The Impact of the AI Revolution on the Practice of Economic Development

Executive Summary

Artificial intelligence (AI) will have a transformative impact on regional economic development. Policymakers and practitioners should take note of both significant opportunities and notable risks. As AI reshapes industries, regions that harness this technology stand to benefit from increased productivity, innovative business models, and economic diversification. AI can drive efficiencies across sectors, particularly healthcare, finance, and manufacturing, and support sustainable urban planning and resilient communities. However, this shift also threatens workforce stability in automation-susceptible regions, especially in manufacturing and low-skill roles, potentially widening wage inequalities. Policymakers must prioritize strategies that balance AI-driven growth with workforce reskilling, ethical AI governance, and proactive support for regions at higher risk of economic disruption.

Whether they realize it or not, state and local economic development agencies are already using AI to guide strategic decisions and improve program outcomes. For example, supporting industry clusters is made easier as AI helps identify regional growth patterns, supply chain gaps, and investment opportunities, ensuring targeted support for emerging sectors like renewable energy. AI also plays a crucial role in business attraction and retention, analyzing financial and employment data to identify high-potential businesses likely to expand or relocate, helping agencies focus on underserved areas.

In rural development, AI tools can assess agricultural trends and workforce shortages, enabling proactive support through workforce training or incentives to stabilize local economies. AI also improves tax incentive program effectiveness by evaluating impact factors like job creation and economic spillover, refining incentive programs for optimal ROI. Furthermore, AI assists in streamlining permits and licensing, automatically reviewing applications, and aligning them with local regulations, which minimizes administrative burdens while enhancing transparency and efficiency. The key for economic development policymakers and practitioners is to leverage these tools proactively to create a competitive advantage.

Introduction

In its 2023 outlook, the Organization for Economic Co-operation and Development (OECD) reports that the U.S. and other developed countries may be at the inflection point for AI's true impact on a fundamental change in the workplace (OECD, 2023). Artificial intelligence (AI) presents a complex array of threats and opportunities for regional economic development in the United States. On one hand, AI is a formidable driver of innovation and efficiency, offering regions the chance to enhance productivity, foster the understanding and development of new industries, and address long-standing challenges in areas that have been stubbornly resistant to operational improvements and subsequent productivity gains, such as healthcare, education, and infrastructure management (Autor, August 2015; Manyika & Sneader, 2018; PwC Global, 2020).

However, this inflection point may be the result of AI evolving from its traditional form in which large, structured databases are used to implement tasks based on predefined rules to AI's newfound ability to create new content or data without supervision (Singh P. , 2024). Unlike traditional AI, which relies on labeled databases, emerging forms of generative AI use natural language processing to solve open-ended questions and problems flexibly and creatively. Generative AI can produce new content where we once relied on traditional AI to use large data sets to support decision making. The perception that big data offers patterns and insights has long limited our vision of AI.

Generative AI moves us beyond traditional AI by creating a whole new way of learning from the vast stores of insights found in every document ever saved. One might compare the use of generative AI from traditional AI to the modern shift to networks from stand-alone personal computers. Generative AI offers the possibility of bringing the power of AI to the masses, but it requires useful interfaces and expertise to pose meaningful questions. With that power, generative AI also brings the same level of potential disruption.

For economic developers, understanding this new technology is crucial. It can spur growth, catalyze job creation in emerging sectors, and lead to the development of smart cities and communities that are more sustainable and livable. Where AI may have the most significant impact on economic development may be in its use as a guide for more nuanced decision making, its role in empowering social governance, its ability to enhance the efficient allocation of social and capital investments, its contribution to the emergence of Industry 4.0 as an operating paradigm for growing businesses, and, of course, its role in fueling innovation (Qin, Xu, Wang, & Skare, 2023).

However, the dual nature of AI as both an opportunity and a threat requires a balanced approach in regional economic development strategies. Rural and manufacturing-heavy regions already rely on those industries susceptible to automation, and those industries may face the most imminent risk of job displacement and increased economic inequality (Acemoglu & Restrepo, 2020; Frey & Osborne, 2017). Even in urban and tech-centric regions, AI-driven innovation may open up avenues for economic diversification and resilience, but there is still a pressing need to address the potential negative impacts on workforce and social equity (Manyika, Chui, Miremadi, & Bughin, 2017; West D. M., 2018).

Rapid advancement and integration of generative AI poses significant threats, not only through the escalation of creative disruption from automation to traditional job markets but also from its potential to disrupt governance models and to use combined information systems and robotics to translate documented processes into action. This long run risk to us all underscores the need for proactive strategic planning and policy intervention to ensure an equitable distribution of the benefits of generative AI and that regions can adapt to and mitigate the challenges this emerging technology presents. Ensuring that a workforce equipped with the skills required in an AI-dominated future is critical to mitigate job losses and economic disparities as well as to ensure that we maintain effective governance models to ensure the ethical uses of generative AI. Using tailored approaches, government and business leaders can use AI to tackle region-specific challenges, from agricultural optimization in rural areas to urban congestion and environmental management in metropolitan regions.

Examining the Threats and Opportunities More Closely

The initial area of concern for economic developers is how AI will impact their local and regional economy. Experts suggest that **AI will disrupt the economy** in several significant ways that economic

developers must consider. Like other economic disruptions (e.g., the industrial and internet revolutions), AI's offers the potential to create a more efficient and innovative economy, and regions that recognize and take full advantage first will be the winners in the next generation economy. Yet, managing that impact and the related economic transition requires initiative-taking measures designed to meet the challenges facing traditional industries and their workforce.

Job Displacement and Creation: AI is likely to displace workers and create new opportunities. AI poses the greatest displacement risk to clerical work, data entry, transportation, customer service (through chatbots), and manufacturing production – all roles with repetitive activities that can be automated. Eventually, it will also likely change the nature of less routinized tasks, including corporate governance and research design. Studies suggest that AI can also lead to the creation of jobs that require new skills, such as those involving creativity, problem-solving, and emotional intelligence. In the short run, implementing AI will create new job opportunities in fields such as AI development, data analysis, and AI system maintenance. AI governance, ethics, and management will also become important new careers. Furthermore, AI will help create new jobs that do not currently exist or do so in small numbers. These jobs will be related to data analysis and digital transformation (Shine & Whiting, 2023). Other emerging roles include data scientists, AI trainers, machine learning engineers, and AI ethicists, all needed to build, maintain, and oversee AI systems.

