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Artificial Intelligence — Crawl-Walk- Run: Run — Strategy, Solutions, Ethics

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Crawl, Walk, Run Series: Artificial Intelligence

Crawl

Understanding the AI
Landscape



Walk

Governance & Security
for AI Apps & Solutions



Run

Advanced Solutions
and Ethics



Client Lifecycle: CLA Digital

Phase 1

- No dashboards or manually compiled dashboards
- Disconnected data
- Abundance of manual processes

Phase 2

- Automated dashboard for one or more departments
- Analytics supported by data integration and automated workflows
- Exploring artificial intelligence for productivity

Phase 3

- Most departments supported by automated dashboards and self-service BI
- Defined sources of truth across enterprise
- Exploring machine learning for analytics

Phase 4

- Integrated systems and solutions supporting advanced analytics
- Machine learning and artificial intelligence integral to business decisions

Crawl

Walk

Run



What is GPT?



GPT is a kind of Large Language Model: Able to generate novel, human-like text, write code, and create datasets

Goal of GPT project was to create chat agent that can interact conversationally, generate coherent, relevant content, answer follow up questions.

Trained on websites, books, and online material.

Humans AI trainers helped GPT models provide more desirable outputs via reinforcement learning.

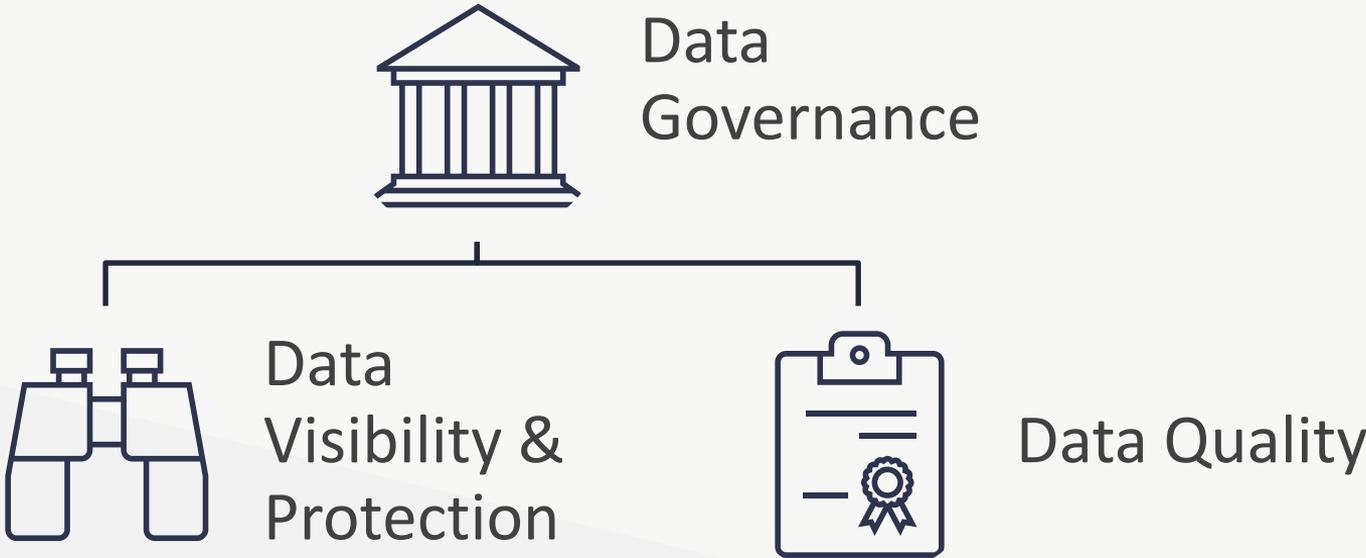
OpenAI released ChatGPT November 2022

Many updates and other new generative AI apps & services released since 2022

7



Governing Your Data Estate





Advanced AI Methods



What is AI?



Natural Language Processing (NLP): Sentiment analysis and conversational AI.



Computer Vision: Image and facial recognition.



Machine Learning: Predictive and prescriptive analytics, classification & anomaly detection



Reinforcement Learning: Models that learn from stimuli.

