

# CAN WE EVER IMAGINE HOW WORK IS DONE?

The terms 'work-as-imagined' and 'work-as-done' help to convey that the way that people think about work and the way that work is actually done are not necessarily the same. There are several reasons for this. In this article, **Erik Hollnagel** explores the dichotomy and questions our assumptions about work.

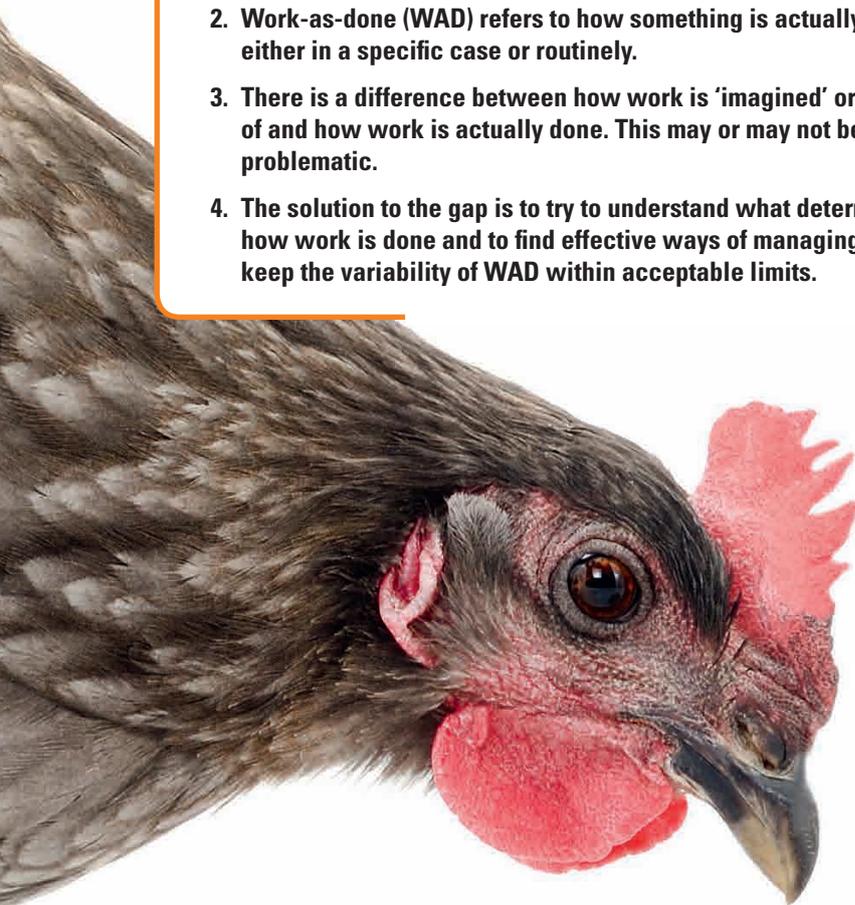
## KEY POINTS

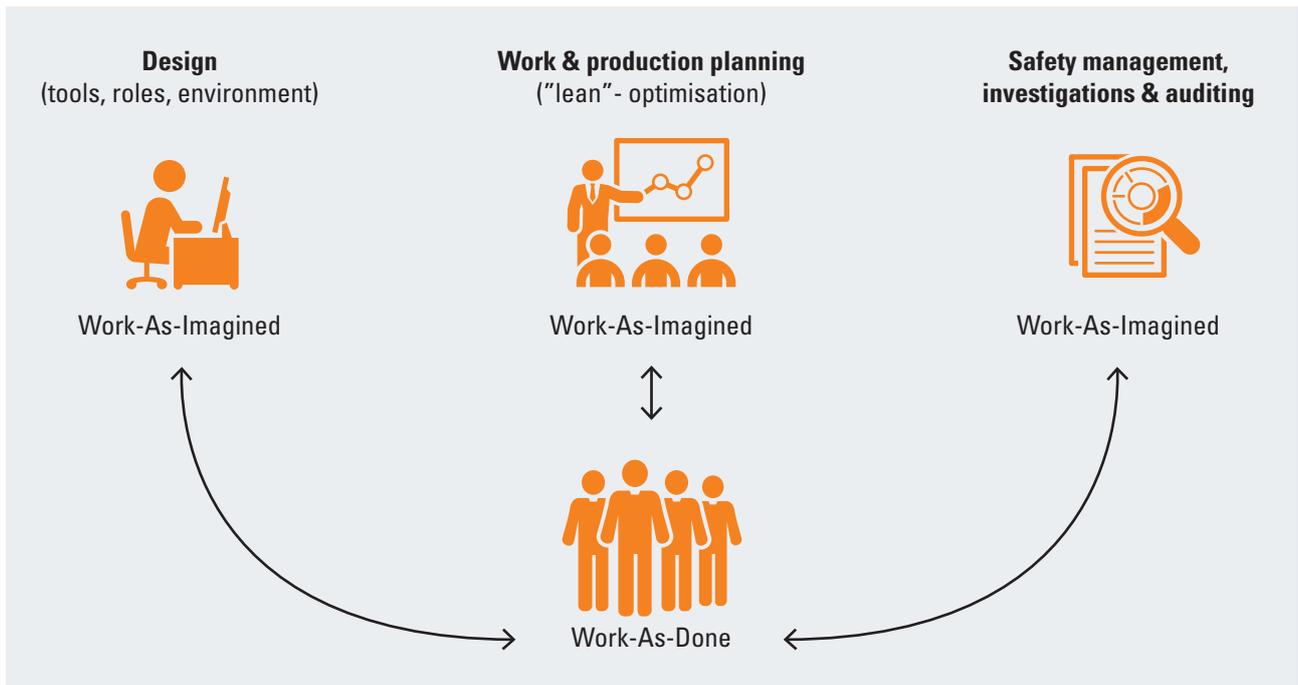
1. **Work-as-imagined (WAI) refers to the various assumptions, explicit or implicit, that people have about how their or others' work should be done.**
2. **Work-as-done (WAD) refers to how something is actually done, either in a specific case or routinely.**
3. **There is a difference between how work is 'imagined' or thought of and how work is actually done. This may or may not be problematic.**
4. **The solution to the gap is to try to understand what determines how work is done and to find effective ways of managing that to keep the variability of WAD within acceptable limits.**

Two terms that frequently crop up in contemporary approaches to safety and to work management in general are Work-as-Imagined (WAI) and Work-as-Done (WAD). They also played an important role in the initial discussions about resilience engineering, as described by Dekker (2006), although the origin can be found much earlier in the French ergonomics tradition (Ombredane & Faverge, 1955).

The meaning of the two terms is – hopefully – obvious. WAI refers to the various assumptions, explicit or implicit, that people have about how work should be done. WAD refers to (descriptions of) how something is actually done, either in a specific case or routinely. There are two main reasons why the terms were adopted in the first place, and why they have become widely used since.

First of all the WAI-WAD dichotomy makes clear that there is a difference between how work is 'imagined' or thought of and how work is actually done. The need to think about how work should be done is found everywhere (cf., Figure 1). There is inevitably a practical need to 'imagine' or think about how work should be done either when trying to improve existing conditions and approaches – often as





**Figure 1: Work-as-Imagined and Work-as-Done**

the result of an accident investigation – or when contemplating new ways of working, including the design of equipment and tools. Design, as David Woods has pointed out, is indeed “telling stories about the future” (Roesler et al., 2001). And telling stories about what may happen in the future requires imagination.

There is also a practical need to think about how work should be done as part of managing and scheduling operations and activities, e.g., to ensure that the right people are on the job or to meet the expectations of customers and clients. And there is finally a need to think about how work should have been done when events are being analysed – which usually means some kind of incident or accident investigation. Unfortunately, this often regresses to inventing stories about the past or proposing explanations in terms of contra-factual conditionals – such as “if only they had done X, then Y would not have happened”. From a Safety-II perspective it is regrettable that the need to explain and understand WAD when something has gone wrong is so obvious and in many cases even mandatory, while it is practically non-existent when something has just worked as it should.

