Journal of Advances in Developmental Research (IJAIDR)
E-ISSN: 0976-4844 ● Website: www.ijaidr.com ● Email: editor@ijaidr.com

Learner Personas for AI-led Organizational Transformation: A case of Healthcare Industry

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Abstract

As artificial intelligence (AI) continues to transform healthcare delivery and operations, organizations face the critical challenge of effectively upskilling their workforce. This paper attempts to addresses a gap in existing literature by leveraging the framework of understanding and implementing learner personas in the context of AI -led transformation in the healthcare industry. Based on comprehensive analysis of application of AI across multiple healthcare domains—including multi-omics, clinical data, behavioral data, environmental factors, and pharmaceutical R&D—this research identifies three distinct learner personas: the "Busy-bee," characterized by severe time constraints and need for bite-sized learning; the "Tinkerer," who requires foundational knowledge and safe experimentation opportunities; and the "Innovator," who combines healthcare expertise with technical proficiency to develop custom AI solutions. Each learner persona is further detailed through seven key elements: archetype description, needs statements, goals, jobs-to-do, frustrations, capabilities, and learning opportunities. The research demonstrates that implementing these personas in learning and development strategies could contribute to realizing an estimated USD 100 million in annual economic benefits from persona-based learning approaches alone. This framework provides healthcare organizations with a structured approach to personalize AI learning and development initiatives thereby accelerating the adoption of AI technologies while ensuring effective, inclusive, and personalized learning dissemination across the workforce in healthcare industry.

Keywords: Change Management, AI, Persona Development, Organizational Transformation

Introduction

The rapid evolution of AI technology is now the major catalyst driving rapid growth in the healthcare space. As healthcare organizations look to new ways to serve patients and customers while containing operating costs, optimizing care, and innovating with new offerings, it's critical to understand what their workforce needs to succeed with AI. This is where learner personas come in - representations of different employee types that describe their learning interests, goals, frustrations, aspirations, and pain points. Organizations can leverage learner personas to understand needs, personalize experiences, and measure success their AI transformation plans and help make the transformation more inclusive and efficient.

Problem statement

This problem statement outlines a key literature gap regarding the use of learner personas during AI-enabled healthcare change. The AI-led radical transformation of the healthcare industry is already underway, but it's hard to achieve this potential without upskilling employees in the nick of time. This

requiresa deeper appreciation of the workforce's learning demands. Hence, this paper aims to understand and identify learner personas in the context of AI transformation in the healthcare industry and how these personas drive a significant economic impact derived from effective and timely adoption and use of AI.

Literature Review

A comprehensive literature review reveals the foundational principles of personas and their critical role in educational and organizational settings. Personas, as a tool, enable organizations to better understand their employees by segmenting them into distinct groups based on shared characteristics. This segmentation is particularly vital in the context of learning, as it allows for the customization of training programs and resources that cater to specific learner needs. Furthermore, the literature underscores the significance of learning personas in the broader scope of AI transformation, emphasizing that a one-size-fits-all approach is insufficient in addressing the varied learning styles and technological competencies present within an organization. This research ultimately aims to bridge the gap between AI transformation initiatives and the learning needs of employees in the healthcare industry by proposing a structured framework for developing and implementing learner personas. By doing so, it aspires to contribute valuable insights that can guide healthcare organizations in navigating the complexities of AI integration, ensuring that their workforce is adequately prepared and engaged in the transformation journey.

A comprehensive literature survey outlines the concept of personas, their use in educational and organizational context, and the underlying benefits. As a tool placed in the execution of overall Learning & Development (L&D) strategy, personas aid in a contextual, visual, and well-communicated understanding of employee types.

This is achieved by forming distinct segments based on shared characteristics and behaviors. This segmentation is especially suited to the area of learning & development, since it allows for the personalization and customization of training courses and assets to learner needs. The literature review also points out the importance of learning personas to support varied learning styles and technological capabilities that exist across an organization. This paper aspires to align AI transformation efforts with the learning needs of healthcare industry employees through a framework for crafting and deploying learner personas, ensuring that they are well-prepared and engaged in the transformation process.

AI-led transformations in the Healthcare industry

AI's significant impact has been studied in the major data types that were identified: multi-omics, clinical, behavioral, environmental, and pharmaceutical research and development (R&D) data (Wang & Preininger, 2019).

1. **Multi-omics data**: Multi-omics data refers to the biological process where different "-omics" data, such as genomics, proteomics, transcriptomics, epigenomics, and microbiomics are jointly collected and analyzed. In comparison to conventional single omics approaches, multi-omics offer a comprehensive understanding of biological processes. Separate omics data sources can often characterize the same or closely related biological processes. In ML, this is referred to as a multi-view setting, where each omic is regarded as a separate view. To integrate these inputs, either data-based integration or model-based integration is required.

