

# A FUTURE OF WORK AND ORGANIZATIONS



©shutterstock/metamorworks

*Future organizations will be flash powered - recruiting freelancers looking for high-autonomy work and engaging them in a collective production process - to generate innovative solutions for complex business and societal problems. Arvind Malhotra, Ann Majchrzak, and Alpheus Bingham present frameworks through which to understand the rapidly evolving nature of work and organizations and to address the resulting issues.*

## **Arvind Malhotra**

Kenan-Flagler Business School,  
University of North Carolina at  
Chapel Hill

## **Ann Majchrzak**

Marshall School of Business,  
University of Southern California

## **Alpheus Bingham**

InnoCentive

A recent study found that 91 percent of organizations depend on external experts to execute some or most of their work.<sup>1</sup> The most common areas where external help is routinely sought are software development, product testing, product ideation, etc. Organizations are also turning more and more to external experts for creative work such as designing marketing materials, developing new products, and even business forecasting. This change, as well as the rising interest in autonomy, reveals extremely important clues as to the kind of work people are interested in. The increase in gig work, in which individuals work as “independent contractors or consultants on specific tasks for a specific duration,”<sup>2</sup> has been linked to the rising demand for work autonomy. McKinsey estimates that 20 to 30 percent of workers in the US and European economies are now engaged in some form of gig work.<sup>3</sup> Another report by Randstad<sup>4</sup> estimates that,

by 2025, most of the workforce will do some form of gig work (i.e., contractor, consultant, temporary, or freelance).

**Autonomous workers perform better, are more satisfied with their jobs, and are more creative. They also learn continuously.**

### Autonomy as a Critical Driver of the Future of Work

As many organizations know, people are happier and more effective if they feel their work is meaningful. One thing that contributes to this sense of meaning is autonomy.<sup>5</sup> Years of research have revealed that autonomous workers perform better, are more satisfied with their jobs, and are more creative. They also learn continuously.<sup>6</sup>

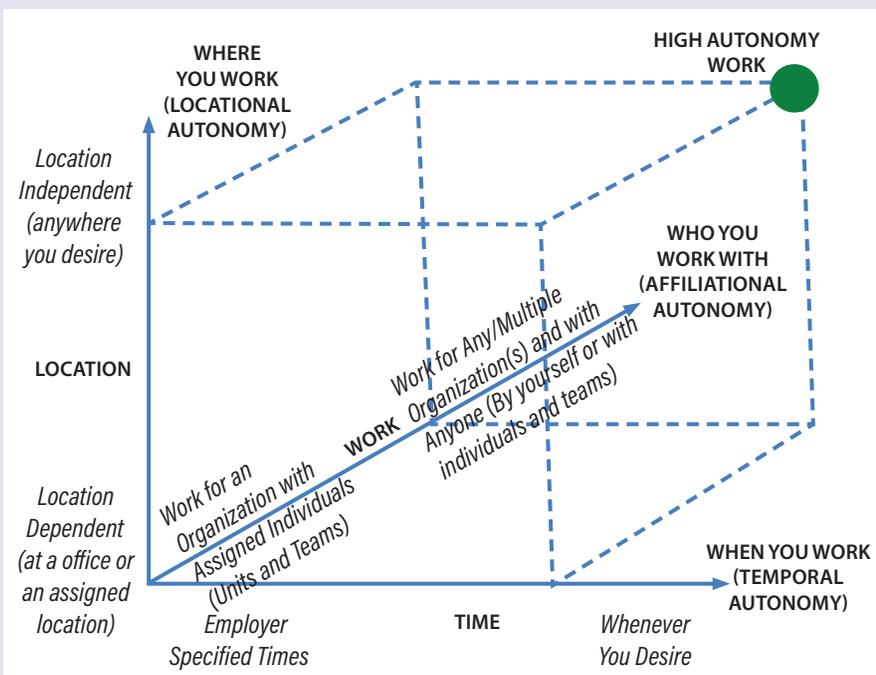
Work autonomy is multidimensional and grounded in a variety of concepts such as choice, ownership, and independence.<sup>7</sup> Figure 1 presents three forms of autonomy which are particularly crucial to the future of work: flexibility of location, time, and affiliation. Workers whose skills are suitable to a gig economy, and have not been automated, will have an ever-increasing choice as to where they work, when they work, and with and for whom they work.

