CIPD

Knowledge Work Performance

An evidence review

Practice summary
and recommendations
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Practice summary and recommendations

Knowledge work performance: An evidence review

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Publication information

This practice summary and the accompanying scientific summary are freely available from www.cipd.co.uk/evidence-knowledge-work

1 Introduction

Knowledge work is an essential part of the modern economy. By definition, knowledge workers create value by creating or using knowledge and understanding – they think for a living, rather than carrying out physical labour.

Nearly 80 million Europeans are estimated to work in knowledge-intensive jobs.[1] Following Germany, the UK has the second highest proportion of knowledge workers in Europe: roughly half of the total British workforce.[2]

The intensive growth of knowledge workers was a consequence of a shift from manual to knowledge-driven production that took place in the twentieth century. According to estimates, knowledge-driven manufacturing increased from 30% in 1920 to 70% in 1980. Today, the pace of growth is slower, but the number of knowledge workers is still increasing. Knowledge is one of the most important assets of an organisation, and a source of competitive advantage.

Because the demand for high-skill knowledge workers is high, many employers prioritise the attraction and retention of these workers. At the same time, managing knowledge workers effectively requires a particular approach and is often as tough as getting them on board. While in manual work the targets and outputs are usually clear, knowledge work and its results are less tangible, and therefore harder to define, measure and evaluate.

Focus of the review

The main purpose of this evidence review is to summarise the best available scientific research on the key factors that contribute to the performance of knowledge workers. We also look at definitions and the nature of knowledge work, and offer actionable recommendations on how to improve knowledge workers' results.

This is one of a series of CIPD evidence reviews focused on employee performance. For other reviews, including on models and measures of people performance, performance feedback, performance management and employee engagement, see the CIPD evidence review hub.

An evidence-based approach

In today's age of information overload, it's easy to be swayed by outdated received wisdom or the latest fads. Effective decision-making can be difficult as it requires us to critically question our assumptions, not be biased by anecdote and avoid cherry-picking the evidence that confirms our worldview. Evidence-based practice gives well-established approaches to cut through the 'noise' and identify best bets for action. Hard proof is harder to find, but we can identify the best available evidence and the most promising options to achieve the desired outcomes.

This review is based on a rapid evidence assessment (a shortened systematic review) on factors associated with knowledge worker performance. To read about our methodology and technical aspects of the studies on which this report is based, see the accompanying scientific summary.

2 What is knowledge work?

Definitions

The term 'knowledge work' was coined by Peter Drucker in the 1950s.[3] Knowledge workers create value by creating or using knowledge and understanding – they think for a living, rather than carrying out physical labour.

Since Drucker's description, many authors have developed more detailed definitions and categories of knowledge work. One approach has been to focus on the degree of collaboration required in a job.[4] For example, librarians are quite independent in their work, whereas surgeons' performance depends to a large extent on collaboration within their teams.

Others have looked at how complex work is, separating jobs focused on rudimentary tasks that rely on set procedures and training (for example, many call centre jobs), from those that involve greater interpretation and judgement and require more experience and expertise (for example, a primary-care physician).[5] Jobs that lie in between, including judgement within a clear regulatory framework, could include banking jobs that involve approving or rejecting loan requests.

