The Feeling Economy:
Managing in the Next Generation of Artificial Intelligence (AI)

Ming-Hui Huang[1], Roland Rust[2], and Vojislav Maksimovic[2]

SUMMARY
The capability of AI is currently expanding beyond mechanical and repetitive to analytical and thinking. A "Feeling Economy" is emerging, in which AI performs many of the analytical and thinking tasks, and human workers gravitate more toward interpersonal and empathetic tasks. Although these people-focused tasks have always been important to jobs, they are now becoming more important to an unprecedented degree. To manage more effectively in the Feeling Economy, managers must adapt the nature of jobs to compensate for the fact that many of the analytical and thinking tasks are increasingly being performed by AI, and, thus, human workers must place increased emphasis on the empathetic and emotional dimensions of their work.

KEYWORDS: artificial intelligence, management, human resources, feeling intelligence, human-machine collaboration, job design, hiring

Automation, and now AI, have transformed the economy as mechanical/routine tasks (such as inspecting equipment, documenting/recording information, and scheduling work and activities) have largely been taken over by machines. Already, human work has moved more toward thinking tasks, such as processing, analyzing, and evaluating data or information.

As machines perform more of the tasks formerly performed by human workers, the human workers tend to focus on the tasks that AI cannot do better. In the last decade, AI has advanced rapidly to develop increased thinking capability. However, conventional wisdom still assumes that thinking jobs and employment will be immune from job displacement.[1] We contend that this conventional wisdom may not be correct, and that we are entering a new economy in which

[1]National Taiwan University, Taipei
[2]University of Maryland, College Park, MD, USA

the feeling tasks of jobs, such as communicating/coordinating with others and establishing/maintaining interpersonal relationship, are becoming more important for human workers than the thinking tasks of jobs. We call this the Feeling Economy. Our projection, based on U.S. government data, predicts that within the next 20 years, the Feeling Economy will become dominant.

The main reason for this shift is that AI—technologies that mimic (or even surpass) human intelligence—has advanced rapidly from being mechanically capable to increasingly being thinking capable. As AI has become capable of doing mechanical tasks, this has resulted in what we call the Thinking Economy, in which the thinking tasks of jobs are more important than the mechanical tasks of jobs to human workers. As AI has become more capable of doing thinking tasks, feeling tasks have similarly gained importance for human workers. Human jobs are increasingly emphasizing feeling tasks, and the importance of feeling tasks is growing, while the importance of thinking tasks is staying roughly the same.

There are both optimistic and pessimistic views about the impact of AI on tasks and work in an economy. The optimistic view considers that AI will augment human workers and create new jobs,[2] because AI (as a form of capital) augments human capabilities (i.e., labor). Labor, thus, is upgraded, from unskilled to skilled, or from mechanical to thinking.[3] In contrast, the pessimistic view holds that AI will replace human workers and take over jobs,[4] because the more AI (i.e., capital) is used, the less labor input is required.[5] Our position, based on empirical evidence, is in the middle: AI both replaces and augments, and because feeling is more difficult for AI to emulate, the feeling tasks of jobs are becoming more important for human workers. Our analysis concludes that in the Feeling Economy, jobs will emphasize feeling tasks more, and workers will need to get more people-oriented, rather than more data-oriented, if they wish to leverage the benefits of thinking AI. Even for managerial jobs that have always had both people-focused tasks (i.e., communicating and coordinating with people), as well as thinking-focused tasks (i.e., analyzing data or information), our empirical evidence shows that the "soft" aspects of managerial jobs are becoming even more important and will need to be prioritized, compared with thinking and analytical skills, in opposition to what many people might generally assume or take for granted in this big data age.

To prepare managers, employees, consumers, businesses, researchers, and educators for the upcoming Feeling Economy, this article addresses the effects of AI on tasks and work, and what this implies for management.

What Is the Feeling Economy?

The Feeling Economy is an economy in which the total employment and wages attributable to feeling tasks exceed the total employment and wages attributable to thinking or mechanical tasks.

In the emerging Feeling Economy, the interpersonal, empathetic, feeling tasks of a job, such as communicating with people inside and outside the

organization, establishing and maintaining interpersonal relationships, and selling to or influencing others, tend to be more important than thinking tasks and mechanical tasks, for both employees and consumers. Thus, employment and wages become more dependent on such tasks. The transformation to the Feeling Economy is already underway.

In the current Thinking Economy, employment and wages are more attributable to thinking tasks, such as processing, analyzing, and interpreting information; planning and prioritizing work; making decisions; and solving problems. In the Thinking Economy, most of the work time is spent dealing with information (i.e., information intensive).[6] The Thinking Economy is still here today, but is increasingly being overtaken by the Feeling Economy.

In the past Mechanical Economy, employment and wages were more attributable to mechanical/physical/repetitive tasks, such as inspecting equipment or material, performing general physical activities, and repairing and maintaining equipment. The Mechanical Economy was overtaken by the Thinking Economy decades ago.

AI Intelligences: Mechanical, Thinking, and Feeling

We posit that the main reason for the emergence of the Feeling Economy is the advance of AI—technologies that mimic (or even surpass) human intelligence. AI is distinct from previous generations of information technology in that it can learn and update using data. The input for the learning is data (which can include text, audio, and video) and can be contextual or noncontextual. The methods by which AI learns from data are various computational methods, with machine learning and deep learning neural networks being especially important methods of learning today.[7] The output of the learning is AI performance.[8] AI converts data into performance in three qualitatively different ways, which we refer to as AI intelligences.

The ability to learn from various types of data and learn from a massive amount of data (i.e., big data) and update thoughts or actions is what makes us consider a machine to be intelligent. A machine that does not learn and update from data, for example, a computer or a cellphone that continues to provide the same functions as designed in the factory throughout its product life, is not AI.

There are multiple AI intelligences. Some AI systems are mechanically intelligent, designed to perform repetitive tasks for consistent and reliable performance; some AI systems are thinking-intelligent, designed to learn and adapt from data autonomously; and some future AI systems may become feeling-intelligent, designed to interact empathetically with people. The development of AI research and practical implementation of AI are (roughly speaking) mechanical AI first, followed by thinking AI, followed by feeling AI. Mechanical AI is already well-established, thinking AI is currently advancing rapidly, and feeling AI may be several decades away for most practical applications.[9] The important insight is that application of AI finds mechanical intelligence to be "easiest,"

followed by thinking intelligence, with feeling intelligence being the most difficult for AI to emulate.

