T5: Cybersecurity & Infrastructure Vulnerability	Detect and mitigate manipulated inputs designed to fool deployed models into incorrect predictions.	•Input scanning •Pattern validation •Alert routing	Input Validation	•adversarial detection •input sanitization •alerting	•cnn •adversarial training •rule engines	AI Operations	Adversarial Defense Lead
Reduce Risk	19: Model Theft Prevention	O5: Customer Engagement & Digital Services	T5: Cybersecurity & Infrastructure Vulnerability	Monitor query patterns to detect and block extraction attempts from external actors trying to steal model functionality.	•Query monitoring •Pattern analysis •Response limiting	Model Security	•usage profiling •extraction detection •rate limiting	•graph analysis •time series •classification models	AI Operations	Model Security Lead

Reduce Risk	20: Training Data Anonymization	S5: Regulatory & Community Engagement	T1: Regulatory & Environmental Compliance Risk	Apply anonymization and strict access controls to training data containing sensitive records to reduce compliance exposure.	•Data redaction •Access control •Audit readiness	Data Privacy	•anonymization •access control •audit validation	•differential privacy •hashing functions •rule engines	Data Security	Data Privacy Officer
Reduce Risk	21: Explainability Dashboard	S4: Strong Financial Transparency	T1: Regulatory & Environmental Compliance Risk	Provide interpretable explanations of model predictions to satisfy regulatory requirements and improve trust in automated systems.	•Feature ranking •Prediction summary •Compliance report	Explainability Tools	•feature attribution •summary reporting •compliance tracking	•shap values •lime models •decision trees	AI Governance	Explainability Lead
Reduce Risk	22: Shadow AI Detection	O5: Customer Engagement & Digital Services	T5: Cybersecurity & Infrastructure Vulnerability	Monitor system traffic and endpoints for unauthorized AI tools that may create hidden risks and untracked costs.	•Endpoint monitoring •Usage tracking •Alerting	Shadow AI	•usage detection •endpoint monitoring •alert generation	•graph analysis •anomaly detection •rule engines	AI Governance	AI Governance Lead
Reduce Risk	23: Secure Model Deployment	O1: Smart Grid & Digital Transformation	T5: Cybersecurity & Infrastructure Vulnerability	Harden model deployment with encryption, rate limiting, and fine-grained access policies to prevent unauthorized usage.	•Encryption checks •Rate limiting •Access enforcement	Deployment Security	•encryption •access control •rate limiting	•rule engines •cryptographic models •decision trees	AI Operations	Deployment Manager
Save Money	24: Continuous Compliance Audit	S5: Regulatory & Community Engagement	T1: Regulatory & Environmental Compliance Risk	Automate mapping of regulatory controls against logs and configurations to lower audit preparation costs and staff hours.	•Control mapping •Gap analysis •Evidence capture	Compliance Automation	•control mapping •gap analysis •evidence collection	•knowledge graphs •rule engines •retrieval augmentation	Compliance	Compliance Audit Lead
Reduce Risk	25: Zero Trust Enforcement	O1: Smart Grid & Digital Transformation	T5: Cybersecurity & Infrastructure Vulnerability	Apply dynamic trust validation across sessions to minimize lateral movement risks and safeguard critical applications.	•Trust scoring •Session validation •Access revocation	Zero Trust	•risk scoring •session monitoring •revocation	•Bayesian inference •graph analysis •decision trees	Infrastructure Security	Zero Trust Manager
Save Money	26: Automated Threat Modeling	S4: Strong Financial Transparency	W1: Aging Infrastructure Costs	Generate system threat models from architecture diagrams to reduce manual effort and speed mitigation planning.	•Diagram parsing •Threat catalog •Mitigation plan	Threat Modeling	•diagram analysis •threat prediction •mitigation guidance	•graph analysis •transformer models •simulation models	Application Security	Threat Modeling Lead
Reduce Risk	27: Penetration Test Prioritization	O1: Smart Grid & Digital Transformation	T5: Cybersecurity & Infrastructure Vulnerability	Prioritize penetration tests using vulnerability severity, asset exposure, and business criticality to maximize coverage.	•Vulnerability ranking •Asset mapping •Test selection	Test Prioritization	•severity scoring •exposure analysis •test scheduling	•Bayesian inference •clustering •graph analysis	Security Testing	Test Lead
Save Money	28: Red Team Automation	O5: Customer Engagement & Digital Services	T5: Cybersecurity & Infrastructure Vulnerability	Automate red team attack simulations to lower manual labor costs and improve coverage of potential weaknesses.	•Scenario generation •Attack simulation •Gap reporting	Attack Simulation	•scenario generation •simulation •gap analysis	•generative models •simulation models •rule engines	Security Testing	Red Team Lead
Reduce Risk	29: Secure Code Review	S4: Strong Financial Transparency	T5: Cybersecurity & Infrastructure Vulnerability	Use automated reviewers to scan pull requests for vulnerabilities and compliance issues before merging to reduce insecure code.	•Pull scan •Vulnerability detection •Policy validation	Code Review	•vulnerability scanning •policy validation •issue detection	•natural language processing •graph analysis •rule engines	Software Development	Secure Code Lead

Save Money	30: Third-Party Code Analysis	S5: Regulatory & Community Engagement	T5: Cybersecurity & Infrastructure Vulnerability	Analyze third-party and open-source code components to reduce risks of vulnerabilities while lowering reliance on manual reviews.	•Component scanning	Code Analysis	•component scanning	•knowledge graphs	Application Security	Third-Party Code Lead
					•License analysis		•license validation	•classification models		
					•Risk detection		•risk scoring	•rule engines		

replace ; with return	=TEXTJOIN(CHAR(10), TRUE, TEXTSPLIT(G8, "; "))			
remove leading spaces	=SUBSTITUTE(F3," ", "", 1)	=SUBSTITUTE(H3," ", "", 1)		
remove trailing spaces	=LEFT(G11,LEN(G11)-IF(RIGHT(G11,1)=" ",1,0))			
do all 3 with one command	=TEXTJOIN(CHAR(10), TRUE, TRIM(TEXTSPLIT(SUBSTITUTE(G11," ", "", 1), "; ")))			
replace ; with return and keep bullet	=SUBSTITUTE(G11, ";", CHAR(10))		=SUBSTITUTE(I11, ";", CHAR(10))	=SUBSTITUTE(J11, ";", CHAR(10))