AI will help enhance productivity and lead to new industry opportunities in AI-powered technology areas like cybersecurity, cloud computing, and data management (Ellingrud & Sanghvi, 2023). Additionally, AI boosts productivity across most sectors, enabling companies to scale faster and potentially requiring more talent to support that growth, emphasizing the need for people to do more complex, creative, or interpersonal work, particularly in sectors like healthcare, customer service, or management. Today, more than 75% of companies surveyed are looking to adopt big data, cloud computing and AI technologies as part of their work process in the next five years (World Economic Forum, 2023, p. 5). Yet, this survey overlooks much of what is likely to change since few corporate leaders today fully understand and appreciate how generative AI technologies will impact future job markets and just how disruptive it may well be to how companies operate.

Increased Productivity and Efficiency: AI can analyze large structured and unstructured data sets more quickly and accurately than humans, leading to increased productivity and efficiency in every industry that uses its power. This can result in cost savings for businesses and potentially lower prices for consumers. A 2018 study suggested that AI has the potential to increase global economic output by $13 trillion by 2030 through productivity gains spurred by improved data analysis (McKinsey Global Institute, September 2018). In fact, some researchers contend that AI may be the answer to the long expected post-COVID productivity slowdown (Manyika & Spence, 2023).

New Business Models and Industries: AI is giving rise to new business models and industries, including personalized healthcare, AI-driven entertainment, and more sophisticated financial services. One analysis highlights how AI can help customer service operations enable self-service and cut costs, automate high-volume tasks (such as processing claims or creating "first drafts" of software code or technical writing), and provide insights from a synthesis and analysis of text and voice data (PwC Global, 2023). These business models offer new economic opportunities for entrepreneurs able to identify where they can add value, but the time advantage for market leaders may continue to shrink as AI tools learn from one another.

Regulatory and Ethical Challenges: The deployment of AI will require new regulations to address ethical concerns, such as privacy, bias, and accountability, which could have economic implications. The European Commission has worked to develop a regulatory framework to manage ethical concerns associated with AI, including data privacy and algorithmic transparency (Beckert, 2021). The key question is whether these frameworks can keep up with the speed of change that generative AI will make possible. Furthermore, biases in existing data are carried forth in AI-generated models and will influence the outcome of research, products, or processes – potentially exacerbating existing social and economic disparities.

Impact on Wages and Inequality: There is a concern that AI could exacerbate wage inequality. High-skilled workers who can work with AI may see their wages increase while low-skilled workers may face wage stagnation or reduction due to automation. A Brookings Institution study discusses the potential of AI to widen income inequality, especially affecting lower-wage workers who are more susceptible to job automation (West & Allen, 2018) unless they receive career counseling, educational opportunities, and supplemental resources to overcome family and other barriers (Holzer, 2022). The irony of this contention however may be that generative AI learns these higher skilled jobs and begins to replace them. Generative AI can learn any readily documented process quickly and replicate it. Human contributions will focus on creating new valued ideas or processes that are not easy to document.

Changes in Consumer Behavior: AI-driven personalization and recommendation systems could significantly alter consumer behavior, leading to new marketing strategies and business practices. AI-driven personalization can significantly influence consumer behavior, leading to changes in marketing and sales strategies across various industries (Huang & Rust, 2018; Rafieian & Yoganarasimhan, 2023). By producing more personalized products, companies will be able to reduce demand uncertainty (and thereby produce less unused inventory), focusing more of their resources on meetings known (and anticipated) consumer needs (O'Connor & Wilson, 2021).

Global Competition: Countries and companies that effectively harness AI could gain significant economic advantages, potentially leading to shifts in global economic power. The Center for a New American Security provides insights into how AI is becoming a key factor in global economic competition, particularly among major powers like the United States and China (Horowitz, Allen, Kania, & Scharre, 2018). AI innovators will have strong incentives to own large quantities of the "right type" of data, develop the digital skills in their population to use those data, invest in the development of ever more powerful computing resources, and will further incentivize the adoption of the use of AI to achieve economic (and military) advantages. Limiting access to data will limit the power of generative AI, so the current fight over unauthorized use of data is a critical determinant about how powerful generative AI can be.

Impact on Specific Sectors: AI could transform sectors like healthcare, finance, transportation, and education, leading to both challenges and opportunities in these fields. Deloitte's insights on AI in healthcare, for instance, illustrate how AI is revolutionizing diagnostics, patient care, and administrative efficiency (Chebrolu, Ressler, & Varia, 2019). The value of AI was highlighted during the pandemic when AI could consume large quantities of data to help identify patterns more quickly and prepare new kinds of technologies to prevent and fight the spread of endemic diseases globally (Thangam, et al., 2022). Generative AI is revolutionizing the construction industry, from helping to generate more intricate designs and optimizing layouts to advancing the use of innovative new construction materials and

technologies and solving complex engineering challenges. AI is helping to advance workflows, the use of robotic systems, and adaptation of new construction management and project control systems to increase the efficiency of this industry (Rain, 2023). Generative AI has a unique role in using language and image recognition for quality control and supply chain and inventory management systems.

Innovation and Research Development: AI could accelerate research and development activities across various domains, leading to faster innovation cycles. The National Science and Technology Council underlines how AI accelerates innovation across various fields, including drug discovery and material science (National Science and Technology Council, 2016). Deep learning from AI represents a new approach to invention that will lead to new pathways to innovation that involve a transformation from routinized labor-intensive research towards greater use of passively generated large datasets and enhanced prediction algorithms (Cockburn, Henderson, & Stern, May 2019).

Environmental Impact: AI could contribute to more efficient use of resources and better environmental management, but it also raises significant concerns about energy consumption due to the computational demands of AI systems. The energy demands from natural language processing at large data centers mean that inefficient algorithms can be costly in terms of energy demand – requiring more efficient software code as well as hardware systems. (Strubell, Ganesh, & McCallum, 2019). However, the full environmental impacts from AI have only been studied in a limited way and it is uncertain whether more efficient production systems offset the increased demand for data analysis (Ligozat, Lefevre, Bugeau, & Combaz, 2022). Overall, while AI presents significant opportunities for economic growth and development, it also poses challenges that will need careful management to ensure equitable and sustainable outcomes.

