FUTURE OF WORK WHITEPAPER
2016

The way we work is changing

These changes will have a far reaching effect on all Australians.

This paper explores how traditional work environments are being disrupted, and what the Future of Work (FoW) may look like for many of us in the next 5-10 years.

LET’S EXPLORE THE FUTURE OF WORK

Join the conversation #RedEyeFoW

redeye.co
Authors: Lochlin Black, Scott Furnell, Gavin Tye
With contribution from: Wayne Gerard, Randall Makin, Becci Medhurst,
Nathan Dench, Professor Rowena Barrett and the RedEye team.

RedEye would like to acknowledge the many interviewees and survey respondents who graciously gave their time contributing to the development of this white paper.
<table>
<thead>
<tr>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - A note from our CEO, Wayne Gerard</td>
</tr>
<tr>
<td>5 - Foreword</td>
</tr>
<tr>
<td>5 - The ‘Future of Work’ isn’t about work – introduction</td>
</tr>
<tr>
<td>6 - Executive Summary</td>
</tr>
<tr>
<td>8 - We’re being disrupted</td>
</tr>
<tr>
<td>8 - Ripe for disruption</td>
</tr>
<tr>
<td>8 - It’s all about value</td>
</tr>
<tr>
<td>9 - Sharing insights</td>
</tr>
<tr>
<td>9 - Key insights</td>
</tr>
<tr>
<td>10 - Workforce trends</td>
</tr>
<tr>
<td>10 - Disrupting management</td>
</tr>
<tr>
<td>12 - Mobile disruption</td>
</tr>
<tr>
<td>12 - Connected collaboration</td>
</tr>
<tr>
<td>13 - Key insights</td>
</tr>
<tr>
<td>14 - Technology adoption</td>
</tr>
<tr>
<td>15 - Security and availability</td>
</tr>
<tr>
<td>15 - Key insights</td>
</tr>
<tr>
<td>16 - Big data</td>
</tr>
<tr>
<td>16 - It’s the insights that matter</td>
</tr>
<tr>
<td>18 - Data democritised</td>
</tr>
<tr>
<td>18 - Key insights</td>
</tr>
<tr>
<td>19 - Emerging technologies and the Future of Work</td>
</tr>
<tr>
<td>19 - Speech recognition</td>
</tr>
<tr>
<td>19 - Immersive technology</td>
</tr>
<tr>
<td>20 - Drones</td>
</tr>
<tr>
<td>20 - Internet of Things (IoT)</td>
</tr>
<tr>
<td>20 - Artificial Intelligence (AI) and Machine Learning</td>
</tr>
<tr>
<td>20 - Wearables</td>
</tr>
<tr>
<td>21 - Key insights</td>
</tr>
<tr>
<td>23 - Closing</td>
</tr>
<tr>
<td>24- Appendix A</td>
</tr>
</tbody>
</table>
A NOTE FROM OUR CEO
Wayne Gerard

The way we work is changing. These changes will have far reaching effects on all Australians.

This paper explores how traditional work environments are being disrupted, and what the Future of Work (FoW) may look like for many of us over the next 10 years.

We are in the age of the mobile worker, with the number of connected devices expected to grow to 21 billion in the next four years. These devices will generate a huge amount of data which will need to be captured, stored, utilised and managed in real-time, in an easily accessible way.

New devices from smart meters to smart cars will bring with them new roles requiring new skills and qualifications. These new devices, new jobs and new skills will replace many of today’s jobs.

The RedEye team are passionate about helping our clients map and successfully navigate this future landscape. We recognise that to support the growing trend towards workplace mobility, enterprise will need to offer faster, more reliable and more accessible ways to connect and use their knowledge and data assets - from any location or device at any time.

With this white paper, our aim was to go beyond the statistics and future predictions to learn more about how enterprise is currently and will likely use technology to help solve workplace challenges. What we discovered is that for many forward thinking enterprise teams, the Future of Work is already here and is delivering some powerful opportunities – and others less prepared, are now working hard to catch-up.

The most advanced organisations we surveyed are starting to adopt emerging technologies in the workspace to reduce cost, increase collaboration and productivity and to extend into new markets. Emerging technology is driving new business models, new revenue streams and underpinning new opportunities that were not visible only a few years earlier.

For most organisations, creating a smarter workplace is not simply about participating in the latest trend; it’s about value creation.

For most organisations, creating a smarter workplace is not simply about participating in the latest trend; it’s about value creation.

The RedEye team are excited to share the rich insights from our research. We have incorporated a number of these insights in our business to help shape the next generation of workplace solutions for organisations like yours.

We look forward to your thoughts.

Wayne Gerard,

@RedEyeFoW
FOREWORD

Professor Rowena Barrett - Head, School of Management, QUT

Workplaces are changing to address the needs of the digital future and to ensure they are fit for their changed purpose. The advent of digital technologies, cloud services, technology enabled mobile working, and connected devices all are causing a rethink about the knowledge, skills and abilities needed in the workplaces of the future. Workers are also rethinking where they want to work and how they do this. So questions of career, performance expectations, and regulation all arise as a result of these changing times.

RedEye’s Future of Work Whitepaper outlines a number of these issues and draws on evidence to understand how their stakeholders and others see these issues playing out. “Value” is the lens through which sense can be made of the changes stakeholders are facing. And it is through the lens of “value” that information about the response to complex technologies and the interactions they enable, can be addressed. Applying the “value” lens turns the question from ‘should we invest in this technology’ to ‘how will an investment in this technology enable us to make a difference to customers’. Technology is a tool that can underpin firm success if it is enabled by, and enables, other organisational capabilities to build value for customers.

I commend RedEye for thinking differently and taking a leadership role in the conversation about the Future of Work.

