Stanford Workshop on New Approaches to Characterize Industries
Position White Paper – Session 2: *Perspective from NAIRR*
Respondent: Suzette Kent

The rapid application and adoption of AI capability in the workplace may have created one of the most fast-paced workforces shifts in history, but reliable data are hard to find. If the anecdotes about explosive job creation and rapid role-based task disruption are correct, it will be critical to develop models to understand, predict, and provide support to the AI-driven evolution of our working world. However, the pace of advancement, variations in adoption of AI capability, and the nascent methods of measurement of actual job impact related to AI, means that the narrative has been more about trends and "headlines" than robust model driven analysis using a comprehensive data framework. Simply put, we lack useful information for informing strategic decisions for national workforce matters.

Having been involved in technology-driven business transformation for the last three decades, I have deep experience with the workforce change journey that occurs when innovative technology becomes operationally pervasive. Examples that are relevant include use of image technology in medicine and financial services, robotics in automotive and transportation, the rise of cloud-based services in technology, and the national public adoption of digital and mobile delivery of services across public and private sector. Today, working with the world's leading technology companies, services companies, institutions of higher education, public company boards, companies that provide alternative pathways for technical training there is not a single area where the impacts of AI are not at the forefront of strategic discussions[1]. My direct experiences in high-level discussions regarding building, deploying, and scaling use of AI and the ramifications to the workforce ecosystems that are relevant to model development and application is that they share a common challenge – finding knowledgeable people to fuel growth that aligns with our national priorities. There is still a great need to develop a framework to analyze the broader context of workforce evolution and inform the public view of key opportunities and challenges to be considered.

Two very recent studies both illustrate the enormous attention that is being paid to explosive growth and disruption, and demonstrate that current publicly available information is myopic and not based on models with repeatable validity.

In December, the World Economic Forum released another piece in their Jobs of Tomorrow series, *Jobs of Tomorrow: Large Language Models and Jobs*, which sought to advance the understanding the direct impact of LLMs on specific jobs[2]. The piece is a toolkit to offer thoughts to business leaders in how they might consider large language models in their strategic business planning. Two major findings included in the paper were that they forecasted that over 40% of working hours could be transformed by LLMs through automation or augmentation and they predicted types of new jobs that would likely emerge. Although this information provides a perspective of some entities, the data is self-reported and based on expectations of the respondents, rather than hard data. This same study also notes that "three out of every four companies across the globe are expected to adopt technologies that include generative AI in the next 3 to 5 years, and 98% of global executives agree AI foundation models will play an important role in their organizations' strategies in that same time period". While one can find many sources of strong beliefs, shared expectations, fear, and other assortments of media hype, what remains lacking is a forward looking, data driven model that is rooted in comprehensive authoritative jobs and task data. Even if the model development moves in stages, we need to develop a sustainable structure to inform public and private sector leaders, practitioners, and those who develop our workforce about the transformation that AI is bringing for national workforce ecosystem.

In another example, the recent "*2023 Europe and US Data, Analytics, and Artificial Intelligence Executive Organization and Compensation survey* by Heidrick & Struggles surveyed approximately 100 companies in US and Western Europe[3]. These companies spanned all industries and have had AI based roles or operational AI capabilities inside their organizations for at least 5 years. This survey grouped employment into three categories: those who work in data science or analytics, machine learning, or AI; those who work in business analytics or intelligence; and those who work in data engineering and the third group is focused more on the back end or foundational elements of data. Since this was focused on data and analytics, it acknowledged that the operational and oversight roles were also increasing, but those were not directly captured.

I propose a very practical approach that can be taken to address the issues. When one considers the concept of "AI", there many aspects that have been directly correlated to generation of jobs. Most visible have been the direct hardware/device, software, services, and data activities. The less visible jobs impact is the secondary and tertiary influences upon business operational infrastructure and governance as AI capabilities move from experimental use to enterprise use at scale. As AI innovation moves from the idea stage to impact on actual jobs, there are conceptual models that can trace the people and specific work from grants, through academic activities, then into business entities. The timely opportunity is to not only trace the practitioners, but also understand how changing dynamics of people and capability impact growth in the workforce areas that are not as visible. In technology industries, advancing products and services using AI has a jobs footprint that is not dissimilar from other transformational technologies. For discussion purposes, this is noted as the **primary** impact. In most cases, the workforce that is involved in the first order of change is technically and functionally skilled for the specific application of AI. These are software engineers, data scientists, process specialists, and may have specialty skills related to the specific innovation. Identification of these individuals and roles is less complicated.