From the literature: How to Engage AI

Research drawn from a mix of academic journals, international organizations, and think tanks reflect the diverse perspectives and research on the application of AI in economic development. Economic development practitioners can leverage artificial intelligence (AI) to promote inclusive economic development in several innovative ways as described below. Examples abound that demonstrate the implementation of these AI-driven approaches for inclusive economic development. One notable example is the city of Pittsburgh, once heavily reliant on the steel industry and now transformed as a hub for technology and innovation. The following is a discussion of key strategies and how various locations, including Pittsburgh, have leveraged AI to support relevant initiatives.

Data-Driven Decision Making: In an increasingly dense population environment, AI-driven data analytics can guide urban development strategies and reshaping economic development policies toward greater sustainability (Herath & Mittal, April 2022; Bachmann, Tripathi, Brunner, & Jodlbauer, 2022). Using AI, leaders can process and analyze more data to guide economic development strategies. By using AI to analyze demographic data, market trends, and economic indicators, practitioners can make more informed decisions about where to allocate resources for maximum impact.

The University of Pittsburgh and Carnegie Mellon University have collaborated on projects using AI to analyze urban data. This includes traffic management, energy usage, and urban planning to make the city more efficient and livable. One example is the Breathe Collaborative, begun in 2014 as a coalition of local citizen leaders working to improve air quality through a science-based, community outreach platform (Spice & Ellis, 2014; Breathe Project, 2023). New York City has leveraged AI in its "Citywide Analytics"

initiative, using data to improve municipal services like waste management and public safety, enhancing overall urban efficiency (New York City Office of Technology and Innovation, October 2023). In an example of a rural area, Vermont analyzed agricultural data with AI to help farmers make informed decisions about crop management, soil health, and resource allocation (Vermont Artificial Intelligence Task Force, January 2020).

Targeted Interventions for Underrepresented Groups: The economic activity associated with AI appears to be highly concentrated in a few "superstar" tech cities with the most specialize talent (Muro, Jacobs, & Liu, 2023). Not surprisingly, then, AI algorithms developed based on historical patterns (as noted earlier) could reinforce biases that already exist in the economy and the workforce (Yarger, Payton, & Neupane, 2020). RAISE (Responsible AI for Social Empowerment and Education) examines how leaders could use AI to address disparities in economic opportunities (MIT, 2023). This research suggests that AI can help identify economic disparities and underrepresented groups within a community, but it may also serve to reinforce existing inequities due to biases in available data. Recognizing these limitations may enable practitioners to design targeted interventions, such as skill development programs or small business support, to ensure that economic growth benefits all segments of the population.

Pittsburgh has initiated programs to use AI in addressing social disparities. For instance, the city's emphasis on providing broader access to data and using natural language processing techniques to analyze housing and employment data to identify and address gaps in these sectors for marginalized communities (City of Pittsburgh; Pittsburgh Urban Redevelopment Authority, 2017). In Los Angeles, leaders used AI to analyze demographic data to identify and address disparities in access to healthcare and housing, especially in underserved communities (City of Los Angeles, December 2020) . The Appalachia Regional Commission is seeking to support nonprofit capacity building focused on the use of AI to enhance local capacity to address local needs through its recently announced READY Nonprofits initiative (Appalachian Regional Commission, 2023).

Improving Access to Financial Services: The financial sector is using AI-enabled solutions to solve a wide variety of market needs, from hyper-personalization to fraud detection. Fintech companies have led the way as significant players in serving underserved market because they were quick to adopt AI-related applications to mine opportunities to engage selected low-income earners, women, and small businesses in the mainstream financial market. (Mhlanga, 2020) AI has the potential to help transform the financial services landscape by datasets to analyze patterns and make more objective predictions of economic performance in several ways by facilitating less biased credit scoring, improving digital identify verification, providing more personalized virtual assistance, and enhancing risk assessments to support microlending (Grosu, 2023). With these insights, businesses and government could use AI to develop financial tools and services that are more accessible to marginalized communities. For example, AI-driven credit scoring models that reflect propensity to pay rather than prior history and existing assets can help provide loans to individuals and small businesses that traditionally lack access to banking services.

In Pittsburgh, PNC is supporting a Center for Financial Services Innovation at Carnegie Mellon University that seeks to look at the role of AI and inclusive banking strategies in addressing financial service gaps in underbanked communities (PNC Center for Financial Services Innovation, 2023; Carmona & Rezk, 2023). In the well-known banking hub of Charlotte, North Carolina, fintech startups are using AI to develop tools that provide more efficient micropayment options that would provide better access to credit and

banking services for underserved populations (Charlotte Fintech Hub, 2023). As bank branches in rural areas decline, efforts to expand capital access to rural areas will rely on technology solutions to fill the credit and financial services gap (Friedline, Naraharisetti, & Weaver, 2020).

Enhancing Educational Opportunities: AI has the potential to change the way people learn, helping to develop more personalized learning adapted to improve educational outcomes (Pedró, Subosa, Rivas, & Valverde, 2019). As AI disrupts work, upskilling workers will be critical and personalized education and training could be the answer (West D. M., 2020). Personalized education involves using data to adapt learning platforms to reflect individual skill strengths and weaknesses as well as an individual's learning pace to create unique pathways as well as to offer appropriate content, resources, and activities (K, 2023; Rouhiainen, 2019). Trainers and educators could use AI for asynchronous learning and assessments to provide learning recommendations based on student preferences and interests as well as offer students conversational style feedback from virtual teaching assistants (i.e., chatbots). AI allows educators and trainers to incorporate interactive text, audio, and video elements to make the teaching material more engaging for learners with different backgrounds. It can also provide more immediate feedback to help evaluate progress and identify areas for improvement.

Not surprisingly, Pittsburgh (represented by Carnegie Mellon University) is at the forefront of using AI to personalize education, developing AI-driven platforms that adapt to individual student's learning styles, helping to reskill or upskill the local workforce (Stokes, 2021). Chicago's public schools have also stepped forward, implementing AI-driven platforms to personalize learning experiences, particularly in STEM education, aiding in closing the educational achievement gap (Chicago Public Schools, 2019). Even in rural Alaska, schools are implementing AI-based educational software to provide personalized learning experiences for students, particularly in remote areas with limited available educational resources (Whicker, 2016).