Research in AI is currently extending into both thinking intelligence and feeling intelligence, which were once thought to be the exclusive domain of human abilities.[10] For example, computational creativity exists whenever AI is capable of being creative on its own, such as composing music or art, and such capability has been used by the fashion clothing company Gap to predict fashion trends and design clothing.[11] Artificial emotional intelligence that uses neural networks to learn is getting better at recognizing and responding to human emotions.[12] Widespread application of feeling AI is still quite a few years away, however.

To elaborate:

- *Mechanical intelligence* is the capability to do mechanical and repetitive tasks with relatively limited amounts of learning or adaptation. Today, when the current development level of AI is higher than just mechanical, the fact that mechanical AI only learns and adapts to a minimum degree is often deliberate, rather than because AI cannot learn and adapt. Designing AI to be mechanical is often for output consistency, standardization, reliability, and precision. Factory automation is one example in which learning algorithms are set to update only periodically, when there is a need to improve output performance.

- *Thinking intelligence* is the capability to analyze and make decisions rationally (or boundedly rationally) and involves learning and adapting systematically from data autonomously. One example is autonomous cars, which automatically adjust to the road and driving conditions based on various sensor data input. Economically rational thinking characterizes the lower end of this intelligence (i.e., analytical). A more advanced (from the standpoint of AI) version of thinking intelligence is bounded rationality, mimicking human intuition for decision-making.[13] In the Thinking Economy, bounded rationality is often considered to be a cognitive bias. From the AI standpoint, however, cognitive bias and intuition are harder for computers to emulate than straightforward logical thought. In that sense, they may be thought of as a "higher" form of intelligence. Today, intuitive thinking is an area of rapid development in AI.[14]

- *Feeling intelligence* is the capability to recognize, emulate, and respond appropriately to human emotions.[15] Such AI learns and adapts from understanding and experience. Experience is characterized by contextual data, in contrast with the noncontextual data for thinking intelligence. AI that is capable of feeling intelligence is not as far along, but is also progressing.[16] Conversational AI, such as chatbots (e.g., Alexa and Siri) that use natural language processing to process and analyze natural language data, is booming. Nevertheless, despite the progress in natural language processing, natural language simulation is more difficult to achieve, given current technology. True emotional

machines must have the ability to recognize human emotions and respond in an emotionally appropriate way. In terms of the theory of mind,[17] such feeling AI may even be considered by some as being able to actually *experience* emotions, just as the Turing test considers AI to have human thinking ability if an observer cannot differentiate its responses from human responses.[18] However, the development of such emotional AI is currently a work in progress, and it is likely to be at least decades more before AI catches up to what humans can do.

Types of Job Tasks

A job is composed of tasks. Tasks that are required for a job vary in the extent to which they require mechanical, thinking, and feeling intelligences. It is useful to sort tasks into these three groups—one group for tasks that are primarily mechanical, a second group for tasks that primarily involve thinking, and a third group for tasks that primarily involve feeling. We can use information-related jobs—which may sometimes be mistakenly thought to involve only thinking tasks—to illustrate the distinction. Obtaining information is often more mechanical, because it is largely simple, standardized, repetitive, and routine, such as typing keywords on Google to search information or asking Alexa for weather information. Processing, evaluating, and analyzing information are mostly thinking, because they are more complex, systematic, rule-based, and well-defined. Using the processed information to communicate with supervisors, peers, or subordinates will typically involve more empathy and feeling, because such tasks are social, communicative, and interactive.

Most jobs are composed of both thinking and feeling tasks (and often mechanical tasks as well). For example, a customer service manager's job may include mechanical tasks such as administrating daily routines, thinking tasks such as analyzing customer preferences, and feeling tasks such as communicating, interacting, and empathizing with customers.

The Theory: When AI Does the Thinking, Humans Emphasize Feeling

We assert that as AI advances to a higher intelligence level, and assumes more tasks related to that intelligence level, human jobs will tend to be "upgraded" to focus on tasks related to higher intelligence levels (those more difficult for AI to assume). For example, the expansion of mechanical AI deemphasized mechanical human labor while giving more emphasis to thinking labor. Similarly, the expansion of thinking AI is currently deemphasizing thinking labor, especially the more straightforward analytical labor, while increasing the emphasis on feeling labor.

It has been argued that the rise of a new economy not only impacts human jobs, but also human shapes (e.g., the muscular factory worker gives way to the

skinny "geek"), activities, and minds.[19] When the industrial revolution freed human physical energy from mechanical jobs, people placed greater emphasis on thinking. Jobs, education, and wages reflected this new emphasis. For example, historian Harold James concludes from his qualitative analysis that AI is going to make the economy "stupid," because the human mind, not just physical energy, will no longer be needed as economic input, and, thus, humans will become collectively duller.[20]

This implies that at the economy level, when one human intelligence is deemphasized in the economy, the nature of tasks, jobs, and industries will transform and give rise to new tasks, jobs, and industries. At the job level, for example, in the industrial revolution, when mechanical tasks were no longer needed as much for jobs, people gravitated toward jobs that emphasized cognitive and analytical tasks, and analytical industries (such as computer, mathematical, and engineering) grew. At the task level, when AI is capable of cognitive thinking, people who are doing thinking tasks may find that those tasks can now be done by AI. The thinking workers must then transform the nature of their jobs to emphasize feeling tasks more or find new jobs that have a greater feeling or interpersonal component.

Altogether, we observe that the Mechanical Economy has already given way to the Thinking Economy, and we posit that the advance of thinking AI is now ushering in the Feeling Economy.

Empirical Evidence

We use the U.S. government's O*NET occupational data in 2006 and 2016 to validate our assertion that the Feeling Economy is emerging. Year 2006 signifies a milestone of modern AI, the year in which IBM introduced Watson, a cognitive machine that defeated a Jeopardy! Champion,[21] and 2016 was the most recent data year when the analysis was performed. Based on our theory, we expected the data to show that the importance of feeling tasks (relative to thinking or mechanical tasks) is becoming more important, and the total employment and average wages are becoming more attributable to feeling tasks from 2006 to 2016.

Data

The O*NET is sponsored by the U.S. Department of Labor/Employment and Training Administration, and its database is the primary source of occupational data covering the entire U.S. economy. The O*NET dataset and its precursors have been used extensively in high-visibility papers in economics, particularly labor economics, and the coding and its properties have been extensively discussed in the technical literature. Those contributions deal with issues such as foreign trade and outsourcing—for example, whether workers in jobs relying in routine manual skills are being displaced by foreign workers and offshoring, whereas workers in jobs relying on nonroutine cognitive skills are

prospering.[22] Publications using the O*NET data have been published in such prestigious outlets as the *American Economic Review, Journal of Labor Economics*, and multiple recent National Bureau of Economics Research Working Papers.

