A FoW Report on Technology and Productivity

FUTURE ofWORK

A report prepared by the Future of Work Research Consortium, De cember 2012
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About FoW

Led by Professor Lynda Gratton, and with researchers in London, Singapore and Mumbai, the FoW Institute is one of the emerging thought leaders in its field. Over the last three years, the team has worked with over 60 multinational companies from Europe, the USA and Asia to build a deep understanding of the external forces that are shaping the context of work; the internal organisational responses to these forces with regard to people-practices and processes; and the manner in which future-oriented practices can be identified, embedded and scaled.

The core of the Institute's research capability is 'collective intelligence'. Using a combination of technological platforms, including tailored portals, 72 hour Jams and sophisticated surveys, the team is able to rapidly assimilate the knowledge of communities drawn from both within and outside of a company.

Introduction

New technologies are continually redefining work, creating rapid transformations in the way that businesses and employees create value, information is consumed, and people interact with each other. The aim of this Future of Work theme is to assess and predict the impact of technology on productivity. In this document, we summarise the key emerging insights from the FoW Masterclass, the 72-hour online Jam, and the initial academic research. In total, more than 300 people from 28 organisations across the world participated in the conversation.

Many people today are using more sophisticated technologies at home than they do at work. As this disparity begins to rebalance, we will see four clear challenges for businesses as they consider the future opportunities of technology:

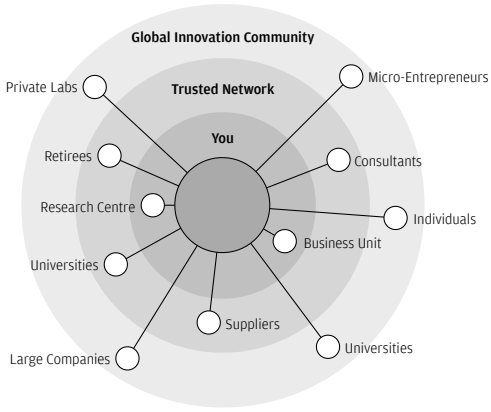
1. **Building Effective Ecosystems:** Technology is transforming the organisation of work and talent, and in particular the emergence of complex and global ecosystems. While these complex systems bring opportunities for much wider value creation, they also create substantial challenges relating to collaboration and control, and around the ownership of skills and IP. **(Page 2)**
2. **Creating New Sources of Productivity:** Emerging technologies are creating enhanced opportunities for productivity in terms of both collaboration and flexibility at work. In particular, we are seeing rising opportunities for emerging collaborative technologies to join up disparate groups, although there are concerns about adoption rates. The same is true for flexible working, which is often hampered by hierarchical notions of 'presenteism' despite being technologically feasible. **(Page 5)**
3. **Transforming Complex Work:** New technologies are facilitating increasingly complex work structures, with 'hyperspecialisation' becoming more prevalent. This has important implications for how skills are developed, as well as how future-proofed careers are supported and maintained. **(Page 8)**
4. **Adopting New Technologies:** The community looked more closely at the adoption rates of technology and reflected on both the barriers to adoption and the likely future drivers. **(Page 11)**

All graphs throughout this report are taken from the Future of Work Technology survey 2011, which surveyed more than 384 people from 19 organisations across the globe. All opinions expressed within this report are those of the attributed author, and may not reflect the opinions of their organisation.

Professor Lynda Gratton
London Business School
Future of Work Consortium

1. Building Effective Ecosystems

Recent technological developments have enabled new and more sophisticated organisational structures. As these underlying technologies continue to advance, new business opportunities will continue to emerge. In particular, the community focused on the emergence of new modes of interaction: the development of more dynamic, plural and responsive interdependencies among organisations, among individuals, and between organisations and individuals. The emerging consensus is that the development of these ecosystems of business and talent will rapidly transcend traditional boundaries and, by doing so, significantly increase the complexity of professional interactions.



Key Technologies
Cloud Computing | Unified Communication | Contextual Security | Fibre-Optic Broadband | Open Innovation

1.1. Ecosystems of Business

These key technologies are creating a framework within which organisations can foster sophisticated networks of coordination, tapping into the best possible sources of innovation both within the organisation and beyond it. Over the next decade, the increasing power of the internet to facilitate new forms of work will enable more complex cross-business collaboration and multilateral innovation, resulting in a mesh of joint ventures, outsourced partners, public-private partnerships, and the empowerment of specialist micro-entrepreneurs. These ecosystems are already emerging, with technology companies such as ARM, Microsoft and Apple benefitting from these more complex organisational structures.