Professor Rowena Barrett

THE ‘FUTURE OF WORK’ ISN’T ABOUT WORK

an introduction

This white paper addresses how emerging technology and globalisation are disrupting organisations, industries and economies. We have set out to understand and communicate the impact, challenges and opportunities of this changing landscape. What does the Future of Work mean to various industries, demographics and geographies? Through the research conducted, we discovered something somewhat unexpected. The Future of Work isn’t entirely about how we ‘work’, it’s also about value creation.

Value can be created internally between departments, externally with customers and partners and within our communities domestically and globally. Value defines success. Value can be delivered many ways including a reduction in costs, increases in efficiency, or delivering an improved experience, product or service to customers. Providing this value has impacts across the supply chain for every business. Systems, automation, technology and data allow value propositions to be maximised through focus on internal or external customers and stakeholders. Technology can become a driver of workforce efficiency on its own; however when it’s used to unlock value, technology becomes a growth engine for business, industries and economies.

Opportunities exist for businesses to collaborate with clients, contractors, and employees like never before, all while being geographically distributed. A megatrend of increasing data accessibility is allowing businesses and workers to shift from commoditised tasks to focus on innovation and business success. A profound shift in the mindset and skillsets of our workforce is required for our organisations, industries and country to capitalise on the opportunities that the Future of Work will present.

Let’s explore the Future of Work.
Few would question that emerging technology and globalisation are disrupting organisations, industries and economies. In this white paper we have set out to understand and communicate the impact, challenges and opportunities of this changing landscape.

We wanted to find out, in the words of the workforce itself, what does the “Future of Work” actually mean to various industries, demographics and geographies?

This document represents more than three months of research by our RedEye team. We conducted numerous in-depth interviews with enterprise leaders and workforce specialists. We curated and analysed the best global research around workforce megatrends. And we infused this information with rich insights generated through our own experience within the workforce mobility field.

In the course of this research, we discovered something unexpected; the Future of Work isn’t entirely about how we ‘work’, it’s also about value creation.

Technology can become a driver of workforce efficiency on its own; however, when it’s used to unlock value, technology becomes a growth engine for business, industries and economies.

Technology is the enabler, value creation is the goal, and innovation is the means.

Here is an overview of some of the key insights from our RedEye Future of Work White Paper:

- **We’re being disrupted**: A significant 76 per cent of the companies that we spoke with identified their industry is being disrupted by technology. A profound shift in the mindset and skillsets of our workforce is required for our organisations, industries and country to capitalise on the opportunities that the Future of Work will present.

- **It’s all about value**: Value creation in the past was a function of economies of industrial scale: mass production and the high efficiency of repeatable tasks. Value creation in the future will be based on an entrepreneurial mindset, deployed to solve the issues and capitalise on the opportunities arising from globalisation.

- **Sharing Insights**: Collaboration is becoming commonplace within organisations, in large part due to cloud-based infrastructure. An impressive 93 per cent of leaders believe cloud-based collaboration stimulates innovation. If this is the result of collaboration within an organisation, collaboration among industry may have a profound impact.

**EXECUTIVE SUMMARY**

**In the course of this research, we discovered something unexpected; the Future of Work isn’t entirely about how we ‘work’, it’s also about value creation.**

- **76%** of respondents indicated their industry is being disrupted by technology.
- **87%** of respondents indicated they are moving towards more performance-based management.
Disrupting management: As workforce trends and technology develop, it is evident our management processes need to adapt. Management need to adapt to skillsets outside of their traditional areas. Specifically, skills around sensemaking and entrepreneurial innovation will be required through many levels of organisations.

Mobile disruption: For knowledge workers, businesses can now offer more flexible work arrangements (such as working from home) to attract and retain talent, or source freelance workers instantly from anywhere in the world using platforms to make this process simple. Of the greatest relevance to the Future of Work is enabling these skilled workers to become increasingly digitally enabled.

Connected collaboration: Connectivity, and the ability to access the correct data when it is required, are drivers of efficiency within the workforce. There are greater opportunities for businesses to collaborate with clients, contractors, and employees than ever before, all while being geographically distributed. Almost all (93 per cent) of those that we interviewed in our research indicated they believe connectivity will increase in the future workplace. Additionally, 87 per cent of respondents see connectivity increasing productivity and 92 per cent of respondents expect increased worker satisfaction as a consequence of connectivity.

Security and availability: Adoption of cloud and Software-as-a-Service (SaaS) solutions can supply workers with a single logon working seamlessly across devices and geographies. This technology provides them with an easy way to access the information they require, while potentially decreasing upfront and ongoing computing and infrastructure costs. Additionally, an organisation could benefit from the security expertise of cloud providers who potentially have much better security as a result of economies of scale.

Big data: It is apparent that organisations have data availability in a raw format - 76 per cent of participants in the RedEye FoW survey indicated data was readily available. However, converting this data into insights and most importantly implementing the insights in a meaningful way, may prove challenging. All respondents indicated they expect data-driven decisions to improve with technology. As data becomes more plentiful, progressing this data to insights will be key to providing maximum value.

Data democratised: The data once held by monopolies is becoming democratised and made available for decision making in the workforce. Many organisations invested in the centralisation of data and decision making work in operations centres with access restricted within the organisation. This paradigm is shifting with the increasing ability to access and view data from all parts of the organisation.

Emerging technologies and the Future of Work: Several emerging technologies are on the precipice of being utilised to allow for value creation and cost reduction in the workplace. These are: speech recognition; immersive technology; drones; Internet of Things (IoT); Artificial Intelligence (AI) and machine learning; and wearables.