The data capture two sides of occupational information: the job side contains data about work activities, characteristics, and tasks; and the worker side contains data about ability, skills, and training. The choice of which side of the data to use depends on whether researchers focus on analyzing job tasks or worker skills. The task data used for the analyses in this article are from the job side, detailing various tasks' importance to jobs, and total annual employment and average annual wages for jobs.[23]

The O*NET database contains almost 1,000 jobs that cover the entire U.S. economy. The database is collected and updated regularly using standardized questionnaires to survey a broad range of workers in each job. There is a standard list of 41 tasks, which vary in their importance to each of the jobs, rated by the surveyed workers using a 1-5 importance scale. The importance rating is transformed into a range between 0 and 1 for the purposes of our analysis, as shown in Table 2. The same task data source has been used by previous researchers to rank jobs according to their susceptibility to computerization.[24]

There are 812 jobs that are available in the data for both 2006 and 2016. Two of the authors, who are experts in AI and service, rated the 41 tasks first. A panel of international informants then similarly rated the tasks.[25] The experts were given the instruction that mechanical tasks are simple, standardized, repetitive, and routine; thinking tasks are complex, systematic, rule-based, and well-defined; and feeling tasks are social, emotional, communicative, and interactive. The tasks were rated based on a 100% split, meaning that a given task is neither necessarily nor typically purely mechanical, thinking, or feeling, but is a weighted combination of all three intelligences. As examples, the task of analyzing data or information might be rated as 15% mechanical, 85% thinking, and 0% feeling; the task of making decisions and solving problems might be 80% thinking and 20% feeling; and the task of selling or influencing others might be 40% thinking and 60% feeling. Each task was then assigned to whichever of the three intelligences had the highest percentage, since it was the most important intelligence for that task. The weighted Kappa statistic between ratings of the two distinct groups of experts is satisfactory at .848, indicating a high level of agreement. This rating resulted in 26.8% mechanical tasks (11 tasks), 41.5% thinking tasks (17 tasks), and 31.7% feeling tasks (13 tasks). Table 1 shows the list of the 41 tasks, as sorted into the three intelligences.

Measures

Table 2 summarizes the operational definitions of variables. Based on these measures, we present the following analyses to show the emergence of the Feeling Economy.

TABLE 1. Mechanical, Thinking, and Feeling Tasks.

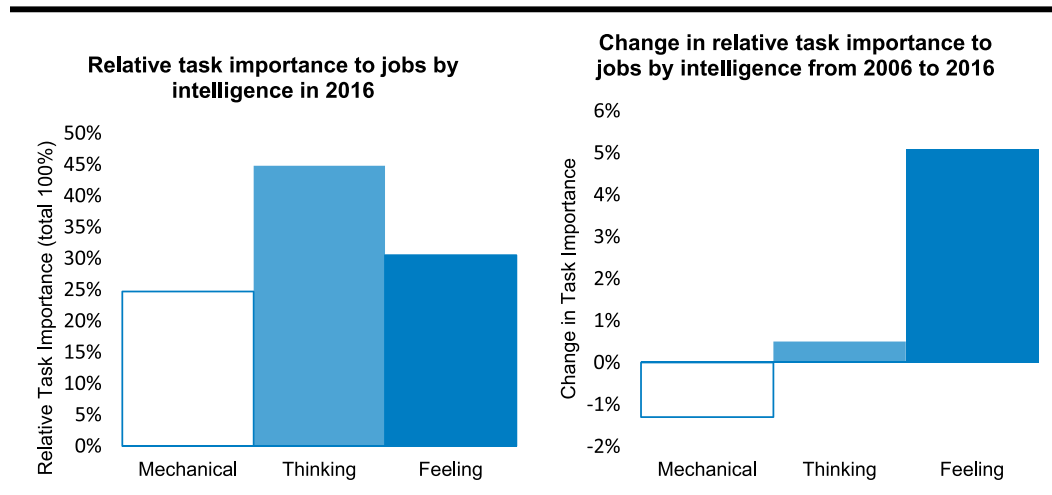| Mechanical	Thinking	Feeling
1. Getting information	1. Monitor processes, materials, or surroundings	1. Communicating with supervisors, peers, or subordinates
2. Inspecting equipment, structures, or material	2. Identifying objects, actions, and events	2. Communicating with persons outside organization
3. Scheduling work and activities	3. Estimating the quantifiable characteristics of products, events, or information	3. Establishing and maintaining interpersonal relationships
4. Performing general physical activities	4. Processing information	4. Assisting and caring for others
5. Handling and moving objects	5. Evaluating information to determine compliance with standards	5. Selling or influencing others
6. Controlling machines and processes	6. Analyzing data or information	6. Resolving conflicts and negotiating with others
7. Operating vehicles, mechanized devices, or equipment	7. Organizing, planning, and prioritizing work	7. Performing for or working directly with the public
8. Repairing and maintaining mechanical equipment	8. Interacting with computers	8. Coordinating the work and activities of others
9. Repairing and maintaining electronic equipment	9. Drafting, laying out, and specifying technical devices, parts, and equipment	9. Developing and building teams
10. Documenting/recording information	10. Monitoring and controlling resources	10. Training and teaching others
11. Performing administrative activities	11. Judging the qualities of things, services, or people	11. Guiding, directing, and motivating subordinates
	12. Making decisions and solving problems	12. Coaching and developing others
	13. Thinking creatively	13. Staffing organizational units
	14. Updating and using relevant knowledge	
	15. Developing objectives and strategies	
	16. Interpreting the meaning of information for others	
	17. Provide consultation and advice to others	

TABLE 2. Operational Definitions of Variables.

