

On the right track

Ian Florance meets **Suzanne Heape**, a Senior Human Factors Engineer

Reading railway station is being given a face lift. I had trouble finding Platform 7 which was, for some reason, next to Platform 4. The train to Chippenham was on time and I exited past a retail park. Suzanne Heape, Invensys Rail's Senior Human Factors Engineer, met me at the back exit of Langley Park, the now somewhat run-down former Westinghouse HQ, which is where her company is based. I'd come to talk to Suzanne, a psychology graduate, about her career in ergonomics. We sat in a meeting room next to a huge open-plan office where, among other tasks, people were simulating new signalling systems along sections of the rail network. That's

Invensys Rail's business: providing safety-related rail automation, control and signalling systems. Suzanne was involved, as an example, in the upgrade of London Underground's Victoria Line. What does psychology contribute to rail travel and how did Suzanne move into this area of work?

'I want what I do to make a difference'

'Psychology seemed quite a good choice as a university course. Like 50 per cent of other students I started off thinking I wanted to be a clinical psychologist. I hadn't realised, however, how much of a psychology degree involved maths and statistics. This didn't grab me, but, in retrospect, I'm glad I went to Hertfordshire where we actually did three years of statistics. It's been incredibly useful in my work and I think students should look at how this area is covered when choosing a course.' Did she develop a preference for a particular psychological application? 'I found the cognitive side interesting, but it seemed difficult to relate to real life. I like things to be logical but visualisable, and I want what I do to make a difference. When I'd finished my degree I applied for all sorts of jobs, but finally an IT company looking for non-IT staff offered me a job and I stayed there three years. I found I wasn't a natural software writer and, in the end, got involved in usability, which, I

suppose, is where my ergonomics career started. Work on IT usability used to focus on the storyboards for software interfaces without taking users into account – nowadays IT companies tend to use specialists and do look at how their products will work in real life.'

Unsure of where to go next, Suzanne got careers counselling and was asked whether she'd ever heard of ergonomics. 'I hadn't, but it sounded interesting, so I rang up Human Engineering, which was then a leading ergonomics consultancy, to find out a bit more about the role. I was lucky that I turned up dressed smartly to pick their brains since it turned out they interviewed me for a job. I got another interview with them and each time I came second, for the simple reason that I didn't have an ergonomics qualification. So I went out and got one. My partner insisted I go on the best course and I graduated with an MSc from Loughborough in 2001. I found it absolutely fascinating.'

Perfect bedfellows?

For those of you who've only come across ergonomics when your chair or work station is examined for compliance with legislation, ergonomics looks at interactions between people and systems and applies theory and data to help design systems that maximise performance and, as we'll see, ensure safety. In some countries and sectors the discipline is known as human factors and there are specialisms within the field: physical, cognitive and organisational. Different courses specialise in different areas, for example Cranfield in air, Nottingham in rail-based, Surrey in physiological factors.

Ergonomics seems to work in the same sort of arena as occupational psychology. 'In old-fashioned terms, occupational psychologists tend to work more on white-collar issues – how teams work together; motivation; coaching; leadership. Their obvious point of contact is the HR function. We tend to work on blue-collar systems – production lines;



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engineering and IT systems. We have to work directly with many different functions. The boundaries are blurred but that gives some feel for it.'

When her husband moved to Bristol, Suzanne got a job in a small consultancy, 'which wasn't a happy experience though it helped me learn about work. University doesn't prepare you for business report writing and it's a critical skill.' Armed with her ergonomics qualification she finally moved to Human Engineering, the company that had started her on the route. 'I was there for five years and 70 per cent of my time was spent on rail-related work, though I was involved in projects in other areas including medical devices, air traffic safety and office design. The ergonomics of medical devices demands very high standards of care and ethics. You're trying to ensure that devices like insulin pens – I worked on these – are designed to avoid human error, the results of which could be calamitous. I was also involved in a two-year project looking at display screen work stations in offices for a Welsh organisation, the application of ergonomics that many office workers come into contact with and which they sometimes criticise as part of an over-zealous health and safety culture.'

Talking of which, I'd noticed that most of the people working in the office were men, and railways involve experts in engineering and applied technologies. Did Suzanne find it hard to gain acceptance in this environment, not least because ergonomics might seem a rather 'soft' science? She was nodding vigorously before I'd finished the point. 'It's still an uphill struggle, though we're getting there. I'm surrounded by engineers, IT technicians and others who see ergonomics as a value-add – a checklist that has to be ticked at the end of the project. Ergonomics is often seen as something that will "keep the client happy". This was particularly true in working on the signalling systems on the Victoria line upgrade where the internal engineers were very dismissive at first. But your task is the same as everyone else's – to prove that you're a help not a problem. So the key thing is to solve problems, rather than just demand attention. You make things easier, not just more pretty! The positive aspect of ergonomics is that projects tend to be long term so you have time to build up trusting relationships through a series of small wins.'