Traditional Machine Learning

- Forecast financial trends
- Detect system anomalies
- Predictive maintenance
- Patient Segmentation
- Route Optimization
- Outbreak Prediction



Computer Vision

- Autonomous Driving
- Agriculture
- Retail
- Manufacturing
- Document Automation
- Healthcare



Large Language Models

Content Creation

Customer Support

Natural Language Processing

Data Extraction/Summarization

Programming



Impact | GPT-4 Performance on Exams

Exam	GPT-4 (with vision) Score
Uniform Bar Exam (MBE+MEE+MPT)	298 / 400 (~90th)
LSAT	163 (~88th)
SAT Evidence-Based Reading & Writing	710 / 800 (~93rd)
SAT Math	700 / 800 (~89th)
Graduate Record Examination (GRE) Quantitative	163 / 170 (~80th)
Graduate Record Examination (GRE) Verbal	169 / 170 (~99th)
Graduate Record Examination (GRE) Writing	4 / 6 (~54th)
USABO Semifinal Exam 2020	87 / 150 (99th - 100th)
USNCO Local Section Exam 2022	36 / 60
Medical Knowledge Self-Assessment Program	75%

OpenAI, Josh Achiam, Steven Adler, et al. "GPT-4 Technical Report." arXiv, 2024. <https://arxiv.org/abs/2303.08774>.



Impact | Reasoning

- Prompt:
 - Suppose $g(x) = f^{-1}(x)$, $g(5) = 4$, $g(7) = 3$, $g(9) = 6$. What is $f(f(f(6)))$?
- GPT-4:
 - There are different ways to approach this problem, but one possible method is to use the fact that $g(x) = f^{-1}(x)$ implies that $f(g(x)) = x$ for any x in the domain of g . That is, applying f to both sides of the equation $g(x) = f^{-1}(x)$ gives $f(g(x)) = f^{-1}(x) = x$. This means that we can undo the effect of f by applying g , and vice versa. Using this idea, we can try to find $f(6)$ by looking for the value of x such that $g(x) = 6$. From the given information, we see that $g(9) = 6$, so $f(6) = f(g(9)) = 9$. Similarly, we can find $f(9)$ by looking for the value of x such that $g(x) = 9$. We see that $g(7) = 3$, so $f(9) = f(g(7)) = 7$. Finally, we can find $f(7)$ by looking for the value of x such that $g(x) = 7$. We see that $g(4) = 7$, so $f(7) = f(g(4)) = 4$. Therefore, $f(f(f(6))) = f(f(9)) = f(7) = 4$.

OpenAI, Josh Achiam, Steven Adler, et al. "GPT-4 Technical Report." arXiv, 2024. <https://arxiv.org/abs/2303.08774>.



