

## FUTURE WORKPLACE



**OFFICE 21<sup>®</sup>**  
Zukunft der Arbeit

This whitepaper is published  
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FRAUNHOFER INSTITUTE FOR INDUSTRIAL ENGINEERING IAO

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**»Eighteen months ago the first evidence of intelligent life off the Earth was discovered.«**

»Where is the link between this quote and the title of the whitepaper?«, you might think right now. We have taken the quote from Stanley Kubrick's seminal movie „2001: A Space Odyssey“ - which was shown across cinemas fifty years ago. Why? Because one of the main characters in that movie was *HAL 9000* – an artificial intelligence. And if you want so HAL himself depicts some kind of an intelligent alien species. But of course this whitepaper is not about alien life forms.

Back in 1968 HAL seemed to be very fictional but if we look around ourselves nowadays we realize that we are witnessing the rise of smart machines. And even if „*Sorry – I didn't understand the question I heard*“ is the number one answer given by today's electronic assistants, we are increasingly interacting with computers as if they were a human being.

While the machines around us are getting smarter day by day they are profoundly altering the way we work and live. But what exactly are the impacts?

As part of the Fraunhofer IAO research project Office 21®, Fujitsu - together with all the other partners – spends a lot efforts into research about how our future working environments will look like. With this whitepaper we want to give you an insight about the research, tell you what kind of changes are ahead of us and why working digital is a must-have and helping people to work better.

The first hypothesis we want to discuss is that digital technology will be all around us and enables us to work and communicate seamlessly. Devices and software programs will interact autonomously and our own digital aura will interact with fully connected environments. That means you can control your whole working environment with a single device like a smartphone. And if you make any changes which effect other parameters, the rest of the environment adapts itself automatically.

One major impact for our working environments will be an increasing use of audio interfaces. Instead of typing it will be common to dictate messages and texts. If you take a look around you can observe how this development is already spreading. Mostly young people – but older ones as well – hold their smartphones in front of their head recording a message instead of typing on the screen.

Another area where technology will envelop us in offices are screens. But it's not the mere availability of large touch-sensitive screens. It's mainly due to the necessity to visualize creative and complex correlations on a larger scale helping users to better understand a certain problem.

Yet today companies face a high pressure to develop digital ways of working because digital technology is related to different positive outcomes.

Generally speaking, employees working for companies who are more future oriented and invest in the latest IT report a much higher performance at work than employees working for companies that are rather reluctant.

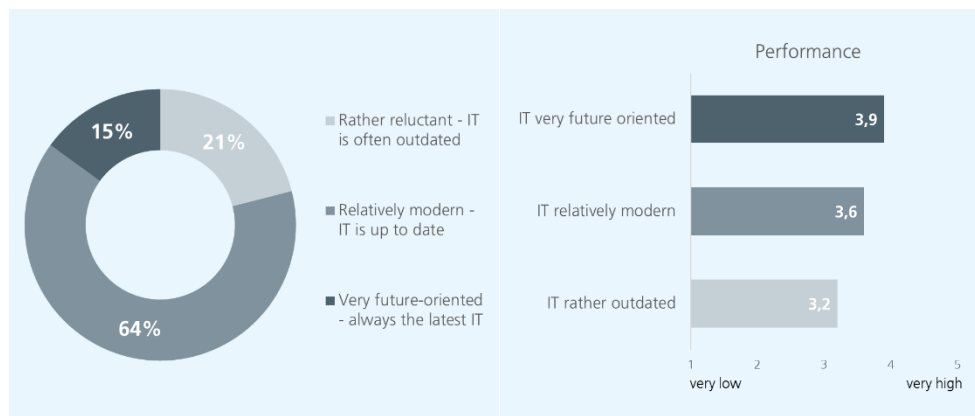


Figure 1: Effect of the IT equipment age on user performance

That's not all: On average employees who frequently use digital equipment like tablets or notebooks also perform better than infrequent users. From all devices we evaluated, one was outstanding. The highest performance rating was made by users who frequently use digital whiteboards.

This result is consistent with one of our former studies which shows that users who work with more than one monitor are almost 36 percent more efficient – meaning they are faster and make lesser errors – when performing specific tasks compared to single monitor users. The conclusion you can draw from that is that investing in large digital surfaces is worth every penny. Especially if you think about our prediction that creative

and complex correlations will be visualized on large-scale, touch-sensitive digital screens.