With the ubiquity of the internet and its platforms for trading skills for pay, workers in the gig economy enjoy both locational and temporal autonomy. Uber drivers have the flexibility to organize their work so they can pick up children from school, while experts in developing countries can sell their knowledge internationally without leaving home. This constantly evolving work has also been termed “agile work,” whereby workers can work anytime, not just during set hours, and work anywhere, not just from the confines of a conventional office.<sup>8</sup>

Workers in the gig economy often also achieve affiliative autonomy, by choosing the organization, team, or colleagues with whom they prefer to work. By maintaining a network of employers to choose from, they can make their own decisions, sharing only temporary affiliations with their employers. In an ideal world, affiliative autonomy allows individuals to perform tasks that resonate with their deeply embedded interests and beliefs rather than tasks assigned by managers.

While some organizations may exploit gig workers by dramatically underpaying them for their work, there is another side to the gig economy. People who are not satisfied with routine work can instead share their knowledge and ideas about difficult and complex problems in ways that benefit a company, a community, or the world. For example, many people are energized

**Figure 1:** The Three Dimensions of Autonomy in the Future of Work



when their passions and interests intersect with a sponsored open innovation challenge. When people collaborate over the internet to solve a particular problem or question, they become a flash crowd, working together for only a few days during which the innovation challenge occurs.

Historically, companies have largely used innovation challenges to fulfill specific one-time needs such as finding new product ideas or solving algorithmic problems. More and more, however, organizations are learning to use flash crowds routinely, to provide a continuous infusion of new expertise, talent, and resources that helps them to maintain close connections with stakeholders while remaining agile enough to pivot instantaneously when necessary. We consider these organizations to be flash powered.

### Flash Powered Organizations

These emerging flash powered organizations are those that most effectively use crowds – globally dis-

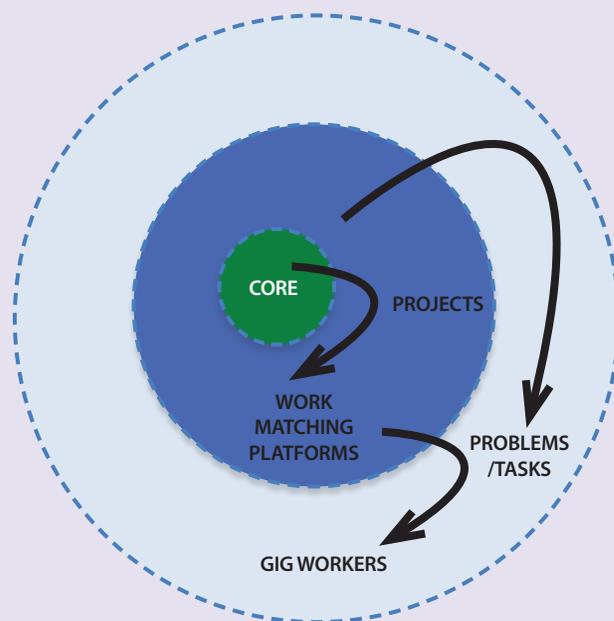
**It will be critical for future organizations to design projects so that crowds of gig workers can accomplish them with little dependence on the organization for resources.**

tributed collections of autonomous workers who cooperate for a short time to solve particular problems.<sup>9</sup> Flash crowds, which are central rather than supplementary to flash powered organizations, are different from those conventionally used for crowdsourcing. They address considerably more complex problems that have not been broken down into simple modules. They examine the entirety of these problems and attempt to simultaneously define and solve them. Flash crowds also coalesce for short periods, a few days rather than months or years. They combine a diversity of perspectives in collaborating to find comprehensive solutions to com-

plex problems rather than just submitting individual ideas. Members of these flash crowds bring their own passion and expertise to each challenge, so organizations do not need to own all of the assets involved. In Figure 2, we envision future organizations that use crowds of autonomous workers with a minimal core who orchestrate those crowds either directly or through work matching platforms (e.g. Upwork, Freelancer, Fiverr, FlexJobs, Gigster, Hyr, and Liveops). InnoCentive, for example, is a very successful platform that matches companies with highly creative and technically advanced gig workers who perform the complex scientific and technical tasks necessary for innovation. It will be critical, then, for future organizations to design projects so that crowds of gig workers can accomplish them with little dependence on the organization for resources. Some of these organizations will then amalgamate the resulting work into commercial products and services. As traditional organizations move towards flash power, they will need fundamentally different organizational skills in order to orchestrate networks of gig workers rather than supervising internal units of full-time employees. Many organizations will initially choose to work through existing platforms, such as Upwork, whose orchestration capabilities are already in place. As they become more comfortable with being flash powered, they may find it more effective to create their own work allocation systems. These choices about how to manage a gig workforce are analogous to past make-versus-buy decisions except that the decision will pertain to human intellectual capital. Human resource departments will thus transcend their historic role as personnel departments, and not in name only.