In summary, the Future of Work holds many challenges and exciting opportunities especially for those who position themselves to adopt innovative technologies and enact change rapidly. More bandwidth will become vital to an organisation’s ability to create value. There are many trends and emerging technologies significantly impacting the Future of Work, from the perspective of workers and organisations; and significant challenges exist for organisations to adopt innovation, collect data and manage their workforces.

#RedEyeFoW
WE’RE BEING DISRUPTED

RIPE FOR DISRUPTION
The digital revolution has and will continue to change the business landscape. Disruption through technological innovation has been a resonating theme within the Future of Work. Technological developments have the potential to displace entire job descriptions and industries over the next decade “moving the coal face” as one survey respondent described it.

Emphasising the discussion, media articles mentioning “disruptive innovation” between 2010 and 2015 have increased more than 440% during this 5 year period. This is not necessarily a correlation with actual disruptive innovation; however, it is an indicator of sentiment and provides insight into the growth of discussion on this topic.

The RedEye FoW survey resulted in 76% of respondents indicating their industry is being disrupted by technology in some way and all respondents indicated the service (internal or external) they provided is changing with technology.

Several factors can lead to industry disruption, the RedEye FoW survey responses highlighted the following key contributors to disruption:

- Eroded customer focus
- Belief of “tenure” or being too established to be disrupted
- Technological shifts that change the competitive landscape
- Globalisation of markets

“Disruptive innovation gains traction because it provides benefits and opportunities for organisations and workforces.”
Wayne Gerard, CEO RedEye

IT’S ALL ABOUT VALUE
Value creation in the past was a function of economies of industrial scale: mass production and the high efficiency of repeatable tasks. Value creation in the future will be based on an entrepreneurial mindset, deployed to solve the issues and capitalise on the opportunities arising from globalisation. Value will be created at scale by companies that develop technologies that achieve mass adoption globally in relatively short timeframes, when compared to the growth of industrial companies.

As identified in a recent study by the PwC Chair in Digital Economy “Customer centricity is a key feature of these high-growth firms. In particular, these high-growth firms emphasise understanding customer ‘pain’ and create innovative solutions to relieve that pain. High-growth firms are equally effective in articulating unique value to their customers.”

Global pressures on business have resulted in the expectation of ‘more for less’. Globalisation of human resources, commoditisation of services and expectations of more competitive pricing translate to an expectation for greater value. Expending resources for commodity solutions could be considered a competitive disadvantage if another organisation is able to maximise innovation and reduce or eliminate time and cost expense. In real terms, the impact of innovation can displace even the most traditionally safe roles and provide more consistent outcomes. For example, a recent trial by IBM’s Watson, an artificial intelligence computer, resulted in an improved lung cancer diagnosis success rate over humans.

“Providers are looking to commoditise and automate legal functions usually produced on a time cost basis” explains a RedEye FoW survey respondent. Artificial Intelligence is now approaching the capabilities of junior lawyers and paralegals in certain disciplines.
within law including due diligence, discovery and document drafting. The Future of Work will require skill sets that aren’t purely discipline focussed. System design, programming and problem solving will be required to create and support value propositions.

“Businesses everywhere will be fighting over those talented individuals, communities and societies with the potential to create the most valuable ideas and innovations,” suggests Rob Hortopp of KPMG. When a business and workforce are able to reduce commodity tasks, they are able to afford time to explore ways to improve the service they provide and develop new value propositions.

Value creation in the past was a function of economies of industrial scale: mass production and the high efficiency of repeatable tasks. Value creation in the future will be based on an entrepreneurial mindset, deployed to solve the issues and capitalise on the opportunities arising from globalisation.

In order to protect both Intellectual Property and competitive advantage, it was usual for organisations to limit access to their data and insights, often working in isolation to achieve small incremental performance gains. This approach potentially limits the speed of innovation within the organisation and across industry. In the Future of Work, companies can utilise and contribute to open source data, technology and projects. Collaboration between organisations, across industry and geographies is accelerating the value created by each organisation and contributes to new applications of technology, new business models and new methods of value creation. Often this collaboration makes the industry or supply chains more competitive and resilient, while assisting each contributor to develop new intellectual property and competitive advantage. Managers may want to consider what data they can share and receive with external collaborators, such that the collective information may provide higher benefits to all parties without compromising Intellectual Property. This approach can provide improved value to customers and improve outcomes overall.

The NZ Oil and Gas industry is an example of what may be possible. Using a collaborative approach, the industry is working together to create a common permit to work process providing authority to perform dangerous tasks. This approach simplifies the requirements by removing unnecessary repetition resulting in improved efficiency and reducing cost for all parties while simultaneously improving safety outcomes. Open source data analytics may also offer opportunities for data where collaboration is accepted by industry. Project Data Sphere is an example in the traditionally closed pharmaceutical industry. Major pharmaceutical companies have agreed to collaborate and share clinical trial results. Clinical trial data captured and used once is time consuming, expensive, and often at risk of duplication. Sharing this data provides for a possible acceleration to results and a reduction of cost in new drug development.

Further collaboration opportunities exist around assets and resources. Rather than idle assets, resources and information, assets can be maximised through technology. Underutilised assets, resources and technology could be shared between organisations to maximise efficiency, achieve more with less and increase the value proposition.

“The gig economy will help foster innovation by engaging with a workforce that operates across different workplaces, exposing them to a wider range of ideas and approaches to work.” envisaged one RedEye FoW respondent. These alternate work arrangements including flexible work, freelancing or contracting can both assist to maximise utilisation of resources and improve the pool of experience across a range of businesses.

**SHARING INSIGHTS**

Collaboration is becoming commonplace within organisations, in large part due to cloud based infrastructure. 93% of “leaders” believe cloud based collaboration stimulates innovation. If this is the result of collaboration within an organisation, collaboration among industry may have profound impacts. In a connected ecosystem it becomes easy for business and workers to collaborate in a wider context.

