AN INTRODUCTION TO THE SHELL MODEL

Discover what it is and how it can help your business
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INTRODUCTION

In this short ebook we're going to give you an introduction to the SHELL model which is widely used in Human Factors.

The SHELL model was first developed in 1972 and later built upon in the mid 1980s into the framework we'll take you through in the following pages.

The history of the model lies in the aviation sector but it's been adopted as a useful Human Factors tool that is widely used across many other industry types today such as oil & gas, healthcare, transport and finance.

The first part of the SHELL model looks at Software.
SOFTWARE

WHAT DO WE MEAN BY SOFTWARE?

Software isn't just computer programs - it's procedures, checklists and symbology.

Even the most basic signs can end up being confusing as in the example below.

Being buried under huge amounts of text makes it impossible for users to follow procedures correctly. And that's when procedures can start to go underground.

Someone jots down their own guidelines to follow, then someone else does, and a few more too because the official procedure just doesn't make sense.

Before you know it, multiple versions of the same procedure have been 'black booked'. This means the business has no control over what's going on and there's no accountability amongst staff because the company hasn't supplied software that's fit for purpose.

Doing things the wrong way can cause accidents. This could even result in the oil platform you are working on being shutdown at great expense.

Worst case, you or a colleague could die as a result of a catastrophic mistake.

Processes and procedures that have been developed in conjunction with the end users, rather than for them by someone else, engenders buy-in, clarity and relevancy.

Just because things have been done a certain way for years, doesn't mean that's the right way or the best way.

Software should always have people at its heart.

The next stage of the shell model is Hardware.
WHAT DO WE MEAN BY HARDWARE?

Hardware is any physical thing you interact with. For example, hardware could be a spanner, a cockpit or the switches in a control room.

When any hardware related components are engineered without the end user in mind, you’ve got problems.

Hardware that’s not fit for purpose can result in a number of human factors issues such as:

- Stress and fatigue
- Difficulty operating equipment
- Lack of attention
- Poor concentration

There’s an old saying “a bad workman blames his tools” but in many cases, it really is the tools at fault.

This is a true story: A military aircraft was designed with the flap lever and the engine shut-off lever right next to each other and these were out of sight of the pilot while he was flying.

The levers had different textures, but pilots wear gloves and couldn’t easily distinguish between the two. During a demanding training sortie, one pilot inadvertently shut down his engine in mid-flight because he operated the wrong lever.

This is an extreme example, but similar hardware issues manifest themselves in all industries.

Hardware, where the design does not adequately consider the end user, is going to negatively impact the operator day in, day out.

The best way to avoid this situation is to get the end users involved in the design process from start to finish so the hardware does what it should and facilitates successful end user operation.

People need the right tools for the job. Full stop.

Next up is the Environment.
WHAT DO WE MEAN BY ENVIRONMENT?

The environment can be natural elements such as the weather, temperature and visibility and can also include man-made things such as confined spaces, noise and lighting.

In some cases, the working environment may be a combination of natural and man-made elements.

Many environmental conditions result in various human factors issues such as fatigue, stress, lack of attention and poor concentration. These individual elements all have a negative impact on the person doing the job.

For example, did you know you’re twice as likely to make a mistake on your 4th night shift in a row than someone who’s on their 4th consecutive day shift?

A stressed out employee is not a productive one. If there’s a problem, make sure you speak up about it. The only way someone can come up with a solution to make the environment better for everyone, is if they know about the issue in the first place.

Too much fatigue and stress results in accidents. Half the battle in dealing with environmental factors is being aware of the problem. So, what can you do?

Take time to THINK about your environment such as the temperature, lighting and noise levels.

Simple remedies for this could be air conditioning and blackout blinds for your accommodation and starting a buddy-buddy system. That way you can keep an eye on how environmental factors are affecting a colleague’s mood and performance - and they can do the same for you.

Remember, awareness of your environment is critical to putting things right.

The two L’s in the SHELL model are Liveware and Central Liveware.
SO WHAT IS LIVEWARE?

You are central liveware. And liveware is simply other humans such as the colleagues, customers and suppliers you interact with at work.

Liveware covers all methods of human interaction, not just face to face - for example radio, email etc.

You may remember the famous incident where a US warship radioed a lighthouse keeper.

“We are a US Warship and you're in our way, please move immediately.”

“But I am a lighthouse!”

Well intentioned communication can very easily miss the mark. Two different people can interpret exactly the same instructions in a different way.

The Two Ronnie’s sketch about four candles and fork handles is a great example of this. That may have been a staged humorous example, but these kinds of misunderstandings can occur all too easily.

When people from different cultures are working together, confusion can easily arise and serious accidents/incidents may happen as a result.

But who’s really to blame?

Ineffective leadership often manifests itself as not listening to the problem. The problem itself is the most important thing, not the status or the rank of the person who identified and reported it.

Think about the bigger picture. Beware of the context and situation people find themselves in.

You’re a better leader if you listen and act accordingly.

Liveware is too important to be ignored.
SUMMARY

The SHELL model is a well known framework in Human Factors which helps with the identification of issues within working environments and in high-risk industries such as oil & gas. Utilising the SHELL model can help save people’s lives and save businesses money.

By putting the individual (Liveware), at the heart of everything that goes on within an organisation, the SHELL model will highlight areas for improvement throughout. If you have any questions about the SHELL model or Human Factors in general, we’d love to hear from you.