Sustainable Urban Planning: AI is also changing the planning profession by enhancing the way planning responds to the changing needs of communities and allows the field to refocus on the human elements of the planning process (Sanchez, 2023). AI allows planners to use extensive databases associated with demographics, traffic patterns, and land use (among others) to forecast changes and explore a broader array of scenarios. Unfortunately, analysts must overcome the challenges associated with the biases inherent in most administrative databases that do not represent all people in equal ways (Peng, Kaifa, Liu, & Zhai, 2023).

Examples of how these changes are being implemented in real-time include how Pittsburgh is using smart traffic lights to enhance traffic flow and increasing the efficiency of the city's street lighting system (City of Pittsburgh, 2024). Images from municipal garbage trucks are helping Tuscaloosa, Alabama, identify blighted areas and target activities to address blight and guide zoning enforcement efforts to remediate blight (Sanchez, 2023). These new insights can better inform the decisions of elected officials and help citizens better understand the consequences and the benefits of past planning and zoning choices.

Supporting Local Entrepreneurs and SMEs: Entrepreneurs and small-medium sized enterprises can gain a critical advantage by adopting digital technology aided by AI (Drydakis, 2022). AI can help small business owners access and understand data providing greater confidence in planning and taking risks amid uncertainty (Mills, 2019). AI tools can help local entrepreneurs and small and medium-sized enterprises (SMEs) to gain insights into market trends, consumer behavior, and operational efficiency,

enabling them to compete more effectively while AI tools can also be used to predict firm survival and help creditors in identifying risks (Ciampi & Gordini, 2013).

When larger firms are more likely to adopt and use AI, these tools can also create a greater disadvantage for smaller firms that are slower to adapt. Thus, it is incumbent upon economic developers to provide opportunities for smaller firms to see how these tools can benefit their individual businesses. Pittsburgh's thriving startup ecosystem, supported by AI innovation from local universities and incubators, is helping local entrepreneurs and SMEs to leverage AI for business growth (Cushman & Wakefield, 2024). In the vibrant tech scene in Austin, Texas, AI is being harnessed by local startups and SMEs for market analysis and operational efficiency, fostering a supportive ecosystem for entrepreneurship, including the creation of a new Center for Generative AI at the University of Texas (Price, 2024). In rural communities across the U.S., AI tools assist small business owners and entrepreneurs in understanding market trends and consumer behavior, improving customer service and responsiveness, and aiding local businesses to make data driven decisions about global market and supplier opportunities they may never have previously known about or explored (Reddy, 2023). The key to entrepreneurial success will be first awareness, then adoption, of AI tools to help create a competitive business environment and help their firms remain nimble and relevant.

Crisis Response and Resilience Building: Depending on the perspective, AI will either be at the heart of the next financial crisis or will be deployed to limit the impact of crises. (Singh O. , 2023; Salmons, 2023). AI reflects the aggregation of biased data, and those biases impact the validity of the models used to forecast market growth or declines. However, with so much data and so many different AI tools available, analysts can more quickly evaluate multiple scenarios and reset a course. AI can also help to build resilience in different parts of our economy, including supply chains impacted by natural and human-caused disasters (Cohen & Tang, 2024). Increasingly, leaders are using AI tools to predict and respond to crises associated with economic uncertainty, natural disasters, and large-scale health epidemics, by analyzing trends and patterns to offer alternative scenarios. These tools help in building resilient economies that can withstand and recover from shocks of all kinds.

Pittsburgh has integrated resiliency planning into every aspect of its governance, and it is tapping AI to help with this planning (Keating, 2021; Fischbach, May, & Chandra, 2017). In implementing its long-standing resiliency strategy, Pittsburgh sought to use AI in emergency response systems, particularly in areas like flood prediction and response coordination (City of Pittsburgh, 2017). Miami and other places hit by frequent hurricanes, flooding, tornadoes, or blizzards, utilize AI in its emergency management systems for predictive modeling of natural disasters and coordinating response efforts (Ellencweig, Mysore, & Spaner, 2023). In Oklahoma's and Kansas' Tornado Alley, analysts are using AI for predictive modeling of severe weather events, aiding in early warning systems and preparedness (Masterson, 2023; Lincoln Laboratory, 2024). With the help of AI tools, business and government can increasingly plan for the unforeseen and prepare for disasters that could disrupt or shut down operations.

AI In the Economic Development Practice

Economic development practitioners must look at ways to use these tools in their work to enhance their efficiency while ensuring that the leaders help to distribute economic benefits more equitably across different segments of society. That means that economic developers must first come to terms with how AI is impacting the practice. How are we using the patterns of big data to drive decision-making about what programs or technical assistance to offer companies? How are we deploying generative AI to

provide more meaningful and more customized information to stakeholders, including policymakers, existing businesses, potential new businesses, and workers in our communities? How is the threat and promise of AI affecting the way we prepare our workforce and sell our communities' economic future? How is the use of AI reinforcing existing biases about how we do our work or leverage our resources?

State and local economic development agencies can use AI to guide and inform their efforts to answer some of these questions in a variety of ways to enhance their programs and improve outcomes. Here are some examples:

Supporting Statewide Industry Clusters

AI can help state agencies analyze and support key industry clusters by identifying growth patterns, supply chain gaps, and investment opportunities. Using data on employment trends, local resources, and regional business performance, AI can help pinpoint areas where clusters are likely to thrive. For instance, a state focused on renewable energy could use AI to analyze data on solar installations or wind turbine production activities, workforce skills as highlighted in job postings, and current supplier locations to identify regions that would benefit from targeted investment and workforce development.

Targeting Business Attraction and Retention

Already used widely, large data sets are being trained to help state and local agencies to better anticipate business activities, identify patterns within regional economic conditions, and assess industry trends. Using company-specific insights, AI can help economic developers identify high-potential businesses for attraction and retention efforts. AI tools are being used to scan through financial reports, market conditions, and employment trends to pinpoint companies likely to expand or relocate. For example, an economic development agency could use AI to identify which businesses could benefit from available tax incentives or workforce development programs, helping attract investment to underserved areas or proactively reaching out to businesses already poised for growth.