Variable	Operational definition
j	= Jobs, equal to 812 for tasks and jobs for the two data years, 753 for employment and 748 for wages in 2006, and 770 for employment and 767 for wages in 2016. The number of jobs for employment and wages varies, due to some jobs not having such data reported.
i	= Tasks, ranging from 1 to 41, as shown in Table 1.
t	= Data year, 2006 or 2016.
m	= Intelligence level of task i, rated by experts, ranging from 1 to 3.
I_{ijt}	= The importance of task i for job j at year t, which is transformed from the 1-5 scale in the raw data into the (0, 1) scale by $I = (I - 1) / 4$.
A_{ijt}	= Relative importance of task i to job j at year t, as compared with the other 40 tasks for job j at year t. $\sum_{jt} A_{ijt}$ adds to 1 across all tasks for job j at year t.
J_{jmt}	= The no. of workers for job j due to intelligence m at year t.
R_{im}	= Relative importance of the three intelligences. For task i, $R_{im} \in \{0, 1\}$, $\sum_{m} R_{im} = 1$.
B_{jmt}	= Relative importance of intelligence m to job j at year t, as compared with the other two intelligences to job j at year t, summed over all 41 tasks.
N_{jt}	= No. of workers employed in job j at year t.
W_{jt}	= Annual wages for job j at year t. Real wages are calculated based on CPI in 2003.
Calculate relative importance of task i in job j	
1. A^{*}_{ijt}	$I * ijt / \sum_{i} I_{ijt}$
2. B_{jmt}	$\sum_{i} (A_{ijt} R_{im})$, where $A_{ijt} \in [0, 1]$. $\sum_{m} B_{jmt} = 1$
Calculate workers in job j, due to intelligence m	
3. J_{jmt}	$B_{jmt} N_{jt}$
Calculate number of total workers due to intelligence m across all jobs	
4. T_{mt}	$\sum_{j} J_{jmt}$
Calculate average wage due to intelligence m across all jobs	
5. $\$_{mt}$	$\sum_{j} \left(B_{jmt} N_{jt} W_{jt} \right) / \sum_{j} \left(B_{jmt} N_{jt} \right)$
Calculate the year when the Feeling Economy will catch up to the Thinking Economy	
6. Y	$2016 + [(T(2016) - F(2016)) / (\Delta F - \Delta T)]$, where feeling task importance, F, in year y, $F(y) = F(2016) + (y - 2016)\Delta F$, $\Delta F = (F(2016) - F(2006))/10$, $\Delta T = (T(2016) - T(2006))/10$, Y = the year when the feeling tasks become more important than the thinking tasks.

Note: CPI = consumer price index.

FIGURE I. Relative task importance in 2016 and relative task importance shift 2006-2016 by intelligence.

Relative task importance to jobs by intelligence in 2016

Change in relative task importance to jobs by intelligence from 2006 to 2016

Note: Importance shift is calculated as (relative task importance$_{2016}$ − relative task importance$_{2006}$) / relative task importance$_{2006}$.

Equations 1 and 2 calculate the percentages of the tasks that are attributable to mechanical, thinking, and feeling intelligences based on our categorization. Equation 3 calculates the weighted average importance of each of the three intelligences across the 41 tasks weighted by the percentage importance of intelligence within the task. Equations 4 and 5 calculate employment and wages due to the three intelligences across all jobs. Equation 6 calculates when feeling tasks will become more important than thinking tasks.

Emergence of the Feeling Economy

Our empirical evidence shows that the shift to the Feeling Economy has already begun. Feeling tasks are becoming more important, and feeling employment and wages are growing. We further show which industries are likely to lead the emerging Feeling Economy. We also illustrate how the nature of jobs is becoming more feeling-oriented.

Feeling Tasks Are Becoming More Important

The left side of Figure 1 shows the relative importance of mechanical (24.7%), thinking (44.8%), and feeling (30.5%) tasks to human jobs in 2016, calculated on a total of 100 percentage based on the average importance rating of each task to jobs in the three intelligences. We observe that, in 2016, mechanical tasks had less importance than thinking tasks for human jobs (24.7% vs. 44.8%, $t = 81.53$, $p < .000$), with thinking tasks still more important on average than feeling tasks (44.8% vs. 30.5%, $t = 57.92$, $p < .000$), consistent with the Thinking Economy. Although the importance of feeling tasks is still less, on average, than thinking tasks, it is already more important than mechanical tasks (30.5% vs. 24.7%, $t = 23.60$, $p < .000$).

FIGURE 2. Change in relative task importance to jobs by intelligence from 2006 to 2016 by sector.

Change in relative task importance to jobs from 2006 to 2016 by sector

Change in relative task importance by intelligence

☐ Mechanical tasks ■ Thinking tasks ■ Feeling tasks
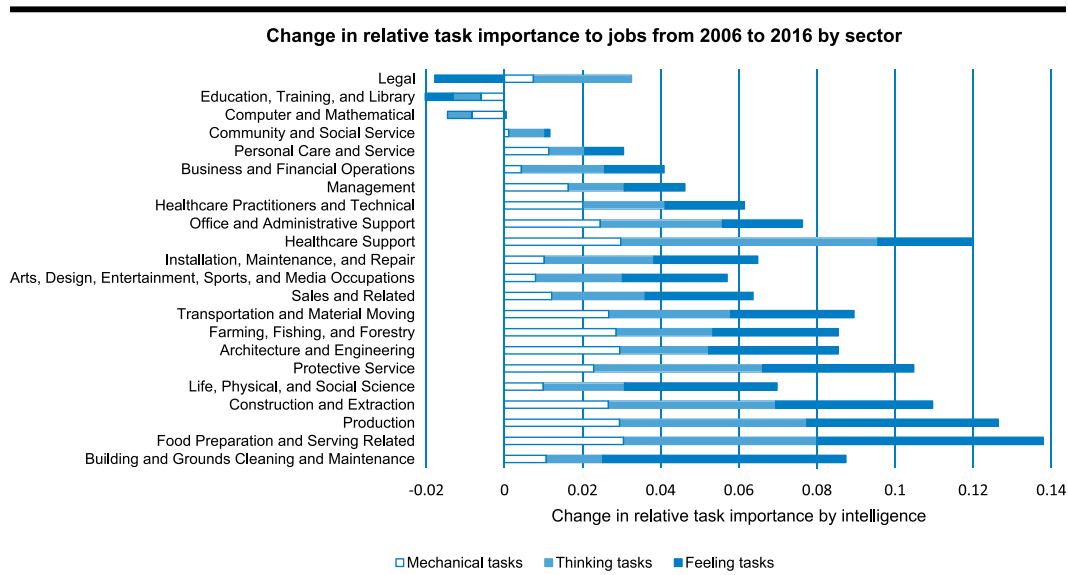
Note: Importance difference is the relative task importance$_{2016}$ − relative task importance$_{2006}$.