Points of View
The community discussed how organisations could develop ecosystems in which multilateral relationships can thrive. Most important is the ability to focus on core competencies and understand where unique value sits within the system. The ability to determine areas of comparative advantage, and rely on the distributed skills of others to connect to these competencies, depends on a strong and transparent flow of information and an ability to filter noise. However, the potential need for inter-company transparency raised concerns around maintaining control:

> “Companies need to be careful about ecosystems... Context can be outsourced, however you need to stay in control or governance, strategy and business metrics and look for continuos improvement and innovation. Also consider risk / reward models based on outcomes. Virtualise your business too much and you start to lose the company brand, culture and ability to execute against strategy.
>
> - Andy Wood, Head of Communication & Collaboration, KCOM Group

> “In the past, companies needed to integrate the complete production and delivery process within their own organisation, as they needed to have information on, and control over, what was being done... Intellectual property was not an issue at that time, as the deliverables produced by employees belonged to the organisation they were working for. If more tasks or activities can now be sub-contracted, this needs to be done in a structured manner, the legal aspects of such relationships need to be assessed, and intellectual property should be clearly covered.
>
> - Frederic Leger, Head Cargo Business Process & Standards, IATA

Alternatively, are ecosystems changing how we create value and how we perceive control? Is the ecosystem approach an opportunity to entrench a more collaborative and less protective arena of innovation?

> “The role definitions between management, employee, customer, local community, as well as vendors are blurring. Organisations will look at new ways to get work done and co-creation will be one of the mantras. Consider the example of Apple co-creating with its customers, or the recent debate in India on how the mining industry should be sharing a percentage of its profits with land owners... Organisations will need to have more flexible and temporary structures, where people from different aspects of life come together to co-create. Would this challenge the very notion of control?
>
> - Sunita Sinha, Portfolio Head of Organisational Effectiveness, Aditya Birla Group

The rise of open innovation, and the increasing propensity for Generation Y to reach beyond the boundaries of the organisation for sources of collaboration and inspiration, implies that fostering an ecosystem mentality will be crucial for the future success of any organisation. However, the value of an ecosystem is in its mutual benefits, and capturing these benefits requires a process that stimulates collaboration while respecting the interests of contributors. Ownership is still important:

> “Ecosystems can only survive if the mutual benefit is achieved AND if the members invest in the system itself. Currently, very successful ecosystems have been set up to investigate nano-technology in Germany: the ecosystem consists of research institutes, private companies, conglomerates etc.
>
> - Remi Gulzar, Global Lead Expert IT Strategy, Sabic

What is clear is that ecosystems have the potential to be much more than outsourcing mechanisms. Rather than simply finding the cheapest suppliers, the development of future ecosystems will involve new managerial and leadership capabilities to maintain a stable, supportive and mutually beneficial environment in which a diverse set of innovators can operate in a collaborative and open way.

1.2. Ecosystems of Talent

Just as technology has increased the capacity of organisations to foster business ecosystems, so too has it empowered new ecosystems of talent. The rise of powerful online platforms that enable individuals to coordinate, and to feed into larger organisations on a more transient basis, has matched the increasing desire for professional flexibility. Emerging talent ecosystems can take the form of Virtual Guilds, where a community of experts can exchange observations, insights and career opportunities, or they can take the form of Virtual Markets, where organisations can tap into a certified and credentialed pool of e-lancers.

Sharing Information at Goldcorp

In 1995, Goldcorp discovered their dying 50 year old mine in Red Lake, Ontario contained potentially dramatic new deposits of gold. They had conducted test drilling on the site and the results were promising, but their internal geologists weren’t able to determine the location of the new deposits or assess their value. CEO Rob McEwen took the bold step of making all the company’s proprietary information for the site open to the public in the form of a contest, and challenged them to help the company find the "next 6 million ounces" of gold. The challenge exceeded McEwen’s expectations, resulting in a new drilling technology, innovative IT strategies and a fresh perspective to the company culture.