As the sources of innovation move outside the company structure, flash powered organizations

**Figure 2:** Future of Organizations: Leveraging an Autonomous Workforce



will become more prevalent. Some, such as HTT and ConSenSys, a blockchain-enabled organization, are already beginning to design themselves exclusively for flash power.<sup>10</sup>

Glimpses of this future have been visible for some time. Early on, pharmaceutical and chemical companies began using the InnoCentive platform to globally broadcast their complex technical and scientific problems to registered freelance solvers. Internal employees then incorporate the flash crowd's solutions into new and existing projects. IBM's long running experiment with Innovation Jam<sup>11</sup> offers another way that flash powered organizations can be operated. Thousands of people, many of whom have a direct stake in the organization, come together to engage in deep and knowledgeable conversations which become the basis for the company's strategies for the future. Landcare Research, Inc., a New Zealand based governmental research institute which does applied research on the management and eradication of invasive pests, also used a flash crowd of stakeholders to inform its strategic planning.<sup>12</sup> IBM's recent acquisition Red Hat is another indicator of the growing importance of flash power. From its early days, Red Hat used flash crowds of software developers to create open-source software. The company's internal employees worked with these outside experts before bringing the software in-house and incorporating it with customer input.<sup>13</sup>

Flash powered organizations will increasingly choreograph the interactions between providers, creating rules of interaction, regulating the flow of information, and resolving conflicts.

As flash powered organizations become prevalent, research, as well as practice, needs to delve deeper into the most efficient and effective ways for work to be accomplished. Some organizations may become purely flash powered, with almost all their workers outside. Uber and Lyft are already showing signs of being purely flash powered. Such organizations serve as intermediaries, centralizing specific services. Flash powered organizations will increasingly choreograph the interactions between providers, creating rules of interaction, regulating the flow of information, and resolving conflicts.<sup>14</sup> Pure flash powered organizations may be feasible only when the services being performed are highly standardized, repetitive, and suitable for remote monitoring. Most other organizations may continue to be only partly flash powered, using outside expertise for either basic, clearly definable tasks or more esoteric and unique innovations. These companies will need to main-

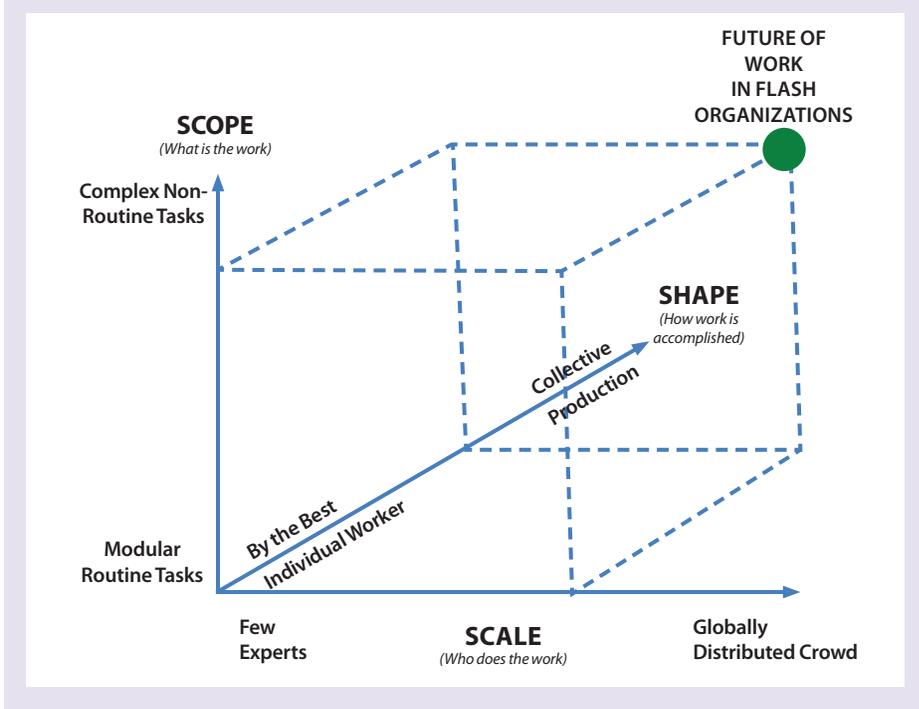
tain a sizable internal employee base to filter, amalgamate, and implement the work of the flash crowds.