Secondly, the use of the terms can be seen as the (tacit) acceptance that it is impossible, in practice as well as in principle, precisely to prescribe how work should be done. This is because a precondition of WAI is another kind of “WAI”, namely the “World-as-Imagined”, i.e., the conditions that are supposed to exist for the work under consideration. It is often taken for granted that the working conditions are known and that they can be controlled within narrow limits. This condition may be approached in highly regular activities where even small discrepancies are economically unacceptable – chip production, pharmaceuticals – but even here there must be an acceptable return on the considerable cost needed to make compliance possible. Similar conditions are unattainable and perhaps even undesirable in most other industries, including aviation and ATM.

The WAI-WAD dichotomy appears to force the question of whether one is right and the other is wrong. (The question is misleading, but is asked nevertheless.) Historically, the answer has been that WAI was right and WAD was wrong, not in the sense that WAD represented errors or failures but in the

sense that it represented a less effective way of doing something. This meaning can be found in the ‘work studies’ of old, also known as Taylorism or Scientific Management, as well as in modern versions of quality management and ‘Lean’ as found in manufacturing, and increasingly in service industries, including health care. But focusing mainly on the differences between WAI

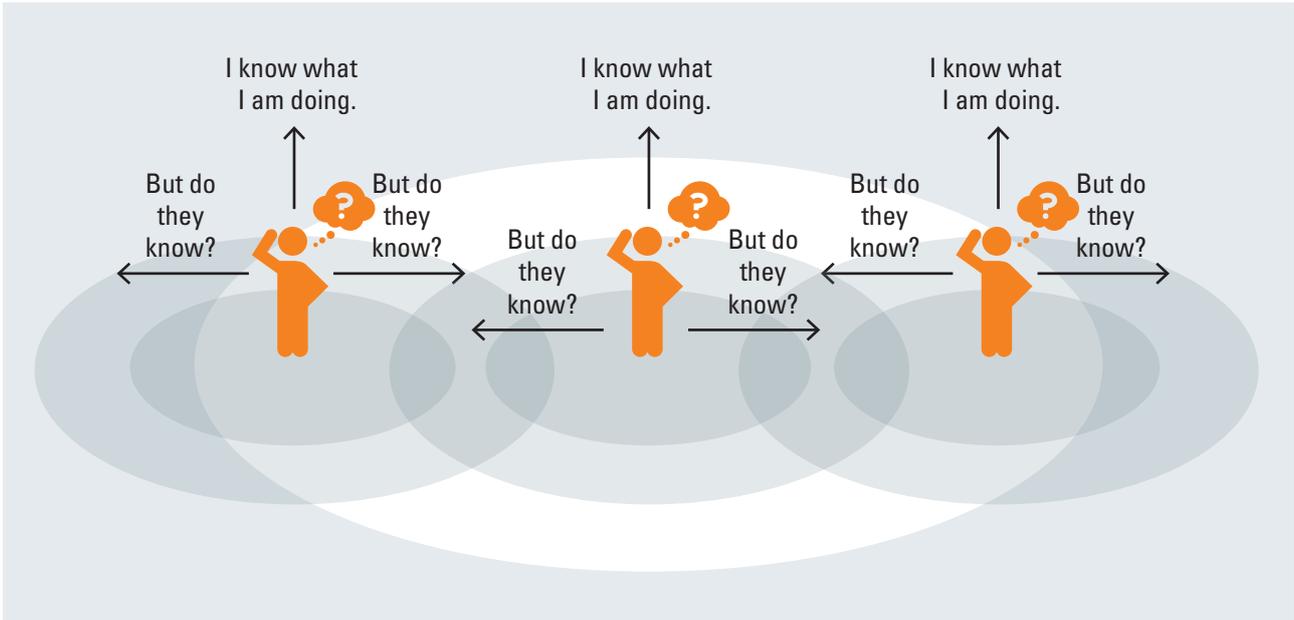
and WAD, and taking for granted that WAI is correct, embraces a Safety-I perspective (Hollnagel et al., 2013). By focusing on the differences,

one also focuses on the deviations – since only differences in one direction usually are noticed. This first of all presumes that we can treat the events as being discrete, when in fact they are always continuous. It also presumes that we can look at them sequentially (as individual steps or components), in accordance with traditional linear thinking.