Points of View

Virtual Guilds, such as Sermo and Lawlink, offer the opportunity for individuals to build industry contacts, establish a reputation and develop an online portfolio of work. They allow specialist e-lancers to develop a sense of community and shared practice independent of employment. Virtual Markets, such as oDesk and Elance, provide employment opportunities by linking these communities of experts with organisations looking for temporary specialist knowledge. With the flexible employment arrangements of Virtual Markets and the community aspects of a Virtual Guild, an e-lancer can be expected to develop more loyalty to their talent ecosystem than any particular organisation. These platforms will grow in importance over the coming decades, as they accommodate a growing alternative to long-term career paths:

> “I think that an employee and a virtual worker from a place like Elance can be motivated by different things. An e-lancer may be more focused on the specific piece of work you are asking them to perform, may move quickly from one project to the next and will want to meet the needs of the customer to the point that it will reflect positively in terms of customer feedback, as this directly impacts their digital reputation and the potential to earn more work.
>
> - Dan Darrow, Virtual Worlds Liaison, ManpowerGroup

For organisations, these burgeoning talent ecosystems provide access to an on-demand, scalable and certified community of experts who are willing to undertake discreet task-based work. For the experts themselves, their ecosystems provide a backdrop for the ongoing skill development necessary to develop deep mastery.

Ecosystems of talent do not necessarily depend on a universal platform such as oDesk or Elance. Individual organisations can foster their own talent ecosystems in the same way that they can develop business ecosystems: by creating a stable environment with a strong incentive and shared rewards. The well-known case of Apple’s App Store was mentioned on many occasions during the Jam, as was the example of Goldcorp, an American mining firm. By creating a framework that fosters innovation, both Apple and Goldcorp have benefitted from an external community of experts intent on finding new sources of value.

2. Creating New Sources of Productivity

Historically, technological innovations have been at the heart of step-changes in productivity. In the current Information Revolution, gains in productivity have resulted from the increasing speed at which data can be transferred and processed. Not only has this enabled more complex tasks to be performed, but it has also enabled authentic communication over distance, promoting an era of flexible working and synchronous global collaboration. What was clear from the conversations within the community was that, as the means of producing, capturing, transferring and interpreting information advance, leaders will have to embrace new protocols of work, both in the way they manage knowledge, and in the way they manage employees.

Key Technologies
Enterprise Social Networks | Virtual Assistants | The Semantic Web | Blended Reality | Predictive Analytics

2.1. Collaborative Knowledge

Over the last decade, we have seen the emergence of complex organisational forms, made up of multiple relations, stakeholders and platforms. As organisations become more sophisticated, we are witnessing a shift away from the vertical hierarchies of the 20th century. In a social world, where employees seek more freedom and choice, it is clear that many companies in the FoW consortium are beginning to question the traditional command and control structures, and are embracing work patterns based more on a connect and collaborate structure.

New technologies have encouraged, and have been encouraged by, the emergence of more social ways of working, where information has become more fluid and less centralised. Many member companies are now aware that this has important implications for knowledge management. More sophisticated technologies will increasingly facilitate the management of collaborative knowledge: data mining will ensure that concise insights emerge from wide pools of information; virtual assistants will provide access to relevant information from across organisations within a business ecosystem; and social networking platforms will provide an opportunity to transfer and catalogue knowledge through continuous interaction.

Points of View
Many members of the community claimed that establishing practices of knowledge management and transfer suited to the increasingly collaborative and cross-functional nature of work was going to be a substantial challenge. Knowledge management platforms will increasingly be designed to understand the substance and context of information, and also to make explicit and tacit knowledge from disparate sources accessible to all, but the general consensus was that social and cultural barriers may still impede rapid progress:

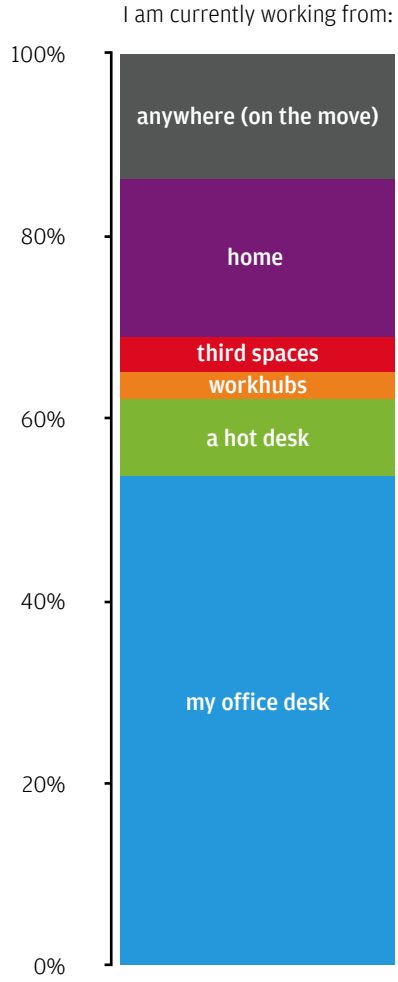
> “Culture is key. You can have the best collaboration tools in the world but if your culture does not value knowledge sharing and collaboration, it won’t matter much… I’ve worked in this environment for the last three years and experienced a noticeable difference in our work culture. People share more and care more about others succeeding.
>
> - Harald Becker, Senior Business Strategist, Microsoft