Technology will be ubiquitous

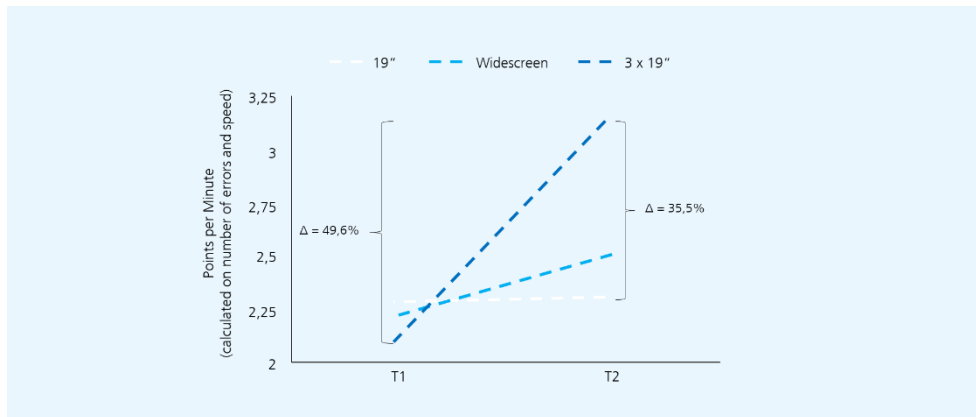


Figure 2: Effect of the available display surface on performance

There are more reasons why people prefer digital over paper based workstyles:

- 92% of respondents stated that they like working digitally because they can exchange documents quickly with other people
- 87% say they prefer it because information can be shared more easily
- 85% say it's because they can find information faster
- 78% like digital workstyles better because of being able to access information at any time and place

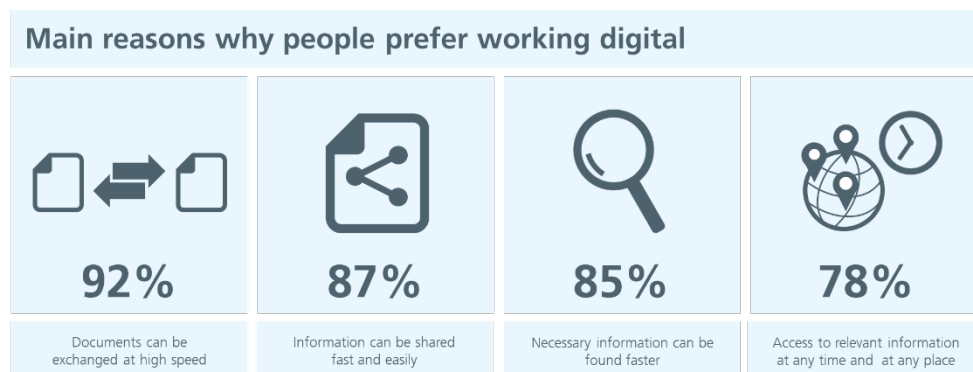


Figure 3: Main reasons why people prefer digital workstyles over paper-based

With all these facts in mind it's quite surprising that many organizations still have outdated IT.

Another hypothesis of the Office 21® research project is that only companies that nurture creativity and expert knowledge will have ongoing economical success.

There is no doubt that more sophisticated algorithms and machines will take over tasks which are highly repetitive and can be easily translated into „if – then“ rules. Of course jobs with high portions of such tasks are threatened by automation but it's expected that this will lead to new job profiles which have some things in common.

The basic characteristics these future job profiles share are:

1. Creative and intuitive thinking will be a core competence
2. There will be a strong demand for problem solving abilities
3. Dealing with complexity will be the norm

So, if you think about yourself: When are these moments when you are very creative or have the best ideas for challenging problems? You will quickly realize that these situations correspond with your personal well-being and motivation as well as with the diversity of new things you are constantly learning.

We will show in the following chapters how the design of an overall work environment – consisting of spatial, technological and organizational settings – can help you nurture creativity.



Most people intuitively feel that it's not the right way to put highly skilled knowledge workers on an office chair between 9 and 5 waiting for them to produce innovative ideas. And it's true, creativity hardly emerges by pushing a button. To get into a mood where creativity arises it is important that we have a high sense of well-being and overall motivation for our jobs.

This leads to our third hypothesis, which says that it will be common for future knowledge workers to choose independently between different workplaces. They might choose to spend some time at their corporate office, some time at home, whilst at other times they choose to go to a coworking center.

It helps a lot if knowledge workers can decide on their own about when and where to work as well as to decide which methods are suitable to reach a certain goal. It is much easier for people who have a high degree of autonomy in these three dimensions to handle issues in their private and working life. People with high autonomy also tend to have a higher motivation, a higher well-being and a better overall job performance.