### The Execution of the Future of Work: A Collective Production View

The future of work has first manifested itself in the use of gig workers to execute routine tasks on demand through platforms such as Amazon's Mechanical Turk. Nonetheless, flash powered organizations will increasingly have to rely on crowds to solve more complex problems such as those requiring radical innovation or addressing complex social issues.

The complexity and breadth of these more intricate problems, which often have several interdependent facets, is such that, in many instances, no single gig worker can solve them. This problem is further complicated by the need for useful novelty, a quality of being both new and also practically feasible.<sup>15</sup> Relatively anonymous individuals who are far apart geographically

Figure 3: The Dimensions of the Future of Work<sup>17</sup>



---

will have to work well together on complex tasks and produce usable solutions.<sup>16</sup> In order to move from a conventional process, that relies on a finite group of internal experts, to a collective production model, three dimensions of work will need to change, as shown in Figure 3. These dimensions are: scope, scale, and shape. Scope refers simply to the complexity of the problem presented to the crowd. Is it an intricate problem that has been broken down into simpler parts to be solved independently? Is the problem instead presented as a whole, with interdependent components and sometimes conflicting objectives? Scale refers to whether the work is presented to a few (often internal) experts or broadcast to a much broader group, often globally distributed, working largely outside the organization. Finally, shape describes the manner in which work will be accomplished. The work can either be allocated to the best possible individual or, if one person cannot be expected to finish it alone, assigned to a collective production process in which many individuals, who may not be identified in advance, work together to get the job done.

Figure 3 shows a progression toward an ideal point in the future of work in which flash-powered organizations employ many individual specialists who work collectively to solve complex problems. While traditional crowdsourcing has already approached this scale and scope, it has not fully embraced the collective production view which differentiates the future of work. The collective production method that underlies the future of work in a flash powered organization necessitates a crowd which responds to innovation challenges by sharing the diverse knowledge and perspectives of all its members. Exploring this knowledge diversity invariably introduces more refined descrip-

tions of the questions, relevant personal experiences, previous solution attempts, and new ideas for solutions.

---

**Collective production requires autonomous workers to freely share their knowledge. Managing such crowds will require the orchestration of individual interests rather than traditional hierarchical command and control management.**

---

This collective production process is different from that of designated experts working as a team inside the organization. Collective production requires autonomous workers to freely share their knowledge. This collective knowledge is drawn from a dynamic pool of independent experts rather than a static team of internal experts. Since the crowd is sharing out of interest, rather than contractual obligation, their motives are different from those of full-time employees. Managing such crowds will require the orchestration of individual interests rather than traditional hierarchical command and control management. For both flash powered organizations and autonomous workers, collective production has a distinct advantage. It is difficult to determine in advance what sort of expertise will be needed to solve complex problems as they emerge. As long as the organization can draw a wide range of gig workers, the likelihood of obtaining the requisite variety of expertise increases. Because the workers are drawn together from diverse backgrounds, they will tend to challenge conventional

notions of how work ‘should’ be done, instead discovering alternative ways to solve problems, and in the process creating further innovations. Collective production also allows workers to exercise their autonomy, selecting work that matches their interests. Each individual can join flash powered organizations and crowds that promise them the greatest potential for learning and professional satisfaction, which will make their work more personally meaningful. Flash powered organizations that cannot provide learning opportunities will find it harder to reap the benefits of this new system.