There was much discussion about how best to overcome the inertia and resistance against new forms of working, with a clear consensus that it would require the adoption of a new collaborative mindset. In order to fully leverage the opportunities of new collaborative technologies, there has to be an overarching culture that promotes transparent and participatory behaviour:

> “In my experience, the shift to a collaborative model needs to be supported by a leadership team that fundamentally understands just how much more can get done in a collaborative model. Part of how we accomplished this shift at ManpowerGroup was by asking our Global Leadership Team to work together in small groups on high stakes projects. We did this for a few years and got quite good at it. The natural outflow was that leaders started to reorganise work in their regions and functions along the collaborative format.
>
> Once we had that mindset in place, we moved to platforms that would better support ongoing collaboration and connection, with an internal 'Facebook' and creative uses of SharePoint. Interestingly, we found that this worked well not only in small groups, but also in large format sessions. In fact, we hosted an entire leadership team meeting using the Jam concept to harvest ideas and get dialogue going.
>
> - Rebekah Kowalski, Director of Global Solutions at Right Management, ManpowerGroup

2.2. Flexible Working

The technology that supports the growing army of flexible workers is becoming more reliable, more authentic and more transparent. The rapid expansion of cloud-based services is ensuring that software is becoming device-independent and work is becoming location-independent, meeting the demand for more flexible working arrangements. Flexible working enables individuals to structure their working lives in more nuanced ways, and allows organisations to benefit from increased productivity, increased retention and lower overheads.



Points of View

The community consensus was that flexible working is a broader concept than home working. While home working is a structured arrangement, flexible working is a fluid negotiation of how, when and where to work, dependent on the needs of the individual and the organisation:

> “Technology makes flexible working possible in an always connected and accessible manner. However there are many cultural, practical and legal aspects that impact upon it. To add complexity, these considerations will vary across your organisation impacted by the breadth of lifestyle and career aspirations of the workforce. I would further argue that we need to divorce 'flexible working' from 'location'. It should mean the ability to align our corporate expectation of the employee's productivity with both individual and group employee work aspirations.
>
> - John Luke, Senior Business Strategy Consultant, Microsoft

> “This is where management plays a key role: 1) balancing the business requirements (i.e. 24/7 team coverage) with personal needs (some wanting to start early, others to finish late); 2) actively developing the social fabric within their team (which will mostly be dispersed between different sites and/or home workers) and with the wider organisation.
>
> - Koen Timmermans, Senior Strategy Advisor for HR, Shell

Flexible working is also about being responsive to context. There is not a universal set of practices that can be implemented independent of individual circumstances, and the notion of how best to work will change in response to the nature of the task:

> “According to some scholars, the pursuit of radical innovations needs three critical aspects: 1) Diversity to bring in new perspectives; 2) knowledge to share these new perspectives; and 3) motivation to engage in knowledge sharing. I believe that the second point, knowledge sharing, is important to set a scene for elaboration and to overcome misunderstanding. Here especially, tacit knowledge sharing, body language, diversity traits, personality etc. become more obvious during F2F interaction. This can enhance mutual understanding and help avoid the misunderstanding that might arise from non-F2F interaction.
>
> - Mikkel Marfelt, Organisational Research, Novo Nordisk

The challenge for larger organisations is that flexible working not only requires a workplace that facilitates ad-hoc working styles, but also depends on a culture of trust. Cloud-based technologies can provide access to advanced centralised software on low-cost devices, but embedding a culture of trust at the level of management is a more complex task to implement, given the level of internal resistance:

> “I think the crux of remote working is trust. In high trust relationships, remote working becomes feasible.
>
> - Alex Johnson, Center for Collaborative Leadership, Cisco

> “Even though the majority of office workers want to work more flexibly, the larger the organisation, the less likely its employees are enabled to do so... As our UK colleagues found out, the problem often lays in the middle management, which does not want to lose control and legitimacy.
>
> - Inger Paus, Area PR Lead Western Europe, Microsoft

> “New work-based technologies allow much more dispersed virtual team working than ever before. Management needs to manage by content/output rather than process and presenteeism, notions that will not appeal to Gen Y desires for flexibility, or an ageing workforce where mobility may be restricted. In many ways, work-based technologies allow better communication than ever before, and the challenge is for Gen X and Baby Boomer managers to master these tools.
>
> - Ian Baron, Head of Strategy Development, Royal Bank of Scotland

3. Transforming Complex Work

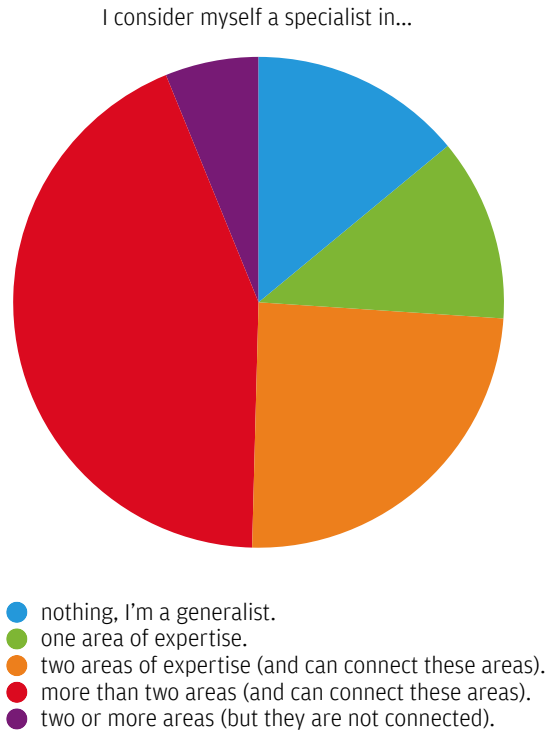
Recent technological developments have led to the automation of many routine tasks, while the underlying complexity of work has grown, and will continue to do so. Value is increasingly found in roles that are inherently difficult to standardise or automate, and are instead dependent on deep knowledge and expertise, or on orchestration and collaboration. We anticipate that complex and valuable work will be carried out by a network of highly trained hyperspecialists, and orchestrated by strong managerial oversight.

Key Technologies
Virtual Markets | Complex Simulations | Social Networking | Cloud Computing | Meta-Goals

3.1. Mastery and Skill Development

The Future of Work community reflected the views of many academics that, as the work of organisations becomes more complex, it will become more dependent on specialists. In order to remain competitive in the context of rapidly accelerating technologies, employee skill development will need to be extensive and continuous. Moreover, an exclusive focus on a single discipline may increase the possibility of redundancy, if that specialist skill became automated or outdated. As a consequence, we predict that the ability to bridge two or more areas will become a valuable characteristic.

In the past, typical knowledge-worker career development has been describes as T-shaped. In this model, a thin tier of broad knowledge supports a single, deep specialisation. But the combined needs for greater specialisation and collaboration are beginning to promote the development of a **π**-shaped model. The idea here is that individual specialists can create valuable linkages between deep knowledge in two disciplines, providing opportunities for cross-functional insights and interdisciplinary orchestration.



Points of View
Mastery will be a crucial aspect of future job security, and has substantial implications for the development and maintenance of marketable skills. Technology is not only transforming what skills are most valuable, but is also how these skills are acquired and developed, with advanced simulations providing a low-risk environment in which to experiment:

> "At IATA one of our most popular training courses helps understanding the aviation industry more holistically through a business computer simulation. Teams compete against each other in running airlines. Participants go through several rounds of simulation. Teams enter a set of parameters (airline routes they wish to serve, frequency, type of plane, services offered to passengers, prices, marketing spend) and the simulation model then gives each team the KPIs resulting from the competition: revenue, number of passenger-miles flown, yield, profit. Participants get a hands-on experience on how to manage an airline, the levers they have and their reach.
>
> - Fred Montivont, Head of ITDI Performance Management & Business Support, IATA