Impact | Visual Context Comprehension

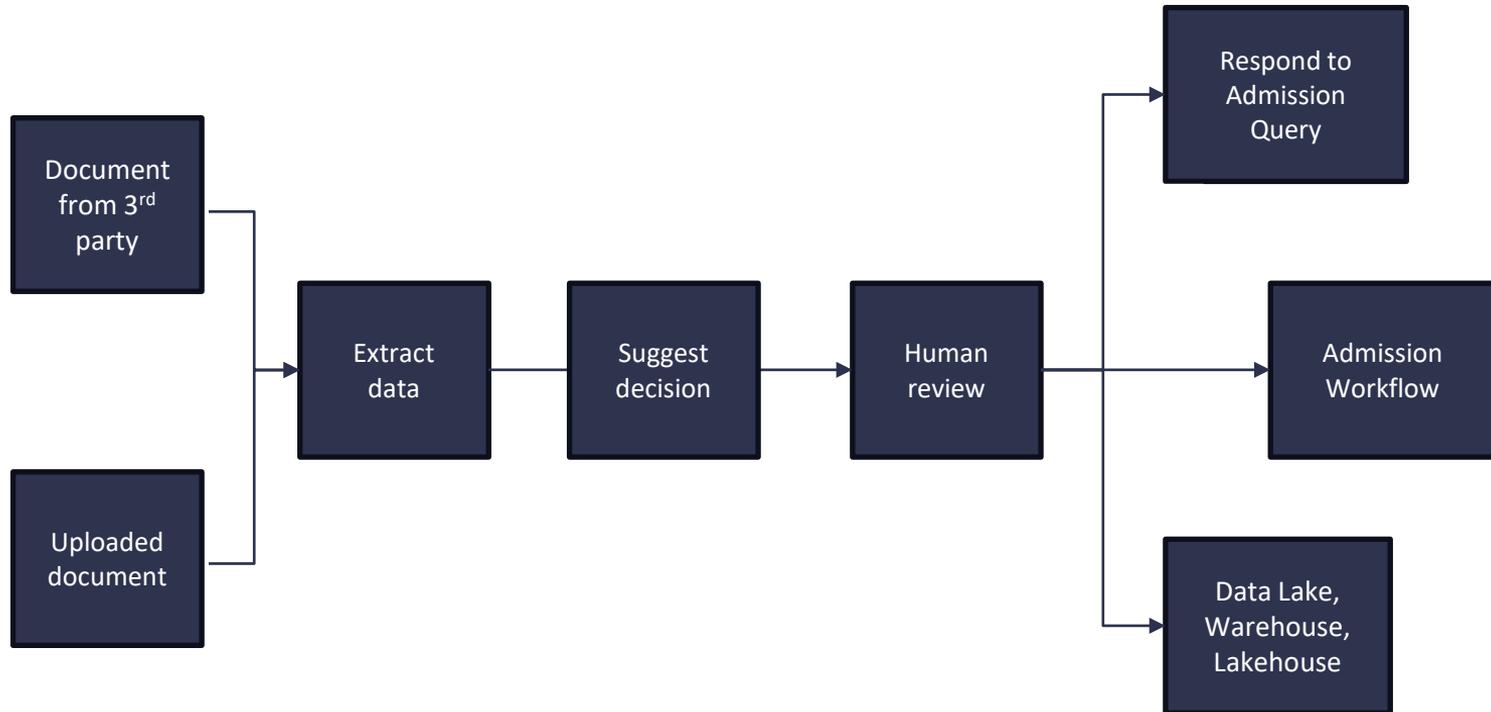
- What's funny about this image?

GPT-4o:



The humor in this image comes from the fact that a VGA connector, which is an older type of video display interface commonly used for computer monitors, is plugged into a modern smartphone. This is amusing because VGA connectors are not compatible with smartphones, and there's no practical reason to connect them. The juxtaposition of old and new technology creates a funny and absurd scenario.

Admission Abstraction



Discharge Note

Riverside General Hospital
General Medicine
1234 River Street, Metropolis, NY 1234 Phone: (555) 123-4567

Patient Information:

- Name: John Doe
- Date of Birth: January 15, 1980
- Medical Record Number: 123456789

Admission Date: June 10, 2024

Discharge Date: June 17, 2024

Attending Physician:

- Name: Dr. Jane Smith
- Department: General Medicine

Reason for Admission: John Doe was admitted to the hospital for the management of acute pneumonia.

Hospital Course: Upon admission, the patient presented with fever, cough, and shortness of breath. Initial chest X-ray revealed infiltrates consistent with pneumonia. The patient was started on broad-spectrum antibiotics and received supportive care, including intravenous fluids and oxygen therapy.

Over the course of the hospital stay, John Doe showed significant clinical improvement. Fever resolved, respiratory symptoms lessened, and follow-up chest X-ray showed marked improvement in infiltrates.

Consultations:

- Infectious Disease: Recommendations for antibiotic regimen and duration.
- Respiratory Therapy: Provided assistance with oxygen management and breathing exercises.

Discharge Condition: John Doe is being discharged in stable condition. He is afebrile, breathing comfortably on room air, and has good overall improvement in symptoms.