Improving Tax Incentive Program Effectiveness

States and localities offer tax incentives to many types of businesses to encourage investment and relocation. However, evaluating the impact of these programs can be challenging. AI can analyze historical data on companies that received tax incentives, looking at factors like job creation, retention rates, and economic spillover effects to assess program effectiveness. This can help states refine their incentive programs to target limited resources to assist businesses most likely to generate the types of quality job creation activity that the state or region would like to see.

Streamlining Permit and Licensing Processes

AI can be used to automate and streamline the process of applying for business licenses, permits, and other regulatory approvals, reducing administrative burdens for both businesses and government agencies. For example, a state or local economic development agency could use AI to review permit applications, cross-reference them with local zoning laws, and approve simple requests automatically. This speeds up the process for businesses, creates opportunities for enhancing transparency associated with business incentives, while freeing up staff to handle more complex cases.

Optimizing Public Infrastructure Investments

State and local governments can use large data sets and AI tools to optimize investments in infrastructure projects that would likely have the greatest economic impact. For instance, using AI models that analyze traffic flow, population growth, and economic data, a state or local agency could predict future infrastructure needs and prioritize projects such as roads, public transportation, or utilities. This ensures that public investments align with future economic development goals, improving transportation systems or broadband access in areas poised for economic growth.

Developing Demand Driven Workforce Training Programs

States and regions aiming to bridge skills gaps across various industries can use AI to assess which skills are most in demand in local labor markets. By analyzing labor market data and projecting future industry needs, AI can help states and regions can design or refine their training programs to meet those needs. For example, if AI identifies a growing demand for coding and data analysis skills across sectors, a state or local development agency could collaborate with community colleges and training providers.

Reducing Employer Costs in Matching Workers to Jobs

Human resource professionals are adopting AI tools to help with their job placement activities. Economic and workforce development agencies are increasingly collaborating with companies to help lower the cost of interviewing and hiring large numbers of workers, especially when companies are starting up their operations in a new location. AI-powered platforms are being created to help state and local agencies connect job seekers with employers by analyzing labor market data, skill gaps, and emerging job trends. For example, a state labor market information agency could use AI to track real-time job vacancies and match local workers with relevant training programs based on predicted industry needs. AI can also help identify underemployed workers and guide retraining efforts to prepare them for higher-demand jobs, such as those in healthcare or advanced manufacturing.

Enhancing Small Business Support

State or local economic development agencies can leverage AI to leverage large data sets about companies to provide tailored support to small businesses. AI tools can offer insights into consumer behavior, regional market trends, and digital marketing strategies, helping small businesses compete with larger firms. For example, a state or community's small business program could use AI-driven market analysis tools to suggest optimal locations for new facilities or to identify potential new customers based on foot traffic, demographic data, and industry purchasing trends.

Planning for and Mitigating Economic Disruptions

AI can help states and regions prepare for economic shocks, such as downturns in key industries or natural disasters, by modeling impacts across scenarios and enabling proactive policies. For example, if AI predicts automation-driven job losses in manufacturing, states can implement retraining programs early. Predictive analytics also aids quick responses to disruptions, fostering resilience in vulnerable areas. Additionally, AI can assess potential economic impacts of natural disasters on sectors like tourism or agriculture, enabling faster response and recovery. AI tools can also identify affected companies and individuals, targeting assistance to those impacted more efficiently.

Real-Time Economic Monitoring and Reporting

AI can assist states and local economic development agencies in tracking economic health indicators in real time, offering granular data that informs better decision-making. For example, AI tools can monitor and analyze economic data such as job postings, employment rates, consumer spending, or business activity. This can enable state or local agencies to quickly identify trends or issues, such as a sharp drop in employment or sales. This would allow governments to take more immediate corrective actions like supporting small businesses or adjusting economic policies to stabilize local economies.

Analyzing Public Sentiment for Policy Feedback

AI-powered sentiment analysis tools can help state and local agencies gauge public opinion on economic policies or local initiatives without the cost or time associated with traditional surveys. By analyzing social media posts, news articles, and public comments, analysts could use AI to assess community sentiment about proposed development projects, business regulations, or budget allocations. This allows agencies to adjust policies in ways that are more likely to gain public support, leading to smoother implementation of economic initiatives.

Facilitating Tourism and Economic Growth

For many states and regions, tourism promotion is an integral part of their economic development strategy. AI-powered platforms can analyze tourism patterns and provide insights into how state and local governments can attract more visitors, thereby boosting the local economy. For example, AI can analyze data on visitor behavior, such as where tourists are coming from, what attractions they visit, and how much they spend. This information can help agencies design more effective marketing campaigns, improve tourist services, and invest in infrastructure that enhances the visitor experience, driving economic growth in tourism-dependent areas.

Concluding Thoughts

The proverbial pink elephant issue in the AI Revolution is who will lead and who will benefit from it? Like all previous economic changes, it is difficult to predict the final impact of AI. All economic sectors are adopting AI as a fundamental tool to monitor and drive effective use of emerging big data sources as well as to search for unforeseen patterns to anticipate inflection points affecting their sector. With that new emphasis comes an emerging demand for talent in data management and manipulation at the heart of AI (Johnson, et al., 2021). Along with the talent shortages facing most other sectors, the AI workforce is woefully undersupplied with a need for talent. The U.S. and its economic regions might address some of these shortages in the short term through a reasonable national immigration reform recognizing the critical role that skilled foreign workers are playing in today's AI workforce (Heilweil, 2023). In the long-term, the U.S. and its regional economic development leaders will need to develop a stronger domestic pipeline of workers through better aligned education and R&D programs (Zwetsloot, Heston, & Arnold, 2019).

At the same time, jobs will be completely reconfigured to reflect the power of AI. Research shows that AI will impact how workers receive directions, what information they need to handle, and how quickly "high-performance work practices" can be implemented (Holm & Lorenz, 2022). Faster access to patterns buried in big data can help make traditionally customized tasks more routinized, increasing productivity. The results will also likely change the nature of many jobs to reduce employee autonomy

and create more opportunities for increased inequities in the labor market, especially for jobs that require repetitively used technical skills (Brunette, 2023).