The needs of rapidly developing multi-specialists may be matched by the emergence of sophisticated learning technologies. These have traditionally been limited to the training of process-oriented tasks such as aviation. However, complex simulations are being developed to encourage deep problem-solving, action-oriented skills such as complex collaboration. We believe that, as computer simulations become more advanced, they will be able to provide a level of experiential learning and cognitive development equivalent to real-world scenarios, but on a larger scale and with zero risk. The development of such platforms also resonates with the emerging skills of younger generations, reared on online video games:

The Skills of Future Careers

- Avatar Management
- Narrow Casting
- Virtual Clutter Organisation
- Time Brokerage
- Social Networking Counselling
- Personal Branding
- Knowledge-Based Engineering
- Information Chain Links Consultation
- Personalised Intelligent Agencies
- Seamless Automation Expertise
- (Information) Portability Expertise
- Integration Expertise
- Real Time Information Processing
- Bio-Information Capabilities
- Speed Training

> “My son is a gaming freak and I have been observing him for the last five years, when i bought first PSII gaming system for him. The guy is very technology savvy, can understand working instructions very quickly, and has developed an interest in reading fiction. He understands difficult situations and has a view to handle them (could be because of the war games). I have never worked consciously on building these competencies in him, but think that gaming has made a difference. His attitude towards precision, speed and concentration has improves through gaming. He wishes to be a game designer and developer, a profession unheard of in India. He is 15 years old.
>
> - Nirmal Singh Raghav, VP HR Telecom, Aditya Birla Group

Modern video games have developed powerful scenarios and incentives to encourage strategic thinking, collaboration and management skills, with online gaming clans often representing textbook examples of well-managed teams:

> “Leaders are chosen based on technical and leadership skills (including 14 year-old kids leading massive teams); reward and recognition is instant (including the threat of being ’deleted’ from the guild); engagement is high (at the expense of the real world though).
>
> - Koen Timmermans, Senior Strategy Advisor for HR, Shell
>
> “Games have very clear goals (missions) with very clear roles and tasks for their contributors and team members, and when the job is done it’s an indisputable hit or miss.
>
> - Sarah Vardey, VP Organisational Development, American Express

3.2. Hyperspecialisation and Re-assembly

The growing importance of mastery, and the hyperspecialism that this produces, is creating a new impetus for management. Though the development of technology that facilitates horizontal hierarchies has undermined the command-and-control role of the traditional middle manager, the emergence of hyperspecialisation has necessitated a new role for management: orchestration. The ability to create valuable linkages between people, to conduct the distribution of tasks and to oversee their coherent reassembly is an emerging skill among knowledge workers.

Points of View

Hyperspecialisation presents a number of opportunities and challenges for organisations. The distribution of micro-tasks through global labour markets allows complex projects to be completed quickly and at low cost, but requires strong oversight. It is clear that managers need to become the architects of work:

> As anyone managing cross functional projects can attest to, you do need such specialists, but more importantly, you need coordinators/generalists who can connect the dots between these specialists and keep them marching in sync to deliver results.
>
> - Derrick Yuen, Senior Manager, Human Capital Metrics, Abbott

The rise of hyperspecialisation also has implications for the meaning of work. If hyperspecialised workers are focusing on discreet tasks, there is a danger of them becoming disconnected from the broader purpose, or disinterested in the end result. There is a belief in the FoW community that, in order for the rewards of work to be more than simply financial, meaning must be found at the level of individual tasks:

> I'd be tempted to reframe work as 'outcome-centred' rather than 'task-centred' because: 1) meaning and purpose are increasingly coming to the fore at a personal level rather than an abstract corporate level, especially for Gen Y and Z; and 2) technology and productivity should make it possible to get to an outcome through different routes or tasks, i.e. by working with different people in different ways using different information. I don't dispute the importance of tasks, but would suggest that a task-centred view is today's world, while tomorrow's is more likely "outcome-centred" or broader. The challenges for Organisation Development professionals and leaders is therefore how to translate the bread and butter tasks that contribute to outcomes into something that is personally meaningful for large groups of people.
>
> - Prateek Sinha, Organisation Development Consultant, BT Global Services

Increasing Underlying Complexity

Automating the atomic pieces of work - the business process itself - is on the increase. but the jobs of the people who have to understand the underlying complexity are getting harder, because the underlying complexity is increasing. If it takes three days to process something today, it will take seconds in the cloud. The volume of communication is increasing, and so orchestration will become a valuable skill.