### **The Execution of Work: Scenarios for the Co-Existence of Autonomy and Automation**

While the future of work promises a much higher degree of autonomy than ever before, that freedom does come at a cost. Such a system could lead to “a dystopian future of disenfranchised workers hunting for their next wedge of piecework”<sup>18</sup> and to lower wages as work becomes commodified in the gig economy. Another major emerging cause of anxiety related to the future of work is the fear that human workers will be displaced by artificial intelligence and robots. While this concern is neither new nor unforeseen,<sup>19</sup> technological development in recent years has accelerated a dash to the future in which robots performing routine mechanical and service work seems more imminent.<sup>20</sup> Uber drivers, for example, may be just a temporary stopgap on the way to ride-sharing in fully autonomous cars. In response to this concern, it has been proposed that the human work of the future will emphasize three categories: solving unstructured problems, working with new information, and performing non-routine manual work.<sup>21</sup>

**Work that requires processing volumes of information (particularly at too great a rate for human cognition) but is repetitive will be handled by AI and robots.**

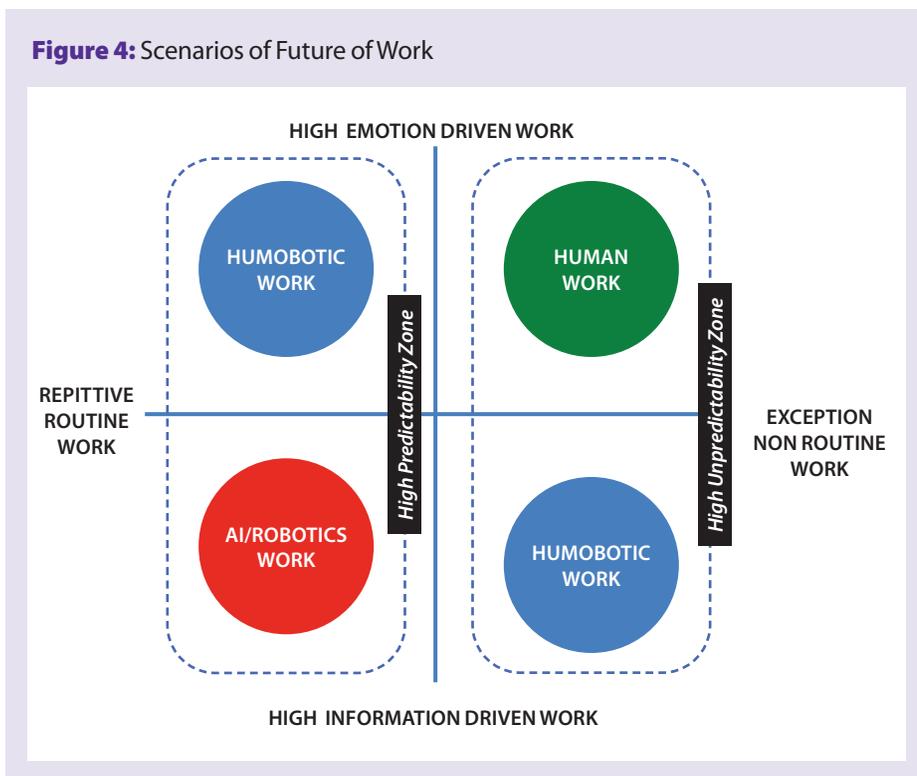
We suggest at least four potential scenarios for the future of work (Figure 4). One factor is whether the work is driven by information or human emotion. Some tasks require processing a volume of information while others require an understanding of human emotions or sensations. The second factor is whether the work is repetitive or unstructured. Using these two factors, we envisage four categories that describe the future of work. Work that requires processing volumes of information (particularly at too great a rate for human cognition) but is repetitive will be handled by AI and robots.

Within this zone machines will displace humans. Even now, with the advent of autonomous cars and the ubiquity of microsensors (the internet of things), we can easily envision work such as taxi and ride-share driving no longer being in the human domain in the very near future.

In two of the scenarios shown in Figure 4, we see intensive synergies between humans and machines. We label this as humobotic work. When the work is routine and repetitive but requires high emotional intelligence, we envision machines performing the informational analysis while humans make the final judgments and deliver the results in a human-centric way. Health care is already being delivered in this way in remote areas of Canada.<sup>22</sup> Doctors can interact with and diagnose their patients remotely through a telestrator or robot. The robot is then left to carry out the routine work on its own. In the very near future, the robot/machine may gather input from the patient,