2. **Clinical data**: AI technologies have also been used extensively in analyzing clinical data, including medical images, electronic health records (EHRs), and physiological signals.
3. **Behavioral data**: In addition to multi-omics and clinical data, behavioral data is also linked to health status. While the use of behavior data in health applications poses some specific challenges, due to the way such data is collected and housed, there are some research teams that investigate the relationship between behavior data and health.
4. **Environmental data**: Environmental factors are important in a number of diseases, including cardiovascular disease (Cosselman et al., 2015), chronic obstructive pulmonary disease (COPD) (Macnee & Donaldson, 2000), Parkinson's Disease (Tanner, 1989), and cancer (Lewandowska et al., 2019). AI technologies have been used to explore environmental data to better understand disease mechanisms and improve care quality. For example, one study (Song et al., 2015) explored the effect of environment on hand, foot, and mouth disease through time-series analyses.
5. **Pharmaceutical research and development (R&D) data**: Medications play important roles in healthcare. Data collected in various stages of drug development often contain insights about disease mechanisms and treatments. AI methodologies have been adopted to extract insights from those data.

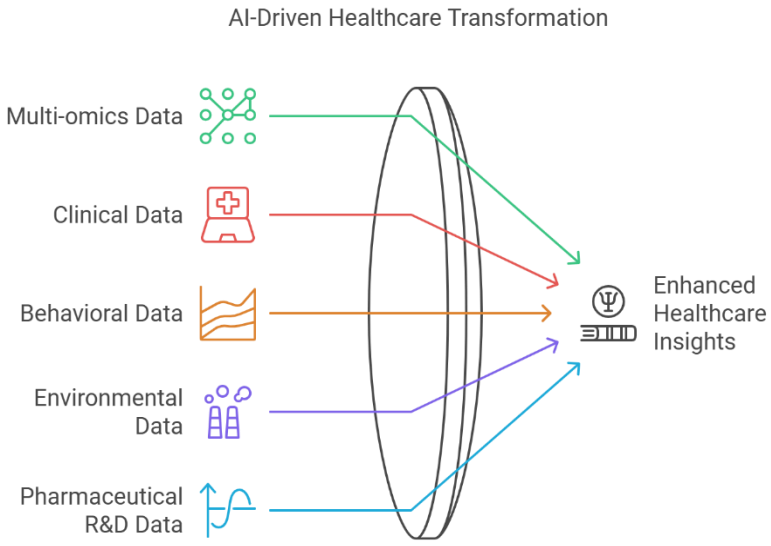

Figure 1: AI-driven Healthcare Transformation

Learner personas and their role in learning & development

Personas are fictional named archetypes of users encompassing generalizations of their key characteristics and goals that emerge from interviews. This method is especially powerful because personas succinctly package information into the form of a person, who is easily understood and reasoned about(Madsen et al., 2014).

In modern education, the teaching and learning approach should be adapted to the specific needs and abilities of students using innovative strategies and educational technologies. This can be achieved using a representation of the student's identity, characteristics, preferences, and needs, referred to as a learner

persona. Learner personas are mainly used in the field of user experience design, but this approach is also becoming increasingly popular in the field of education (Tudor et al., 2024).

For the purposes of this paper, the following elements were considered specific to a learner persona: 1) Named Archetype, 1) Archetype description, 2) "I need to…." statements depicting needs, 3) Goals, 4) Jobs-to-Do (J-T-D), 5) Frustrations, 6) Capabilities, and 7) Opportunities for learning & development. Learner persona and the elements above are contextual to learning & development towards AI in the healthcare industry.