As AI is scaled within any entity, moving beyond pilot or experimentation into broader enterprise operational use, there are other **secondary** jobs that are created in business support or business oversight functions. These are risk and compliance roles, model validation roles, data management and testing roles, new skills required for procurement, legal, privacy, service, and operations. I have directly observed that in many cases, the first step is to add the AI related responsibilities to individuals currently holding these business support type roles. These individuals usually have little practical or academic experience with applied artificial intelligence. The effect is that deployments can either move slowly due to steep learning curve or, in some cases the results of an immature process becomes evident in business outcomes. As an entity begins to use AI capabilities more pervasively, one often sees new role criteria developed (and hiring changes) or organizational changes to centralize internal skills. With AI, new trends are emerging, and those trends appear to be very different for industry types and data classifications, so even actual experiences are less applicable from use case to use case. For example, rapid use of AI for language augmentation for customer service functions may seem effective whereas the same model and data are not effective for legal purposes. Further examples to be examined in the workshop include regulated industries, industries having more restrictions for data use and sharing, and industries/functions with greater potential for disruption. Another ripple or overlay to consider in the discussion is the growth of responsibilities in oversight, risk, and regulatory areas. These **tertiary** impacts are in addition to operational risk type roles that are inside a standard business operational paradigm. Examples of these tertiary-type workforce changes include Board responsibilities, government regulatory interactions, third party risk assessment activities, and social justice driven requirements. Tertiary impacts also include creation of roles that are reflective of the market dynamics of a transformational

technology. These types of roles are reflected in increased merger and acquisition activities, investment market interests, introduction of new companies, and development of new business models.

It is critical to develop models that are effective at each stage as they will influence the applicability of the model to the following stages. Short term impact measurement can be done using data related to people and new lab to market capabilities. Trend expectations can be analyzed in comparison with previous technology expansion waves (digital, cloud, cyber, mobile).

Medium- and longer-term steps should seek to create models that can relate the transfer of people and capability to identifying and quantifying the triggers of scale. Industry and scale can then be correlated to the expansion in other types of roles based on operational use of AI. For example, in regulated industries, the processes to examine business functions, models, and validation processes are well defined. As AI is introduced into existing business functions, those oversight processes are also impacted. I have had firsthand involvement with individuals having regulatory responsibilities and they are challenged to keep up with the pace of change in operational areas. A specific government example might be where drones are used to inspect safety and soundness of a physical structure versus a human examining the structure. While there might be a high level of confidence about the fidelity of images gathered, one may question if there is sufficient data and model capability to interrogate those images to propose a decision. The oversight function must understand the new processes and ensure that the use of AI improves the existing processes and does not introduce any new risks.

By identifying role types, tasks embedded in job postings and other public data, we could develop a perspective on scale of business operational impact (people, process type, regulatory applicability). The scale of impact could then inform forward looking views about the expansion of secondary and tertiary roles and the prevalence of AI capability as a required skill set. Consider the correlation of AI skills as an emerging role requirement to the historical pattern of workplace digital tools skills requirements. Using public job postings and data contained in role postings, a correlation between the primary jobs impact of capability adoption and the secondary and tertiary workforce impacts that follow from operational adoption at scale. In addition, one might use the current O*NET and the United States Bureau of Labor Statistics (BLS) taxonomy of over 19,000 tasks which matches tasks performed to occupations, and breaks down the time spent on each task within an occupation. This could become a baseline for creation of a calculation of year over year change (increase or decrease) as a factor for interpreting disruption and expansion in existing roles. That forecast could then inform future job demand expectations.

As AI continues to become deeply embedded in how businesses deliver products and services and how governments meet their missions, there is an effect of maturity and scale which will directly drive job creation and demand. With detailed data collection aligned to key industry characteristics, we could forecast the types of jobs, the scope and scale of economic impact. A conceptual sample of the waves of job creation will be shared in the discussion (*see attached DRAFT visual*). These role titles have been validated with industry persons and can be tracked and traced through public job postings.

There are also learnings from the digital/mobile wave, cloud transformation, cybersecurity industry and technology "as a service" industry that can be used to inform the baseline and to identify the significant areas of deviation. Using that baseline, common milestone points could be identified to build demand forecasts for various roles and tasks. These same demand signals can be used to inform future academic and skills training planning and approaches for government support.

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References:

1. LinkedIn Profile: https://www.linkedin.com/in/suzettekent/
2. World Economic Forum (in collaboration with Accenture), December 19, 2023, Jobs of Tomorrow: Large Language Models and Jobs – A Business Toolkit, https://www.weforum.org/publications/jobs-of-tomorrow-large-language-models-and-jobs-a-business-toolkit/
3. Heidrick & Struggles: *2023 Europe and US Data, Analytics, and Artificial Intelligence Executive Organization and Compensation survey,* December 2023

Additional reference notes:

- For the session in March, I will have actual corporate org charts, role description samples and third-party risk framework for a public company to leverage in discussion. Clearing use of these examples is in process.
- The graphic is a work in progress and will be enhanced for the March event.