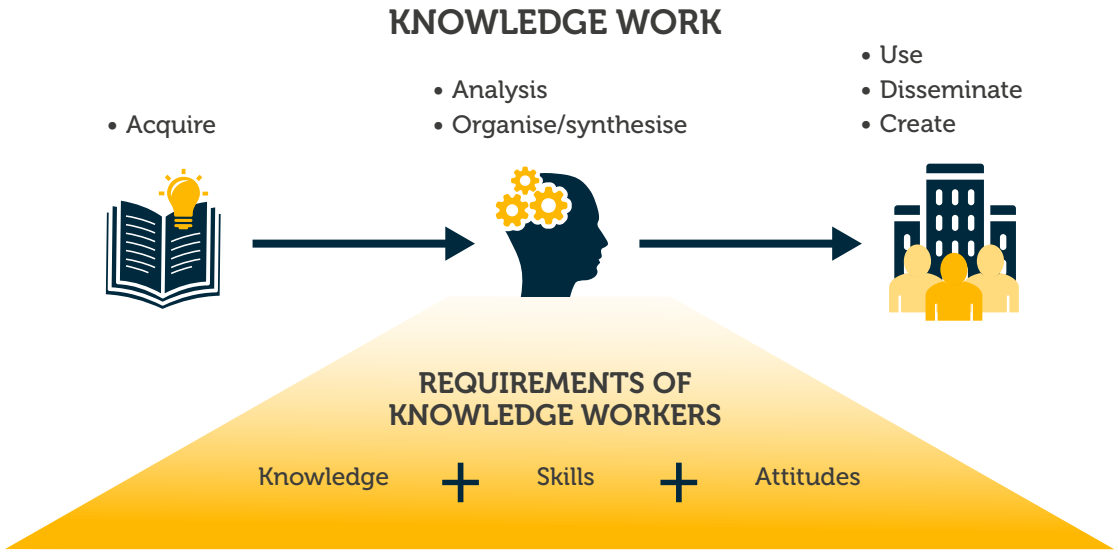
Building on this, researchers have recently differentiated *knowledge work from information work*.[6] According to this view, information workers disseminate or make use of knowledge that already exists – for example, trainers and customer service workers. On the other hand, knowledge workers create knowledge through complex cognitive activities – for example, scientific researchers. Much research on knowledge work doesn't distinguish it from information work, but it's often possible to see the focus from descriptions, or the outcomes investigated. For example, if work results in innovation, it is clearly genuine knowledge work.

In this report, in line with the varied body of research, we take a broad definition of knowledge workers and explore factors that contribute to effective knowledge work in general.

The evolving nature of knowledge work

The growth of knowledge-intensive industries has been fast, and knowledge work has become substantially more diverse. Besides more traditional professions such as lawyer, doctor, professor, accountant or engineer, it includes many newer jobs that have emerged, such as web programmer, web designer, technical writer or system analyst. Thus, the job requirements (the knowledge, skills and attitudes needed), work processes, job quality and nature of performance in knowledge work can also vary a great deal.

Figure 1: Knowledge work – process and characteristics



Source: De Sordi et al (2021) (see endnote 6)

Knowledge work can involve different ways of processing data (the raw 'facts'), information (processed or organised data) and knowledge (processed information made usefully applicable). Knowledge workers may:

- acquire, locate or gather data, information or knowledge
- analyse or interpret data, information or knowledge
- organise or synthetise data, information or knowledge
- generate or develop data, information or knowledge
- disseminate, teach or transfer data, information or knowledge
- apply or exploit data, information or knowledge to create a useful product, competitive advantage, better decisions or some other form of value.

Finally, it's worth noting that knowledge work usually requires fewer physical assets than manual work. As a result, knowledge workers are more likely to work remotely in virtual or hybrid environments. Clearly, this is especially relevant following the COVID-19 pandemic. For example, in the US, the proportion of working days done at home increased from about 5% pre-pandemic to 50% at the peak of lockdown, and is expected to settle at 20% post-pandemic.[7] A CIPD survey of the UK indicates similar changes: 40% of employers envisage that more than half their workforce will work regularly from home, compared with just 15% pre-pandemic.[8] This is a huge change, estimated by some as equating to almost 25 years' worth of change in a two-year period.[9]

Recommendations for practice

- Knowledge work is a broad and diverse category, and there are different ways of conceptualising it.
- It has grown and evolved substantially and is likely to continue to do so.
- It's worth understanding different types of knowledge work in their own right, tailoring management strategies to specific contexts.
- Nonetheless, there are common job characteristics of knowledge work jobs that have implications for how to improve performance.

3 What drives the performance of knowledge workers?

In this section we discuss how various aspects of management and organisational life influence knowledge work performance. These include vision and goals, support for innovation, people management and leadership, team dynamics and communications. A summary of the specific factors is shown in Table 1.

Several of these factors may also be very important for other types of work – notably jobs involving physical labour – but here we're concerned with the factors that have the greatest influence more specifically on knowledge workers.