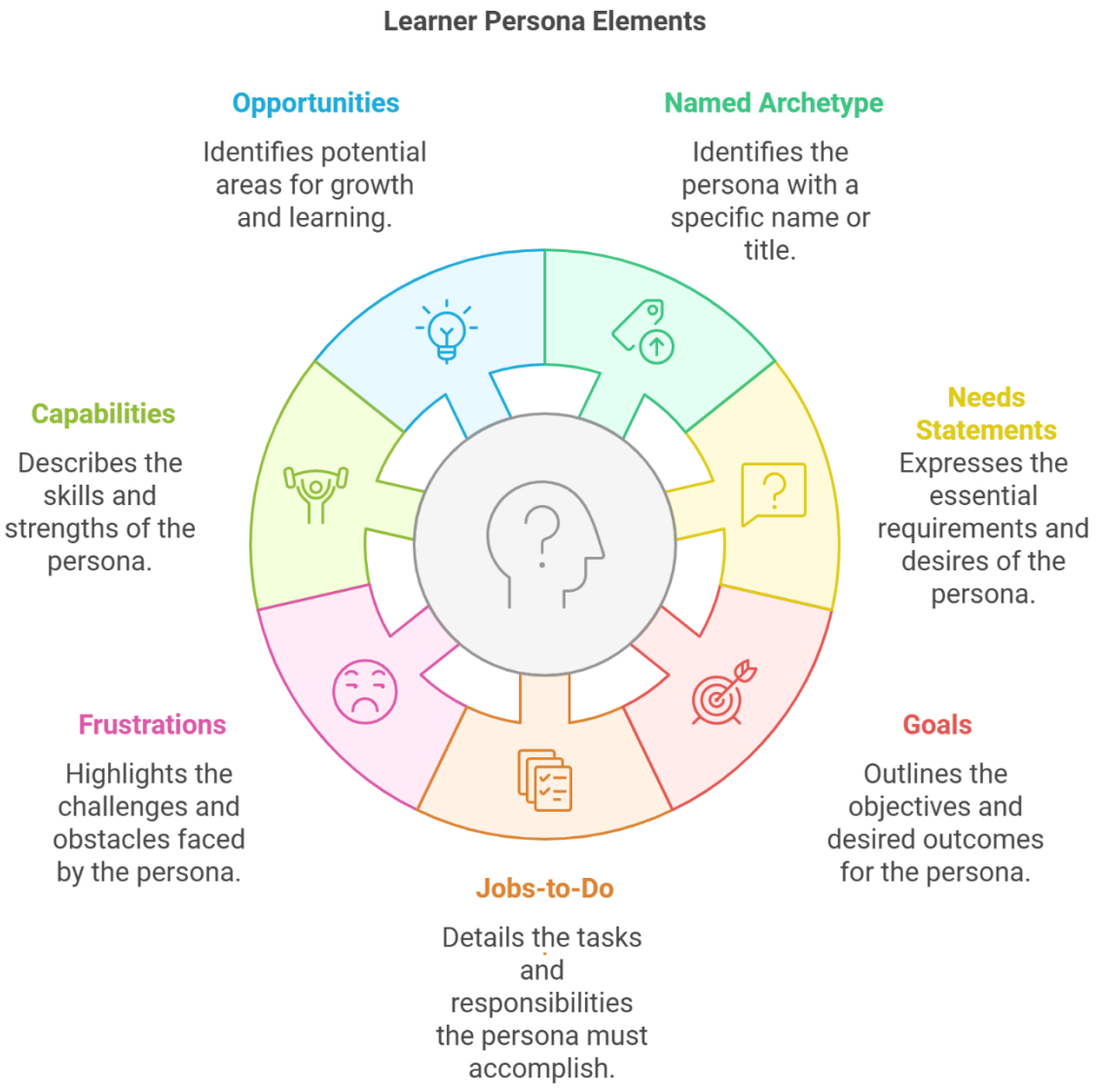

Figure 2: Elements of Learner Persona

Learner personas in AI-led transformation in healthcare

Based on her work within the healthcare industry on organizational transformation, the author suggests four different personas as follows:

1. Archetype name: **Busy-bee**

   1.1 Archetype description:

An individual who is very busy with her day-to-day work and has no time to study and adopt AI. "Busy-bee" expresses the hustle and exhaustion of this individual and is indicative of the workload that this person has.

1.2 “I need to…”:

- find bite-sized learning opportunities that can fit into my packed schedule, ideally in 10-15 minute segments between patient consultations or administrative tasks.
- how AI tools can immediately reduce my daily workload, rather than becoming another task I have to learn and manage.
- learn at my own pace with resources that I can easily pause and resume, acknowledging that my primary focus must remain on patient care and critical day-to-day responsibilities.

1.3 Goals:

- Maintain high-quality patient care while gradually incorporating AI learning into daily workflow.
- Discover immediate time-saving applications of AI in current role without extensive training.
- Build basic confidence in using AI tools safely and ethically in healthcare settings.

1.4 J-T-D:

- Identify and prioritize which AI tools are most relevant for their specific role and immediate needs.
- Learn essential AI concepts and tools through micro-learning sessions during brief breaks.
- Apply basic AI tools to streamline routine administrative tasks and documentation.

1.5 Frustrations:

- Limited time to attend traditional training sessions due to unpredictable schedules and patient demands.
- Overwhelmed by the rapid pace of AI advancement and feeling pressure to "catch up".
- Difficulty finding practical, healthcare-specific AI learning resources that respect time constraints.