There is growing evidence that AI will markedly change our regional economies, and we must recognize both the threats and opportunities posed by this technology through initiatives designed to leverage the full advantage while addressing the potential negative consequences. The examples provided demonstrate the diverse applications of AI in addressing unique regional challenges and promoting inclusive economic development across different parts of the United States, including the unique challenges facing rural areas. The Pittsburgh case study reflects how these strategies can come together in one region. Pittsburgh's transformation from an industrial stronghold to a tech-savvy, AI-driven city illustrates the potential of AI in fostering inclusive economic development and addressing various urban challenges. Yet, no region has fully figured out how to harness the power of AI.

AI is invaluable in data-driven economic development activities. Integrating AI into the economic development practice is the next step in the evolution of our field. Using these tools to help communities, regions, states, and nations gain a competitive advantage will involve economic developers to embrace AI tools in their day-to-day work. It will help to influence the industries we target, the workforce skills we develop, and the individual companies and workers we are trying to support. This is how economic development as a practice can remain relevant in the AI Revolution.

References

Acemoglu, D., & Restrepo, P. (2020). Robots and jobs: Evidence from US labor markets. *Journal of political economy, 128*(6), 2188-2244.

Appalachian Regional Commission. (2023, December 26). *Strengthening Nonprofits in the Appalachian Region*. Retrieved from READY Nonprofits: https://readynonprofits.arc.gov/

Autor, D. (August 2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation. *Journal of Economic Perspectives*, 3-30.

Bachmann, N., Tripathi, S., Brunner, M., & Jodlbauer, H. (2022). The contribution of data-driven technologies in achieving the sustainable development. *Sustainability, 14*(5), 2497.

Beckert, B. (2021). The European way of doing Artificial Intelligence: The state of play implementing Trustworthy AI. *B. Beckert, "The European way of doing Artificial Intelligence: The state of play implementing Trustworthy AI," 2021 60th FITCE Communication Days Congress for ICT Professionals: Industrial Data – Cloud, Low Latency and Privacy (FITCE), Vienna, Austria, 2.* Vienna: IEEE.

Breathe Project. (2023, December 26). *Tech Tools*. Retrieved from https://breatheproject.org/tech-tools/

Brunette, A. (2023, December 12). *As AI pushes forward, professionals look for ways to find more meaning in their work.* Retrieved from Thomson Reuters: https://www.thomsonreuters.com/en-us/posts/government/ai-pushes-meaningful-work/

Carmona, T., & Rezk, P. (2023, April 3). *Centering racial equity and inclusion in Pittsburgh's innovation economy.* Retrieved from Brookings: https://www.brookings.edu/articles/centering-racial-equity-and-inclusion-in-pittsburghs-innovation-economy/

Charlotte Fintech Hub. (2023, December 26). Retrieved from Innovation in the Financial Services Industry: https://www.carolinafintechhub.org/innovation/

Chebrolu, K., Ressler, D., & Varia, H. (2019). *AI augments health care: How artificial intelligence can boost hospital performance.* Deloitte Center for Health Solutions.

Chicago Public Schools. (2019). *CPS Success Starts Here: Five-Year Vision 2019-2024.* Chicago: Chicago Public Schools.

Ciampi, F., & Gordini, N. (2013). Small Enterprise Default Prediction Modeling through Artificial Neural Networks: An Empirical Analysis of Italian Small Enterprises. *Journal of Small Business Management, 51*(1), 23-45. doi:10.1111/j.1540-627X.2012

City of Los Angeles. (December 2020). *SmartLA 2028: Technology for a better Los Angeles.*

City of Pittsburgh. (2017). *One PGH: Resilient Pittsburgh.* New York, NY: Resilient Cities Network. Retrieved from https://resilientcitiesnetwork.org/downloadable_resources/Network/Pittsburgh-Resilience-Strategy-English.pdf

City of Pittsburgh, P. (2024, February 24). *Mobility and Infrastructure*. Retrieved from Smart Cities and Emerging Mobility: https://pittsburghpa.gov/domi/smart-cities

City of Pittsburgh; Pittsburgh Urban Redevelopment Authority. (2017). *City of Pittsburgh Roadmap for Inclusive Innovation.*

Clayton, C. (2023, November 14). AI's Future in Agriculture: Artificial Intelligence Creates Opportunities and Risks in Ag Space. *DTN Progressive Farmer*. Retrieved December 26, 2023, from https://www.dtnpf.com/agriculture/web/ag/news/business-inputs/article/2023/11/14/artificial-intelligence-creates-ag

Cockburn, I. M., Henderson, R., & Stern, S. (May 2019). The Impact of Artificial Intelligence on Innovation: An Exploratory Analysis. *The Economics of Artificial Intelligence: An Agenda* (pp. 115-146). University of Chicago Press.

Cohen, M. C., & Tang, C. S. (2024, February 5). The Role of AI in Developing Resilient Supply Chains. *Georgetown Journal of International Affairs*. Retrieved February 25, 2024, from Georgetown School of Foreign Service: https://gjia.georgetown.edu/2024/02/05/the-role-of-ai-in-developing-resilient-supply-chains/

Cushman & Wakefield. (2024). *Unveiling The Robotics and AI Landscape In Pittsburgh: A Comprehensive Report on the City's State.* Pittsburgh.

Drydakis, N. (2022). Artificial Intelligence and Reduced SMEs', Artificial Intelligence and Reduced Business Risks: A Dynamic Capabilities Analysis during the COVID-19 Pandemic. *Information Systems Frontiers*. doi:doi.org/10.1007/s10796-022-10249-6

Ellencweig, B., Mysore, M., & Spaner, J. (2023, October 7). Generative AI is set to transform crisis management. *Next Gov FCW*. Retrieved February 25, 2024, from https://www.nextgov.com/ideas/2023/10/generative-ai-set-transform-crisis-management/391264/

Fischbach, J. R., May, L. W., & Chandra, A. (2017). *OnePGH: Supporting Development of Pittsburgh's Resilience Strategy.* Retrieved February 25, 2024, from Rand Social and Economic Well-being: https://www.rand.org/well-being/community-health-and-environmental-policy/projects/pittsburgh-resilience.html

Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? . *Technological forecasting and social change, 114*, 254-280.