It is also worth noting that the importance of the factors influencing performance will depend on the aspect or type of performance in question. In discussing what factors influence performance of knowledge workers, we specify the principal outcome measure that it concerns. Some outcomes (for example, task performance) are relevant to all workers, whereas other outcomes (such as innovation) will be especially important in knowledge work that's more complex or requires greater collaboration (see Section 2). For more detailed information about different types of performance, see our evidence review on people performance.

Table 1: Main factors that influence performance of knowledge workers

Factor	Outcome measures	
Vision/goal clarity	Team performance and innovation	●●●●○
Group goals	Group performance	●●●●●
Perceived support for innovation	Individual and team innovation	●●●●○
Perceived supervisory support	Employee performance	●●●●○
Team empowerment	Task performance	●●●●○
Psychological empowerment	Task performance and innovation	●●●○○
Social cohesion	Team performance (outcome and behavioural)	●●●●●
Psychological safety	Task performance	●●●●○
Information-sharing	Team innovation	●●●●○
External communication	Team innovation	●●●●○

Notes: Effect sizes indicate a positive influence on retention/negative influence on turnover: ●●●●● very large; ●●●●○ large, anybody can easily see the difference; ●●●○○ moderate, visible to the naked eye of an expert or careful observer; ●●○○○ small, the difference probably needs to be measured to be detected; ●○○○○ very small. For more detail, see the accompanying scientific summary.

Vision and goals

Goal-setting is a central aspect of performance management. Two factors particularly important for the performance of knowledge workers are clear vision and goals and setting group targets. Other aspects of effective goals that enhance knowledge work performance are that they need to be achievable and accepted by the team or employee.

Vision and goal clarity

Vision is a higher order aim of organisations that should serve as a motivating force for employees. However, given its global, long-term character, an organisation's vision is usually broken down into smaller, more specific goals for departments, teams and individuals.

For any vision and goals to be effective, they need to be clear in themselves and in relation to each other, so people understand what they are expected to do to contribute to the organisation. However, the outcomes of knowledge work are less tangible than those of manual work, and their quality standards are less intuitive and harder to define. This makes carefully designed goals that provide direction and focus especially important: they make a major contribution to individual and team results.

Employers can measure how clear vision and goals are for employees. Examples of questionnaire items include:

- How clear are you about what your team's objectives are?
- To what extent do you think your team's objectives are clearly understood by other members of the team?

Other aspects of effective goals that enhance knowledge work performance are that they need to be achievable and accepted by the team or employee.

Group goals

Goals can be set at individual and/or group level. Studies show that group goals may yield higher performance in knowledge work than individual goals. Part of the reason is that group goals are likely to trigger unique motivational mechanisms, such as planning, co-operation, morale-building communication, and collective efficacy within a team, all of which help improve performance.

Recommendations for practice

- Make sure that employees understand how the organisation's vision, and specific individual and team goals cascade to their tasks and responsibilities.
- Set both individual and group goals. While shared goals are likely to improve team dynamics, individual goals help make employees accountable for their job.
- When setting team-building activities, include a focus on setting goals and clarifying roles of the team members.
- Make sure goals are challenging but realistic and accepted by the employee or team.

Support for innovation

Innovation is so important that often it's seen as an outcome in its own right, as a part of 'adaptive performance'.[10] In work environments that support innovation, employees feel that their attempts to improve or change ways of doing things are expected, approved and practically supported.

Support for innovation means that organisations or teams tolerate and even show appreciation for unsuccessful attempts to innovate. This is necessary to encourage employees to take risks to develop and implement new ideas – it relates closely to psychological safety (see Team dynamics).

Strong employee perceptions of support for innovation in a team or organisation help build an innovation climate. Items to evaluate employees' perceptions about support for innovation are often included in questionnaires to assess this. Some examples of these items are:

- My boss encourages me to develop my ideas.
- My boss likes me to try new ways of doing my job.
- My boss encourages me to find new ways around old problems.

To read more on different types of organisational climate, including examples of scales to measure innovation climate, see our evidence review on organisation culture and climate.

