Digital Agents Program: innovation, academic immersion and professional leadership to transform the public sector

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Abstract: This explores the transformative potential of digital agents in enhancing public sector efficiency and responsiveness. It highlights how the program fosters innovation by integrating cutting-edge technology with academic insights, enabling participants to develop practical solutions to real-world challenges. Emphasizing the importance of professional leadership. In addition, this talk illustrates how empowering individuals with the skills and knowledge to navigate digital landscapes can drive meaningful change within public institutions. By bridging the gap between academia and practice, the Digital Agents Program aims to cultivate a new generation of leaders equipped to lead the digital transformation of the public sector.

Keywords: Digital Agents engagement, open innovation, Government and Academia Cooperation, Problem-Based Learning (PBL) methodology, agile methodologies, innovative learning practices, incremental and disruptive innovation.

1. CONTEXT AND RATIONALE The digitalization of administrative activities is one of the greatest challenges for public institutions. According to the OECD, the adoption of digital technologies in public services is key to effective governance, including essential service delivery, crisis management, and transparent communication with citizens (OECD, 2021).

In Brazil, initiatives such as the Digital Government Strategy by the Ministry of Economy have proven essential to streamline interactions between the State and citizens, reduce bureaucracy, and accelerate processes (BRASIL, 2020). Pernambuco's 2024–2027 Digital Government Strategy (EGD), led by the Secretariat for Digital Transformation (SETD), aims to establish a connected, innovative, transparent, and inclusive digital government. This strategy focuses on creating a digital culture and environment, not just digitalizing processes, to modernize the relationship between the public administration and society (EGD, 2024).

However, the success of digital transformation relies heavily on the skills of public servants. EGD identifies as a strategic goal the empowerment of public servants through

continuous learning in innovation and digital transformation, encouraging them to spread best practices (EGD, 2024).

This project adopts the Problem-Based Learning (PBL) methodology—an innovative, hands-on approach to develop digital solutions collaboratively. Public servants will tackle real challenges with expert support, applying incremental and disruptive innovation concepts. PBL reinforces technical knowledge application and strengthens the technical capacity of civil servants.

This hands-on learning aligns with contemporary pedagogical approaches, emphasizing practical, contextualized learning. Kolb (1984) argues that experiential learning—gained through direct and reflective experience—leads to better knowledge retention and application.

By enabling public servants to learn through practice and share that knowledge internally, the project fosters a culture of innovation. This internal knowledge multiplication ensures sustainability of improvements and enhances institutional autonomy, empowering civil servants to tailor digital solutions to their department's needs.

The project aligns with Brazil's National Digital Transformation Strategy (2020), which emphasizes fostering a digital culture to improve service delivery and administrative efficiency. The proposed training responds directly to these guidelines and serves as a model for other levels of government.

In the long term, knowledge multiplication and peer-to-peer training will establish a sustainable innovation culture in public institutions. This contributes to better public services, increasing citizen access and trust. According to the UN's E-Government Development Index (EGDI), countries with advanced digital services demonstrate greater transparency, lower corruption, and higher trust in government (UN, 2020).

This project is not a one-time response but a strategic investment in the future of public administration. Continuous training and a multiplier model ensure that innovations are absorbed and scaled. Its success can inspire similar initiatives and raise digital competency across the public sector.

2. OBJECTIVES The "Digital Agents Engagement Program" aims to accelerate digital transformation in Pernambuco's government through hands-on, collaborative learning. It trains civil servants to develop, redesign, and optimize services and data structures using agile methods and project-based learning (PBL).

Specific objectives:

- Improve the efficiency, transparency, and accessibility of digital public services.
- Empower public servants to become knowledge multipliers and innovation advocates.
- Apply PBL for developing solutions to real challenges, supported by experts and mentors.
- Enhance collaboration between public servants and ICT teams.

- Promote an innovation and digital transformation culture aligned with Pernambuco's EGD 2024–2027.
- Train new digital agents focused on public services and strategic data.
- Ensure solution continuity through integration into the LIGA GD community.

3. GOALS

- Train 720 digital agents by December 2026.
- Deliver 45 digital products (services redesign, data management improvements) by 2026.
- Focus on creating simple, accessible, and efficient digital services.
- Train 150 civil servants at LIGALab by 2026.
- Train 100 civil servants in 2025 and 150 in 2026 as knowledge multipliers.
- Apply agile methodologies in 100% of projects.
- Use PBL to tackle real challenges.
- Develop functional prototypes for all mapped services.
- Encourage agency and staff engagement.
- Provide scholarships and symbolic incentives to boost participation.
- Evaluate results through digital transformation indicators (impact, feasibility, innovation).