Friedline, T., Naraharisetti, S., & Weaver, A. (2020). Digital Redlining: Poor Rural Communities' Access to Fintech and Implications for Financial Inclusion. *Journal of Poverty, 24*(5-6), 517-541. doi:https://doi.org/10.1080/10875549.2019.1695162

Grosu, A. (2023, August 30). *AI in Financial Inclusion: Banking Services for Underserved Populations*. Retrieved from Medium.com: https://medium.com/@alexandragrosu03/ai-in-financial-inclusion-banking-services-for-underserved-populations-918d30f8b7d2

Heilweil, R. (2023, July 17). Schumer: Congress has 'no choice' but to join the AI revolution. *FedScoop*. Retrieved from https://fedscoop.com/schumer-congress-must-join-the-ai-revolution/

Herath, H., & Mittal, M. (April 2022). Adoption of artificial intelligence in smart cities: A comprehensive review. *International Journal of Information Management Data Insights, 2*(1).

Holm, J. R., & Lorenz, E. (2022, March). The impact of artificial intelligence on skills at work in Denmark. *New Technology, Work and Employment, 37*(1), 79-101.

Holzer, H. J. (2022). Automation, Jobs, and Wages: Should Workers Fear. In C. W. Zia Qureshi, *Shifting Paradigms: Growth, Finance, Jobs, and Inequality in the Digital Economy* (pp. 123-150). Washington, DC: Brookings Institution Press.

Horowitz, M. C., Allen, G. C., Kania, E. B., & Scharre, P. (2018). *Strategic Competition in an Era of Artificial Intelligence.* Washington, DC: Center for a New American Security.

Huang, M.-H., & Rust, R. T. (2018). Artificial Intelligence in Service. *Journal of Service Research*, 155–172. doi:10.1177/1094670517752459

Johnson, M., Jain, R., Brennan-Tonetta, P., Swartz, E., Silver, D., Paolini, J., . . . Hill, C. (2021). Impact of Big Data and Artificial Intelligence on Industry: Developing a Workforce Roadmap for a Data Driven Economy. *Global Journal of Flexible Systems Management, 22*, 197-217. doi:doi.org/10.1007/s40171-021-00272-y

K, M. (2023, June 6). *How AI Is Personalizing Education For Every Student.* Retrieved from elearningindustry.com: https://elearningindustry.com/how-ai-is-personalizing-education-for-every-student

Keating, M. (2021, September 7). Sustainability and resiliency are becoming embedded in municipal operations. *American City & County*. Retrieved February 25, 2024, from https://www.americancityandcounty.com/2021/09/07/sustainability-and-resiliency-are-becoming-embedded-in-pittsburghs-municipal-operations/

Levesque, E. M. (2018, October 28). *The role of AI in education and the changing US workforce.* Retrieved from A Blueprint for the Future of AI: https://www.brookings.edu/articles/the-role-of-ai-in-education-and-the-changing-u-s-workforce/

Ligozat, A.-L., Lefevre, J., Bugeau, A., & Combaz, J. (2022, April 25). Unraveling the Hidden Environmental Impacts of AI Solutions for Environment Life Cycle Assessment of AI Solutions. *Sustainability, 14*(9), p. 5172. doi:doi.org/10.3390/su14095172

Lincoln Laboratory. (2024, February 25). *Intelligent Tornado Prediction Engine* . Retrieved from Massachusetts Institute of Technology: https://www.ll.mit.edu/r-d/projects/intelligent-tornado-prediction-engine

Manyika, J., & Sneader, K. (2018, June 1). Retrieved December 26, 2023, from AI, automation, and the future of work: Ten things to solve for: https://www.mckinsey.com/featured-insights/future-of-work/ai-automation-and-the-future-of-work-ten-things-to-solve-for

Manyika, J., & Spence, M. (2023). The Coming AI Economic Revolution: Can Artificial Intelligence Reverse the Productivity Slowdown? *Foreign Affairs*, 70.

Manyika, J., Chui, M., Miremadi, M., & Bughin, J. (2017). *A Future That Works: Automation, Employment, and Productivity.* McKinsey Global Institute.

Masterson, V. (2023, December 14). AI can now outperform conventional weather forecasting – in under a minute, too. *Centre for the Fourth Industrial Revolution*. Retrieved from World Economic Forum: https://www.weforum.org/agenda/2023/12/ai-weather-forecasting-climate-crisis/#:~:text=The%20AI%20is%20also%20better,in%20their%20Science%20journal%20paper.

McKinsey Global Institute. (September 2018). *Notes from the AI Frontier: Modeling the Impact of AI on the World Economy.* McKinsey & Company.

Mhlanga, D. (2020, July 28). Industry 4.0 in Finance: The Impact of Artificial Intelligence (AI) on Digital Financial Inclusion. *International Journal of Financial Studies*. doi:https://doi.org/10.3390/ijfs8030045

Mills, K. (2019, June 3). *How AI Could Help Small Businesses.* Retrieved from Harvard Business Review: https://hbr.org/2019/06/how-ai-could-help-small-businesses

Mississippi State University. (2023, October 26). Retrieved from MSU officially opens nation's first Agricultural Autonomy Institute: https://www.msstate.edu/newsroom/article/2023/10/msu-officially-opens-nations-first-agricultural-autonomy-institute

MIT. (2023, December 26). *Responsible AI for Social Empowerment and Education*. Retrieved from MIT RAISE: https://raise.mit.edu/

Muro, M., Jacobs, J., & Liu, S. (2023, July 20). *Building AI cities: How to spread the benefits of an emerging technology across more of America.* Retrieved December 26, 2023, from https://www.brookings.edu/articles/building-ai-cities-how-to-spread-the-benefits-of-an-emerging-technology-across-more-of-america/

National Science and Technology Council. (2016). *Preparing for the Future of Artificial Intelligence.* Washington, D.C.: Executive Office of the President, National Science and Technology Council, Committee on Technology.

New York City Office of Technology and Innovation. (October 2023). *The New York City Artificial Intelligence Action Plan.* New York, NY.

O'Connor, J., & Wilson, N. E. (2021). Reduced demand uncertainty and the sustainability of collusion: How AI could affect competition. *Information Economics and Policy, 54*. doi:https://doi.org/10.1016/j.infoecopol.2020.100882

OECD. (2023). *OECD Employment Outlook 2023 : Artificial Intelligence and the Labour Market.* Paris. doi:doi.org/10.1787/08785bba-en

Pedró, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education. *Artificial intelligence in education: challenges and opportunities for sustainable development.* UNESCO Education Sector.