In order to protect both Intellectual Property and competitive advantage, it was usual for organisations to limit access to their data and insights, often working in isolation to achieve small incremental performance gains. This approach potentially limits the speed of innovation within the organisation and across industry. In the Future of Work, companies can utilise and contribute to open source data, technology and projects. Collaboration between organisations, across industry and geographies is accelerating the value created by each organisation and contributes to new applications of technology, new business models and new methods of value creation. Often this collaboration makes the industry or supply chains more competitive and resilient, while assisting each contributor to develop new intellectual property and competitive advantage. Managers may want to consider what data they can share and receive with external collaborators, such that the collective information may provide higher benefits to all parties without compromising Intellectual Property. This approach can provide improved value to customers and improve outcomes overall.

**Value creation in the past was a function of economies of industrial scale: mass production and the high efficiency of repeatable tasks. Value creation in the future will be based on an entrepreneurial mindset, deployed to solve the issues and capitalise on the opportunities arising from globalisation.**

**KEY INSIGHTS**

1. **Disruption can occur where there is poor customer focus, industry monopolies, technological shifts or globalisation of markets.**

2. **Customers of all industries expect ‘more for less’. Commodity tasks traditionally performed on a time cost basis should be a focus for automation or systemisation with technology as an enabler.**

3. **When employees are free from commodity tasks, time may be available for value adding functions.**

4. **Collaboration can allow companies to beneficially learn and problem solve together within industries.**
The Future of Work presents challenges and opportunities for both management and the workforce. In a 2015 survey of 5,038 professionals, 83% of Australian professionals believed productivity was slowed by outdated ways of working and 61% of Australians would actually change jobs for less paperwork.

In the same survey, 54% of Australians indicated mundane tasks and inefficient processes distracted them from doing more important tasks, and 27% believe mundane tasks were actually holding back their career advancement. It is clear from these statistics, management and workplace practices require improvement. Respondents to RedEye’s FoW survey all indicated they expected technology to empower their workforce with technology adoption being a significant factor in the Future of Work.

Technological innovation in the workplace has great potential to alter this landscape and is continuously becoming easier to integrate with existing business systems and processes. From the RedEye FoW survey it is evident that, while there is willingness to adopt innovation, traditional approval and procurement processes are limiting value creation.

DISRUPTING MANAGEMENT

As workforce trends and technology develop, it is evident our management processes need to adapt. Research recently performed by the Centre for Workplace Leadership determined innovation is a critical source of productivity growth and competitiveness, and workplaces with more capable leaders are more innovative.

According to estimates by researchers at Oxford University, approximately 47% of total US employment is at risk of computerisation. Managers need to be capable of rapidly adapting to new technologies, processes and management techniques.

Management (especially middle management) need to improve and develop, including:

1. Managing a globalised workforce
2. Managing a mobile workforce
3. Managing a workforce culture that encourages problem solving, risk taking and iterative thinking
4. Understanding the required management data, its impacts and application in decision making
5. Ability to quantify task requirements and the metrics best suited to measure performance

Management need to adapt to skill sets outside of traditional skills. Specifically, skills around sensemaking and entrepreneurial innovation will be required through many levels of organisations. Workers on the forefront will require value creation skills to innovate within the business, which will no longer be restricted to management. Sensemaking includes components important to the Future of Work including information seeking, sensegiving and negotiating change. As organisations transition to focus on value creation and rapid change rather than performance measurement, managers and workers will be required to re-skill. McKinsey found “The hardest activities to automate with the technologies available today are those that involve managing and developing people (9% automation potential), where expertise is applied to decision-making, planning, or creative work (18%), or interacting with customers, suppliers, and other stakeholders (20%).” Many of these skills fall into an entrepreneurial category and are key to creating value. Technological improvements can assist with entrepreneurial value focus by rendering many of the administrative tasks managers currently perform today obsolete or at a minimum, far less onerous.

Workforce management activities such as time and attendance and site safety inductions can now be managed through digital workforce management applications. Solutions such as these have been deployed with success at site locations ranging from hospitals, to construction sites, and in most industrial organisations. The development of digital workforce management solutions was born out of necessity, in this case to effectively administer the onboarding of workers during a time of skills shortage and with Australian workers becoming increasingly transient. The implications are similar for managers who need to deal with mobile workforces. As this trend continues, businesses need to position themselves to rapidly onboard workers, provide them with the information needed to successfully complete their work, and provide access to systems for collecting relevant data both during and at the completion of the work.

Connected workforces allow organisations to reimagine the way tasks are managed. Organisations are enabled to adopt agile practices for completing work which is more opportunistic, though may conflict with traditional models of individual accountability. The opportunity exists for tasks to be managed using a Pull rather than Push model of task assignment. Rather than push tasks to individuals, organisations can use cloud and collaborative connected technology to allow workers to “pull” tasks fitting with
their current working state. Workers are able to select tasks nearby, or associated with their current task, providing significant opportunities for greater productivity. This allows workers to feel enabled, and to engage in areas where they can learn or provide diverse input, share ideas, encourage innovation, and develop leadership skills. Managers need to consider alternative methods to measure team success and individual performance alike if they want to benefit from true collaboration. Gamification, or using game like scoring and ranking is emerging as a method for motivating greater productivity and as a potential way to measure workforce performance. In this way, businesses must consider the data required and the ability of emerging technology to solutions to drive desired behaviours. Management approaches may in fact already be shifting. 87% of RedEye FoW respondents indicated they are moving towards more performance based management. A shift towards performance based management allows for management of a distributed workforce due to outcomes becoming the driver, not time and attendance. This management style and technological enablement also allows for wider participation in the workforce. Collaborative technologies can enable greater participation in areas of the workforce where participation was previously limited by the requirement of physical attendance such as those workers with a disability or those with family commitments. Job sharing, offshoring, follow the sun processing and sharing economy type engagement models will all be more easily and effectively enabled with collaborative and the mobile technologies.