4. CHARACTERIZATION OF R&D&I ACTIVITIES The R&D&I activities in the "Digital Agents Engagement Program" are structured to integrate civil servant training with the development of practical, applicable digital solutions for public sector challenges. Using agile methodologies and innovative learning practices, the project fosters both incremental and disruptive innovation.

Each phase will follow rigorous technical investigation and implementation, including digital solutions development, data management improvements, and process redesign. PBL and design thinking methodologies ensure practical application of acquired knowledge and ongoing innovation.

4.1. Technical-Scientific Problem The main technical-scientific challenge is the urgent need for efficient, accessible, and sustainable public service digitalization. There is a lack of trained personnel to implement new technologies, exacerbated by traditional administrative structures and fragmented data systems. The project addresses these issues through targeted training and practical methodology implementation.

4.2. Innovative Aspects of the Project The program’s main innovation lies in continuous training via PBL, creating a sustainable learning and innovation cycle. It combines agile methodologies (Scrum, Kanban), design thinking, and data culture, enabling civil servants to both implement and strategically plan digital transformations.

The project also encourages multidisciplinary teamwork and real-government challenge prototyping, with expert and mentor involvement. This fosters disruptive innovation tailored to each department's specific needs—resulting in a scalable, sustainable transformation with short- and long-term impact on Pernambuco's public sector.

5. METHODOLOGY

The Digital Agents Training Program will follow a practical, results-driven approach to prepare public servants to lead digital transformation projects. The training will combine agile methodologies and Project-Based Learning (PBL), enabling participants to develop practical solutions for real challenges in their institutions.

The program will unfold in two phases:

- **Phase 1**: Prototyping training, focusing on learning-by-doing.
- **Phase 2**: Advanced training at the LIGALab (Digital Government Innovation Lab), supporting public sector "startups" created by Digital Agents—public servants trained to drive innovation.

The full cycle spans five months: two months of core training followed by three months of project acceleration. The aim is to deliver tangible, impactful results.

Program Scale:

- In 2025: 80 participants per cohort, divided into 16 groups of 5.
- In 2026: 100 participants per cohort, in 20 groups of 5, reflecting program growth.

At the end of Phase 1, an evaluation panel will select the most promising projects to proceed to Phase 2. These projects will then move to production-ready MVPs.

Training Approach:

- **PBL (Problem-Based Learning)**: Teams tackle real challenges from their agencies, supported by mentors. Encourages critical thinking, collaboration, and practical problem-solving.
- **Design Thinking**: Employed in early project phases—empathy, ideation, prototyping, and testing—to ensure user-centered solutions.
- **Agile (Scrum & Kanban)**: Used to organize and manage project workflows in short iterative cycles, enabling quick feedback and adaptation.

LIGALab Tools and Methodologies:

- **CRISP-DM**: A structured process for data mining projects.
- **Double Diamond**: Guides teams from problem discovery to final delivery.
- **Lean Startup**: Promotes iterative MVP development through build-measure-learn cycles.

These combined methodologies ensure a strong link between theory and practice, with the flexibility to adjust to evolving project needs.

Evaluation Team:

- **Market Mentors**: Strategic advisors for outcome-oriented projects (1 per 8 groups).
- **Technical Triad**: A requirements analyst, UX designer, and agile coach supporting project alignment (1 triad per 4 groups).
- **On-demand Mentors**: Provide guidance on specific technical or strategic questions (1 per 2 groups).
- **Support Specialists (LIGALab)**: Experts in software engineering, data analysis, UX design, frontend/backend development, and AI. They assist with MVP development and deployment.

Evaluation Criteria: Deliverables will be assessed based on:

- **Clarity**: Structured, comprehensible content with a coherent narrative.
- **Technical Adequacy**: Functional fit, appropriate methodologies, and validation evidence.
- **Relevance**: Alignment with initial challenges and measurable impact.
- **Innovation**: Creative, differentiated, and scalable solutions.
- **Presentation Quality**: Clear, engaging visuals and written materials.

Scoring System: Each criterion is rated on a 4-point scale: 1 = Not Met, 2 = Partially Met, 3 = Met, 4 = Exceeded Expectations. Weights vary by project phase.

Evaluation Process:

- **Submission**: Teams submit deliverables in advance, with organized supporting materials.
- **Individual Review**: Evaluators score independently using standardized forms.
- **Group Review**: Evaluators align feedback collaboratively.
- **Feedback**: Each team receives a detailed report with strengths, areas for improvement, and recommendations.

Result Presentation:

- End-of-phase meetings will highlight best practices.
- Final MVPs will be showcased and evaluated during closing sessions, with both written and oral feedback provided.

a. Training Structure Duration: 2 months.