process that information, and even make an initial diagnosis. Once that's done, the human doctor can interact with the patient and decide which treatment to apply. In such humobotic work, the human is responsible for the perceptive and emotional part of the work while the robot does the background work of processing information. The machine may someday process the information it has gathered and convey it to a crowd of gig work doctors who can then collaborate to tell it how to proceed in delivering necessary health care to the patient. The information could even be broadcast so that the best available doctors can collectively design a treatment plan. In another humobotic scenario, the machine processes high volume information that the human then applies to a non-routine task. Alternatively, the machine can be used to perform intense physical labor. Humans would then be free to do value-added work. This is already the case with Amazon and Gap, where robots are used to fulfill orders so that human bandwidth can be devoted to work which brings value to the company. Another example of humobotic work is when humans interact intensively with machines in order to train those machines to perform certain tasks correctly.<sup>23</sup> The da Vinci surgical system represents yet another kind of humobotic work in which the robot performs very precise operations while controlled at all times by a surgeon. Walmart has begun investing in robots to perform mundane jobs like floor-cleaning, sorting deliveries, picking up dropped products, and shelf-scanning, which tend to produce ennui in human workers. Walmart's plan is to free up human employees to perform more satisfying work like selling merchandise and serving customers. Meanwhile, SEB, a Swedish Bank, uses the virtual

**Figure 4:** Scenarios of Future of Work



---

assistant Aida to handle routine customer service calls while referring more complex issues to human agents.<sup>24</sup>

The eventual scenario, then, of the future of work is one in which human workers are still the main actors. This is certainly the case when the work requires the worker to understand human emotions or sensations or when it demands unique or non-routine solutions. In these cases, humans are indispensable and will continue to have a distinct advantage over machines. Our concept of collective production falls within this scenario of human knowledge-intensive work, supported by machines, which produces innovations and solves wicked problems. Machines can process dynamically evolving crowd knowledge and extract patterns. These patterns can then be fed back to a crowd of autonomous humans to inform their judgment and stimulate them to produce more refined knowledge by which to solve complex problems.

### Preparing for the Future of Work: The Need for More Extensive Thinking

While our future destination may be flash powered organizations, there are several speed bumps on the road that will take us there. These challenges, some of which concern organizations and others concern individual workers, will demand deeper thinking by managers as well as more extensive research. There are several evident questions which will help to spur this deeper managerial thinking and future research. Answering them may, in itself, require flash-powered organizations to share insights from research and practice. Beginning from the perspective of organizations, reflective thinking is needed to discover how to create and sustain a productive culture in flash powered organizations that exist more outside than

inside. Will organizational culture matter as much when the “full time” employees are not performing the work central to the organization? Will the full-time employees of flash powered organizations consist only of those who orchestrate on-demand work, and not those who execute that work? What will such organizations have to do to attract the best talent when so many other flash powered organizations will be competing for that same talent?

---

**Companies will need to ensure that they do not exploit workers in the name of being flash powered. If they don't, regulators should and will.**

---

On the individual level, will simply making the work interesting and meaningful be enough? Throughout this article, we have assumed that when flash powered organizations broadcast their needs to creative freelancers, they will be able to attract the right people to work on their problems. However, as more and more organizations become flash powered, they may find themselves competing for the same workers. They may, therefore, need to consider how to craft challenging and complex problems that appeal to the best problem solvers. They will need to devote more thought to how to make work more meaningful to those who highly value their autonomy. Will these organizations have to act as venture capitalists, investing in developing the best ideas of the crowd while letting the crowd develop and implement the chosen solutions? What else can organizations do to attract and retain people who prefer to seek new challenges rather than be bound to a single company? For flash organizations whose work is less episodic

and tends more toward longer projects and problems that take time to solve, attracting and retaining talent will be an even more complex issue. Longer jobs can also encounter thornier regulatory issues, such as whether workers must be treated and compensated as full-time employees. The recent legal wranglings between Uber and its drivers as to whether the drivers should be treated as employees is an early example of the sort of issues that flash powered organizations will face. Companies will need to ensure that they do not exploit workers in the name of being flash powered. If they don't, regulators should and will. Flash powered organizations will also have to ensure that the work they offer is truly accessible to all and that those executing the work are fairly compensated. Systems that build reputations, such as online ratings, are often used in selecting gig workers. More refined thinking is needed to determine how new entrants into the workforce, who have not yet established a reputation, will get work. How can reputation mechanisms be designed to allow autonomous workers fair and equitable opportunities to find work? How, then, do we overcome the forces that drive us toward less than fair compensation, halting the race to be the cheapest worker? Organizations and managers will have to resist the conventional outsourcing mentality which allocates work to the cheapest bidder. They may also need to balance automated, commodified work with designing more creative work for autonomous human workers.