According to Suzanne, another problem is more organisational. 'A lot of our work is based on bids. We tend not to be included in the original bid so we're often seen as an extra end-of-project cost,

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eating away at profits. You have to be involved right at the beginning, and I now go to bid team meetings. This improves relationships with project managers.

'I think you can see that that you need good personal skills in this sort of environment and my psychology training is invaluable in helping me communicate and work with vastly different sorts of people. Experience in a consultancy helps build on these skills by giving you a privileged insight into how business works. You get a wider view than you

would in any other sort of role. You also get flung in at the deep end – my first job at Human Engineering was writing a proposal, something I'd never done before, and another area students should think about if they're planning to go into any sort of large organisation.'

Air traffic control centres for the rail system

Suzanne moved to Invensys in 2008 having decided to start a family. 'I'd done

enough consultancy. I wanted to see more projects through from start to finish and get more feedback.' She's very involved in a bid to replace signalling and points systems across Network Rail. 'Without going into too much detail, the project will gradually replace the old style of controlling the system with much more complex PC-based systems. Old-style signal boxes with levers still exist, controlling the track that a signal person can see. They pose physical ergonomics problems. At the top level there are going to be control centres, with seven to eight people running a very wide area though quite complex control systems. You can see these as something like air traffic control centres for the rail system. Across the network 800 control centres will be

replaced by 14 new ones at much higher degrees of complexity. Workers here will have to monitor what's going on, look at traffic loading and get involved if things start going wrong.' Does Suzanne understand all the technologies involved in railways? 'Not in depth. I'm no expert in fibre optics for instance. But I've done a signalling course and driven a train in Sweden.' I was hugely impressed by this latter point and Suzanne smiles at this. 'You have to understand the processes of a person doing a job and how a system is built. The degree of technical knowledge you require depends on the sort of ergonomics you're doing.'

One of the most high-profile applications of ergonomics – even if the media didn't use that word – was the

signal array on the line outside London's Paddington Station. This became a matter of huge controversy in the aftermath of the 1999 rail crash. 'Yes, I got involved with the array after the crash. We looked at issues like contrast in the lights, how well they communicated in different seasons, their height. When rail signals are close to traffic lights we quite often have to look at how far they interfere. This is a good example of how exciting and important ergonomics work is and the real sense it gives of making a difference.'

I asked Suzanne to describe the stages she goes through in a typical ergonomics project. 'You start with an integration plan to show how your work fits in with the total project. Then you observe and

A road less travelled

Laura Tozer wrote this article at 'Arco Iris' (which translates as 'Rainbow Centre') in a small Peruvian town called Urubamba. How did someone with a BSc and MSc in psychology end up working there, and what does she do?

I started working in an NHS adult mental health service after my education. Two hours commuting into London and back every day made life rather wearisome, so I decided I needed to do something different. I knew I wanted to work with children and help others, so I got a job working at my local special needs school for nine months. This was invaluable preparation for the next big step, which involved travelling 6320 miles from England to volunteer for a UK NGO, Kiya Survivors. I stumbled across the organisation online and I knew instantly this was the charity I wanted to work with. I liked their ethics, aims and ambitions.

The organisation works with children with special needs and those who have been abused, abandoned and neglected. It was founded by Suzy Butler in 2000 after she came across a young boy with autism who had been left on the streets of Peru. She soon realised there was a chronic lack of facilities to look after children with special needs and hence Kiya Survivors was born. Kiya means 'New Moon' in Quechua, the local indigenous language. It's the perfect name to represent what Kiya Survivors offers – a new chance and opportunity for children to make the most of life.

The 'Rainbow House' was founded in 2008, as a home that offers a stable and loving environment. It immediately acquired five very grateful occupants. Subsequently a sixth child joined after both her parents died. These six are supported by two 'tutoras' who act as substitute mothers.

The Kiya Survivors team at the Rainbow Centre consists of social workers, a psychologist, teachers and of course, volunteers. Everyone has a different role, but we all work together to provide for the 50 children and their families Kiya Survivors currently supports. The atmosphere at the centre gives no hint of tragedy or sadness but a feeling of hope that is critical for the children and the workers.

When we go on outings, our children are often the subject of stares and sideways comments, mainly because of a lack of understanding about children who may look or act differently. Children with special needs were always thought to be 'the Devil's children', but we are changing this perception by showing the community our children's amazing achievements. The Rainbow Centre leads all the other schools in marches around the 'Plaza de Armas' in Urubamba when celebrating special occasions and as a result the children are becoming more accepted by the local population and more self-confident. Whereas the team once had to knock on people's doors to check if a special needs child lived somewhere, now parents knock on our door, asking for help and an education for their child.

I have been here for five months and have witnessed poverty I couldn't have imagined before this experience. I have heard stories of children being abused, sleeping amongst animals and having no

clean water or food or a safe place to live. For example, a girl of 15 who has attended the Rainbow Centre for many years was abused by multiple family members as a young girl. She has Down's syndrome and her family lacked the education to understand why she was different. She was found when the Kiya Survivors outreach team heard of her plight. This is one of the organisation's many roles – to go out into the community and help impoverished, uneducated families and educate them about special needs children. The team



worked closely with the family and accepted the young woman at the Rainbow Centre, and she no longer suffers neglect.