Additionally employees who spend at least 10% of their time working mobile, generally develop more ideas than their settled coworkers. By the way: As the nature of work is changing the importance of good IT tools that support mobile workstyles is evermore growing.

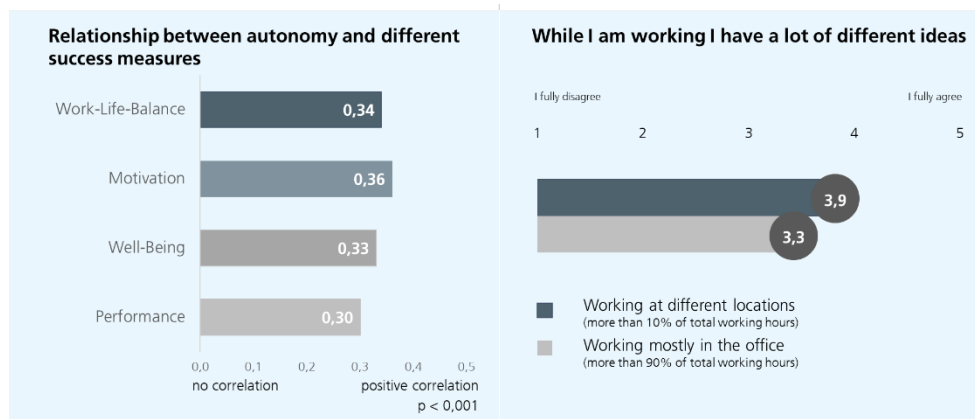


Figure 4: The impact of autonomy on different success measures for knowledge workers

Especially third places, like coworking centers, will play a special role to support work-life-integration and work as a hot-spot for creativity and innovation. From our definition coworking means that mainly independent knowledge workers are working together at a common location. The emerging network of coworking users is characterised by being a hierarchy free social network which facilitates cooperation benefits for the participants.

Coworking spaces are a great place to meet interesting people and learn new things. Companies can use those vibrant environments as temporary project spaces or an idea incubator.

Coworking spaces will also play an important role as a part-time working environment. Just imagine that from time to time you need to take care of an older relative with

dementia. Unfortunately, this person lives in a town far away from your regular working space. A coworking space nearby would give you the opportunity to use a professional working environment, structure your working day and provide you with a social network which is important for well-being.

Working multi-local

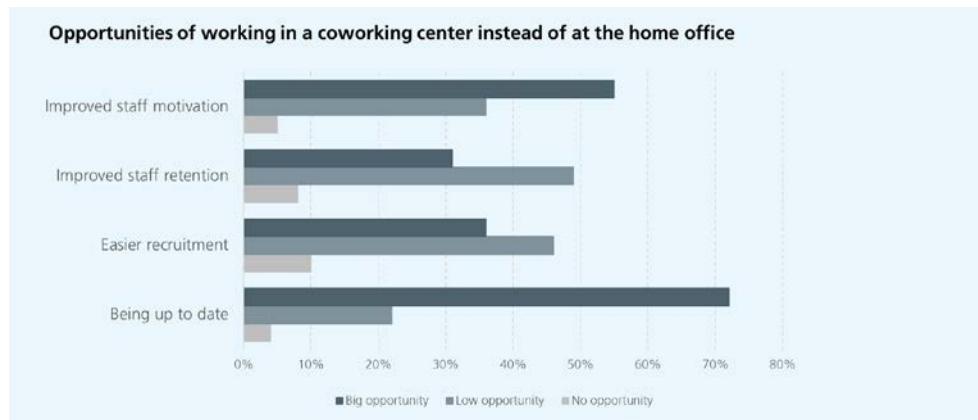


Figure 5: Opportunities of working in a coworking center

## 5

### Offices as places for maximum productivity

Offices as places for maximum productivity

The fourth hypothesis we want to discuss is that offices will be a place for maximum productivity.

Giving people more autonomy is a great thing in a complex world. With all the necessary tools at hand it might be a good idea to save a lot of office space and by that money. Why would especially big tech companies – those who provide us with many tools for working mobile – spend money to create inspiring working environments?

Because there is another factor which has a great impact on creativity and ideas: Being together with people face-to-face. Research has clearly shown that most ideas are based on face-to-face conversations and that digital communication can hardly replace that need. Being face-to-face with others is also a critical success factor for people to maintain their relationships at work.