For work that is more creative and less routine, requiring a collective production process, there will be even more complex issues to resolve. Flash powered organizations will need to motivate a crowd composed largely of strangers to work together. These companies will need to rethink the nature of incentives. They will need to design dual

incentive systems, aligned with both the intrinsic and extrinsic motivation of flash workers, in order to quickly attract the right individuals to form a temporary team. Those who do creative and innovative work want to know how their ideas will be used.<sup>25</sup> Questions of ownership and intellectual property will need to be addressed. Who owns the collectively devised product? How will intellectual property rights be determined?

Each new generation of workers — nurtured in an increasingly global education and training system — prizes autonomy more than the last.

### A Final Word

It was not so long ago that the image of the “company man” was revered.

The title was a testament to an employee’s loyalty and evidence of personal and familial responsibility. But in the modern world, the term not only reveals an outdated gender bias but also is rooted in concepts that most workers would find foreign. Each new generation of workers -- nurtured in an increasingly global education and training system -- prizes autonomy more than the last. At the same time, employers who face increasing demands to create value in an instantaneously responsive marketplace have been forced to reexamine workplace values from both sides, preparing their companies for what comes next. ■



**Arvind Malhotra** is H. Allen Andrews Professor of Entrepreneurial Education. His research focuses on open-innovation organizational and extra-organizational structures. His work has been published in leading academic and busi-

ness journals. He and Ann Majchrzak have recently released a new book: *Unleashing the Crowd: Collaborative Solutions for Wicked Business and Societal Problems*.



**Ann Majchrzak** is the USC Associates' Chaired Professor of Business Administration for Marshall. She teaches and does research on digital innovation. She and Arvind Malhotra have recently released a new book: *Unleashing the Crowd: Collaborative Solutions for Wicked Business and Societal Problems*.



**Dr. Alph Bingham** is a pioneer in the field of open innovation. He is co-founder and former president and CEO of InnoCentive Inc. Alph's book, "The Open Innovation Marketplace," introduces groundbreaking ways to leveraging the world's best innovation sources.

### Endnotes

1. Please see: Younger, J., and Oliveira, A. (2017). Make Work Meaningful for Your Freelancers Too. *Harvard Business Review*, December 8, 2017. <https://hbr.org/2017/12/make-work-meaningful-for-your-freelancers-too>
2. For further discussion related to the rise of the gig economy and its implications please see: Malhotra, A. (2020). Making the One-sided Gig Economy Really Two-Sided: Implications for Future of Work. *Handbook of Digital Innovation*, Springer, forthcoming.
3. The McKinsey report referred to is: *Independent Work: Choice, Necessity, and the Gig Economy*, McKinsey & Company, 2016.
4. The report referred to is: *Demystifying the Future Workforce*, Randstad.
5. Younger and Oliveira discuss the notion of meaningful work in: Younger, J., and Oliveira, A. (2017). Make Work Meaningful for Your Freelancers Too. *Harvard Business Review*, December 8, 2017. <https://hbr.org/2017/12/make-work-meaningful-for-your-freelancers-too>
6. For a more detailed discussion of the implications of autonomy in work design please see the following sources. De Cuyper, N., & De Witte, H. (2006). Autonomy and workload among temporary workers: Their effects on job satisfaction, organizational commitment, life satisfaction, and self-rated performance. *International Journal of Stress Management*, 13(4), 441; Kim, H., & Stoner, M. (2008). Burnout and turnover intention among social workers: Effects of role stress, job autonomy and social support. *Administration in Social Work*, 32(3), 5-25; Langfred, C. W., & Moye, N. A. (2004). Effects of task autonomy on performance: an extended model considering motivational, informational, and structural mechanisms. *Journal of Applied Psychology*, 89(6), 934-; Man, D. C., & Lam, S. S. (2003). The effects of job complexity and autonomy on cohesiveness in collectivistic and individualistic work groups: a cross-cultural analysis. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 24(8), 979-1001; Volmer, J., Spurk, D., & Niessen, C. (2012). Leader-member exchange (LMX), job autonomy, and creative work involvement. *The Leadership Quarterly*, 23(3), 456-465; Wang, G., & Netemeyer, R. G. (2002). The effects of job autonomy, customer demandingness, and trait competitiveness on salesperson learning, self-efficacy, and performance. *Journal of the Academy of Marketing Science*, 30(3), 217-228.
7. A more detailed discussion of various dimensions of job autonomy can be found in Younger, J., and Oliveira, A. (2017). Make Work Meaningful for Your Freelancers Too. *Harvard Business Review*, December 8, 2017. <https://hbr.org/2017/12/make-work-meaningful-for-your-freelancers-too>
8. For a more elaborate description of agile work please see: *Flexible Working: The Way of the Future*, Forbes, May 28, 2019. <https://www.forbes.com/sites/joyburnford/2019/05/28/flexible-working-the-way-of-the-future/#7d6207434874>
9. Examples of various types of flash organizations can be found in the book: Majchrzak, A., & Malhotra, A. (2020). *Unleashing the crowd: Collaborative solutions to Wicked Business and Societal Problems*, Palgrave-McMillan.
10. A description of Consensys can be found in Majchrzak, A. & Griffith, T (2019) *Organizations as Platforms and what that means for research*. *Handbook of Digital Innovation*; HTT is described in detail in Majchrzak A., Griffith, T., Reez, D., Alexy, O. (2018) *Organizations Designed for Grand Challenges: Generative Dilemmas and Implications for Organization Design Theory*. *Academy of Management Discoveries*, 4(4), 472-496.
11. A detailed description of the how and why of IBM InnovationJam can be read in Bjelland, O. M., & Wood, R. C. (2008). An inside view of IBM's InnovationJam. *MIT Sloan management review*, 50(1), 32.
12. The description of how Landcare Research Inc. engaged in an open strategy