Rather than push tasks to individuals, organisations can use cloud and collaborative connected technology to allow workers to “pull” tasks fitting with their current working state.
MOBILE DISRUPTION

Mobility in the workforce can be used to drive efficiencies. RedEye FoW survey respondents are all introducing mobility to the workforce in some form. The rapid expansion of mobile technologies into the home has resulted in new expectations for technology at work. 35% of respondents in a recent Dell and Intel survey said the technology they have available in their homes is more cutting edge than what is available in their place of work. Consumer design principles are deliberately simplistic with the aim to provide the best user experience and ease of use. 100% of RedEye FoW respondents now expect the same thoughtful design, ease of communication, automation and collaboration to be considered in the tools and applications they use at work.

In their homes, consumers can connect with people anywhere, any time, from any device. A study of 9,000 knowledge workers from the United States, United Kingdom and Germany identified 70% of respondents believed “having a single office as a physical workplace is less important than it was in the past.” This proliferation of mobile devices and the availability of enterprise applications on these devices enables much more flexibility for businesses to decide how they enable their workers to perform. For knowledge workers, businesses can now offer more flexible work arrangements (such as working from home) to attract and retain talent, or source freelance workers instantly from anywhere in the world using platforms to make this process simple. Yet probably the most relevant to the Future of Work is enabling the skilled workers to become increasingly digitally enabled.

Remote workers are able to access and record data without leaving the work area. Remote workers may be enabled to migrate from danger using mobility and therefore improving productivity and safety. The disconnects between field and office traditionally slowed by the pace of change are diminishing rapidly. Capturing timely and relevant site knowledge directly from the proverbial coal face, and becoming more responsive than reactive. This allows for value to be provided to stakeholders. Managing a mobile workforce in this changing dynamic of distributed workers is where workforce mobility and management require significant forethought. Strategy and solutions to manage this workforce and ensure maximum value addition to the business are crucial.

73% of respondents to the RedEye FoW survey indicated their workforce is becoming more distributed

CONNECTED COLLABORATION

Connectivity and the ability to access the correct data when it is required, are drivers of efficiency within the workforce. When this connectivity is combined with collaboration, it allows for the rapid solution of problems and provision of value to a range of stakeholders. 64% of those surveyed by Forbes Insights say cloud-based collaboration tools accelerate business results.

In order to realise this productivity and satisfaction gain, several respondents identified a requirement for management to understand the impact of being “always connected”. Increasing connectivity may impact focus and work life balance, these issues require proactive management. Connectivity needs to assist teams to solve problems and initiate solutions at a greater speed. Collaboration across teams is in most cases, currently limited to some video, text and voice. In the Future of Work, collaboration technologies will require more ‘bandwidth’. An example of this might be the ability to stream live machine data to communicate issues or opportunities rather than voice, text and static screenshots. As the Internet of Things (IoT) expands and more of our devices and machines become connected, collaboration will expand to include the devices and machines we work with.

Benefits to businesses implementing collaborative solutions have proven obvious for knowledge workers. The Future of Work will bring the benefits of collaboration to skilled workers too. Workers in remote locations are now more connected than ever before, and through mobile enabled enterprise applications, can gain access to the same real-time data as their knowledge worker counterparts, operating seamlessly between devices. Productivity and innovation both stand to improve within businesses deploying enterprise applications, as with collaboration where access to data has always been most restricted.
KEY INSIGHTS

1. Management teams need to adapt to the Future of Work, entrepreneurial and sensemaking skills will be required through many levels of organisations. Intrapreneurs will become vital to an organisation’s ability to create value.

2. Connected workforces allow organisations to reimagine the way tasks are managed and support the ability for businesses to adopt agile practices where workers “pull” their next task.

3. Workers expect consumer style design and usability in enterprise applications.

4. Collaboration technologies will require ‘bandwidth’ (e.g. live machine data) to communicate issues or opportunities rather than voice, text and static screenshots.
TECHNOLOGY ADOPTION

Adopting the right technologies can serve to increase efficiency and reduce cost.

Rather than looking at solutions, respondents to the RedEye FoW survey indicated when adopting innovative technology, organisations should target known business problems and desired outcomes first. This approach ensures solutions are right for the business and adoption will drive business outcomes. One survey respondent put this simply as “Technology is an enabler if you choose right.”

While from a business perspective, use case driven technology adoption is favourable, it may create future unintended consequences. If multiple market leading solutions are purchased to solve specific use cases, two risks may result: the first being data and process duplication and the second being integration costs and delays. Adoption of platform technologies utilising cloud based software and API integration may mitigate these risks through ease of integration and accelerated adoption. Early identification and ongoing collaboration with SaaS companies that have a relevant platform strategy and partner ecosystem will improve an organisation’s ability to create value. The trend towards SaaS allows for step changes to be implemented quickly with agile responses to new challenges. One contributor to the RedEye FoW survey considered SaaS a “great opportunity to take step changes quickly” another contributor noted “SaaS reduces implementation costs, enables a distributed workforce and increases productivity.” There are many advantages to adopting these alternative software models, including lower cost of implementation, rapid adoption of new technology without lengthy development periods, and the ability to remain agile. The ability to easily collaborate externally with industry and supply chains is also identified as a major benefit for SaaS solutions.