The right side of Figure 1 shows the change of relative task importance to human jobs by the three intelligences from 2006 to 2016. We see from the data that feeling tasks have been gaining in importance for human jobs (5.1%), while thinking tasks have been staying roughly constant in importance (0.5%), and mechanical tasks have suffered the largest importance decline over the last 10 years (−1.3%). Notably, the importance shift of thinking tasks is not significantly different from the importance shift of mechanical tasks (0.5% vs. −1.3%, $t = 1.32$, *n.s.*), but the importance shift of feeling tasks is significantly higher than both mechanical tasks (5.1% vs. −1.3%, $t = 4.81$, $p < .000$) and thinking tasks (5.1% vs. 0.5%, $t = 3.49$, $p < .001$).

The data imply that while the importance of thinking tasks to jobs is not changing very much, the importance of feeling tasks to jobs is growing significantly. It shows that although the Thinking Economy is still well-established, the Feeling Economy is approaching.

Figure 2 shows a sector breakdown of the change of relative task importance to jobs by the three intelligences between 2006 and 2016. It is clear that this shift toward feeling tasks is widespread, and includes most of the sectors, not just a few specific sectors.

When Will the Feeling Economy Arrive?

One may wonder how soon the Feeling Economy will arrive, meaning that feeling tasks have surpassed thinking tasks in average importance. We calculate the rate at which feeling task importance is catching up to thinking task importance using Equation 6 shown in Table 2.

FIGURE 3.   Shift of employment and wages toward feeling.
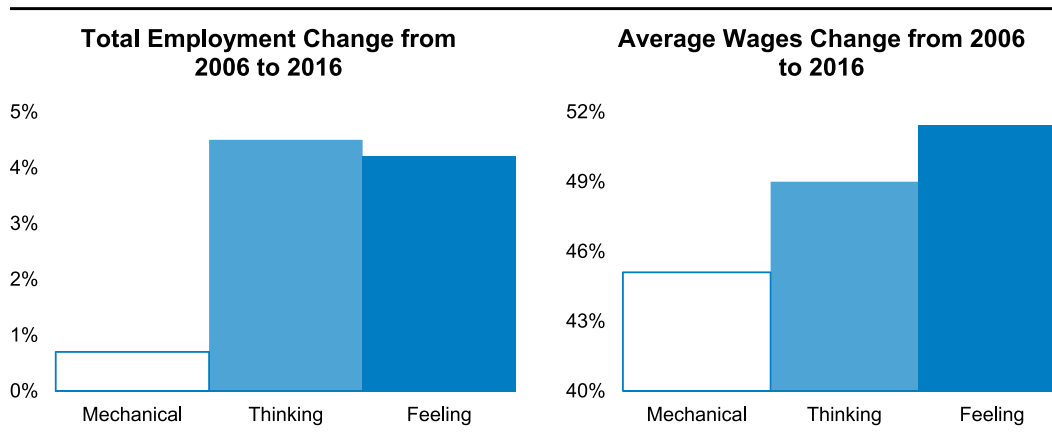
Note: Total employment change is calculated based on the relative task importance by intelligence to jobs following the equation $(\text{total employment}_{2016} - \text{total employment}_{2006}) / \text{total employment}_{2006}$. For average wage change, simply substitute total employment by average wage.

Based on a simple linear extrapolation, the Feeling Economy would fully overtake the Thinking Economy by the year 2036. This is consistent with an IBM AI expert prediction, based on the speed of progress in computing time and data storage, that AI will be capable of both cognition and commonsense reasoning, important elements of feeling intelligence, within the next 20 to 30 years.[26] Meanwhile, however, the economy is becoming more like the Feeling Economy every day, and managers need to adapt.

Feeling Employment and Wages Are Growing

We now investigate whether the employment and average wages attributable to feeling tasks are also growing.[27] The left side of Figure 3 shows the employment growth attributable to mechanical, thinking, and feeling tasks between 2006 and 2016. We see that, over this decade, both thinking tasks (4.5%) and feeling tasks (4.2%) have contributed about the same amount to employment increase, whereas the employment increase attributable to mechanical tasks has been small (0.7%). On the right side of Figure 3, we see that the average wages attributable to feeling tasks have increased more (51.4%) than the wages attributable to thinking tasks (49.0%), and also more than the wages attributable to mechanical tasks (45.1%).[28] Because wage rates result from supply and demand, this is evidence that the demand for employees with feeling skills is increasing, relative to employees with thinking skills. Thus, we see evidence that feeling tasks are increasing in importance, with respect to both employment and wages. Viewed as a whole, Figures 1 to 3 present a strong preliminary indication of the emergence of the Feeling Economy.

The Growing Feeling Industries

Which industries will gain importance in the Feeling Economy? We calculate the relative importance of each intelligence to jobs in 2016 for the 22
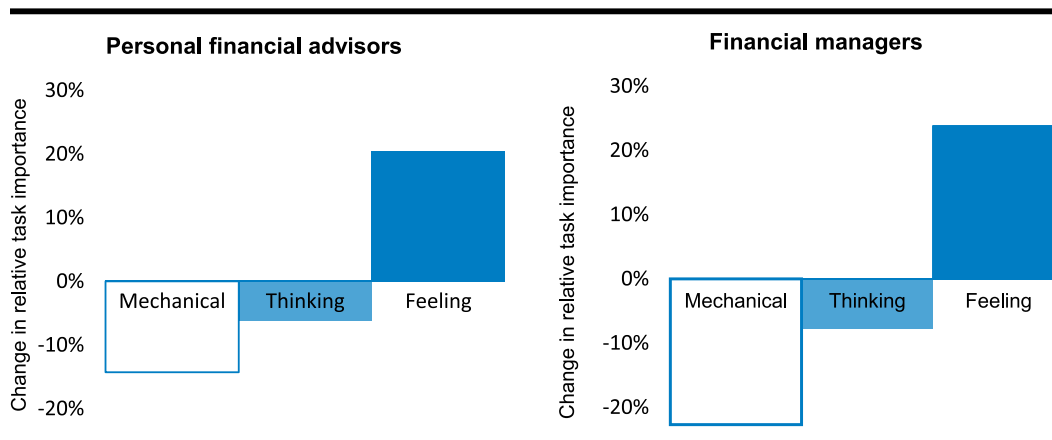
TABLE 3. The Top 10 Feeling Industries Ranked by the Relative Importance of Feeling Tasks to Jobs in 2016.