- 
- formulation process using flash crowds can be found in Malhotra, A., Majchrzak, A., & Niemiec, R. M. (2017). Using public crowds for open strategy formulation: mitigating the risks of knowledge gaps. *Long Range Planning*, 50(3), 397-410.
13. You can read and watch more about the RedHat development model at <https://www.redhat.com/en/about/development-model>
  14. For more on the notion of orchestration and choreography please see: Peltz, C. (2003). Web services orchestration and choreography. *Computer*, (10), 46-52.
  15. The notion of useful novelty is described in detail in Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in Organizational Behavior*, 10(1), 123-167.
  16. The various elements of collective production are described in Majchrzak, A., & Malhotra, A. (2020). *Unleashing the crowd: Collaborative Solutions to Wicked Business and Societal Problems*, Palgrave-McMillan.
  17. This figure has been adapted from a figure in Majchrzak, A., & Malhotra, A. (2020). *Unleashing the crowd: Collaborative solutions to Wicked Business and Societal Problems*, Palgrave-McMillan.
  18. The downsides of the gig economy are discussed by Arun Sundararajan's opinion piece in *The Guardian* (2015): The 'gig economy' is coming. What will it mean for work?; The commodification of work is discussed in Hill, S. (2015). *Raw Deal: How the "Uber Economy" and Runaway Capitalism are Screwing American Workers*. New York: St. Martin's Press.
  19. The aspects of future of work, especially displacement anxiety, can be found as early as 1982 in the article: Levitan, S. A., & Johnson, C. M. (1982). The future of work: does it belong to us or to the robots? *Monthly Labor Review*, 105(9), 10-14.
  20. A detailed discussion of the use of robots in the service industry can be found in: Willcocks, L. P., & Lacity, M. (2016). *Service automation robots and the future of work*. SB Publishing.
  21. For a more detailed discussion of the three aspects of future of work please read Levy, F., & Murnane, R. J. (2013). *Dancing with robots: Human skills for computerized work*. Washington, DC: Third Way NEXT.
  22. This example is described in more detail in the article at: <https://theconversation.com/how-robots-are-helping-doctors-save-lives-in-the-canadian-north-104462>
  23. For a more detailed discussion of how humans can train robots to better perform work please read: <https://www.nytimes.com/2019/08/16/technology/ai-humans.html>
  24. For more details on examples of humobotic work please read: <https://medicalfuturist.com/robotics-healthcare/>; <https://hbr.org/2018/07/collaborative-intelligence-humans-and-ai-are-joining-forces>; and, <https://www.vox.com/the-goods/2019/4/11/18306229/walmart-robot-job-automation-retail-labor-bossanova-robotics>
  25. A more detailed description of the need for the crowd to know how its ideas will be used please see: Malhotra, A., Majchrzak, A., Kesebi, L., & Loram, S. (2017). Developing innovative solutions through internal crowdsourcing. *MIT Sloan Management Review*, 58(4), 73.