Medications at Discharge:

Prepopulated Extraction

- ✓ Payer Source
- ✓ Primary Diagnosis
- ✓ BMI
- ✓ Medications
- ✓ Mental Health Status

Accept

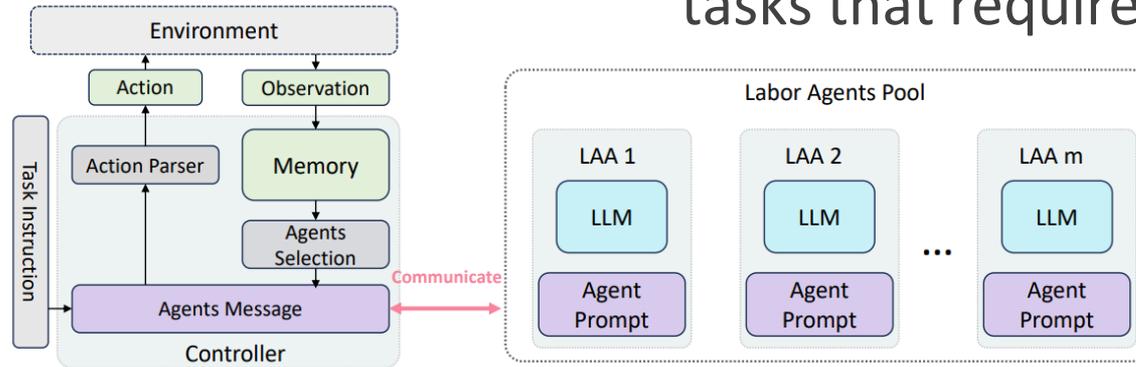
Reject



Impact

- Autonomous Agents
 - Given high level goal, plan & execute

- Actions
 - Web browsing
 - Mathematical reasoning
 - OS navigation
- Longer-running, high-level tasks that require reasoning



Liu, Zhiwei, Weiran Yao, and Jianguo Zhang, et al. "BOLAA: Benchmarking and Orchestrating LLM-augmented Autonomous Agents." arXiv, 2023. <https://arxiv.org/abs/2308.05960>.

Example: Traffic Management AI Agent

Goals

- Optimize traffic flow
 - Enhance road safety
 - Reduce environmental impact
 - Improve public transportation efficiency
- Data Collection
 - Real-time data from cameras, sensors, and GPS.
 - Flow Optimization
 - Adjust signals, reroute traffic.
 - Incident Management:
 - Detect and respond to accidents/hazards.
 - Public Transport:
 - Adjust schedules, provide updates





Ethics



Ethics in AI



Moral principles AI development,
deployment, and management



Applications:

Design of AI systems

Data usage in AI

Implications of AI deployment

Impact of AI on society



Ethical Questions in AI



Transparency, Ownership,
Accountability &
Compliance



Fairness, Bias Mitigation,
& Social Justice



Privacy, Security & Data
Governance



Human Impact &
Sustainability

AI Gone Awry

Amazon Recruitment Tool Pilot

- Trained on 10 years of employee resumes
- Intended to identify which resumes should advance to interview
- Demonstrated gender bias
 - President of Women's Chess Club
- Potential to reinforce industry biases favoring men due to training dataset
- Amazon notes tool was not used in production to make decisions.

Microsoft Chatbot Tay

- Designed to learn from conversations
- Released on Twitter in 2016
- Began producing offensive tweets almost immediately
- Taken down by Microsoft within 16 hours of release
- Demonstrates risk of AI learning from unfiltered inputs



Copyright and Attribution

AI Trained on Artistic Works

- Art used to train generative AI models
- Intellectual property
- Loss of income
- Quality, authenticity, bias & appropriation
- Legal ambiguity & questions of authorship

NY Times Lawsuit

- Content used for training
- Allegations of copyright infringement
- Impact on subscriptions
- Broader implications on training AI models



Ethical Applications of AI

Education

Healthcare

Environmental
Sustainability

Financial
Inclusion

Accessibility

Political
Engagement

Community
Engagement

Ethical AI
Development



Considerations for Your Organization

- Mission
- Values
- Strategy
- Policies
- Regulations
- Intention and Impact
- Stakeholders
 - Can include the public and less visible groups
- Data
 - Sourcing
 - Bias mitigation
 - Privacy & Governance
- AI transparency & explainability
- Security & Safety
- ESG





Strategy

Launching Digital Transformation with an Assessment



Polling Question – Does your organization have a digital roadmap or strategy in place?