Industry	Jobs Illustrated
Community and Social Service	Health counselors; marriage and family therapists; child, family, and school social workers; health educators; religious workers
Sales and Related	First-line supervisors of retail-sales workers, retail salespersons, insurance sales agents, sales representatives of technical and scientific products, service sales agents
Personal Care and Service	First-line supervisors of personal service workers, animal trainers and caretakers, entertainment attendants, hairdressers, hairstylists, and cosmetologists, concierges, tour guides and escorts, childcare workers, personal care aides, fitness trainers
Management	Marketing, financial, training and development managers; education administrators; medical and health service managers
Food Preparation and Serving Related	Chefs and head cooks, first-line supervisors of food preparation and serving workers, bartenders, waiters, and waitresses
Education, Training, and Library	Business, biological science, environmental science, anthropology and archeology, economics, political science, psychology, sociology, health specialties
Protective Service	Forest fire inspectors and prevention specialists, private detectives and investigators, security guards
Business and Financial Operations	Management analysts; meeting, convention, and event planners; fundraisers; market research analysts and marketing specialists; financial analysts; personal financial advisors; financial specialists
Healthcare Practitioners and Technical	Dentists, orthodontists, optometrists, pediatricians, psychiatrists, physicians and surgeons, podiatrists, therapists, speech-language pathologists, veterinarians
Healthcare Support	Home health aides, nursing assistants, occupational therapy assistants, massage therapists, medical assistants, veterinary assistants

industries in the O*NET data. Table 3 shows the 10 industries for which feeling tasks are more important to jobs than other industries. They include community and social service, sales and related, personal care and service, management, and food preparation and serving related.[29] All those are high-touch services and are intensive in social interaction, emotion, and communication.

We further calculate the average employment growth from 2006 to 2016 of the top 10 feeling industries. Figure 4 shows that the growth of feeling employment is mainly driven by the personal care and service (21%), followed by the business and financial operations (16%), the community and social service (14%), and the healthcare practitioners and technical (13%) industries. The growth momentum is also strong for the management (8%) and the education, training, and library (8%) sectors.

FIGURE 4. Change in relative task importance by intelligence for personal financial advisors and financial managers from 2006 to 2016.

Personal financial advisors

Change in relative task importance

30%

20%

10%

0%   Mechanical   Thinking   Feeling

-10%

-20%

Financial managers

Change in relative task importance

30%

20%

10%

0%   Mechanical   Thinking   Feeling

-10%

-20%

Note: Change in task imporance by intelligence is calculated as (relative task importance$_{2016}$ − relative task importance$_{2006}$) / relative task importance$_{2006}$ for the three intelligences.

Jobs Are Becoming More Feeling-Oriented

To illustrate the change in the nature of jobs, we examine data for personal financial advisors and financial managers about the intelligences required for their jobs. Personal financial advisors "advise clients on financial plans using knowledge of tax and investment strategies, securities, insurance, pension plans, and real estate. Duties include assessing clients' assets, liabilities, cash flow, insurance coverage, tax status, and financial objectives," whereas financial managers "plan, direct, or coordinate accounting, investing, banking, insurance, securities, and other financial activities of a branch, office, or department of an establishment."[30]

An important trend now in Finance is Fintech and Robo-advising, providing automated analytical financial planning services to customers, with limited human involvement. Based on our theory, this trend should drive the personal financial advisor job to be more feeling-oriented. The government data confirm this view (see Figure 4). We see a dramatic change in the nature of the personal financial advisor and financial manager jobs in the last decade: in 2016, feeling tasks were much more important to the two jobs (20.5% gain in importance for personal financial advisors and 23.8% gain in importance for financial managers) than in 2006, whereas thinking tasks become less important (6.3% decline for personal financial advisors and 7.8% decline for financial managers). Even for financial managers, who are mainly responsible for the financial health of an organization, their job shows an even stronger emphasis for feeling tasks than the personal financial advisor job does.

We further investigate how the most important tasks for personal financial advisors and financial managers have changed between 2006 and 2016. For personal financial advisors, in 2006, getting, processing, and analyzing data and information (mechanical and thinking tasks) were all among the most important,

whereas in 2016, establishing and maintaining interpersonal relationships (feeling tasks) surpass many mechanical and thinking tasks to become one of the most important tasks for the job. Similarly, for financial managers, in 2006, getting, processing, and evaluating information (mechanical and thinking tasks) were among the most important, whereas by 2016, communicating, relationship interacting, and team building (feeling tasks) become the more important tasks.

Even if different jobs require different intelligence compositions of tasks, we observe a general trend that, similar to what we see for personal financial advisors and financial managers, many jobs that have traditionally emphasized thinking intelligence are becoming more feeling-oriented. In 2006, for example, biochemists and biophysicists required almost no feeling intelligence (7.9%), but, by 2016, their job requirement for feeling intelligence surged to 25.5%. Specifically, feeling tasks such as training and teaching others (task importance $_{2006 \text{ vs. } 2016}$ = 1.50 vs. 3.95) and guiding, directing, and motivating subordinates (task importance $_{2006 \text{ vs. } 2016}$ = 1.16 vs. 3.86) are much more important for biochemists and biophysicists in 2016. Similarly, for statisticians, in 2006, the job required high thinking intelligence (55.6%) but much lower feeling intelligence (26.5%), while, in 2016, they required somewhat less thinking intelligence (from 55.6% to 51.8%) and more feeling intelligence (from 26.5% to 31.2%). For example, feeling tasks such as establishing and maintaining interpersonal relationships (task importance $_{2006 \text{ vs. } 2016}$ = 3.3 vs. 3.8) and coordinating the work and activities of others (task importance $_{2006 \text{ vs. } 2016}$ = 2.74 vs. 3.6) all become more important tasks for statisticians in 2016.[31] When AI is capable of doing the thinking tasks, we see even jobs that traditionally emphasized thinking tasks emphasizing feeling tasks more and thinking tasks less.

This may be thought of as "upgrading" the job to require a higher level of human intelligence. We show that this upgrading of a job to more feeling intelligence is reflected by higher pay. For example, the employment of biochemists and biophysicists gained 56.3%, while the employment of statisticians increased 70.1%, compared with the national average of 3.1% total employment increase between 2006 and 2016. Thus, the shifting of a job from thinking to feeling does not necessarily imply the loss of that job—but may rather result in a change in the nature of the job that makes the job more effective. Teaming up with AI is not necessarily a job killer, but the nature of the job may need to change.

Managing in the Next Generation of AI

The empirical evidence confirms our prediction that as AI develops from mechanical to thinking to feeling, the feeling tasks within human jobs are becoming more important, and are projected to surpass the importance of thinking tasks. We also observe that feeling wages are growing faster than thinking wages. What do all these mean to human jobs and the future of the economy? How can we be more prepared for it? We provide the following implications for managers, employees, consumers, businesses, educators, and researchers to

TABLE 4. Managing in the Next Generation of AI.