Weekly sessions take place on Mondays (1:30–5:00 p.m.), with teams applying their knowledge in their workplaces throughout the week. Mentors and technical advisors remain available for ongoing support.

Training Timeline:

Week	Topic	Practical Activities	Deliverable	Professionals Involved
1	Challenge Definition Workshop	Identify and frame problems within institutions.	Structured challenge for each group.	Market Mentor, Technical Triad, Mentors
2	Problem Analysis and Prioritization	Apply Design Thinking and Impact Matrix to prioritize challenges.	Prioritized problem report.	Technical Triad, Mentors
3	Hypothesis Testing and Feedback	Validate assumptions and develop data collection tools.	Validated hypothesis report.	Mentors, Market Mentor, Research Experts
4	Initial Prototyping	Create prototypes using tools like Figma or Canva.	Initial prototypes.	UX Designer, Mentors, Market Mentor
5	Prototype Testing and Iteration	Refine solutions based on stakeholder feedback.	Refined prototypes.	UX Designer, Mentors, Market Mentor
6	Requirements Specification	Detail functional and non-functional requirements.	Complete requirements document.	Technical Lead, Mentors, Market Mentor
7	Agile Planning with Scrum/Kanban	Build backlog, organize sprints, set up workflows.	Backlog and Kanban board.	Business & Technical Leads, Mentors, Market Mentor
8	Final Review and Presentation	Review learning outcomes and present final plans and prototypes.	Final consolidated deliverables.	Market Mentor, Technical Triad, Mentors

5.1. CAPACITATION PIPELINE OVERVIEW

The training program is designed to integrate **theory and practice**, offering participants both conceptual knowledge and practical tools to address real challenges in their work environments. While **Mondays** are reserved for theoretical sessions, the rest of the week focuses on applying this knowledge directly within public sector organizations. Each week,

teams progressively develop more refined solutions with guidance from specialized professionals.

Week-by-Week Breakdown

Week 1 – Kickoff & Challenge Definition
Monday:

- **Goal:** Introduce the project, align expectations, and conduct a collaborative challenge-definition workshop.
- **Content:**
    - Project presentation
    - Introduction to Problem-Based Learning (PBL)
    - Workshop: turning problems into actionable challenges
- **Expected outcome:** Clear challenge statements per group

Weekdays:

- Validate challenges with internal stakeholders
- Gather contextual data and impact insights
- Prepare a summary presentation of the validated challenge

Week 2 – Problem Analysis & Prioritization
Monday:

- **Goal:** Teach methods for in-depth analysis and prioritization
- **Content:**
    - Empathy phase of Design Thinking
    - Impact-Effort Matrix
    - Collaborative analysis and prioritization workshop
- **Expected outcome:** Prioritized problems

Weekdays:

- Conduct interviews with stakeholders
- Create cause-effect diagrams or similar tools
- Refine priorities based on new insights

Week 3 – Hypothesis Validation & Feedback Collection
Monday:

- **Goal:** Guide participants in validating assumptions and collecting user feedback
- **Content:**
    - PBL-based hypothesis formulation
    - Rapid validation tools (interviews, surveys)
    - Data collection planning workshop
- **Expected outcome:** Validated hypotheses and data collection plans

Weekdays:

- Collect data through interviews/surveys
- Analyze findings to adjust hypotheses
- Deliver summary validation report

Week 4 – Initial Prototyping
Monday:

- **Goal:** Train teams to build rapid prototypes
- **Content:**
    - Introduction to Design Sprints and prototyping tools (e.g., Figma, Canva)
    - Low-fidelity prototyping session
- **Expected outcome:** First version of prototypes

Weekdays:

- Refine prototypes with organizational context
- Test and gather feedback from users
- Prepare a presentation for the following week

Week 5 – Prototype Iteration
Monday:

- **Goal:** Improve prototypes based on feedback
- **Content:**
    - Agile iteration practices

    - Feedback Canvas tool
    - Evaluation and refinement workshop
- **Expected outcome:** Updated prototypes

Weekdays:

- Revise based on feedback
- Validate improved versions with stakeholders
- Document changes and learnings

Week 6 – Requirements Gathering
Monday:

- **Goal:** Support transformation of prototypes into detailed projects
- **Content:**
    - Requirements engineering and User Stories
    - Requirement identification workshop
- **Expected outcome:** Complete requirements document

Weekdays:

- Identify functional and non-functional requirements
- Validate with technical teams
- Structure final requirements documentation

Week 7 – Agile Planning
Monday:

- **Goal:** Organize project execution plans
- **Content:**
    - Scrum & Kanban introduction
    - Backlog building and sprint planning
- **Expected outcome:** Initial backlog and sprint roadmap

Weekdays:

- Break down tasks for Kanban
- Configure visual workflow tools

- Validate planning with focal points

Week 8 – Final Presentations & Wrap-Up
Monday:

- **Goal:** Consolidate learning and showcase solutions
- **Content:**
    - Concept review
    - Final presentations
- **Expected outcome:** Solutions ready for LIGALab phase

Weekdays:

- Final adjustments and documentation
- Prepare presentation materials
- Ensure readiness for transition to LIGALab

Key Deliverables

- **Structured Challenges:** Clearly defined and validated challenges aligned with government needs
- **Refined Prototypes:** Tested and improved digital solution models based on real feedback

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5.2. LIGALab STRUCTURE

Duration: 3 months (12 weeks)
LIGALab focuses entirely on **practical execution**. From the 16 initial solutions, the top **5 projects** will be selected for intensive development into working MVPs.

Participants will build **proofs of concept (PoC)** and iterate on them continuously, with real-world testing in their organizations. The goal is to create **production-ready MVPs** validated by users and stakeholders.

LIGALab Weekly Schedule

Week	Content & Activities	Professionals Involved
1	Project Kick-off & strategic planning	Market Mentor, Triad, Floating Mentor

Week	Content & Activities	Professionals Involved
2	User-Centered Design & MVP interface validation	Floating Mentor, Design Specialist
3	Product Management & MVP lifecycle	Floating Mentor, Product Specialist
4	Data Literacy – collection, structuring, analysis	Floating Mentor, Data Specialist
5	Data Mining – extracting patterns and insights	Floating Mentor, Data Specialist
6	Applied AI – solving project challenges using AI	Floating Mentor, AI Specialist
7	MVP Testing – collecting user feedback	Floating Mentor, Cloud Specialist
8–10	Final Sprints – refining MVPs for production	Floating Mentor, Tech Specialists
11	Product validation & stakeholder approval	Floating Mentor
12	MVP launch with feedback loop plan	Floating Mentor

Note:
Throughout the program, activities are centered on iterative development and validation. Collaborative tools like **Miro, Jira, and Figma** are encouraged to enhance team efficiency and ensure consistent mentorship and progress tracking.

5.2.1. LIGALab Execution Track

LIGALab is fully dedicated to hands-on execution, ensuring participants apply the skills acquired during training. Each week, teams focus on solving real public-sector challenges by building, iterating, and validating MVPs (Minimum Viable Products). This **practical, outcome-driven approach** guarantees tangible results and experiential learning through real achievements.

Weekly Workflow

Week 1 – Kick-off & Strategic Planning

- **Goal:** Introduce LIGALab structure, align expectations, and organize project planning.
- **Content:** MVP concept, strategic planning, Agile (Scrum), and product roadmap design.
- **Activities:**
    - Present 5 selected projects

- Define team roles
- Set up project management tools (e.g., Trello, Jira)

Week 2 – Data Literacy

- **Goal:** Equip teams to use data in decision-making.
- **Content:** Structured/unstructured data, basic tools (Excel, Tableau), data storytelling.
- **Methodology:** Data-Driven Decision Making (DDDM)

Week 3 – Data Mining

- **Goal:** Extract insights from large datasets.
- **Content:** Data cleaning, analysis (Python, Power BI), clustering & patterns.
- **Methodology:** Knowledge Discovery in Databases (KDD)

Week 4 – Applied Artificial Intelligence

- **Goal:** Use AI to solve project challenges.
- **Content:** Machine learning, automation, tools like AutoML and ChatGPT.
- **Methodology:** CRISP-DM

Week 5 – User-Centered Design

- **Goal:** Develop accessible, user-friendly solutions.
- **Content:** Advanced Design Thinking, usability testing, high-fidelity prototyping (Figma).
- **Methodology:** Double Diamond

Week 6 – Product Management

- **Goal:** Manage MVP lifecycle and define OKRs.
- **Content:** Product roles, feature prioritization (MoSCoW, Kano), KPIs.
- **Methodology:** Lean Product Management

Week 7 – Cloud Deployment & Sustainability

- **Goal:** Prepare scalable and secure cloud-based solutions.
- **Content:** Cloud platforms (AWS, Azure), cost optimization, security.
- **Methodology:** FinOps

Week 8 – MVP Validation Sprint

- **Goal:** Validate MVPs with stakeholders.

- **Content:** A/B testing, user feedback, Build-Measure-Learn cycle.