- Yes, we have one built out and are actively pursuing it
- Yes, but no action on it yet
- No, we do not
- I am not sure if we have a digital roadmap



CLA Digital Helps Businesses in 3 Ways...



Software Integration

Inhouse products and resale solutions allow businesses to leverage off-the-shelf value.



Data and Automation

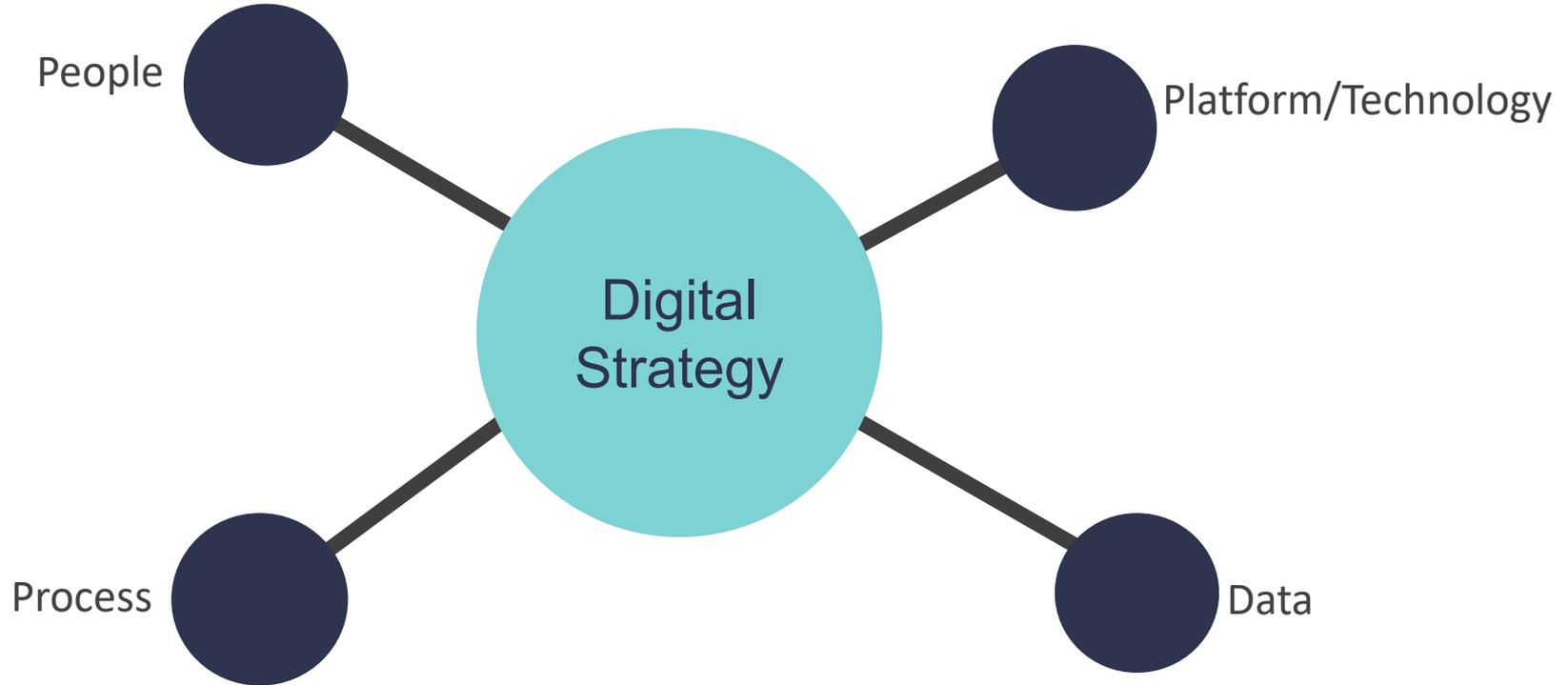
Every business relies on data insights to make accurate informed decisions.