Recommendations for practice

- Encourage and give recognition for sharing original ideas and trying new ways of doing things.
- Create a safe work environment, where people can make mistakes and learn from them.
- Show tolerance for failure and learning, but not tolerance for incompetence.

People management and leadership

The most prominent aspects of leadership and people management for knowledge worker performance are supervisory support and empowerment.

Supervisory support

Perceived supervisory support (PSS) is an employee's belief that the manager helps in times of need, praises individuals or the team for tasks well done, and recognises them for the extra effort. Supervisory support is most often shown through interaction and feedback.

PSS is important because people seek reciprocity or give-and-take in their employment relationships. Employees who experience their supervisor's support (for example, recognition, trust, feedback, help) are likely to repay it, acting in a way that's of value to the manager and that benefits the whole organisation (for example, striving to meet goals and objectives).

An example of a questionnaire to assess perceived supervisory support is the Supervisor Support Scale. The items include:

- My supervisor goes out of his/her way to promote my career interests.
- My supervisor encourages an atmosphere for an open discussion.
- My supervisor gives specific guidance as to how I can improve.
- My supervisor demonstrates trust and confidence in me.

Empowerment

Empowerment is a multifaceted, largely psychological state. It describes employees' belief that:

- their work is intrinsically meaningful
- they can perform their tasks competently
- they have the autonomy to decide how to do their jobs
- their behaviour makes a difference.

Psychologically empowered individuals and teams have the information, knowledge and abilities they need to do a good job, control over their work, and motivation to meet the organisation's goals. These, in turn, are related to performance. They also have greater job satisfaction and organisational commitment and are less likely to quit their job.

Empowerment can be understood and measured as an individual state as well as collectively at the team level. For knowledge workers, research shows that team empowerment is especially related to performance, even more than psychological empowerment.

Examples of items that can be used to measure team empowerment are:

- Our team can select different ways to do its job.
- Our team makes its own choices.

Recommendations for practice

- Provide employees with opportunities that help them learn, develop new skills and grow.
- Provide resources (for example, information, guidance and training) that help employees achieve their goals.
- Give autonomy, devolving decisions where possible, so employees and teams can decide on how to do their jobs.

Team dynamics

Two important aspects of team dynamics are social cohesion and psychological safety.

Social cohesion

Social cohesion means the strength and quality of the relationship between the group or team members. The components of social cohesion include shared liking or attraction to the group, caring and closeness among group members, their emotional bonds of friendship, and enjoyment of others' company or social time together. As the group develops, the form and intensity of social cohesion are likely to change.

A strong social cohesion contributes to a safe working environment, where the members of a group or team explore new ways of doing things and share ideas. For example, a researcher who has a strong positive bond with their colleagues and supervisor is more likely to explore new interpretations of a problem and share findings and conclusions with the team (even if they are unpopular or challenge the other team members' ideas). Such attitudes increase learning and are likely to improve work outcomes as well as task and contextual performance.[11]

One measure of social cohesion is the Group Cohesion Questionnaire (GCQ).[12] The items include:

- For me this team is one of the most important social groups to which I belong.
- Our team would like to spend time together outside of work hours.

Psychological safety

In general, psychological safety is an outcome of social cohesion. It refers to a shared belief that team members can take personal risks to ask questions, share ideas, and talk about their own mistakes and errors, without suffering negative consequences – for example, being ridiculed, punished, or rejected by others in the team. However, it's distinct from social cohesion, as strongly cohesive groups can be prone to group thinking, making it feel less safe to speak up and disagree.

Psychological safety is important because being willing to admit mistakes, ask for help, constructively disagree and seek feedback all foster learning, which, in turn, improves the performance of the group. For instance, admitting a mistake might start a conversation that eventually results in creating guidance or checklists relevant to all team members which contribute to better performance.

Psychological safety can be measured with questionnaire scales. Examples of items are:

- Members of this team are able to bring up problems and tough issues.
- No one on this team would deliberately act in a way that undermines my efforts.