App Stores and the ease of purchasing mobile applications is further influencing workforce expectations relating to the procurement of innovation. Development of a detailed business case or justification for technological innovation, by the workforce, can be a struggle. New procurement models that enable rapid access, implementation and adoption of innovation will be required to maximise workforce efficiency.

A recurring theme from our research indicated adoption of a technology is relative to its ease of use. Consumer design and usability is what people are used to ‘at home’, and are growing to expect in their workplace. The Technology Adoption Model

Organisations should target known business problems and desired outcomes first

As has been explored throughout this paper, workforce expectations are changing. Several respondents indicated there is a general expectation from the workforce for innovation and mobile technology adoption. 100% of respondents indicated they would spend more time using business technology if it was easier to use.
(TAM), indicates perceived usefulness (PU) and perceived ease of use (PEOU) as key factors for traction of a technology. Technology may struggle to gain significant traction (and therefore not deliver the intended value) in an enterprise without consumer design. Demographics of the workforce championing technological innovation varies from business to business. RedEye’s FoW survey responses indicated not only millennials are seeking innovation but older segments of the workforce are also looking to improve their efficiency through adoption of technology.

The trend towards SaaS allows for step changes to be implemented quickly with agile responses to new challenges

SECURITY AND AVAILABILITY

In the Future of Work we have discussed how organisations can ensure everyone is able to access relevant data from the location and device of their preference while maintaining security. Accessibility of services from a locally operated enterprise WAN or LAN, especially where workers or contractors are temporary or geographically dispersed presents challenges. Providing remote workforces, contractors or 3rd parties with access to relevant enterprise data and the ability to work seamlessly across devices is seen as a requirement to maximise value in the Future of Work.

Adoption of cloud and SaaS solutions can supply workers with a single logon working seamlessly across devices and geographies. Providing them with an easy way to access the information they require, while potentially decreasing upfront and ongoing computing and infrastructure costs. Additionally an organisation could benefit from the security expertise of cloud providers who potentially have much better security as a result of economies of scale.

Many organisations are restricted by bandwidth and internet access in remote, hazardous or regulated operating environments. Allowing workers to access or download data such that it can be utilised offline with changes synced later, improves workforce productivity, safety and reduces rework.

Cloud based technologies allow for rapidly scaling, flexible infrastructure to meet troughs and peaks in demand along with a possibility of improved disaster recovery due to the geographical distribution of infrastructure. Overall, in order to enable workers to provide the greatest value to an organisation, security and availability are considerations for today, not tomorrow. Implementation of scalable and accessible solutions for the future workforce will present opportunities to realise many of the benefits of a connected, collaborative workforce including improved security and control of business critical data and systems.

Cloud based technologies allow for rapidly scaling, flexible infrastructure to meet troughs and peaks in demand along with a possibility of improved disaster recovery due to the geographical distribution of infrastructure.

KEY INSIGHTS

Management teams need to adapt to the Future of Work, entrepreneurial and sense-making skills will be required through many levels of organisations. Intrapreneurs will become vital to an organisation’s ability to create value.

Connected workforces allow organisations to reimagine the way tasks are managed and support the ability for businesses to adopt agile practices where workers “pull” their next task.

Workers expect consumer style design and usability in enterprise applications.

Collaboration technologies will support require ‘bandwidth’ (e.g. live machine data) to communicate issues or opportunities rather than voice, text and static screenshots.
BIG DATA

Data is being created at an amazing rate, 90% of the world’s data was created in the last 2 years. Data is one of the most valuable assets a business possesses. A 10% increase in data accessibility translates into an additional $65.7 million in net income for a typical Fortune 1000 company.

Almost five times the estimated number of devices in 2015. These connected devices will produce large amounts of data. In a recent study, researchers predicted the internet will double in size every 5.32 years. Analysis and use of this data becomes a key competitive advantage for organisations ready to adopt.

IT’S THE INSIGHTS THAT MATTER

Data is plentiful. Experts point to an increase of 4,300% of yearly data production by 2020, however only 0.5% of data is ever analysed. Converting data into valuable insights for a business may be challenging. Organisations need to begin with data, then turn this into information, from which understanding may be derived. The last phase is to gain insights. This is the lifecycle of data as described by a respondent in our RedEye FoW survey.

Cisco emphasised a similar progression within their 2011 IoT White Paper.

From our research, it is apparent organisations have data availability in a raw format. 76% of respondents of the RedEye FoW survey indicated data was readily available. Converting this data into insights and most importantly implementing the insights in a meaningful way however, may prove challenging. All respondents indicated they expect data driven decisions to improve with technology. As data becomes more plentiful, progressing this data to insights will be key to providing maximum value. “The more we get digital the more insights our customers get.” explains a RedEye FoW respondent.
# Big Data
Gartner theorise data analytics will allow organisations to...

“...shift from the dashboard reporting of lagging indicators to autonomous business processes and business intelligence (BI) capabilities that help humans make better context-based decisions in real time” 30

Businesses have much to gain from automating the collection of data, the distribution of completed data throughout business processes, and storing the data in an appropriate location and format. There is significant opportunity through data analytics to utilise machine data that provides insight for real time data-driven decisions. Many organisations currently collect this data; however it is usually not used to its full potential in generating value creating insights.

DATA DEMOCRATISED
The data once held by monopolies is becoming democratised and made available for decision making in the workforce. Many organisations invested in the centralisation of data and decision making in operations centres. Where once data was collated in one central point, with access restricted within the organisation, data is now accessible by the workforce on mobile devices with the ability to view data from all parts of the organisation. This is not only an emerging trend in organisations, it is relevant to entire industries. “As data becomes more available and web based, there is an expectation for real time dashboards to be made available.” believes one RedEye FoW respondent. Such a dashboard will allow business decisions to be readily data-driven and in many cases automated. Democratisation of data will enable the continuous collection and improvement of data from both connected and non-connected devices as well as data from workforce performance. Data relating to location, time, speed, quality and completeness will be more easily collected using the technologies and incentive models (like gamification) outlined in this paper.