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### Egocentric and allocentric WAI-WAD

Although WAI and WAD sometimes are used polemically to confront “them and “us” – the blunt end and the sharp end – this is not the only important



**Figure 2: Egocentric and allocentric WAI-WAD**

distinction. Equally important, if not more so, is the distinction between egocentric and allocentric WAI (cf., Figure 2). The former refers to the assumptions that people have about their own work, what they plan to do and how. When we begin work in the morning, for instance, we obviously have an idea about what we should have accomplished by the end of the day and how we should go about it. But we also know that it often may end up differently. The differences that occur in egocentric WAI-WAD are, however, usually easy to reconcile because WAI and WAD are connected in space and time. A mismatch can therefore quickly be noticed and used to revise either the expectations (WAI) or adjust the actual work (WAD).

Allocentric WAI refers to situations where WAI and WAD are separated by space and time. (Allocentric means ‘concerned with others more than oneself’.) It is allocentric because WAI is not about what people do themselves but about what others do; plans and procedures are typically developed away from the actual place of work and by people who do not have up-to-date knowledge about how everyday activities take place. Allocentric WAI-WAD corresponds to the commonly

used distinction between the blunt end and the sharp end. The problem is, however, not just the polemic clash between the two ‘ends’, but rather that it is practically impossible to predict or describe how work that is done by others, at a different time and in a different place, will unfold in practice.

In such cases there are neither possibilities for feedback, revisions, and adjustments, nor many opportunities for learning. People at the (relative) blunt end undoubtedly do their best to imagine

or understand what Work-as-Done – and the “World-as-Is” – will be like. But their job is often made difficult by a lack of time as well as by incomplete, delayed and partly obsolete information. Because the world at the sharp end is a ‘blooming, buzzing confusion’ made up of countless, interconnected systems, the blunt end must try to make ends meet by relying on approximate adjustments in their reasoning.

### WAI and the Zero Accident Vision

Safety-I tacitly assumes that work can be completely analysed and prescribed and that Work-As-Imagined therefore will correspond to Work-As-Done. A good example of that is the Zero Accident Vision (ZAV), which has been

expressed as follows: “ZAV is based on a belief that all accidents are preventable. If accidents are not preventable right away, then this should be feasible in the longer run. The aim of ZAV is to encourage people to think and act in a manner that supports the vision that all accidents are preventable.” (Zwetsloot et al., 2013). One tenet of the ZAV is the insistence on “simple and non-negotiable standards” – in other words that it is possible to define and enforce a common, simple set of standards that guarantees that work will be perfect.

But the more intractable environments that we have today means that Work-As-Done will differ significantly from Work-As-Imagined. Since Work-As-Done by definition reflects the reality that people have to deal with, the unavoidable conclusion is that our notions about Work-As-Imagined are inadequate if not directly misleading. This constitutes a challenge to the models and methods that comprise the mainstream of safety engineering, human factors, and ergonomics. It also challenges traditional managerial authority. Safety management must correspond to Work-As-Done and not rely on Work-As-Imagined. Safety-I begins by asking why things go wrong and then tries to find the assumed causes to make sure that it does not happen again – it tries to re-establish Work-As-Imagined. The alternative is to ask why things go right (or why nothing goes wrong), and

**Safety management must correspond to Work-As-Done and not rely on Work-As-Imagined.**

then try to make sure that this happens again. A practical implication of this is that we can only improve safety if we get out from behind our desks, out of meetings, and into operational environments with operational people.

### Can we ever imagine how work is done?

Returning to the question that serves as the title of this note, the answer is the typical human factors reply of “Yes, but ...”. The answer is on the one hand affirmative, because we certainly can imagine how work is (to be) done if we try, especially if we pay attention

to what actually happens instead of relying on what we imagine should happen or should have happened. On the other hand, the provisory “but” signifies that we should not expect ever to achieve a perfect match. The solution is neither to force WAD to comply with WAI – as in the ZAV and Lean – nor to modify WAI so that it corresponds to WAD. Work-as-Done is a moving target because working conditions, demands, and resources rarely are stable. The solution is rather to try to understand what determines how work is done and to find effective ways of managing that to keep the variability of WAD within acceptable limits. The

way that work is actually shaped by the working conditions and environment is the best basis for making improvements as well as for identifying hazards. The difference between WAI and WAD should not be looked at simply as a problem that ought to be eliminated if at all possible. The difference should instead be seen as a source of information about how work is actually done and as an opportunity to improve work. **S**

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