- Anantha Sekar, Global Head - Architecture Consulting, Tata Consultancy Services

> In the research that we undertook earlier in the year, the overriding sentiment from both permanent and contingent workers, when asked how they defined meaningful work, was that they wanted to ensure that the work they were performing was positively contributing to collective outcomes. A staggering 46% of those we surveyed said that finding work that offered them such potential was their priority consideration when evaluating what employers had to offer. As such, the challenge for employers in the future will be to reconsider how they package whatever roles they have on offer. They will need to trade less on the legacy credentials of their brand (with the exception of a few aspirational brands) and to focus more on what the role can offer the worker (regardless of engagement status) within the context of the increasing trend of portfolio careers.
>
> - Belinda Johnson, Knowledge & Insight Director, Randstad

Orchestration Skills

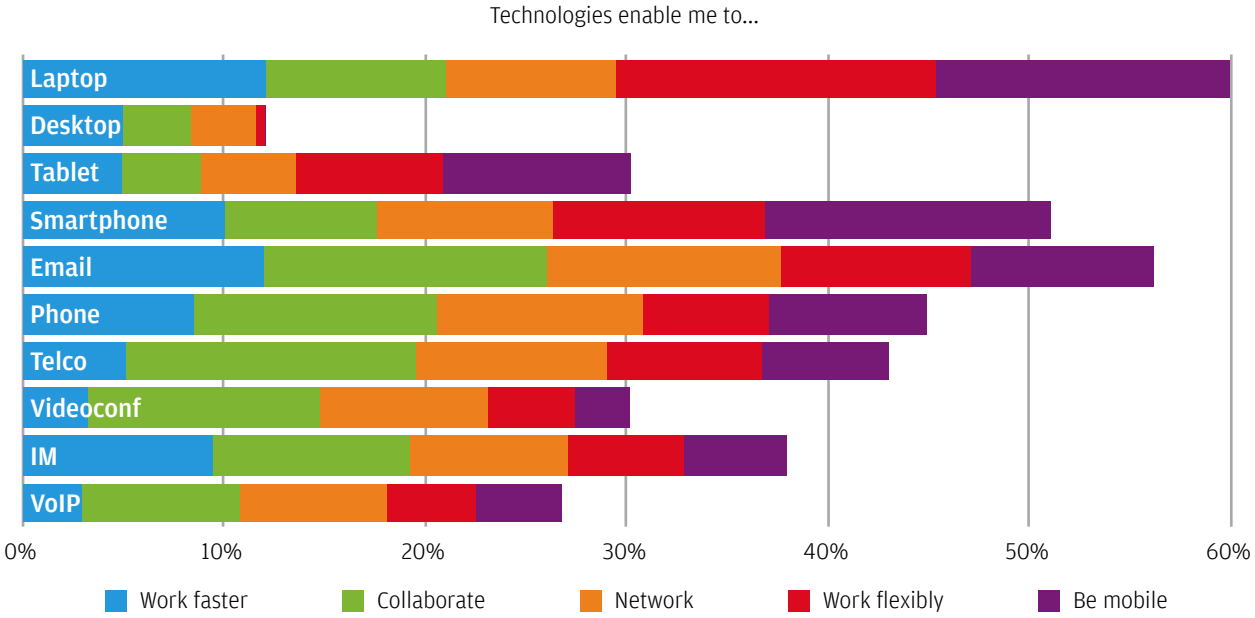
- A clear vision of the project objectives. Ensuring that this is communicated to hyperspecialists.
- Identify risks and negotiate working arrangements with hyperspecialists to ensure good communication and timely delivery.
- First-class people skills. The ability to negotiate and build relationships between sponsors and hyperspecialists.
- Ability to drive accountability well and in a constructive manner. Identify issues where they occur, drive ownership of the issue without disengaging the team

- Derrick Yuen, Abbott

Organisations determined to leverage hyperspecialists may have to reshape their employee value proposition in order to attract high-end talent seeking work on complex tasks for a short period of time. The more rewarding these individual tasks, the better the reputation of the organisation and the more the organisation can draw from the top tier of the fluid hyperspecialist markets.