Data improvement and associating data to locations, assets, organisations and people will be made easier as data collection and improvement is democratised with mobile and cloud based technologies. Data analysis and in context decision making will also accelerate improving organisational performance and value creation.

KEY INSIGHTS

1. Analysis and use of data becomes a key competitive advantage for organisations ready to adopt.

2. Data is plentiful; however converting data into valuable insights for a business has proven challenging.

3. Use of analytics and automated data collection from devices and machines will allow for real time context-based decisions.
EMERGING TECHNOLOGIES AND THE FUTURE OF WORK

Several emerging technologies are on the precipice of being utilised to allow for value creation and cost reduction. There have been many trends and technologies discussed through this paper. It is likely all of them will affect each of us in one way or another. From a business perspective, managers must consider not only the things affecting them today, but what impacts future trends and technologies will have on their business.

SPEECH RECOGNITION

Speech recognition is on the cusp of becoming a highly effective feature and productivity tool in the workplace. “Accuracy, followed by latency, are the two key metrics for a production speech system...”

As speech recognition becomes faster and more accurate in the coming years, this technology will be extensively adopted into the workplace as a productivity improvement tool. Speech recognition is hands free, can be used in conjunction with Artificial Intelligence (AI) to trigger commands or functions, enables users to continue with hands-on tasks, and when compared to conventional keyboard operation is significantly faster. Users are able to speak around 150 words per minute (wpm) compared to typing an average of 40wpm.

Baidu, a major Chinese developer and leader in Speech recognition technology estimates by 2020, around 50% of all searches will be through images or speech.

IMMERSIVE TECHNOLOGY

Another technology that is rapidly becoming more relevant is immersive technologies. Immersive technology encompasses both Virtual and Augmented Reality, and is more than 3D headset displays - it is a whole experience involving perception and interaction features. Perceptive elements coupled with gesture and speech recognition, enables users to be interactive in a fully immersive environment. Virtual Reality (VR) technology is already revolutionising everything from open house inspections in the real estate industry, to education where experiential learning is applied with VR simulators.

Augmented Reality will have profound implications for engineering. Through Augmented Reality users are enabled to blend virtual data
such as 3D models with the physical world around them, and then interact with this environment. The opportunities for asset owners are many, from walking through 3D models during engineering design, to assessing the impact of proposed changes; inspecting welds for quality assurance; through to performing complex data analysis in virtual control rooms with visualisations of data collected from smart devices.

**Drones**
Removing workers from dangerous places and/or minimising their exposure to these environments is one of the most significant benefits organisations seek when sourcing innovative technologies. Drone technology is assisting industries to mitigate risk of workers performing high risk activities. The power industry provides one such example, where traditionally workers would need to drive long distances and work from height to inspect distribution networks, wind turbines, and more. With the advent of Unmanned Aerial Vehicles (drones), forward thinking organisations are building the capability to perform inspections remotely. Drones are capable of thermal imagery, and capturing high resolution still and video imagery. In addition, drones can be operated over distances of many kilometers, enabling operators to perform inspections rapidly. The improvements in speed of inspection provides opportunities to identify and resolve issues sooner, increase reliability, reduce downtime and ultimately improve value for end-users.

**Internet of Things (IoT)**
An emerging trend set to greatly impact on businesses is the connectivity of devices to a network. Following the trends of increasing data availability and mobility, the Internet of Things (IoT) is creating an environment where almost any device or component can be connected to a network. Devices can be remotely monitored or activated, and data can be instantly distributed to other people, devices, and data stores for analysis. The implications of this are so enormous, entire cities are currently being prepared for connection, and are being called ‘Smart Cities’. South Korea is an example of such deployment of networks, with plans to connect everything up to and including street lamps to a Long Range Wide Area Network (LoRaWAN). For operators with dispersed assets, this form of unmanned data gathering has the potential to offer substantial benefits by providing instant feedback. This enables rapid responses to problems for mobile workers, minimises waste, increases opportunities for automation, and provides valuable data for analysis.

For workers, the implications of the IoT are many and varied. Some key elements to consider are the impacts on mobility, the use of smart contracts and the megatrend toward increasing contract workforce. The Future of Work may see workers engaged by organisations on smart contracts, and collaborating through cloud based applications capturing device data to automate the creation of maintenance jobs. These digitally enabled contractors may even be offered work based on their current location which, with less travel between jobs, could translate into more completed jobs per day and subsequently more earning capacity. Though the same system could also negatively impact workers under certain circumstances, as was the subject of a Taxi industry protest in 2013 where a location based job allocation model was in use.

**Artificial Intelligence (AI) and Machine Learning**
An example of Artificial Intelligence (AI) was provided earlier in this paper. Artificial Intelligence being used for traditionally labour centric tasks such as functions of junior lawyers in the legal industry is highly effective for organisations though may have implications for workers.

Through machine learning, machines analyse data to identify patterns, ultimately enabling the machine to propose new solutions or highlight problems in a way that is similar to human intuition, except much faster. A simple example many people could relate to is Netflix, which uses your previous viewing history to suggest more programs you may be interested in. Oil and Gas users of machine learning technology could enable machines to monitor and optimise production levels based on feedback data from devices, in some instances even predicting what a human would do based on a user’s previous actions and suggesting this solution.