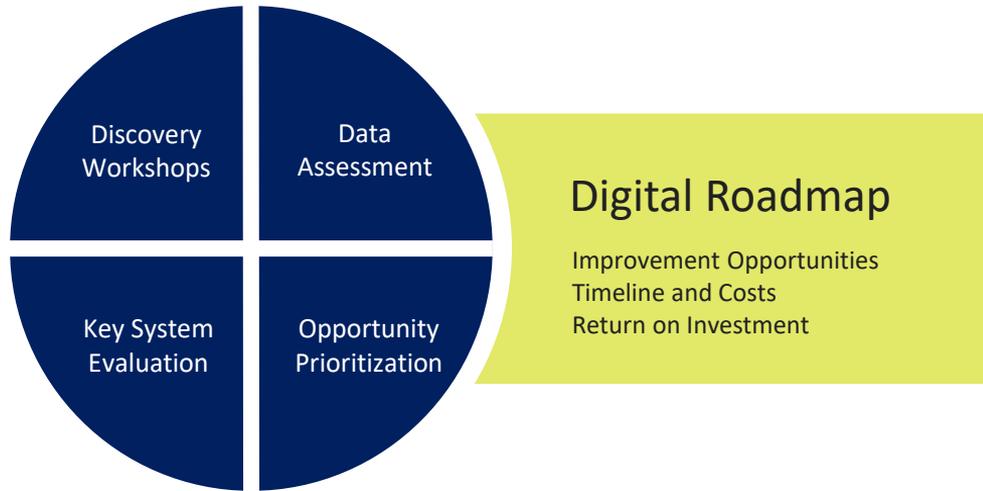
Cyber Security

Evaluating and implementing cyber security improvements for businesses.