Stakeholder	Implications
Managers	• Think of AI and human workers as a team • Transform jobs to be more people-oriented • Shift emphasis in hiring from analytical ability to people skills
Employees	• Increase emphasis on feeling intelligence and people skills • Learn to work with AI
Consumers	• Recognize that consumers are increasingly feeling- and relationship-oriented • Be more responsive to consumers' emotional needs
Businesses	• Add feeling components to the business • Become more feeling intelligent • Emphasize feeling more when marketing to consumers
Researchers	• Explore non-AI contributing factors to the Feeling Economy • Relate the Feeling Economy to other constructs, for nomological validity • Further characterize the Feeling Economy • Investigate changes in the intelligence composition of jobs • Explore the boundaries of the Feeling Economy
Educators	• Emphasize education on emotional intelligence and place somewhat less weight on thinking intelligence • Teach human–AI collaboration

Note: AI = artificial intelligence.

manage in the next generation of AI. Table 4 summarizes some important implications for various stakeholders.

Implications for Managers

• *Think of AI and Human Workers as a Team.* The nature of jobs will change. Within specific jobs, feeling tasks will become more important to human workers, leaving more of the thinking tasks to AI. It means that AI and human workers need to work as a team. Different jobs have different task requirement compositions. For machine-human collaboration, typically, AI will assume an increasing number of the thinking tasks, and human workers will spend more of their time on feeling tasks and interactions with others. Human workers will need thinking skills only to the extent that they can pose thinking problems that can be solved by AI, and can explain to others what AI has done. For example, AI professionals in organizations can serve as the interface between AI and human workers to prevent employees from blindly relying on AI decisions.

• *Transform Jobs to Be More People-Oriented.* Jobs that are dominated by thinking intelligence need to restructure their task portfolio to focus more on

feeling tasks. For example, managerial jobs need to be more people-oriented and feeling-conscious, as do the people performing the jobs. Even for computer-related jobs, the task focus will shift from coding and programming to supervising, controlling, and maintaining AI/algorithms, tasks that emphasize the management of AI in jobs.

- *Shift Emphasis in Hiring from Analytical Ability to People Skills.* In the Feeling Economy, the most successful workers will be those who can manage relationships in an empathetic and emotionally intelligent way. When AI is performing more thinking tasks that, until now, have been traditionally dominated by men, women may be in a better position in the job market because, increasingly, jobs will require more feeling intelligence.[32] It has been found that the proportion of skilled women in cognitive/high-wage jobs increases, because when emotional skills become more important for jobs, females are (on average) more suited than males to do those jobs.[33] The implications are that the criteria for hiring need to shift in this direction. Workers who are strong on emotional and relationship skills will tend to be more valuable than antisocial cognitive stars ("geeks").

Implications for Employees

- *Increase Emphasis on Feeling Intelligence and People Skills.* As AI becomes more capable of cognitive thinking, thinking workers must find new tasks or jobs to do, most likely with a greater feeling or interpersonal component. When people no longer need to think as much on their jobs, employers will place less weight on cognitive and analytical ability, and more weight on feeling intelligence and people skills. As a result, workers will need to become more sensitive to the feeling side of jobs. It is already noted that people management, coordination with others, emotional intelligence, and negotiation are all top skills in strong demand in the future, according to a recent *Business Insider* article.[34]

- *Learn to Work with AI.* Rather than worrying about whether someday AI is going to take over their jobs, it is more constructive for employees to learn how to work with AI in their jobs. Although most workers will not be AI experts, they need to have knowledge of AI's strengths and weaknesses, and must be able to communicate with AI. They must think of AI as a team member whose skills must be utilized. Typically, this will mean AI focusing on thinking tasks, and human workers focusing on feeling tasks.

Implications for Consumers

- *Recognize That Consumers Are Increasingly Feeling- and Relationship-Oriented.* Consumers, especially young consumers, are already accustomed to anywhere-anytime interaction through computers and smartphones on social media. This shift toward constant interaction results in both greater emotional intelligence and greater reliance on feeling and social interaction for consumption decisions. For example, we have witnessed the unprecedented use of emotional shorthand, such as emoji on AI-facilitated social interactions.[35] Those

interactions seem to have different norms involving empathic and warm communication through text and symbol. Firms need to interact with such consumers in a different way.

- *Respond to Consumers' Emotional Needs.* Technology is already responding to this consumer need. It is observed that customers increasingly interact with brands using an AI-managed conversational interface, for example, talking to Expedia's bot about travel booking and planning, or using Amazon's Alexa and IBM's Watson on 1-800-Flowers to order and to obtain customer support.[36] These cases show the importance of meeting customers' interactional and emotional needs in the Feeling Economy.

Implications for Businesses

- *Add Feeling Components to the Business.* Just as the displacement of mechanical tasks created opportunities for thinking (information-based) companies and products (e.g., Microsoft), the displacement by AI of thinking tasks will create new opportunities for feeling-oriented companies and products. Firms need to focus more on the feeling and empathetic nature of business. For example, the search engine Google has logos for different historical figures and has an April Fools' joke each year, which add a feeling aspect to its information service, a distinctive example of a firm utilizing feeling intelligence.

- *Become More Feeling Intelligent.* When consumers focus more on their feelings, firms need to be more attuned to these emotional needs to get (and keep) business. It means many of the calculation-based, rationally thinking economics, management, and marketing models to predict consumer preference may need to change. Scholars have long recognized that there are two ways to appeal to consumers—a rational appeal or a directly emotional appeal—yet the emotional appeal has traditionally been treated as only *peripheral*, not as important as the *central* rational appeal.[37] In the Feeling Economy, firms need to recognize that feeling is no longer peripheral.

- *Emphasize Feeling More When Marketing to Consumers.* Smart entrepreneurs are already thinking this way. It is no accident that Facebook, Instagram, and Twitter are among the most widely used companies on the planet. Furthermore, feeling intelligence may become a comparative advantage for countries with diverse populations, such as the United States, in global economic competition. Even if more authoritarian countries have a comparative advantage in the other two intelligences, they may have less capability in managing feeling intelligence. The winning strategy for the more advanced economies is to emphasize feeling intelligence, rather than going back to the Mechanical Economy to compete for lower cost production or continuing to emphasize the Thinking Economy to compete with thinking AI head-to-head.