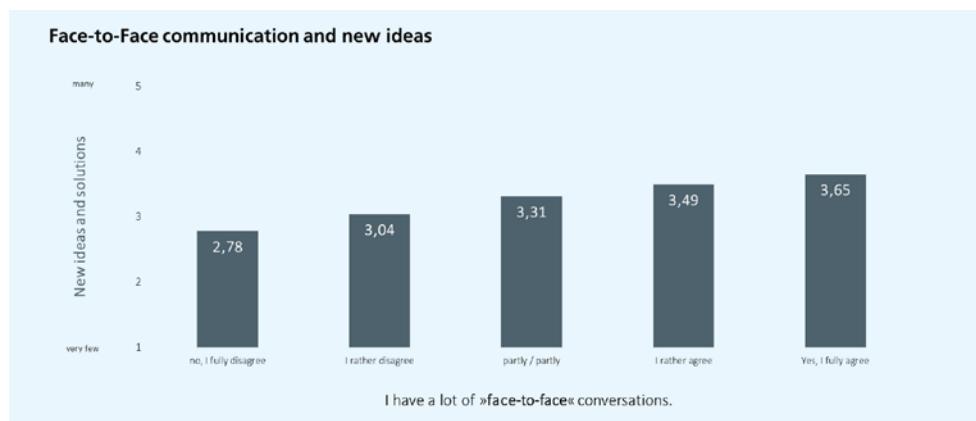


Figure 6: Frequency of face-to-face communication and the impact on new ideas and solutions

So what makes a future office a place for maximum productivity? One aspect we have shown in the second chapter are great digital tools. The other aspect is an overall office design which enhances the well-being and performance of its users and a spatial concept which fosters communication.

A spatial layout with inviting community areas will help to create informal encounters by chance. If different work place settings are available, people can easily choose the right one for any kind of task they need to perform.

Our research shows that the following aspects have a tremendous positive influence on the overall satisfaction with the office environment:

- Enough opportunities to withdraw for concentrated work
- Overall acoustic situation
- IT equipment
- Availability of recreation areas
- Variety of formal and informal meeting spaces
- Having colorful and casual designed work spaces

Our last two hypotheses are concerned with ecology. When it comes to the challenges regarding the climate change, it seems quite obvious that:

1. It is expected that new office buildings will be energy neutral and all kinds of direct and indirect (as well as hidden) energy consumptions will be visualized to the end user.
2. Green technology and especially green IT technology will be mandatory for any company.

But of course – being a sustainable company and act responsible towards nature requires a much more holistic approach which goes far beyond just buying equipment with low energy consumption.

Companies and their employees need to strive for social and ecological responsibility as well. Meaning they must behave ethically and with sensitivity toward social, economic and environmental issues. Let's think about any single product for example. With an holistic approach it's required to have a look at the whole life cycle of the product as well as a supply chain which is based on ecological and ethical standards.

Doing so has a positive impact on the reputation of a company. And companies which incorporate sustainability into their core strategies have a much higher return on investment than companies which hardly take any actions - as a report by CDP shows.

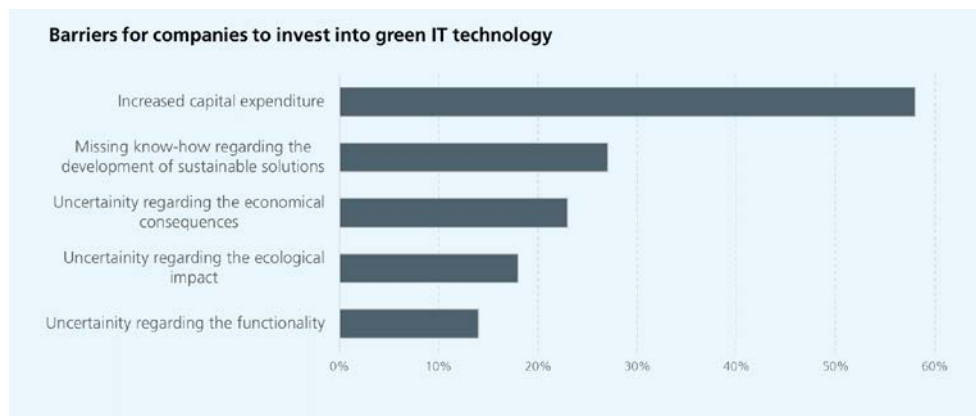


Figure 7: Barriers for companies to invest into green IT technology

Office 21® is a joint research project by the Fraunhofer IAO.

The aim of the Office 21® research project is to identify current and future developments at an early stage and to develop specific options for the successful design and implementation of new working environments within enterprises.

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## Imprint

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