Why should she return to a mother who allowed her to be subject to such mistreatment? It's a question I asked myself. The answer is that we try to keep families together and with help from Kiya Survivors and our team of social workers, her mum has learnt to protect, help and love her daughter, recognising her strengths. For Kiya Survivors, the focus is not solely on the children; we work

interview people using the existing system before creating a description of the users – their visual and physical capabilities for instance. This leads to a set of user requirements which you discuss with the design team, creating a predictive task analysis. There's then a phase in which you develop the human-machine interface, by defining the human-machine interface style and design then writing an interface guidance document that can be used by software and hardware designer and developers in producing the system prototype. You take this to the users and there are a series of iterations of usability testing. You take the system back to the designers, improve it, and try it out again. We use computer-aided design and simulations a lot at this

stage. In the end the system is signed off, handed over to safety and implementation teams and there's a built in follow-up process.'

We walked back through the offices where large areas are designated for specific projects. What is Suzanne's biggest challenge? 'I'd like a bigger team and the ability to influence project design earlier so that ergonomics is a core discipline, not something you have to fight to get its due importance.' Suzanne

seems very enthusiastic in talking about the whole area. 'It makes a difference and a wide spectrum of psychology knowledge helps make it effective. It would be nice to see more psychologically trained students entering the discipline. There's enough work to do.'

And, as you can imagine, I looked out of the train window on my journey back from Chippenham to Reading with new eyes and, I have to say, a greater sense of reassurance.

FEATURED JOB

Job Title: Clinical Psychologist (Child and Adolescent Specialty); Highly Specialist Clinical Psychologist
Employer: Health and Social Services, Guernsey



'Guernsey is geographically and politically separate from the rest of Britain,' says James Murray, Head of Profession for Psychology. 'While it is a relatively small place, with around 60,000 inhabitants, almost all of the health and social care has to be provided locally, and so every professional needs to have a real breadth of skills and be prepared to take on a wide variety of work.'

Two posts are advertised. What type of psychologist are you looking for? 'For the disability post, we are looking for a psychologist with enough breadth and depth of experience in the field of disability and autism to be able to provide a high-quality service for children and families,' Murray replies. 'The successful candidate will also need to be able to work alongside multidisciplinary colleagues. For the Looked After post, we are looking for a "hands on" psychologist who can work creatively with young people in their own environments and build relationships with them, alongside providing support and training for the adults that care for them. This may mean working within a residential unit, a secure environment, with foster carers, or out in the community.'

Will the successful candidates find much distinctive about living and working in Guernsey and the health and social services system, in comparison with the mainland? 'In our experience, the best psychologists for our particular environment are those that can balance the need to work independently with whatever comes their way, with the need to consult with colleagues, use supervision effectively, and keep up to date with UK best practice. Our health and social services system is very similar to the UK, but there are some important differences – our GPs are all in private practice, and charge for appointments; our senior managers and political leaders are much closer and easier to communicate with; and of course our health and social services are in one single department, which makes some kinds of planning and service delivery better coordinated.'

What is it like to live and work in Guernsey? 'In many ways it's a fantastic place to live – we have a great climate, sunny beaches, a safe, friendly atmosphere, and no long-distance commuting. But it can also be a challenge – the cost of living is high, the mainland is an hour's flight away, and it's a place where everybody seems to know everybody else's business. The breadth of work each psychologist is responsible for is also both a benefit and a challenge – clinical work never feels repetitive, but trying to keep up to date across a wide field can be hard work. We are fortunate that as a psychology service we control our own CPD budget and can fund training according to our own priorities.'

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holistically to improve all aspects of a child's socio-economic situation. Parental roles are treated as critical to children's well-being. We recently held a 'Parents Day' which many parents attended. They worked together in groups at the school, discussing their experiences of parenting a child with a learning difficulty. Many parents do not receive the help and support we are lucky enough to have in England and don't have access to a social welfare fund. They rely entirely on family and friends and Kiya Survivors works where the extra challenge of a child with a learning difficulty can overwhelm this extended family network.

We recently hosted a campaign where we travelled to more isolated, indigenous communities to spread the important message of dental hygiene. The children treated the toothbrushes and toothpaste we handed out like precious gifts, but the real value of such initiatives is to provide children with love, hope and support. These outreach projects find new families who need help, and the team identifies how to make that help sustainable. We recently visited a mother and her son whose husband had died of TB. She was struggling to cope, in one windowless room with animals roaming around where they ate, slept and cooked. At the end of our visit, she pleaded with us to give her basic supplies such as food, clothes and electricity. Kiya Survivors plans to raise some money to provide her and her son with a better life. Sadly she is not an isolated case.

This might seem an exotic environment for someone trained in psychology to work, but I can't think of a more rewarding one.

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