Implications for Researchers

- *Explore Non-AI Contributing Factors to the Feeling Economy.* We observe the shift toward the Feeling Economy, but factors other than AI that also contribute to this shift can be explored. We recognize several factors that may tend to

exacerbate the trend toward the Feeling Economy. One factor is demographics. For example, the aging of the population will require more support people helping the aged, resulting in more feeling jobs and increased demand for feeling intelligence. Another factor is population density. As population density increases, we may need to emphasize interpersonal tasks more, all other things being equal. Also, in our data, we see that feeling intelligence has become more important even for mechanical jobs, an indication that as AI is capable of doing more mechanical tasks (i.e., automation, healthcare robots), human workers need to be more feeling-oriented in those mechanical jobs, or move to jobs with more of a feeling component.

- *Relate the Feeling Economy to Other Constructs for Nomological Validity.* For example, some may feel that the Feeling Economy shares some conceptual similarity with the experience economy idea.[38] We contend that the two are distinct. The experience economy has the core idea that experiences are a distinct economic offering, with all goods and services providing value to the customer only at the moment of use,[39] whereas in the Feeling Economy, the advance of thinking AI intelligence pushes human workers to emphasize empathetic tasks, which do not necessarily involve offering experiences as products. Relating the Feeling Economy to similar concepts can further establish the nomological validity of the Feeling Economy.

- *Further Characterize the Feeling Economy.* Our theoretical model and empirical evidence support our assertion that in the Feeling Economy, people skills and emotional intelligence will become even more important to a majority of jobs, not just important to a few specific sectors or jobs. Although people skills and emotional intelligence have always been important to many jobs, our data show that they are becoming even more important. Researchers need to both chronicle and predict the advance of the Feeling Economy across different sectors and jobs. A related issue is what do we mean by feeling tasks? Are some of them more about interpersonal relationships, and some more about feeling? What is the most useful way to categorize feeling tasks, to provide the best insights? This is related to the observation that when consumers use more emoji in their social media interactions, the nature of feeling involved in such AI-enabled social interactions may not be the same as the nature of feeling involved in face-to-face social interaction. Further characterizing feeling intelligence and feeling tasks as a result of AI advances can provide a more complete picture of the Feeling Economy.

- *Investigate Changes in the Intelligence Composition of Jobs.* Almost all jobs contain tasks from all three intelligences, not just one. Therefore, it is misleading to think the intelligence composition of jobs is fixed and that job loss is only related to a certain intelligence level. Think of telephone customer service representatives. A couple of decades ago, calling a company on the phone meant talking directly to a representative. Today, one is more likely to encounter an automated phone menu. The result is that companies do not need as many customer service representatives, and the ones that remain have a higher level job, because they spend less time on routine matters

(that AI can handle through the phone menu). Thus, we see that the jobs are transformed.

- *Explore the Boundaries of the Feeling Economy.* AI is slowly making inroads into creativity and feeling intelligence. What can, will, or should human employees do once AI can also be creative and feel? Those are currently technological bottlenecks for AI, but deep learning and convolutional neural networks are advancing toward computational creativity.[40] The progress of AI in creativity and intuition suggests that AI is getting increasingly better at these kinds of tasks (although often not yet cost-efficiently or with acceptable quality at present). There is already a considerable amount of creative work that is augmented by AI. For example, music-making AI software is used to compose songs,[41] and IBM Watson AI has been used to write the script for a Lexus car ad.[42] These real-world examples show that the boundaries of the Feeling Economy can eventually be blurred, as AI becomes capable of creativity and feeling.

Implications for Educators

- *Emphasize Education on Emotional Intelligence and Place Somewhat Less Weight on Thinking Intelligence.* The educational system has traditionally emphasized thinking, to the extent that it is virtually unquestioned that the primary purpose of education is to teach people to think in a disciplined way. For some time now, thinking intelligence has been highly prized and heavily rewarded. For example, we observe a strong shift to Business Analytics programs, and to more analytics in functional courses (such as Marketing) for business students, as a response to thinking AI (e.g., big data, machine learning, cloud computing). Although such skills continue to be highly important, as AI progresses further, analytics may not be the right curriculum for getting students ready for the Feeling Economy. We see the task and job shift in the business world, yet we have not seen this shift in curriculum. Now, however, we are beginning to see that AI is increasingly able to perform thinking tasks, for both businesses and consumers. The result is that education needs to move in the direction of feeling intelligence, with more emphasis on interpersonal relationships, in both school admissions and curriculum, and somewhat less emphasis on cognitive measures (e.g., math SAT scores) and training.

- *Teach Human–AI Collaboration.* The proposed shift of curriculum to emphasize people skills suggests more that such a shift can enhance human-AI complementarity, rather than just implying competition. It is well known in the academic world that most students now spend much more time letting technology do most of the calculation or analytical thinking for them, through computers and smartphones. When AI is able to handle the thinking tasks, we should teach students to be good at feeling. This applies to formal education as well as child development. For example, nowadays, children are acquainted with various AI products, and the way they interact with AI products is a developmental process that parents can supervise and educate to facilitate human-AI collaboration.

Conclusion

As the Feeling Economy emerges, organizations need to manage differently to cope with this new generation of AI. The current emphasis on thinking and analytics, although undeniably important today, will inevitably decline for human workers, as AI assumes more thinking tasks, resulting in an increased emphasis on feeling, empathy, and emotional intelligence for human workers. The most successful new companies will take advantage of this trend. Workers can best safeguard their jobs by enhancing their feeling and empathetic skills and gravitating toward jobs that emphasize those tasks. The Feeling Economy will threaten some jobs, transform others, and also provide exciting new business opportunities. Managers can succeed in the Feeling Economy by increasingly using AI to perform the thinking tasks, and shifting the emphasis of human workers from thinking to emotion, empathy, and personal relationship skills.

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Author Biographies

Ming-Hui Huang is Distinguished Professor in the Department of Information Management at National Taiwan University, where she focuses on the impact of technology on management and strategy (email: huangmh@ntu.edu.tw).

Roland Rust is Distinguished University Professor and David Bruce Smith Chair in Marketing at the Robert H. Smith School of Business at the University of Maryland, holds a joint appointment at Erasmus University, and is International Research Fellow at the University of Oxford (email: rrust@rhsmith.umd.edu).

Vojislav Maksimovic is the William A. Longbrake Chair in Finance at the Robert H. Smith School of Business at the University of Maryland (email: vmaksimo@rhsmith.umd.edu).

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