Recommendations for practice

- Encourage team members to interact and share opinions about their work.
- Set expectations that people should be able to share their thoughts and ideas without fear of being rejected, ashamed or judged.
- Team leaders should set the tone and role-model this, praising employees who admit errors, learn from them and share the experience with others.
- Celebrate success within the team – for example, during regular catch-up meetings.

Communications

Information-sharing is a specific form of communication that makes a major contribution to knowledge worker performance. It is important for both internal and external communication.

Internal information-sharing

Information-sharing is the extent to which team members use their distinctive knowledge and/or expertise for the team's benefit. Sharing individual insights and

exchanging and discussing opinions help generate new ideas that are particularly useful for solving complex problems. These ideas and shared knowledge become registered in the team's collective memory, building what researchers call a transactive memory system (TMS). This collective memory works like an indexing system that informs members who knows what.

The more team members share information, the better their group decisions will be and, as a result, the better overall team performance. Moreover, a better awareness of who knows what in the team (the TMS) gives team members quick and co-ordinated access to one another's specialised expertise, enabling them to effectively combine knowledge to solve complex problems.

Some examples of questionnaire items to measure information-sharing are:

- Our team members share their work reports and official documents with other team members.
- Our team members share their experience or know-how with other team members.
- Information to make key decisions is freely shared among the members of the team.

External communication and knowledge exchange

External communication refers to the ability to seek information and resources outside the team or organisation, and share information with outsiders. It is especially important for teams that require creativity and innovation. Studies show that the more communication knowledge workers have with colleagues outside their team or organisation, the more likely they are to innovate. That's because external communication increases the chances to get new knowledge and perspectives. In turn, having more comprehensive knowledge and a broader view of a problem enhances the development of new ideas (that is, creativity) and the adoption of new ways of doing things (that is, innovation).

Examples of questionnaire items to assess a team's external communication are:

- [I/we, in my team] keep other groups in the company informed of our team's activities.
- [I/we, in my team] co-ordinate activities with external groups.
- [I/we, in my team] collect technical information/ideas from individuals outside of the team.

Recommendations for practice

- Create opportunities for sharing knowledge and information within and across teams and departments.
- Set expectations that the information shared within and outside the team is of good quality (that is, relevant, complete, clear) and accessible (for example, timely and available for those who may need it).
- Consolidate knowledge and data management systems.
- Encourage and facilitate external communication.

4 Conclusions

Successful management of knowledge workers' performance requires a good understanding of what that work comprises and the nature of the job. Knowledge workers are a diverse group, so tailored strategies to manage their performance tend to be most effective.

For example, in some more regulated jobs, it's critical that criteria and rules are clear. An example of this is loan approval in back-office banking. At the same time, a job may be highly technical, in which case a *transactional* leader – focused on organising and planning work and using reward or punishment to leverage performance – is likely to increase employees' compliance with regulations and procedures, supporting ethical behaviour and good management of risk.

On the other hand, an employee in research and development who's developing a new product is more likely to thrive in an environment where communication and collaboration are emphasised, and people are encouraged to share ideas and try new solutions.

To summarise, key aspects of knowledge work to consider are:

- the main processes and desired outcomes
- how complex the work is – for example, how technical, or how many different sequences or steps are involved, or how much judgement
- the extent to which knowledge is either used and applied, or created and developed
- the degree of collaboration or communication needed with colleagues
- how central the management of risk is or how regulated the work is.

Following the COVID-19 pandemic, knowledge workers are more likely to work remotely or in virtual teams than manual workers. So it's likely that managers and people professionals whose businesses centre on knowledge work will benefit from considering the nature of remote and hybrid working and factors that enhance it – for more information, see our evidence review on virtual teams.

Knowledge workers have long been central to modern economies and look set to continue to grow in number and demand. Although they're far from a group of completely same people, there are certain characteristics that are often present to a degree that is not the case for more manual jobs. By taking time to reflect on the nature of the jobs in hand, deciding which aspects to prioritise, and tailoring approaches to managing individuals and teams, managers and people professionals can create the team climates and conditions of work that enable knowledge workers to give their best.

5 Endnotes

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