Peng, Z.-R., Kaifa, L., Liu, Y., & Zhai, W. (2023, June). The Pathway of Urban Planning AI: From Planning Support to Plan-Making. *Journal of Planning Education and Research*, 1-17. doi:10.1177/0739456X231180568

PNC Center for Financial Services Innovation. (2023, December 26). Retrieved from Leading Research on FinTech: https://www.cmu.edu/tepper/pnc-center-for-financial-services-innovation/

Price, A. (2024, February 2). *Austin's artificial intelligence boom.* Retrieved from Axios Austin: https://www.axios.com/local/austin/2024/02/02/artificial-intelligence-booms-austin

PwC Global. (2020). *Sizing the prize: Exploiting the AI Revolution.*

PwC Global. (2023). *AI and generative AI in 2023: Four top questions answered.*

Qin, Y., Xu, Z., Wang, X., & Skare, M. (2023, March 11). Artificial Intelligence and Economic Development: An Evolutionary Investigation and Systematic Review. *Journal of the Knowledge Economy*. doi:doi.org/10.1007/s13132-023-01183-2

Rafieian, O., & Yoganarasimhan, H. (2023, March 13). AI and Personalization. *Review of Marketing Research, Vol. 2), , 20*, pp. 77-102. doi:https://doi.org/10.1108/S154

Rain, N. (2023, December 11). *Role of ChatGPT and Similar Generative Artificial Intelligence (AI) in Construction Industry.* doi:dx.doi.org/10.2139/ssrn.4598258

Reddy, R. K. (2023, September 15). *Top AI Trends Which Small Businesses Could Adopt.* Retrieved from Rural Handmade: https://ruralhandmade.com/blog/top-ai-trends-which-small-businesses-could-adopt

Rouhiainen, L. (2019, October 14). How AI and Data Could Personalize Higher Education. *Harvard Business Review*. Retrieved from https://hbr.org/2019/10/how-ai-and-data-could-personalize-higher-education

Salmons, F. (2023, August 12). AI will be at the center of the next financial crisis, SEC chair warns. *Axios Markets*. Retrieved February 25, 2024, from https://www.axios.com/2023/08/12/artificial-intelligent-stock-market-algorithms

Sanchez, T. (2023). *Planning With Artificial Intelligence (PAS Report 604).* Washington, DC: American Planning Association.

Singh, O. (2023, April 26). Can artificial intelligence prevent the next financial crisis? *Coin Telegraph*. Retrieved February 25, 2024, from https://cointelegraph.com/explained/can-artificial-intelligence-prevent-the-next-financial-crisis

Singh, P. (2024, January 3). *All About Generative AI vs Traditional AI.* Retrieved March 3, 2024, from Analytics Vidhya: https://www.analyticsvidhya.com/blog/2023/12/generative-ai-vs-traditional-ai/

Spice, B., & Ellis, J. (2014, December 3). *Breathe Cam Lets Citizens Document Pittsburgh's Visual Air Pollution and Its Sources*. Retrieved from Carnegie Mellon News: https://www.cmu.edu/news/stories/archives/2014/december/december3_breathecam.html

Stokes, S. (2021, October 15). *A call to integrate AI and STEM education.* Retrieved from https://engineering.cmu.edu/news-events/news/2021/10/15-integrate-ai-stem.html

Strubell, E., Ganesh, A., & McCallum, A. (2019). Energy and Policy Considerations for Deep Learning in NLP. *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics. 10*, pp. 3645-3650. Florence, Italy: Association for Computational Linguistics. doi:10.1038/s41467-019-08936-1

Thangam, D., Malali, A. B., Subramaniyan, G., Mariappan, S., Mohan, S., & Park, J. Y. (2022). Relevance of Artificial Intelligence in Modern Healthcare. In *Integrating AI in IoT Analytics on the Cloud for Healthcare Applications* (pp. 67-88). doi:10.4018/978-1-7998-9132-1.ch005

Trilogy Networks. (2023, June 6). *Trilogy Networks and MLGC Launch World's Largest Precision Ag Deployment with the 'Dakota*ICP'*. Retrieved from https://trilogynet.com/news/trilogy-networks-and-mlgc-launch-worlds-largest-precision-ag-deployment-with-the-dakotaicp/

Vermont Artificial Intelligence Task Force. (January 2020). *Vermont Artificial Intelligence Task Force Final Report.* Vermont Agency for Commerce and Community Development. Retrieved December 26, 2023, from https://outside.vermont.gov/agency/ACCD/ACCD_Web_Docs/ED/MajorInitiatves/ArtificialIntelligenceTaskForce/FinalReport.pdf

West, D. M. (2018). *The future of work: Robots, AI, and automation.* Washington, DC: Brookings Institution Press.

West, D. M. (2020, September 10). *If AI takes jobs, humans will need lifelong learning and portable benefits.* Retrieved from https://www.brookings.edu/articles/if-ai-takes-jobs-humans-will-need-lifelong-learning-and-portable-benefits/

West, D. M. (2020, September 10). Machines, Artificial Intelligence, & and the Workforce:Recovering & Readying Our Economy for the Future. *A Hearing of the U.S. House Budget Committee .* 2020, Washington, DC: U.S. House of Representatives.

West, D. M., & Allen, J. R. (2018). *How artificial intelligence is transforming the world.* Brookings Institution.

Whicker, B. (2016, October 21). *An Alaska Personalized Learning Framework.* Retrieved December 26, 2023, from Association of Alaska School Boards: https://aasb.org/wp-content/uploads/10-21-2016ExperiencedBoardAcademy-PersonalizedLearning-Final.compressed.pdf

World Economic Forum. (2023). *Future of Jobs Report: Insight Report May 2023.* Geneva, Switzerland: World Economic Forum.

Yarger, L., Payton, F. C., & Neupane, B. (2020). Algorithmic equity in the hiring of underrepresented IT job candidates. *Online Information Review, 44*(2), 383-395. doi:10.1108/OIR-10-2018-0334

Zwetsloot, R., Heston, R., & Arnold, Z. (2019). *Strengthening the U.S. AI Workforce: A Policy and Research Agenda.* Georgetown University. Center for Security and Emerging Technology. doi:doi.org/10.51593/20190003