1.6 Capabilities:

- Basic understanding of AI tools' capabilities and limitations in healthcare settings
- Ability to use simple prompts effectively with AI assistants for routine tasks.
- Knowledge of organizational AI policies and ethical guidelines for healthcare applications.

1.7 Opportunities:

- Transform routine documentation and administrative work through basic AI automation.
- Access just-in-time learning resources that fit naturally into workflow breaks.
- Build a foundation for more advanced AI applications while managing current workload.

2. Archetype Name: **Tinkerer**

2.1 Archetype Description:

An individual who is relatively new to AI and needs introductory training to help improve their use and knowledge of AI tools. "Tinkerer" expresses this individual’s innate curiosity and spirit of experimentation without being an expert.

2.2 “I need to…”:

- understand the fundamental concepts of AI and how they specifically apply to healthcare workflows and patient care.
- experiment with different AI tools in a safe environment where I can learn from mistakes without compromising patient care.
- connect with other healthcare professionals who are also learning AI to share experiences and best practices.

2.3 Goals:

- Develop practical skills in using AI tools for daily healthcare tasks and process improvement.
- Build confidence in customizing AI prompts and workflows for specific healthcare scenarios .
- Create a personal learning roadmap for advancing AI capabilities while maintaining clinical excellence.

2.4 J-T-D:

- Practice and refine prompt engineering skills for healthcare-specific use cases.
- Experiment with different AI tools to identify which ones best suit their workflow needs.
- Document and share successful AI implementations with colleagues to promote learning.

2.5 Frustrations:

- Difficulty finding the right balance between experimentation and maintaining productivity.
- Uncertainty about which AI tools and techniques are most relevant for healthcare applications.
- Lack of structured guidance for progressing from basic to more advanced AI applications.

2.6 Capabilities:

- Understanding of usage principles and best practices.
- Knowledge of available AI tools and their appropriate use cases in healthcare.
- Ability to evaluate AI outputs for accuracy and relevance in clinical contexts.

2.7 Opportunities:

- Create department-specific AI workflows that can be shared with colleagues.
- Develop expertise in combining multiple AI tools for enhanced productivity.
- Become an informal AI mentor for "Busy-bee" colleagues while continuing to learn.

3. Archetype Name: **Innovator**

3.1 Archetype Description:

An individual who is proficient at building and customizing AI solutions, particularly GPT and AI-ML models. This individual combines healthcare expertise with technical knowledge to create innovative AI applications, while seeking to deepen expertise through advanced training and constant experimentation.

3.2 “I need to…”:

- access advanced AI training resources that bridge healthcare domain expertise with technical implementation.
- collaborate with other AI innovators in healthcare to tackle complex challenges and share solutions.
- stay current with emerging AI technologies and their potential applications in healthcare.

3.3 Goals:

- Develop sophisticated AI solutions that address complex healthcare challenges.
- Build scalable and reproducible AI models that can benefit the wider healthcare organization.

- Create frameworks for evaluating and implementing new AI technologies in healthcare settings.

3.4 J-T-D:

- Design and implement custom AI solutions for specific healthcare use cases.
- Mentor others in AI implementation while continuing to advance personal expertise.
- Evaluate and validate AI models for healthcare applications.

3.5 Frustrations:

- Limited access to healthcare-specific datasets for training and testing AI models.
- Challenge of balancing innovation with healthcare regulations and compliance requirements.
- Difficulty finding advanced training resources that specifically address healthcare AI applications.

3.6 Capabilities:

- Advanced AI-ML model design, AI-aided coding, advanced prompt engineering, data science, and GPT model customization skills.
- Understanding of design, development, and deployment of AI-ML models in healthcare context.
- Knowledge of healthcare data governance and AI ethics frameworks.

3.7 Opportunities:

- Lead the development of organization-wide AI solutions and best practices.
- Create specialized AI training programs for healthcare professionals.
- Bridge the gap between technical AI capabilities and practical clinical applications in real world.