**Wearables**
A key implementation of technology in the Future of Work is for devices to augment human skills allowing workers to achieve maximum productivity, the Future of Work will involve wearable technologies assisting workers with sensors and displays, providing relevant information at the point of work.

Smart glasses may provide access to data and act as comfortable, wearable Augmented Reality headsets. Wearable devices have already penetrated the consumer markets heavily, with the most commonly used for fitness. Organisations around the globe have recognised the potential for their employee wellness programs, and have been using pedometers to help employees monitor their activity levels and be more active. Though, in the Future of Work more advanced wearables could also be used to improve workers safety. For example, in a similar way to monitors worn by workers in confined spaces, workers could have their vitals tracked when performing hot work to reduce likelihood of heat exhaustion.
KEY INSIGHTS

1. Speech recognition is handsfree and may allow for a 400% throughput increase over typing.

2. Barriers to accessing Immersive Technology including Virtual and Augmented Reality are being eroded through innovative technology.

3. Connectivity of devices through the Internet of Things will massively increase the amount of data being generated and captured, and methods to rapidly analyse this data will be required to convert it into insights or actions.

4. Artificial Intelligence and Machine Learning will have significant impact on individuals, while enhancing user experiences and productivity, and may provide opportunity for autonomous optimisation.

5. Use of drones may be used to remove workers from danger.

6. The Future of Work will provide many opportunities for organisations and workers to collaborate, but will also pose challenges in finding balance.
CLOSING

Technology is the enabler, value creation is the goal and innovation is the means.

The *Future of Work* will present challenges and opportunities to workers and organisations alike. A technology shift is occurring, a range of emerging technologies will underpin disruption within many industries and the way we manage workforces will require disruption. Intrapreneurs, easy to use technology and more bandwidth will become vital to an organisation’s ability to create value. In summary, the *Future of Work* will be more collaborative and everything will be more connected.

We’d love to hear your thoughts. Join the conversation on Twitter or Facebook #RedEyeFoW.
Appendix A

Survey respondents
RedEye completed the survey across industries including:

Water utilities and management
Power utilities and transmission
Mining and resources
Oil and Gas
Financial
Law
Construction
Management consulting
Technology Sector
Government

The survey accounted in-depth respondents across these industries to gain insights into how each industry is being affected and the trends each are seeing within their sector.

APPROACH TO ANALYSIS
The approach to analysis taken by this white paper was a qualitative approach. Thematic analysis was conducted and congruence were sought from responses to answer the purpose of the paper “What does the Future of Work look like across different industries?”

Analysis of the survey created the structure of the white paper with literature reviews being conducted within the identified themes to support or provide counterpoint to themes introduced.

QUESTIONS ASKED
The questions asked of survey respondents were as follows:
Name?
Company?
What challenges do you see for your business in the Future of Work?
How do you plan to address these challenges?
Is your industry or business being disrupted by technology?
How?
Are there technologies or services disrupting the way you do business e.g. the way people work?
Is the service (internal or external) you or your employees provide changing with technology?
How?
How do you see this evolving? Will technology enable productivity gains in the service you provide?
Do you see technology as empowering your workforce?
Why/why not?
How do you see technology impacting your workforce now and in the future?
How significant do you think technology adoption will be in the Future of Work?
Is your business introducing mobility into the workforce?
How?
How has this impacted your business?
How do you see it impacting in the future?
Has the workforce readily adopted mobility tools?
How are your workers keeping connected when not at the workplace?
Do you expect connectivity to increase in the future workplace?
How?
Will it increase productivity?
Will it increase worker satisfaction?
Is your workforce becoming more distributed?
What challenges does this present?
How does this impact your business?
How are you managing these workers?
Are you seeing a growth in contracted workers?
Do you expect this growth to continue?
How does this impact your business?
How are you managing these workers?
How is your business implementing SaaS and cloud based systems?
Do you see your business as an early or late adopter of SaaS and cloud?
How do you see SaaS contributing to your business?
Will SaaS/cloud enable your workforce to be more connected and mobile?
How?
What are the expectations of your workforce for technology in the workplace?
Are these expectations growing?
How is this appearing across demographics (age, blue/white collar)
Are your employees more satisfied and engaged when mobile and connected technology is implemented?
How?
What percentage of your decisions are data driven?
Is data readily available to make decisions?
Do you expect data driven decisions to improve with technology?
Are there competitive impacts around data?
What are they?
Will data be more or less accessible for leaders? How?
Is your organisation shifting towards a more output (performance) based culture?
How is this being enabled?
How are you managing the transition?
Is increased competition due to technology enablement a factor in the future?
How?
REFERENCES


RedEye is a disruptive tech business, and the first software business to make engineering data truly mobile. Established in Brisbane in 2012 by Wayne Gerard and Randall Makin, RedEye is one of Australia’s fastest growing startups with an expanding global footprint.

RedEye’s cloud-based solutions help asset owners and their service providers improve their productivity and safety, while reducing business risks and costs. With a mission to reinvent the way people work, the company has pioneered a new product category globally, of Engineering Data Management. RedEye’s solutions are built with the industry, for the industry.

In 2016, RedEye will launch its workforce mobility solution, which can be used by professionals in any industry or sector.
Our thanks to Christie Tamas, Matt Gulliver, Rod Mitchell, Robert Alaia, Wouter Grimme, James Blair, Helen Gillies, Paul Moynagh, Kant Webb, John Ebbett, Dannielle Dendle, Chris Titley, Matthew Bower, Brad Vinning, Simon Anthonisz, Geoffrey Jamieson, Tim MacTaggart, George Fitos, Lisa Jenkinson, Pat Williams, Nick Beaton, Craig James

Expert commentary provided by: Professor Rowena Barrett, Professor John Burgess, Dr. Alexandra Bratanova,