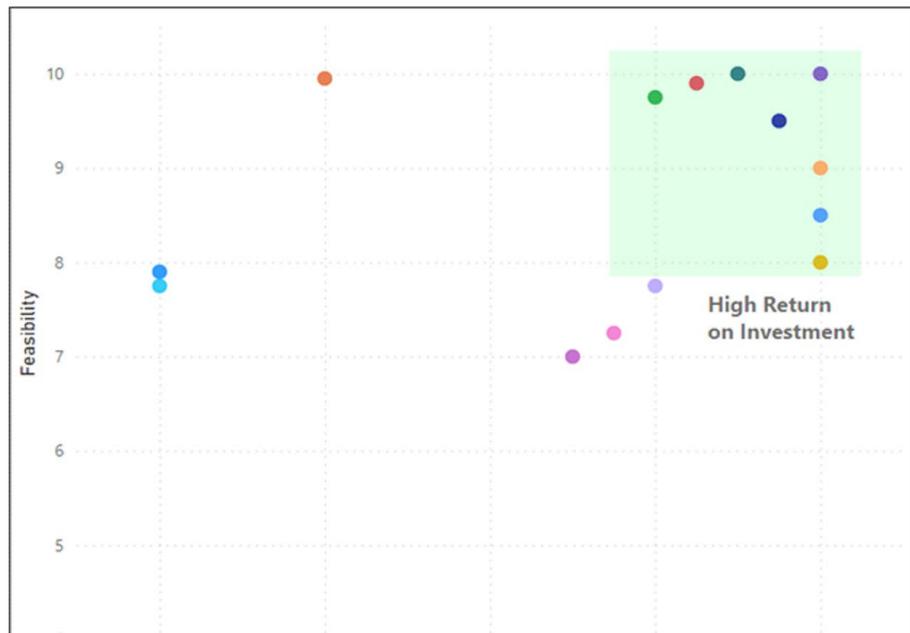
Integrated Approach



Digital Readiness Assessment



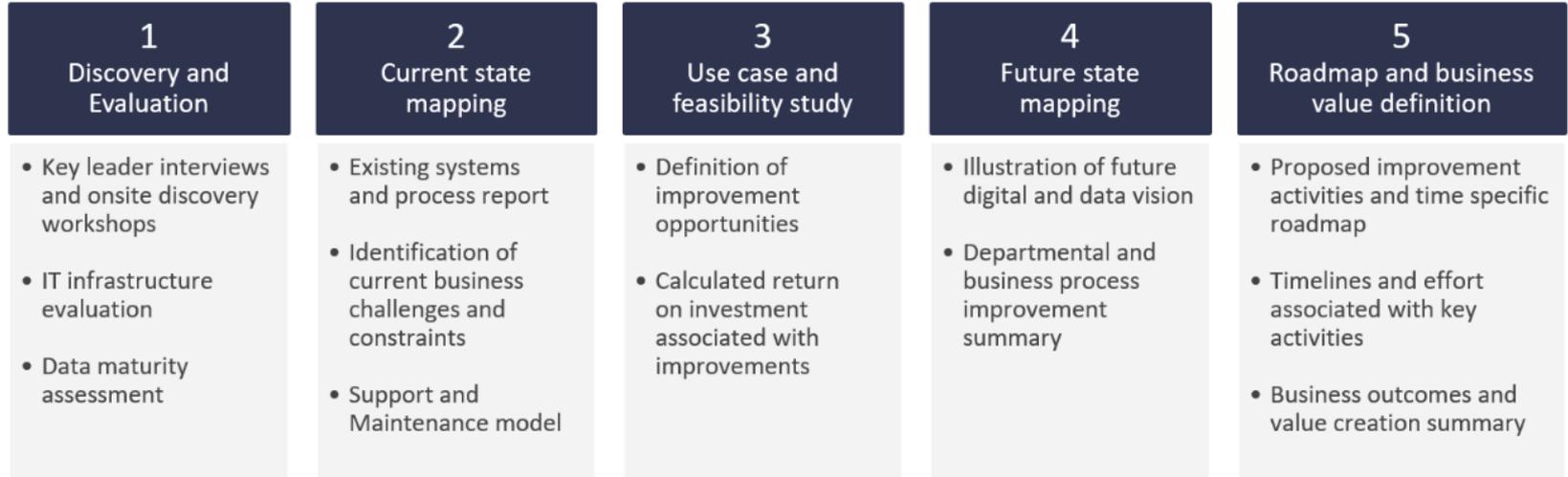
Use-Case Prioritization Matrix



Use-Case Name/Description	Value	Feasibility
Create Automated Workflows Implement Automated Workflows to bring Efficiencies and Automation to Database Management & Existing Business Processes	10.00	8.50
ERP Evaluation & Selection Conduct deep-dive evaluation of potential ERPs to explore possibility of replacing / consolidating disparate systems & Access DBs currently in place	10.00	10.00
ERP/CRM Optimization Leverage newly selected ERP/CRM to Further Host and Build Out Applications Pulling or Pushing Data to Support the Organization	10.00	9.00
Implement ERP Solution Implement & Customize Selected ERP Solution to Support / Facilitate Whitetails Unlimited's Business Processes	10.00	8.00
Consolidated BI / Reporting Development Develop Custom Dashboards/Reports/Insights to Serve the Needs of the Business and Enhance Speed to Information Baseline	9.75	9.50
KPI Identification Conduct an Exercise / Discovery Session(s) to Brainstorm, Identify and Prioritize KPIs Critical to the Success of the Business	9.50	10.00
KPI Consolidation	9.25	9.90
KPI Segmentation	9.00	9.75
Ticketing Solution Review, Evaluation & Selection Evaluate Potential Off-the-Shelf Solutions vs. Custom Application Build for a Digital Ticketing Solution	9.00	7.75
34		
Integrate Digital Ticketing Solution w/ Existing Data Models & Reporting Infrastructure Incorporate Data From Digital Ticketing Solution Into Existing Data Models / Reporting Tools to Derive Insights & KPIs	8.75	7.25
Implement Digital Ticketing Solution Implement & Customize Selected Digital Ticketing Solution to Further Enhance Efficiency of Business Processes / Attendee Experience	8.50	7.00
Data Calendar	7.00	9.95
Ad-Hoc Reporting		



Assessment Journey



“Success Will Depend On Those That Have Or Have Not?”

- Organizational Strategic Plan + Digital Transformation Strategy
- Focused Digital Assessment
 - Prioritized Phases of Implementation
 - Foundational Data Infrastructure
 - Implement right strategies to realize ROI to pay for the next phases
- Courage to Innovate + Culture + Execution



Thank you!

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