Week 9 – Refinement & Final Adjustments

- **Goal:** Finalize MVPs and address feedback.
- **Content:** Bug fixes, documentation, final QA.

Week 10 – Pitch Preparation

- **Goal:** Prepare clear and compelling MVP presentations.
- **Content:** Pitch structure, presentation tools, simulation sessions.

Week 11 – Final Simulation

- **Goal:** Test final presentations and MVPs in a controlled environment.

Week 12 – Final Presentation (Demo Day)

- **Goal:** Present MVPs to stakeholders and evaluators.

5.2.1. Key Deliverables

Validated Functional MVPs
Each selected team delivers a fully tested, usable MVP ready for deployment in real public service contexts.

Structured Presentations
Includes final prototypes, detailed reports, and impact dashboards to support decision-making.

5.2.2. Weekly Deliverables Summary

Training Phase (2 months)

1. Week 1 – Structured challenge statements
2. Week 2 – Problem analysis report
3. Week 3 – Validated hypothesis report
4. Week 4 – Initial prototypes
5. Week 5 – Refined prototypes
6. Week 6 – Technical requirements document
7. Week 7 – Initial backlog & Kanban board
8. Week 8 – Final prototype and project plan

5.2.4. LIGALab Phase (3 months)

1. Week 1 – Strategic roadmap
2. Week 2 – Data insight report
3. Week 3 – Data mining report
4. Week 4 – Applied AI prototype
5. Week 5 – Validated high-fidelity prototype
6. Week 6 – Product management plan with OKRs
7. Week 7 – MVP deployed in cloud
8. Weeks 8–10 – Validated MVP with documentation
9. Week 11 – Final presentation rehearsal
10. Week 12 – Final stakeholder pitch

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6. INSTITUTIONAL RESPONSIBILITIES

SAD commits to:

- Propose adjustments for underperforming projects
- Appoint official liaison officers
- Ensure alignment with the work plan
- Disburse funding as outlined in Section 10

EGAPE commits to:

- Propose adjustments as needed
- Assign state staff to support training
- Co-develop course syllabi with pedagogical support
- Provide physical spaces for workshops
- Execute its designated tasks from the work plan

UPE commits to:

- Offer in-kind support via Professors Dr. Márcia Macedo and Dr. Eduardo Gonçalves (project coordination)
- Provide 17 professionals (UX/UI Designers, Data/AI Analysts, Software Engineers, Product Specialists), selected through interviews
- Ensure quality and timely delivery of all project outputs

7. EXPECTED RESULTS

Deliverable	Description	Responsible	Project Phase
1. Commitment Document	Formal engagement from participating agencies	Agencies	Engagement
2. List of Selected Agents	Official list of digital agents	SETD	Engagement
3. Training Certificates	Completion certificates for trained staff	UPE/SETD	Training
4. Participation Report	Documentation of engagement & performance	UPE/SETD	Training
5. Digital Solution Prototypes	New public service/data prototypes	Digital Agents	Solution Development
6. Process & Data Mapping	Documentation of services/data structures	Digital Agents	Solution Development
7. Technical Requirements	Detailed solution specs	Agents/ICT	Requirements
8. Data Architecture	Strategic data model (for Data Agents)	Data Agents	Requirements
9. Final Presentations	Group demos during Demo Day	Digital Agents	Demo Day
10. Impact Evaluation	Assessment using Digital Transformation Indicators (DTIs)	SETD/Agents	Implementation
11. LIGA GD Integration	Continued collaboration after project end		

8. RESULTS ACHIEVED:

The methodology is designed to run 8 cycles by December 2026, with a new cycle starting every 3 months. The program's positive impact is already evident, as demonstrated by the figures below:

Cycle 01 (pilot cycle carried out in November 2024):

- 09 digital solutions ideated;
- 37 Digital Agents trained from 5 different public bodies;
- 02 solutions incubated in the public innovation lab.

Cycle 02 (April 2025):

- 16 challenges selected;
- 76 Digital Agents from thirteen different public bodies;
- 05 solutions incubated (Phase-2 begins in June 2025).

9. GOALS 2025-2026

With these positive results, we've set new goals for 2025 and 2026:

- Train 720 Digital Agents
- Deliver 48 Sets of Requirements and Prototypes
- Develop 45 MVPs
- Train 75 Digital Agents at LIGALabs
  (focused on the development and use of digital tools)

10. CONTRIBUTIONS:

This initiative represents a robust and innovative strategy to transform public administration. It combines technology, capacity-building, and modern methodologies to accelerate digital transformation in the public sector, contributing to more agile and efficient governance. Ongoing training is essential to ensure institutions are equipped to meet constant technological challenges and better serve the needs of the population.

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