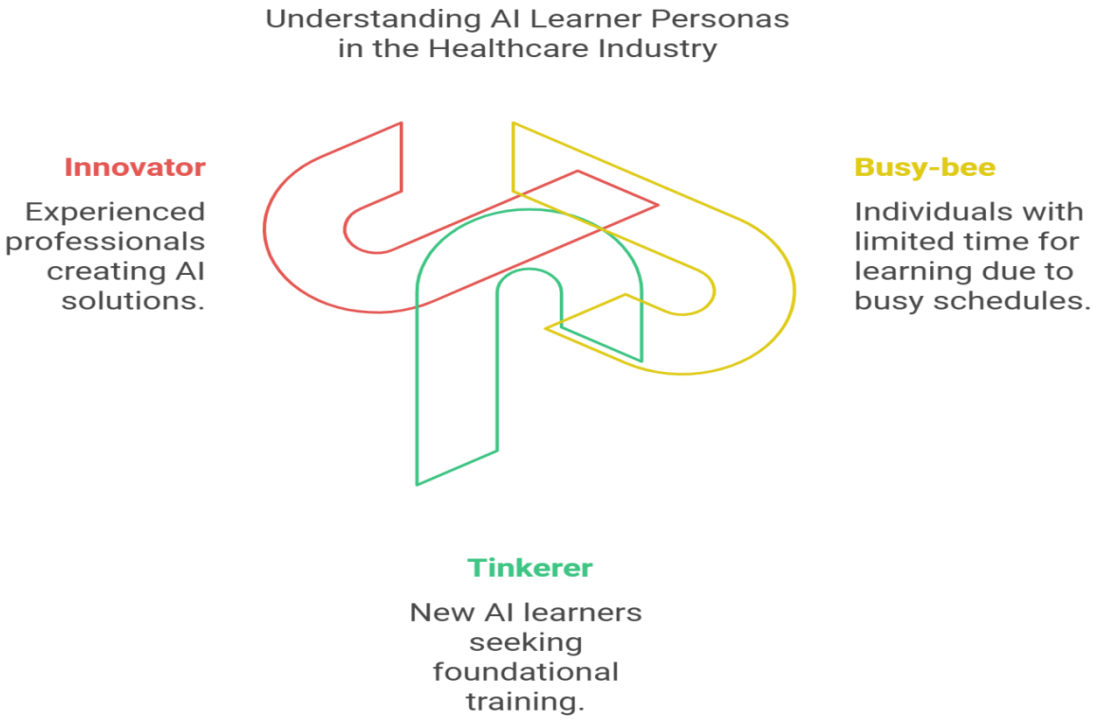

Figure 3: Understanding AI Learner Personas in Healthcare Industry

Economic impact to U.S. of using learner personas in AI transformation

The potential of artificial intelligence (AI) to simplify existing healthcare processes and create new, more efficient ones is a major topic of discussion in the industry. Yet healthcare lags other industries in AI adoption. In this paper, we estimate that wider adoption of AI could lead to savings of 5 to 10 percent in US healthcare spending—roughly USD 200 billion to USD 360 billion annually in 2019 dollars. These estimates are based on specific AI-enabled use cases that employ today's technologies, are attainable within the next five years, and would not sacrifice quality or access. These opportunities could also lead to non-financial benefits such as improved healthcare quality, increased access, better patient experience, and greater clinician satisfaction (Sahni et al., 2023).

Accelerating learning & development for individuals with customized, personalized training specific to their personas can have a significant impact. Assuming a very conservative 1% adoption of the learning personas identified in this paper applied to the lower end of productivity gains assumed at 5% for the aforementioned range minimum of USD 200 billion in terms of impact of AI to US healthcare, we arrive at 1% *x* 5% x USD 200 billion which equates to a **conservative estimate of economic impact of USD 100 million annually to the healthcare industry in U.S**.

Conclusion

This research makes several significant contributions to understanding the role of learner personas in facilitating AI transformation within the healthcare industry. The identification and detailed characterization of three distinct personas—Busy-bee, Tinkerer, and Innovator—provides healthcare organizations with a structured framework for understanding and addressing the diverse learning needs of their workforce. Each persona, with its unique goals, frustrations, capabilities, and opportunities, represents different segments of healthcare professionals navigating the AI transformation journey.

The economic analysis suggests that effective implementation of learner personas could contribute to realizing the broader potential of AI in healthcare, with a conservative estimated impact of USD 100 million annually in the U.S. This figure, while significant, likely represents just the 'tip of the iceberg' in terms of the potential economic benefits.

More importantly, the research highlights that successful AI transformation in healthcare requires a nuanced understanding of and customized learning for different employee cohorts. The persona-based approach enables organizations to develop targeted learning and development strategies that acknowledge the time constraints of busy healthcare professionals, embraces the experimental nature of emerging AI practitioners, and nurtures the innovative potential of these organizations.

Future research could explore additional personas as they emerge, measure the actual impact of persona-based learning programs on AI adoption rates, and investigate how these personas evolve as AI technology continues to advance. Organizations implementing these findings should consider regular reassessment of their persona definitions to ensure they remain relevant as the healthcare AI landscape matures.

This framework provides a foundation for healthcare organizations to create more inclusive, effective, and economically beneficial AI transformation strategies.

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