4. Adopting New Technologies

Though it is possible to forecast the development of many technologies, what is acknowledged across the consortium companies is that the adoption rates of such technologies are much less predictable. This arises from the complex and often unpredictable combination of technological and cultural factors. As new technologies emerge, the challenge for their adoption is whether they are seen as useable, suitable or necessary. There is also a much broader issue of how the cultural norms and economic circumstances enable or create barriers to adoption. It is clear that invention does not necessarily result in innovation, and innovations are not always embraced by their intended market. For example, the adoption rate of mobile video calling has been relatively low compared to mobile VoIP, as in reality most users find voice communication preferable in the majority of circumstances.



Points of View

Consortium members raised a number of points around how technologies are adopted within their organisations, and what could ease the process of adoption. One important distinction was whether or not these technologies are implemented as a product of employee desire or as an organisational push for greater efficiency:

> “In general, we witness a significant difference between those technologies that organisations are trying to 'push' into life and those that either the organisation's workforce or its consumers demand of it ('pull' technologies).
>
> The former are often productivity orientated, without clear sponsorship and/or endorsement from those the organisation seeks to become more productive as a consequence. The latter are often a product of innovation, and come with the associated energy and determination for the initiative to succeed from the instigators and subsequent adopters.
>
> An example would be Additive Manufacturing (aka 3D printing). For over two decades, the technology has been slowly pushed (due to the lack of the significant investment that is required to drive its true potential) by a manufacturing community that is totally aware of its potential to the point of it becoming embedded within many organisations as a rapid prototyping tool. For the technology to accelerate at pace up the adoption curve, the impetus for cross sector and/or competitor collaborations must arise (to realise the necessary investment) or a tipping point needs to be arrived at where there is a consumer-led pull for mass customisation. If I were a betting woman, I would put my money on it being the latter that drives adoption!
>
> - Belinda Johnson, Knowledge & Insight Director, Randstad

If the adoption of new technologies within organisations is not an employee-centric activity, it may even have negative implications for productivity. By creating an overly rational and process-oriented framework, the ability for technology to create new sources of value could be muted:

> “Most decisions around technology are taken by technologists - very rational people with clear expectancies around input, output and result (very "Blue" people according to Insights colour discovery, people who know the importance of detail in processes). I believe you need people who are yellow according to Insight colour discovery (very "Yellow" people can articulate and are masters in communication, probably with a dash of "Green", consistent and trustworthy). I believe that currently, the wrong type of people are making the decisions on new technology adoption - it is more than a rational process.
>
> - Remi Gulzar, Global Lead Expert IT Strategy, Sabic

The community consensus was that technologies are easier to adopt if they reflect human needs, rather than business needs:

> “The more that a business technology reflects what people like to use in their private life to collaborate and share ideas, the more likely they are going to adopt it. Giving an example: Most of our employees are twitter enthusiasts, but they needed a ‘safe’ environment to connect with colleagues through means other than email. Thus, we established a Microblogging service (OfficeTalk) for internal communications that everybody loves, because it is so easy to share ideas and interesting content. Our executives are using it for internal communications and thereby pull more and more employees into the service.
>
> - Inger Paus, Area PR Lead Western Europe, Microsoft

An environment of experimentation emerged as a crucial factor in determining the ability of an organisation to take risks when faced with new technologies. Executive sponsorship is crucial in this context, as it mitigates the risk of failure and creates a more dynamic culture:

> “I have seen new technologies implemented in organisations without a clear understanding of the benefit they will bring or how they will be used. I think there is great benefit to just ’giving it a go’ and accepting failure (and lessons learned) but we need to understand and communicate how these technologies will be used.
>
> - Kathryn Thomson, Head of OD & Effectiveness, Save the Children

In an environment of experimentation, a high tolerance of failure and a sense of flexibility are also essential. The ability to fail allows sponsors to abandon or repurpose unsuitable technologies, while initial ambiguity around how new technologies should be used allows people to find unexpected applications:

> “I can observe some of the things [Office Labs] have learned over the course of the 40+ concept tests and incubations they built. Killing projects and implementing a "fail fast" culture is crucial. We also learned that it’s important to be very flexible during the front end of the project. Often those projects morphed from one question they were trying to answer to one that’s a bit different. I believe giving innovation teams the power to morph projects into different directions is a key to success. In the beginning we often don’t have enough information about what’s driving value.
>
> - Harald Becker, Senior Business Strategist, Microsoft

Company Members of the Future of Work Phase3

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